

ANNUAL REPORT
OF THE
METEOROLOGICAL
AND THE
SEISMOLOGICAL OBSERVATIONS
MADE AT THE
INTERNATIONAL LATITUDE OBSERVATORY
OF MIZUSAWA
FOR
THE YEAR 1928.

LATITUDE $39^{\circ} 8'$ N., LONGITUDE $141^{\circ} 8'$ E.,

HEIGHT ABOVE MEAN SEA LEVEL 61 METRES.

PUBLISHED BY THE INTERNATIONAL LATITUDE OBSERVATORY
OF MIZUSAWA.

1929.

The present report gives the results of the meteorological and seismological observations made at this observatory during the year 1928. No alteration has been made in the nature and methods of observation. The observations and the calculations were made by Messrs. 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 observations—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. In the total number of days only those, on which the amount is 0.1mm or more in the day, are reckoned. But all the days, on which snow, hail, or graupel fell, are included without reference to the amount.

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.—1.7m above the ground,

Anemometer.—15.4m above the ground,

Wind vane.—16.6m above the ground,

* 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	Cumulo-cirrus
↖	Lightning without thunder	ψ	Lunar corona	SC	Strato-cirrus
△	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	ℳ	Wave cloud
~	Glazed frost	⊜	Ice Column in the ground	Z	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

July, 1929

H. Kimura, Rigakuhakushi

Director of the International Latitude Observatory
in Mizusawa.

SEISMOLOGICAL OBSERVATIONS

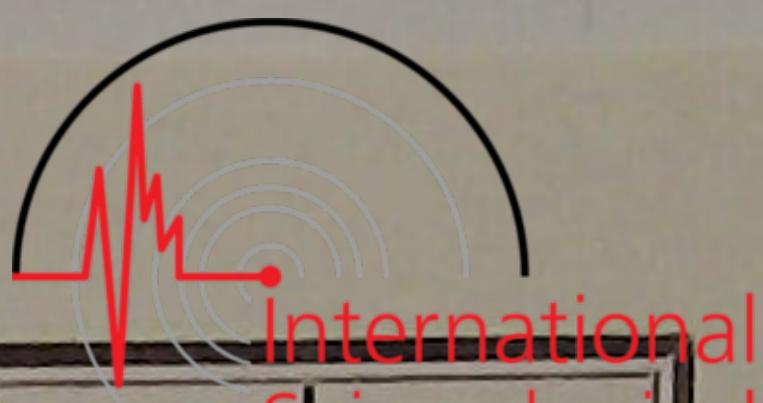
TABLE A.

(Earthquakes)



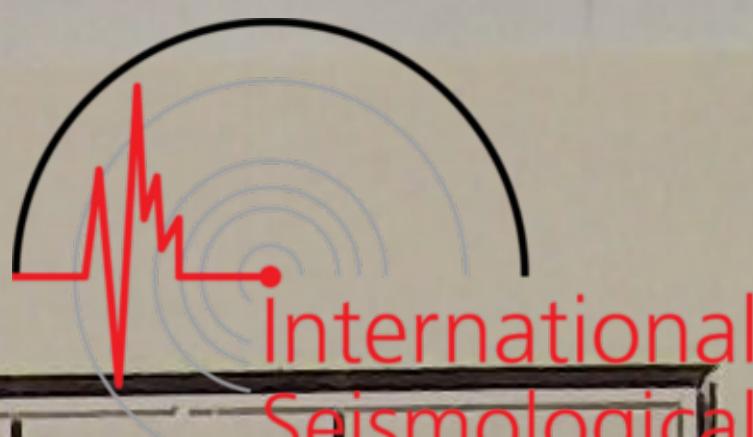
No.	Date 1928	P				S				L				Duration of Total Earthquake (mean)	Maximum Range of Motion			Character of Motion	Intensity	Remarks	
		E	W	N	S	E	W	N	S	E	W	N	S		E	W	N	S			
1	Jan. 1	h 7	m 17	s 54		m 17	s 55	m 18	s 33	m 18	s 38	m —	s —	8.8	mm 0.29	mm 0.30	Slow	Feeble			
2	1	18	46	49		46	51	49	28	49	35	—	—	10.2	0.16	0.20	"	"			
3	4	21	—	—		39	28	—	—	43	39	—	—	30.0	—	0.09	"	"			
4	8	2	06.0			—	—	06	15	—	—	—	—	?	0.01	—	"	"			
5	8	10	07.5		?		—	08	27	?	—	—	—	?	0.02	0.02	"	"			
6	11	13	51.5			—	—	52	11	—	—	—	—	?	0.01	—	"	"			
7	12	18	43.9			—	—	44	32	—	—	—	—	?	0.03	—	"	"			
8	14	18	18	08		?	—	18	39	18	40	—	—	4.4	0.02	0.02	"	"			
9	16	4	08	58		?	—	09	31	09.7	—	—	—	4.4	0.03	0.03	"	"			
10	17	17	?	—	—	—	—	25	40	—	—	—	—	?	0.01	—	"	"			
11	18	13	?	—	—	—	—	13	32	—	—	—	—	?	0.01	—	"	"			
12	20	6	?	—	—	—	—	29	38	—	—	—	—	?	0.01	—	"	"			
13	20	16	42	16		—	—	42	29	—	—	—	—	1.6	0.01	—	"	"			
14	24	10	20	15		?	—	20	31	20	33	—	—	3.4	0.06	0.05	"	"			
15	24	21	36	46		?	—	37	32	37	30	—	—	5.5	0.03	0.04	"	"			
16	26	18	?	—	—	—	—	12	33	—	—	—	—	?	0.01	—	"	"			
17	26	18	53	28		53.6	—	51	41	54	41	—	—	20.6	0.02	0.06	"	Weak	Felt		
18	27	15	39	58		39	58	40	08	40	08	—	—	3.8	0.12	0.10	Quick	Feeble			
19	30	11	?	—	—	—	—	16	43	—	—	—	—	?	0.01	—	Slow	"			
20	Feb. 2	22	35	21		—	—	35	55	—	—	—	—	4.5	0.01	—	"	"			
21	3	14	—	—	?	—	—	—	—	?	—	—	—	?	—	0.10	"	"			
22	3	18	—	—	49	42	—	—	50	02	—	—	—	9.2	—	0.45	"	"			
23	3	22	12	56	—	—	—	13	15	—	—	—	—	4.2	0.01	—	"	"			
24	5	5	30.1	—	—	—	—	30	30	—	—	—	—	?	0.01	—	"	"			
25	7	0	—	—	?	—	—	?	—	—	—	—	—	?	—	0.13	"	"			
26	10	9	21	46	?	—	—	22	18	22	17	—	—	4.7	0.05	0.05	"	"			
27	11	21	11	09	11	08	—	11	42	11	40	—	—	11.4	0.51	0.54	Quick	Weak	Felt		
28	12	13	46	01	—	—	—	46	15	—	—	—	—	4.6	0.04	—	Slow	Feeble			
29	13	5	?	—	?	—	—	39	37	?	—	—	—	?	0.01	0.03	"	"			
30	13	5	?	—	—	—	—	?	—	—	—	—	—	?	0.01	—	"	"			
31	15	17	?	—	—	—	—	06	03	—	—	—	—	?	0.02	—	"	"			
32	21	19	56	25	?	—	—	62	28	?	—	66	53	66	22	48.1	0.03	0.27	"	"	
33	22	15	09	03	—	—	—	09	23	—	—	—	—	4.1	0.02	—	"	"			
34	22	17	34	17	—	—	—	34	37	—	—	—	—	2.5	0.01	—	"	"			
35	Mar. 1	7	02	42	?	—	—	03	35	03	36	—	—	5.1	0.03	0.03	"	"			
36	1	21	28	51	—	—	—	29	29	—	—	—	—	3.5	0.01	—	"	"			
37	2	0	?	—	?	—	—	36	46	?	—	—	—	?	0.02	0.03	"	"			
38	2	10	?	—	—	—	—	56	43	—	—	—	—	?	0.01	—	"	"			
39	3	9	?	—	—	—	—	45	55	—	—	—	—	?	0.01	—	"	"			
40	3	17	?	—	—	—	—	21	43	—	—	—	—	?	0.02	—	"	"			
41	4	21	?	—	—	—	—	02	39	—	—	—	—	?	0.02	—	"	"			
42	7	22	50.3	—	?	—	—	56.8	—	—	—	—	—	?	0.01	0.10	"	"			
43	8	18	15	41	?	—	—	15	56	15	56	—	—	3.9	0.10	0.12	"	"			
44	9	0	29	38	?	—	—	30	22	30	22	—	—	9.3	0.11	0.06	"	"			
45	9	17	44	36	?	—	—	45	24	—	—	—	—	4.6	0.02	0.02	"	"			
46	9	18	15	58	16.1	—	—	24	36	24	28	41	19	38	46	117.8	0.70	2.85	"	"	
47	13	18	40	06	?	—	—	46	32	46	37	49	48	49.9	42.6	0.01	0.04	"			
48	14	7	47	40	?	—	—	47	46	47	47	—	—	3.4	0.07	0.10	Quick	Weak	Felt		
49	14	16	58	54	—	—	—	59	33	—	—	—	—	3.7	0.03	—	Slow	Feeble			
50	16	5	12	00	12	01	—	20	50	20	52	28	18	28	10	105.0	0.03	1.00	"	"	
51	16	14	47	19	47	33	—	47	42	47	57	—	—	3.7	0.04	0.02	"	"			
52	17	10</																			

TABLE A.
(Earthquakes)



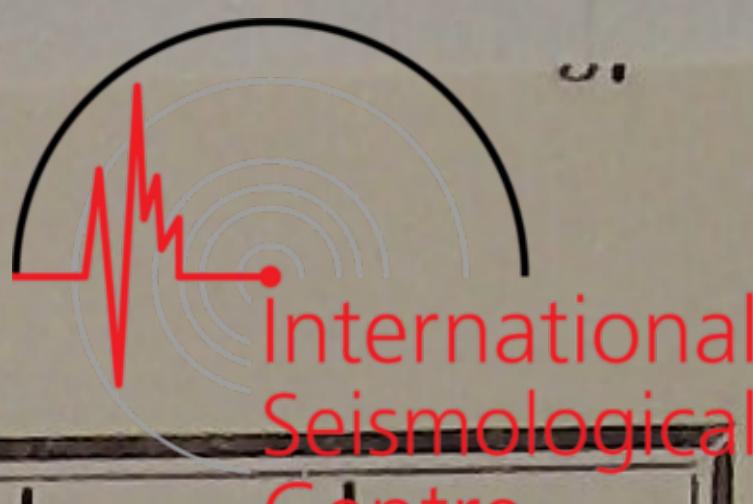
No.	Date 1928	P			S			L			Duration of Total Earthquake (mean)	Maximum Range of Motion		Character of Motion	Intensity	Remarks		
		E	W	N	S	E	W	N	S	E	W	N	S	E	W			
56	Mar.	h	m	s	—	m	s	—	—	m	s	—	—	m	mm	mm	Slow	Feeble
57		16	?	25	—	—	—	23	04	23	05	—	—	?	0.00	—	"	"
58		1	22	25	?	—	—	34	05	—	—	—	—	5.1	0.05	0.05	"	"
59		5	?	—	—	—	—	09	27	09	27	—	—	?	0.01	—	"	"
60		5	08	00	08	00	—	09	27	—	—	—	—	22.6	0.92	1.06	Quick	Weak
		2	?	—	—	—	—	09	16	—	—	—	—	?	0.02	—	Slow	Feeble
61	Apr.	6	7	?	02	—	—	?	—	—	—	—	—	?	0.01	—	"	"
62		6	10	34	02	—	—	34	39	—	—	—	—	3.4	0.01	—	"	"
63		9	2	?	—	—	—	?	—	—	—	—	—	?	0.01	—	"	"
64		13	16	37	15	?	—	37	49	37.8	—	—	—	4.4	0.04	0.03	"	"
65		15	10	?	—	—	—	?	—	—	—	—	—	?	0.01	—	"	"
66	May	16	3	50	57	—	—	51	30	—	—	—	—	4.5	0.02	—	"	"
67		16	8	44	16	—	—	45	11	—	—	—	—	8.5	0.04	—	"	"
68		16	19	53	13	53	11	53	25	53	23	—	—	2.5	0.08	0.08	Quick	Weak
69		18	17	27.6	—	—	—	28	03	—	—	—	—	?	0.01	—	Slow	Feeble
70		18	19	35	08	35.2	—	45	20	45	20	65	36	64.7	61.1	0.02	0.40	"
71	May	21	11	01	50	?	—	02	18	02	18	—	—	5.6	0.05	0.10	"	"
72		21	15	?	—	—	—	34	40	—	—	—	—	?	0.01	—	"	"
73		22	4	56	52	56	50	58	08	58	10	—	—	10.5	0.32	0.45	"	"
74		25	23	?	—	—	—	52	32	—	—	—	—	?	0.00	—	"	"
75		1	9	30	51	?	—	31	15	31	15	—	—	4.3	0.02	0.02	"	"
76	May	1	11	?	—	—	—	42	47	—	—	—	—	?	0.00	—	"	"
77		1	11	?	—	—	—	46	25	—	—	—	—	?	0.01	—	"	"
78		4	2	36	01	—	—	36	31	—	—	—	—	5.6	0.01	—	"	"
79		6	11	05	54	—	—	06	17	—	—	—	—	2.5	0.01	—	"	"
80		8	4	48	54	48.9	—	51	03	51	03	—	—	?	0.42	0.33	"	"
81	May	8	4	?	—	—	—	59	53	59	53	—	—	?	0.03	—	"	"
82		12	10	?	—	—	—	20	31	—	—	—	—	?	0.01	—	"	"
83		14	7	?	—	—	—	00	28	?	—	—	—	?	0.03	0.02	"	"
84		14	16	?	—	—	—	16	05	?	—	—	—	?	0.01	0.01	"	"
85		14	22	34	04	34.2	—	37	32	37	31	—	—	122.7	0.01	0.13	"	"
86	May	17	11	?	—	—	—	03	00	—	—	—	—	?	0.01	—	"	"
87		17	16	?	—	—	—	57	56	—	—	—	—	?	0.01	—	"	"
88		19	2	35	17	—	—	37	47	—	—	—	—	7.3	0.02	0.02	"	"
89		19	9	32	55	32	53	33	23	33	19	—	—	23.6	?	0.60	"	"
90		20	16	30	08	30	08	30	46	30	47	—	—	17.4	0.85	0.97	"	"
91	May	20	17	32	54	?	—	33	35	?	—	—	—	5.7	0.04	0.02	"	"
92		20	18	?	—	—	—	00	10	—	—	—	—	?	0.01	—	"	"
93		20	19	24	32	?	—	25	13	25	15	—	—	6.3	0.03	0.03	"	"
94		22	20	24	40	?	—	25	15	25.3	—	—	—	5.5	0.02	0.02	"	"
95		24	8	?	—	—	—	39	47	—	—	—	—	?	0.01	—	"	"
96	May	24	17	?	—	—	—	43	43	—	—	—	—	?	?	—	"	"
97		26	20	02	47	?	—	03	06	03	09	—	—	4.0	0.08	0.08	"	"
98		27	5	41	00	41	00	41	20	41	23	—	—	68.1	0.19	0.37	"	"
99		27	9	50	52	50	52	?	—	—	—	—	—	?	?	?	Quick	Weak
100		27	10	?	—	—	—	32	05	—	—	—	—	?	0.01	—	Slow	Feeble
101	May	27	10	49	07	?	—	49	32	49	32	—	—	?	0.04	0.03	"	"
102		27	10	57	54	?	—	58	22	58	20	—	—	12.1	0.14	0.16	"	"
103		27	11	14	33	—	—	14	55	—	—	—	—	4.4	0.02	—	"	"
104		27	11	59	12	?	—	59	44	59	43	—	—	?	0.03	0.05	"	"
105		27	12	03	39	?	—	04	08	04	02	—	—	4.5	0.02	0.02	"	"
106	May	27	16	15	20	—	—	15	39	—	—	—	—	2.4	0.01	—	"	"
107		27	16	?	—	—	—	?	—	—	—	—	—	?	0.00	—	"	"</

TABLE A.
(Earthquakes)



No.	Date 1928	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	E	W	N	S		
111	May 27	h 22 00	m 00 49	s — —	m — —	m 01	s 15	m — —	s — —	m — —	s — —	2.9	mm 0.02	mm —	Slow	Feeble	
112	27	22 ?	?	— —	?	47	44	47	44	— —	— —	?	0.03	0.02	"	"	
113	27	22 ?	?	— —	?	— —	— —	— —	— —	— —	— —	?	0.00	—	"	"	
114	28	0 14	46	— —	— —	15	13	— —	— —	— —	— —	3.3	0.01	—	"	"	
115	28	2 51	06	— —	— —	51	34	— —	— —	— —	— —	4.0	0.01	—	"	"	
116	28	3 56	50	?	— —	57	23	57	25	— —	— —	3.7	0.03	0.01	"	"	
117	28	4 ?	— —	— —	— —	18	35	— —	— —	— —	— —	?	0.00	—	"	"	
118	28	7 23	13	— —	— —	23	37	— —	— —	— —	— —	3.0	0.01	—	"	"	
119	28	7 ?	— —	— —	— —	36	40	— —	— —	— —	— —	?	0.01	—	"	"	
120	28	7 58	07	58 09	— —	58	34	58	30	— —	— —	6.1	0.11	0.12	"	"	
121	28	13 08	44	— —	— —	09	13	— —	— —	— —	— —	4.2	0.02	—	"	"	
122	28	13 34	35	34 36	— —	35	01	35	01	— —	— —	5.6	0.14	0.10	"	"	
123	28	15 —	—	36 07	— —	— —	36 27	— —	— —	— —	— —	?	—	3.29	Quick	Weak	Felt
124	28	15 ?	— —	— —	— —	50	58	— —	— —	— —	— —	?	0.01	—	Slow	Feeble	
125	28	15 52	44	52.8	— —	53	06	53	06	— —	— —	10.0	0.45	0.53	"	"	
126	28	16 34	46	?	— —	35	17	?	— —	— —	— —	5.0	0.02	0.02	"	"	
127	28	18 46	08	— —	— —	46	35	— —	— —	— —	— —	3.7	0.02	—	"	"	
128	28	19 19	24	— —	— —	19	49	— —	— —	— —	— —	3.8	0.01	—	"	"	
129	28	19 30	08	30 08	— —	30	30	30	39	— —	— —	7.5	0.13	0.15	"	"	
130	28	20 ?	— —	— —	— —	17.7	— —	— —	— —	— —	— —	?	0.00	—	"	"	
131	28	20 20	59	— —	— —	21	29	— —	— —	— —	— —	4.1	0.01	—	"	"	
132	28	20 37.4	—	—	—	37	55	?	— —	— —	— —	?	0.02	0.02	"	"	
133	28	20 ?	— —	— —	— —	51	26	— —	— —	— —	— —	?	0.00	—	"	"	
134	28	21 10	02	?	— —	10	37	?	— —	— —	— —	6.1	0.03	0.02	"	"	
135	28	22 22.6	— —	— —	— —	24	03	— —	— —	— —	— —	?	0.01	—	"	"	
136	29	6 51	19	— —	— —	51	40	— —	— —	— —	— —	3.6	0.01	—	"	"	
137	29	6 55	21	?	— —	55	39	55.7	— —	— —	— —	4.3	0.04	0.03	"	"	
138	29	7 ?	— —	— —	— —	?	— —	— —	— —	— —	— —	?	0.01	—	"	"	
139	29	7 36	00	— —	— —	36	20	— —	— —	— —	— —	4.3	0.01	—	"	"	
140	29	8 ?	— —	— —	— —	33	21	— —	— —	— —	— —	?	0.01	—	"	"	
141	29	8 55	12	— —	— —	55	35	— —	— —	— —	— —	3.4	0.01	—	"	"	
142	29	9 50	27	50 28	— —	50	43	50	46	— —	— —	5.2	0.07	0.04	"	"	
143	29	10 57	58	— —	— —	58	19	— —	— —	— —	— —	3.3	0.01	—	"	"	
144	29	14 54	48	— —	— —	55	16	— —	— —	— —	— —	2.8	0.01	—	"	"	
145	29	16 ?	— —	— —	— —	33	24	— —	— —	— —	— —	?	0.01	—	"	"	
146	29	22 28	06	?	— —	28	25	?	— —	— —	— —	4.5	0.04	0.02	"	"	
147	30	8 20	02	— —	— —	20	19	— —	— —	— —	— —	1.8	0.00	—	"	"	
148	30	9 47	00	— —	— —	47	27	— —	— —	— —	— —	3.8	0.02	—	"	"	
149	30	11 ?	— —	— —	— —	?	— —	— —	— —	— —	— —	?	0.00	—	"	"	
150	30	12 32	02	?	— —	32	47	?	— —	— —	— —	5.3	0.06	0.04	"	"	
151	30	17 56	36	— —	— —	57	00	— —	— —	— —	— —	2.7	0.01	—	"	"	
152	31	0 34	59	— —	— —	35	23	— —	— —	— —	— —	3.5	0.02	—	"	"	
153	31	0 58	49	?	— —	59	14	?	— —	— —	— —	5.5	0.04	0.04	"	"	
154	31	7 26	25	26 25	— —	26	45	26	47	— —	— —	11.3	?	0.75	Quick	Weak	Felt
155	31	8 —	—	?	— —	— —	01	46	— —	— —	— —	?	—	0.03	Slow	Feeble	
156	31	8 —	—	36 18	— —	36	39	— —	— —	— —	— —	6.1	—	0.35	?	?	
157	31	8 55	16	?	— —	55	44	?	— —	— —	— —	?	0.02	0.02	?	?	
158	31	9 56	10	?	— —	56	44	?	— —	— —	— —	5.8	0.05	0.04	?	?	
159	31	10 03	21	?	— —	03	43	03	34	— —	— —	4.9	0.09	0.08	?	?	
160	31	10 09	19	— —	— —	09	41	— —	— —	— —	— —	3.5	0.02	—	?	?	
161	31	11 25	36	?	— —	26	00	?	— —	— —	— —	4.4	0.03	0.01	?	?	
162	31	12 34	17	?	— —	34	54	35	06	— —	— —	7.2	0.05	0.05	?	?	
163	31	12 ?	— —	— —	— —	45	41	— —	— —	— —	— —	?	0.01	—	?	?	
164	31	13 ?	— —	— —	— —	10	59	— —	— —	— —	— —	?</					

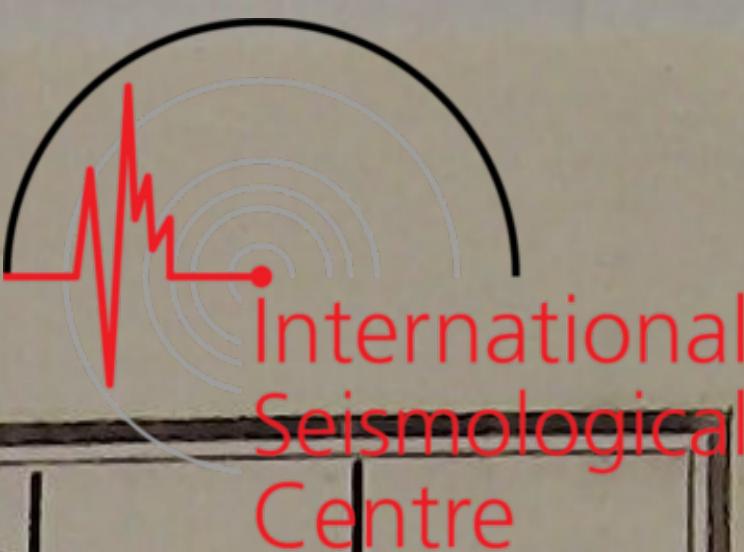
TABLE A.
(Earthquakes)



No.	Date 1928	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	
166	May	h	m	s		m	s	m	s	m	s	m	s	m	mm	mm	Slow	Feeble
167		31	14	?		—	—	54	28	—	—	—	—	?	0.01	—	"	"
168		31	16	34	47	—	—	35	07	—	—	—	—	4.4	0.02	—	"	"
169		31	20	45	09	—	—	45	32	—	—	—	—	4.2	0.02	—	"	"
170		31	21	?		—	—	01	08	—	—	—	—	?	0.01	—	"	"
171	June	1	2	45	05	—	—	45	31	—	—	—	—	2.9	0.02	—	"	"
172		1	2	?		—	—	?		—	—	—	—	?	0.00	—	"	"
173		1	4	?		—	—	14	29	—	—	—	—	?	0.01	—	"	"
174		1	4	?		?		47	21	?		—	—	?	0.01	0.02	"	"
175		1	4	57	02	57	02	57	24	57	25	—	—	7.2	0.17	0.18	"	"
176	1	12	23	54	23	55	24	17	24	16	—	—	—	14.4	1.23	1.30	"	"
177	1	12	41	43	41	45	42	07	42	04	—	—	—	8.1	0.21	0.26	"	"
178	1	12	?		—	—	54	18	—	—	—	—	—	?	0.02	—	"	"
179	1	12	?		—	—	58	18	—	—	—	—	—	?	0.01	—	"	"
180	1	13	01	47	?		02	08	02	08	—	—	—	5.7	0.06	0.05	"	"
181	1	13	12	50	?	?	?		13.2	—	—	—	—	?	?	?	Quick	Weak
182	1	13	?		—	—	33	12	—	—	—	—	—	?	0.02	—	Slow	Feeble
183	1	13	38	40	—	—	39	00	—	—	—	—	—	?	0.01	—	"	"
184	1	13	42	09	—	—	42	31	—	—	—	—	—	3.6	0.01	—	"	"
185	1	13	46	09	?		46	31	46	30	—	—	—	?	0.12	0.20	"	"
186	1	13	56	13	?		56	36	56	35	—	—	—	?	0.05	0.05	"	"
187	1	14	?		—	—	00	55	—	—	—	—	—	?	0.02	—	"	"
188	1	14	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
189	1	14	17	21	—	—	17	47	—	—	—	—	—	4.0	0.02	—	"	"
190	1	14	50	18	?		50	44	?		—	—	—	3.7	0.05	0.05	"	"
191	1	14	56	00	—	—	56	24	—	—	—	—	—	3.2	0.01	—	"	"
192	1	15	05	40	05	41	06	07	06	06	—	—	—	7.9	0.67	0.52	"	"
193	1	15	?		—	—	14	35	—	—	—	—	—	?	0.01	—	"	"
194	1	15	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
195	1	15	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
196	1	16	13	08	?	—	13	31	?		—	—	—	4.6	0.04	0.01	"	"
197	1	16	53	59	—	—	54	22	—	—	—	—	—	3.1	0.01	—	"	"
198	1	17	?		—	—	?		—	—	—	—	—	?	?	—	"	"
199	1	18	22	13	22	14	?		22	32	—	—	—	11.1	1.40	0.57	Quick	Weak
200	1	18	58.6		—	—	58	59	—	—	—	—	—	?	0.01	—	Slow	Feeble
201	1	20	35	19	—	—	35	41	—	—	—	—	—	2.2	0.00	—	"	"
202	1	21	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
203	1	21	28	55	29.0		29	19	29	19	—	—	—	3.3	0.05	0.05	"	"
204	1	21	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
205	1	22	06	47	06	47	07	07	07	07	—	—	—	12.6	0.86	0.68	Quick	Weak
206	1	22	?	37	02	38	57	40	—	—	—	—	—	?	?	—	Slow	Feeble
207	2	0	02	37	02	38	02	57	02	55	—	—	—	7.2	0.10	0.12	"	"
208	2	4	?		—	—	19	18	—	—	—	—	—	?	0.01	—	"	"
209	2	4	58	16	—	—	58	39	—	—	—	—	—	2.5	0.01	—	"	"
210	2	5	06	06	—	—	06	28	—	—	—	—	—	2.7	0.01	—	"	"
211	2	5	?	35	?	—	?		—	—	—	—	—	?	0.00	—	"	"
212	2	9	08	35	?	—	08	58	08	59	—	—	—	6.8	0.13	0.09	"	"
213	2	11	10	59	?	—	11	23	?	—	—	—	—	4.6	0.04	0.04	"	"
214	2	13	?		—	—	05	25	—	—	—	—	—	?	0.01	—	"	"
215	2	13	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
216	2	13	?		—	—	37	50	—	—	—	—	—	?	0.01	—	"	"
217	2	14	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
218	2	16	?		—	—	?		—	—	—	—	—	?	0.01	—	"	"
219	2	17	30	46	30	47	31	09	31	09	—	—	—	7.7	0.13	0.17	"	"
220	2	22	?		—	—	38	03	—	—	—	—	—	?	0.01	—	"	"

TABLE A.

(Earthquakes)



No.	Date 1923	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			
221	June 3	h 8 34	02	m 33.9	s	m 37	06	m 37	11	m 44	38	m ?	s	m ?	mm	mm	mm	?	Slow	Feeble	
222	3	9 ?		— —		?		— —		— —		— —		?	0.01	—	—	—	"	"	
223	4 20	?		— —		01 04		— —		— —		— —		?	0.01	—	—	—	"	"	
224	5 5	?		— —		58 32		— —		— —		— —		?	0.01	—	—	—	"	"	
225	5 15	?		— —		42 35		— —		— —		— —		?	0.01	—	—	—	"	"	
226	5 19	37 54	?			38 20	?			— —		— —		4.7	0.05	0.03	—	—	"	"	
227	6 19	31 42	?			31 57	?			— —		— —		1.9	?	?	—	—	"	"	
228	7 6	17 56	— —			18 20	—	—		— —		— —		2.4	0.01	—	—	—	"	"	
229	7 6	26 43	26 44			28 23	28 22			— —		— —		6.1	0.06	0.05	—	—	"	"	
230	7 23	06 41	?			07 06	?			— —		— —		3.3	0.02	0.01	—	—	"	"	
231	9 16	20 47	?			21 05	?			— —		— —		4.9	0.04	0.03	—	—	"	"	
232	11 9	?	— —			07 34	—	—		— —		— —		?	0.01	—	—	—	"	"	
233	13 16	?	— —			43 14	—	—		— —		— —		?	0.01	—	—	—	"	"	
234	13 21	?	— —			?	—	—		— —		— —		?	0.01	—	—	—	"	"	
235	13 22	57 43	57 44			58 08	58 11			— —		— —		6.3	0.05	0.03	—	—	"	"	
236	14 13	08 18	?	—		08 42	08 38			— —		— —		?	0.09	—0.09	—	—	"	"	
237	14 16	54 20	— —			54 47	—	—		— —		— —		?	0.02	—	—	—	"	"	
238	15 6	19 02	19 01			26 36	26 41	36 11	36 12	48.6	0.04	0.27							"	"	
239	15 17	22 50	22 47			27 34	27 34	31 11	31 03	33.3	0.04	0.20							"	"	
240	16 18	?	?			34 56	?	— —		— —		— —		?	0.01	0.04	—	—	"	"	
241	16 18	?	53	?		41 57	?	— —		— —		— —		?	0.01	0.05	—	—	"	"	
242	17 2	42 53	— —			43 14	—	—		— —		— —		2.9	0.01	—	—	—	"	"	
243	17 3	?	— —			38 12	—	—		— —		— —		?	0.01	—	—	—	"	"	
244	17 3	45 07	45 08			52 32	52 36	63 21	62 13	7.0	0.05	0.70							"	"	
245	17 6	?	— —			52 21	—	—		— —		— —		?	0.01	—	—	—	"	"	
246	17 7	?	— —			?	—	—		— —		— —		?	0.01	—	—	—	"	"	
247	17 18	?	— —			24 35	—	—		— —		— —		?	0.01	—	—	—	"	"	
248	17 22	41 57	— —			42 20	—	—		— —		— —		4.0	0.02	—	—	—	"	"	
249	17 23	21 09	— —			21 36	—	—		— —		— —		3.5	0.01	—	—	—	"	"	
250	18 17	?	?			45 21	45 21	— —		— —		— —		?	0.02	0.03	—	—	"	"	
251	20 6	?	— —			10 31	—	—		— —		— —		?	0.01	—	—	—	"	"	
252	20 21	?	— —			?	—	—		— —		— —		?	0.01	0.05	—	—	"	"	
253	21 11	— —	— —			— —	—	—		— —		— —		?	—	?	—	—	"	"	
254	21 14	?	— —			58.2	—	—		— —		— —		?	0.01	—	—	—	"	"	
255	21 16	?	— —			?	—	—		42.9	—	57 b	—	52 J	?	?	?	?	"	"	
256	22 7	56.4	— —			57 06	—	—		— —		— —		?	0.01	—	—	—	"	"	
257	22 12	?	— —			54 11	—	—		— —		— —		?	0.01	—	—	—	"	"	
258	22 16	?	— —			26 25	—	—		— —		— —		?	0.02	—	—	—	"	"	
259	25 15	?	— —			49 24	—	—		— —		— —		?	0.01	—	—	—	"	"	
260	27 2	15.7	?			16 10	16.2	— —		— —		— —		?	0.03	0.06	—	—	"	"	
261	27 18	17 18	17 18			17 51	17.8	— —		— —		— —		3.4	0.03	0.03	—	—	"	"	
262	29 22	59.9	60.1			68 10	68 14	76 51	76 04	?	?	?	—	?	0.30	—	—	"	"		
263	30 22	?	— —			28 28	28 29	— —	—	— —		— —		?	0.05	0.05	—	—	"	"	
264	July 3	0 25	04	?	— —	25 40	25 44	— —	—	— —		— —		6.9	0.06	0.05	—	—	"	"	
265	3 1	19 41	— —			20 13	—	—		— —		— —		5.1	0.02	—	—	—	"	"	
266	3 1	26 48	— —			27 13	—	—		— —		— —		4.5	0.02	—	—	—	"	"	
267	5 7	53 14	?			53 49	53 50	— —	—	— —		— —		3.6	0.04	0.03	—	—	"	"	
268	7 18	01 31	01 30			02 13	02 12	— —	—	— —		— —		14.2	0.						

SEISMOLOGICAL OBSERVATIONS AT MIZUSAWA.

TABLE A.
(Earthquakes)

No.	Date 1928	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	July 28	h	m	s		m	s	m	s	m	s	m	s	3.1	mm	mm	—	Slow	Feeble		
277		17	31	37	—	—	—	31	59	—	—	—	—	?	0.01	—	—	“	“	“	“
278		9	53	34	?	—	—	53	56	?	—	—	—	?	0.06	0.04	—	“	“	“	“
279		10	19	17	?	—	—	19	37	?	—	—	—	?	0.03	0.05	—	“	“	“	“
280		19	29	02	29	02	—	29	23	29	21	—	—	11.7	0.69	0.45	—	“	“	“	“
281	1	23	?	—	—	41	36	—	—	—	—	—	—	?	0.01	—	—	“	“	“	“
282	2	2	?	—	—	53	51	—	—	—	—	—	—	?	0.01	—	—	“	“	“	“
283	2	3	10	47	?	—	11	09	?	—	—	—	—	?	0.04	0.06	—	“	“	“	“
284	3	7	55	59	56	00	56	18	56	22	—	—	—	6.2	0.12	0.15	—	“	“	“	“
285	3	13	40	49	?	—	41	09	?	—	—	—	—	4.9	0.02	0.03	—	“	“	“	“
286	3	18	18.0	—	—	18	21	—	—	—	—	—	—	?	0.01	—	—	“	“	“	“
287	4	15	?	—	—	?	—	—	—	—	—	—	—	?	0.01	—	—	“	“	“	“
288	4	19	?	?	—	?	—	08	57	18	26	17	54	?	?	0.20	—	“	“	“	“
289	5	14	48	03	?	—	52	58	52	56	—	—	—	?	?	?	—	“	“	“	“
290	5	15	?	—	—	?	—	—	—	—	—	—	—	?	0.01	—	—	“	“	“	“
291	5	22	?	—	—	30	35	—	—	—	—	—	—	?	0.02	—	—	“	“	“	“
292	12	8	16	15	16	19	22	06	22	05	26	46	?	?	?	?	—	“	“	“	“
293	14	8	26	57	?	—	27	36	?	—	—	—	—	4.8	0.02	0.04	—	“	“	“	“
294	16	3	51	39	51	38	53	37	53	37	—	—	—	5.9	0.08	0.09	—	“	“	“	“
295	16	16	44	57	44	54	45	14	45	11	—	—	—	?	0.78	0.90	Quick	Weak	Felt		
296	16	16	?	—	?	48	14	?	—	—	—	—	—	?	0.08	?	Slow	Feeble			
297	18	1	?	—	—	56	18	—	—	—	—	—	—	?	0.01	—	“	“			
298	18	14	?	—	—	03	46	—	—	—	—	—	—	?	0.01	—	“	“			
299	20	1	59	38	—	—	60	57	—	—	—	—	—	7.8	0.03	—	“	“			
300	21	12	47	06	—	—	47	29	—	—	—	—	—	3.7	0.01	—	“	“			
301	22	17	?	—	—	02	22	—	—	—	—	—	—	?	0.01	—	—	“	“		
302	22	23	16	56	—	—	17	19	—	—	—	—	—	4.0	0.01	—	—	“	“		
303	23	1	20	26	20	25	22	31	22	31	—	—	—	9.8	0.10	0.07	—	“			
304	23	21	?	—	—	?	—	—	—	—	—	—	—	?	0.00	—	—	“	“		
305	24	7	50	23	?	—	50	38	?	—	—	—	—	3.8	0.03	0.03	—	“	“		
306	24	21	53	16	53	15	61	06	61	06	—	—	—	?	?	?	—	“	“		
307	25	1	?	—	—	52	59	—	—	—	—	—	—	?	?	?	—	“	“		
308	26	0	03	53	—	—	04	03	—	—	—	—	—	2.8	0.02	—	—	“	“		
309	26	8	?	—	—	17	01	—	—	—	—	—	—	?	0.01	—	—	“	“		
310	26	13	?	—	—	31	45	—	—	—	—	—	—	?	?	?	—	“	“		
311	26	18	12	13	?	—	12	42	12	42	—	—	—	10.5	0.08	0.08	—	“	“		
312	27	18	00	25	?	—	01	39	?	—	—	—	—	5.1	0.02	?	—	“	“		
313	28	8	32	23	—	—	38	59	—	—	—	—	—	?	?	?	—	“	“		
314	29	4	?	—	—	10	37	—	—	—	—	—	—	?	0.02	—	—	“	“		
315	30	6	36	17	—	—	40	32	—	—	45	10	—	?	0.01	—	—	“	“		
316	Sept.	1	7	?	—	?	?	?	?	?	—	—	40	38	?	0.03	0.15	—	“	“	
317	3	4	34	08	?	—	34	49	?	—	—	—	—	5.0	0.02	0.04	—	“	“		
318	3	16	23	44	?	—	24	30	?	—	—	—	—	4.7	0.02	?	—	“	“		
318	4	17	14	11	?	—	14	28	14	27	—	—	—	3.4	0.04	0.04	—	“	“		
320	6	5	31	49	?	—	32	09	?	—	—	—	—	4.6	0.02	?	—	“	“		
321	6	6	29	04	29	03	29	26	29	25	—	—	—	17.1	0.55	0.46	—	“	“		
322	6	8	?	—	—	?	—	—	—	—	—	—	—	?	0.01	—	—	“	“		

TABLE A.

(Earthquakes)



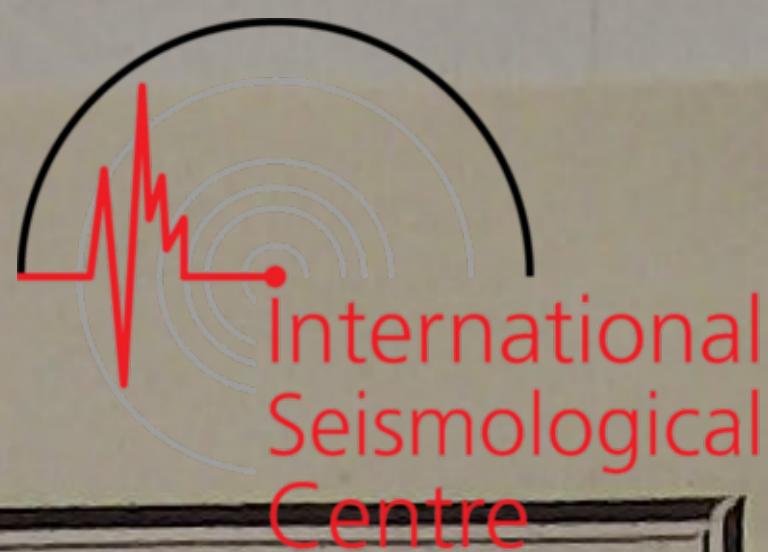
No.	Date 1928	P			S			L			Duration of Total Earthquake (mean)	Maximum Range of Motion			Character of Motion	Intensity	Remarks		
		E	W	N	S	E	W	N	S	E	W	E	W	N	S				
331	Sept.	7	h 16 ?	m	s	m	s	07	39	m	s	m	s	m	mm	mm	Slow	Feeble	
332		7	21 ?	—	—	—	—	02	50	—	—	—	—	—	? 0.01	—	"	"	
333		7	23 49	24	—	—	—	49	51	—	—	—	—	—	3.9 0.02	—	"	"	
334		8	11 ?	—	—	—	—	09	52	—	—	—	—	—	? 0.01	—	"	"	
335		9	18 ?	—	—	—	—	13	37	—	—	—	—	—	? ?	—	"	"	
336		9	23 39 03	—	—	39	31	—	—	—	—	—	—	—	? 0.03	—	"	"	
337		9	23 43 12	—	—	43	40	—	—	—	—	—	—	—	? 0.04	—	"	"	
338		11	0 ?	?	—	?	—	?	—	—	—	—	—	—	? 0.01	0.05	"	"	
339		12	2 13 54	?	—	14	17	?	—	—	—	—	—	—	3.6 0.01	0.05	"	"	
340		13	3 33 54	33	55	39	50	39	50	—	—	—	—	—	? ? ?	?	"	"	
341		13	19 ?	—	—	52	32	—	—	—	—	—	—	—	? 0.01	—	"	"	
342		14	11 ?	—	—	27	35	—	—	—	—	—	—	—	? 0.01	—	"	"	
343		15	4 ?	?	—	08	58	?	—	—	—	—	—	—	? 0.02	0.05	"	"	
344		15	20 38 00	?	—	38	21	?	—	—	—	—	—	—	4.5 0.02	0.06	"	"	
345		19	8 18 26	?	—	20	17	20.3	—	—	—	—	—	—	8.9 ? 0.05	?	"	"	
346		22	7 41 16	41	16	49	01	48	59	53	11	53	03	58.2	0.07 0.30	"/	"/	Felt	
347		23	3 ?	—	—	?	—	—	—	—	—	—	—	—	? 0.01	—	"/	"/	
348		23	6 55 58	55	59	56	08	56	06	—	—	—	—	—	8.3 ?	2.70	Quick	Weak	
349		23	13 ?	—	—	45	48	—	—	—	—	—	—	—	? 0.01	—	Slow	Feeble	
350		25	8 ?	?	—	07	08	07	10	—	—	—	—	—	? 0.05	0.07	"/	"/	
351	Oct.	29	21 18 53	?	—	19	17	19	17	—	—	—	—	—	? 0.06	0.04	"	"	Felt
352		30	16 03 13	?	—	03	37	03	43	—	—	—	—	—	4.2 0.04	0.05	"	"	
353		1	12 50 03	?	—	50	42	50	41	—	—	—	—	—	9.6 0.05	0.06	"	"	
354		2	16 ?	—	—	46	58	—	—	—	—	—	—	—	? 0.01	—	"	"	
355		2	18 47 38	—	—	48	12	—	—	—	—	—	—	—	4.3 0.01	—	"	"	
356		3	15 41 55	41	52	42	07	42	05	—	—	—	—	—	3.6 0.05	0.04	"	"	Felt
357		5	1 34 46	34	47	35	03	35	03	—	—	—	—	—	6.6 0.20	0.25	"	"	
358		5	6 —	59	19	—	—	60	01	—	—	—	—	—	6.9 —	0.12	"	"	
359		5	20 52 42	52	40	53	20	53	17	—	—	—	—	—	7.4 0.07	0.06	"	"	
360		12	7 32 17	32	16	34	16	34	16	—	—	—	—	—	34.1 0.05	0.24	"	"	
361		13	15 24 43	24.9	—	30	48	30	50	35	02	?	—	—	? ?	?	"	"	Felt
362		14	3 52 01	?	—	53	04	53	01	—	—	—	—	—	4.4 0.02	0.05	"	"	
363		15	14 29 58	?	—	38	14	38	11	?	—	51	19	—	? ?	0.20	"	"	
364		17	0 ?	—	—	07	32	—	—	—	—	—	—	—	? 0.01	—	"	"	
365		17	22 51 54	?	—	52	21	52	22	—	—	—	—	—	5.9 0.13	0.20	"	"	
366		19	11 —	?	—	—	—	01	17	—	—	09	51	—	? ?	?	"	"	Felt
367		20	12 49 53	49	54	53	08	53	05	—	—	—	—	—	? ?	?	"	"	
368		21	5 52 03	?	—	53	02	?	—	—	—	—	—	—	5.3 0.02	?	"	"	
369		23	4 —	—	—	28	58	—	—	29	16	—	—	—	5.4 —	0.31	Quick	Weak	
370		24	12 ?	—	—	53	57	—	—	—	—	—	—	—	? ?	—	Slow	Feeble	
371		24	13 17 17	?	—	17	34	17	36	—	—	—	—	—	4.6 0.03	0.05	"	"	Felt
372		26	15 ?	—	—	46	36	—	—	—	—	—	—	—	? 0.01	—	"	"	
373		26	20 37 34	?	—	37	51	37	53	—	—	—	—	—	2.5 0.02	0.05	"	"	
374		31	19 ?	—	—	19	48	—	—	—	—	—	—	—	? 0.01	—	"	"	
375		31	20 06 01	06	01	07	11	07	13	—	—	—	—	—	12.9 0.09	0.09	"	"	
376	Nov.	10	20 46 56	46	54	47	14	47	14	—	—	—	—	—	6.4 0.17	0.18	"	"	Felt
377		13	14 ?	—	—	29	52	—	—	—	—	—	—	—	? 0.02	—	"	"	
378		16	12 ?	—	—	59	20	59	19	—	—	—	—	—	? 0.07</td				

TABLE A.
(*Earthquakes*)



No.	Date 1928	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			
386	Dec. 7	h 22	m 42	s 58	— —	m —	s —	43	03	m —	s —	m —	s —	2.0	mm	0.01	—	Slow	Feeble		
387	10	9	16	02	16 00	16	24	16	25	— —	— —	— —	— —	4.1	0.13	0.15	“	“	“		
388	10	15	29	28	? —	23	46	29	43	— —	— —	— —	— —	3.6	0.13	0.15	“	“	“		
389	11	18	? —	— —	32 10	— —	— —	— —	— —	— —	— —	— —	— —	? 0.01	—	“	“	“	“		
390	12	20	31	44	31 40	41	14	42.6	—	—	—	56	52	49.9	?	?	?	“	“	“	
391	13	20	06	53	06 57	07	49	07	52	— —	— —	— —	— —	7.9	0.10	0.10	“	“	“		
392	18	16	05	27	05.4	05	59	06	02	— —	— —	— —	— —	6.6	0.06	0.06	“	“	“		
393	19	4	? —	— —	45 53	— —	— —	— —	— —	— —	— —	— —	— —	? —	—	“	“	“	“		
394	19	11	44	18	— —	52	59	— —	— —	59	37	— —	— —	44.6	0.10	—	“	“	“		
395	19	15	19	50	— —	22	53	— —	— —	— —	— —	— —	— —	8.3	0.07	—	“	“	“		
396	20	3	01	49	— —	02	28	— —	— —	— —	— —	— —	— —	3.1	0.01	—	“	“	“		
397	20	6	49	19	— —	49	58	— —	— —	— —	— —	— —	— —	4.9	0.02	—	“	“	“		
398	20	17	? —	— —	05 11	— —	— —	— —	— —	— —	— —	— —	— —	? 0.01	—	“	“	“	“		
399	21	1	41	36	— —	42	26	— —	— —	— —	— —	— —	— —	9.0	0.14	—	“	“	“		
400	22	17	41	07	41 05	42	12	42	06	— —	— —	— —	— —	7.9	0.10	0.10	“	“	“		
401	22	21	? —	— —	10 51	— —	— —	— —	— —	— —	— —	— —	— —	? 0.01	—	“	“	“	“		
402	26	18	26	16	? —	26	27	26	26	— —	— —	— —	— —	2.6	0.04	0.05	“	“	“		
403	28	13	? —	— —	26 21	— —	— —	— —	— —	— —	— —	— —	— —	? ?	—	“	“	“	“		
404	28	14	26	39	26 36	31	41	31	42	34	29	34	21	45.3	0.09	0.38	“	“	“		
405	29	13	? —	— —	43 39	— —	— —	— —	— —	— —	— —	— —	— —	? 0.01	—	“	“	“	“		

TABLE B.
(*Pulsatory Oscillations EW Component*)



Beginning			Ending			Maximum						Double Amplitude
Date			Date			Date			Date			
Month	Day	Hour	Month	Day	Hour	Day	Hour	—	Day	Hour	—	
January	2	1	January	3	9	2	17		2	21		μ 8
	6	21		8	11	6	13		7	16		3
	9	0		12	21	11	19		12	1		11
	16	13		17	5	16	19		16	23		6
	18	9		22	4	19	17		19	23		5
	24	1		24	13	24	5		24	8		6
	27	17		30	21	28	6		28	17		9
February	6	16	February	9	13	7	13		7	23		10
	14	16		16	5	14	21		15	5		25
	17	1		19	1	17	17		17	21		8
	23	13		26	17	24	6		24	11		8
	26	21		28	5	27	5		28	9		2
March	2	13	March	4	17	2	21		3	5		24
	10	13		14	5	10	21		11	5		14
	21	5		22	13	21	21		21	23		5
	25	21		26	21	26	6		26	13		12
	31	13	April	2	1	31	19		31	21		7
April	22	13		24	17	22	21		23	13		80
May	9	9	May	10	9	9	11		9	14		10
	16	14		17	9	16	16		16	23		4
	25	17		26	14	25	21		26	1		5
June	2	11	June	4	5	2	22		3	5		7
	13	9		15	1	13	17		14	1		8
	20	15		22	9	21	9		21	21		14
	25	1		26	1	25	5		25	9		6
July	20	2	July	22	21	20	14		20	17		5
	25	14		26	17	25	21		26	1		4
	30	1	August	5	9	31	16		1	1		10
August	8	17		13	14	11	17		11	23		7
	17	21		21	11	20	5		20	9		6
	31	23	September	2	2	1	13		1	17		5
September	18	21		20	5	19	5		19	9		4
	24	9		26	9	25	5		25	17		12
October	6	21	October	10	1	8	13		9	3		20
	18	1		19	21	18	19		19	1		7
	29	5		31	1	29	21		30	1		7
November	2	9	November	4	13	?			4	1		11
	8	21		10	7	9	5		9	9		10
	14	21		17	9	15	21		16	10		5
	18	19		20	17	20	5		20	9		5
	21	9		23	21	22	9		22	17		10
	26	1		28	1	27	5		27	11		8
	29	21	December	1	1	30	5		30	9		3
December	3	5		7	9	3	15		4	1		18
	9	17		11	1	9	23		10	7		13
	15	19		18	1	16	2		16	10		10
	22	17		24	5	23	13		23	21		9
	29	1		30	21	29	6		29	13		7