

ANNUAL REPORT  
OF THE  
METEOROLOGICAL  
AND THE  
SEISMOLOGICAL OBSERVATIONS  
MADE AT THE  
INTERNATIONAL LATITUDE OBSERVATORY  
OF MIZUSAWA  
FOR  
THE YEAR 1917.

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LATITUDE  $39^{\circ} 8' N.$ , LONGITUDE  $141^{\circ} 7' E.$ ,  
HEIGHT ABOVE MEAN SEA LEVEL 61 METRES.

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PUBLISHED BY THE INTERNATIONAL LATITUDE OBSERVATORY  
OF MIZUSAWA.

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1918

The present report contains the results of the meteorological and the seismological observations in the observatory during the year 1917. No alteration is done in the kinds and the methods of observations. The observations and the computations were done by Messrs. K. Aoki, T. Gôukon and S. Sato under the superintendence of Dr. M. Hashimoto.

The following are to be generally noticed with respect to the meteorological observations:

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

*Air Pressure.*—The barometric readings in millimetres are reduced only to freezing point of water; the corrections to sea level and to standard gravity are given at the bottoms of the respective pages.

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

*Wind.*—The velocity is expressed in metres per second. The direction is observed according to the sixteen cardinal points.

*Cloud.*—The amount is estimated by the scale 0–10, the forms are of the *International classification*, and the direction of motion is observed according to the eight cardinal points.

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

*Relative Humidity.*—It is given in percentages.

*Precipitation.*—The amount is given in millimetres. The number of days is counted only when the amount is 0.1 mm. or more in a day; but for those days with either snow, hail, or graupel, the amount is not taken into consideration.

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

*Duration of Sunshine.*—It is recorded by a sunshine-recorder of *Jordan's* pattern.

*Amount of Evaporation.*—It is given in millimetres, The daily amount being, according to the instruction of the Central Meteorological Observatory in Tokyo, that which results from 10h of the preceding day till 10h of the day in question.

The occurrence of meteorological phenomena is recorded with the following international symbols:

●	Rain	⊕	Snow drift	c	Cirrus
*	Snow	←	Ice crystals	cs	Cirro-stratus
⚡	Thunder storm	⊙	Solar corona	ck	Cirro-cumulus
⚡	Thunder without lightning	⊕	Solar halo	kc	Cumulo-cirrus
⚡	Lightning without thunder	☽	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	~	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 *instrumental constants* are as follows:

	EW Component	NS Component
	Apparatus	Apparatus
Period of free oscillation	17 seconds	38 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 of suspension }	104 centimetres	104 centimetres

The *time* adopted in the observations is the Japanese Central Standard Time *reckoned from midnight*.

April, 1918.

H. Kimura, *Rigakuhakushi*

*Director of the International Latitude Observatory  
of Mizusawa.*

SEISMOLOGICAL OBSERVATIONS.

**TABLE A.**  
(Earthquakes)



No.	Date 1917	Time of Occurrence †				Beginning of the Principal Portion				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	
1	Jan.	4	13	29	46	29.8	—	—	—	—	—	0.8	0.01	0.00	Slow	Feeble		
2		4	15	36	50	36	50	—	—	—	—	2.1	0.01	0.01	"	"		
3		5	1	54	58	55	00	2	—	—	01	10	18.4	?	0.09	"	"	
4		5	12	30.0		30	01	12	30	33	30	33	3.0	0.02	0.02	"	"	
5		9	10	28	08	28.2		10	28	29	28	29	3.2	0.04	0.04	"	"	
6		17	8	30	02	30	02	8	30	24	30	25	18.2	0.41	0.50	"	"	
7		17	19	26	09	26	09	19	26	26	26	26	2.0	0.01	0.01	"	"	
8		19	2	23	46	23	45	2	24	19	24	19	1.9	0.02	0.02	"	"	
9		21	2	39	16	39	15	2	—	—	39	48	?	0.12	0.18	"	"	
10		21	2	44.6		44.6		—	—	—	—	—	2.8p	0.01	0.01	"	"	
11		21	8	21	00	21	01	8	28	29*	28	28*	?	0.01	0.05	"	"	
12		21	8	57	54	57	55	9	05	11*	05	11*	47.9	?	0.02	"	"	
13		23	0	20.3		—	—	—	—	—	—	—	1.5p	0.01	—	"	"	
14		23	8	35	34	35	32	8	35	57	35	56	2.7	0.02	0.02	"	"	
15		24	9	53	47	53	47	10	00	53	57	44*	30.6	0.02	0.04	"	"	
16		25	6	05	50	5	50	6	06	06	06	06	2.2	0.01	0.01	"	"	
17		25	7	36	23	—	—	7	36	36	36	36	1.9	0.03	0.01	"	"	
18		26	3	38	59	38	59	3	39	10	39	10	5.3	0.15	0.18	Quick	"	Felt
19		26	3	44	50	44	51	3	45	03	45	03	1.7	0.02	0.01	"	"	Felt
20		26	5	13	20	13	20	5	13	32	13	33	2.2	0.03	0.03	"	"	Felt
21		26	6	31	21	31	21	6	31	34	31	34	4.7	0.08	0.10	"	"	Felt
22		26	9	59	02	59.1		9	59	13	—	—	1.5	0.01	0.00	Slow	"	
23		26	14	13	52	13	50	14	17	43*	17	43*	57.9	?	0.05	"	"	
24		27	10	21.4		21	25	10	22	39	22	41	4.7	0.03	0.04	"	"	
25		27	12	39	34	39.6		12	40	22	40	21	3.5	0.03	0.02	"	"	
26		27	—	—	—	—	—	3	04	01	—	—	?	0.00	—	"	"	
27		27	20	40	15	40	15	20	40	39	40	40	3.8	0.07	0.10	Quick	"	Felt
28		30	11	50	34	50	34	11	54	49*	54	42*	226.8	?	?	Slow	"	
29		30	15	55	58	55.7		15	59	24	—	—	6.7	0.00	0.01	"	"	
30		30	16	28	10	28	10	16	32	16	32	20	30.1	?	0.01	"	"	
31		31	13	07	20	07	17	13	12	59*	12	51*	70.5	0.01	0.10	"	"	
32		31	17	03	51	08	47	17	12	53*	12	52*	21.6	?	0.02	"	"	
33	Feb.	3	10	33	19	33	19	10	33	46	33	46	4.7	0.06	0.06	"	"	
34		6	16	35	56	35	56	16	37	02	37	02	3.6	0.02	0.03	"	"	
35		12	18	04	03	04	06	18	04	27	04	27	4.6	0.09	0.10	"	"	
36		17	7	43	14	43	15	7	43	43	43	43	8.3	0.15	0.22	"	"	
37		18	10	29	14	29	14	10	34	07*	34	07*	23.2	?	0.01	"	"	
38		18	17	10	20	—	—	—	—	—	—	—	0.6	0.00	—	"	"	
39		21	3	18	38	18	38	3	18	48	18	48	2.8	0.04	0.04	"	"	
40		21	5	02.9		04.0		—	—	—	—	—	93.4p	0.05	0.21	"	"	
41		22	0	46	19	46	21	0	47	19	47	23	5.9	0.06	0.10	"	"	
42		22	4	36	21	36	18	4	36	54	36	53	5.3	0.05	0.05	"	"	
43		23	3	28	26	28	26	3	29	53	29	53	6.4	0.07	0.11	"	"	
44		24	12	15.2		15.2		12	15	31	15	32	1.9p	0.01	0.01	"	"	
45		25	14	26	28	26	17	14	31	17*	31	12*	?	?	0.04	"	"	
46		25	14	52	02	52	01	14	56	56*	56	42*	105.6	?	0.05	"	"	
47		27	19	27	41	27	40	19	28	23	28	23	14.9	0.13	0.20	"	"	
48		27	23	55	53	55	50	23	56	42	56	40	4.1	0.03	0.02	"	"	
49	Mar.	1	2	24	36	24	35	—	—	—	—	—	3.0	0.02	0.01	"	"	
50		3	21	51	00	51	00	21	51	41	51	43	18.9	0.22	0.20	"	"	
51		13	15	40	06	40	06	15	40	17	40	17	2.3	0.02	0.01	"	"	
52		14	4	57	55	57	56	4	58	26	58	27	9.0	0.07	0.08	"	"	
53		15	9	14	48	14	48	9	—	—	15	21	?	?	?	Quick	"	Felt
54		15	9	—	—	29	37	9	—	—	30	06	3.8	—	0.15	Slow	"	
55		15	9	46	26	46	29	9	47	00	47	01	3.2	0.07	0.10	"	"	

† Japanese Central standard Time (9h east from Greenwich), reckoned from midnight.

\* Commence Time of the 2nd preliminary tremor.

## TABL A.

(Earthquakes)



No.	Date		Time of Occurrence †				Beginning of the Principal Portion				Duration of Total Earthquake (mean)	Maximum Range of Motion		Character of Motion	Intensity	Remarks		
	1917		E	W	N	S	E	W	N	S		E	W				N	S
56	Mar.	15	10 <sup>h</sup>	00 <sup>m</sup>	21 <sup>s</sup>	00.4	—	—	—	—	—	—	—	2.1 <sup>P</sup>	0.05	0.05	Slow	Feeble
57		15	10	14	24	14	24	10	14	58	14	57	—	2.7	0.12	0.11	"	"
58		15	10	22	27	22	28	10	—	—	22	57	—	5.4	0.15	0.20	"	"
59		15	10	30	44	31.1	—	10	31	26	—	—	—	1.8 <sup>P</sup>	0.06	0.07	"	"
60		15	10	35	28	35.5	—	—	—	—	—	—	—	3.2	0.04	0.05	"	"
61		15	10	59	11	—	—	—	—	—	—	—	—	2.1	0.01	—	"	"
62		15	11	20	11	—	—	11	20	47	—	—	—	2.0	0.01	—	"	"
63		15	11	36.6	—	—	—	—	—	—	—	—	—	1.9 <sup>P</sup>	0.01	—	"	"
64		15	12	05	33	—	—	12	06	05	—	—	—	2.8	0.02	—	"	"
65		15	12	50	01	—	—	—	—	—	—	—	—	1.1	?	—	"	"
66		15	13	04	22	04	24	13	04	55	—	—	—	2.4	0.02	0.01	"	"
67		15	13	15	56	—	—	13	16	27	—	—	—	2.0	0.01	—	"	"
68		15	15	20	31	20	32	15	21	05	21	08	—	3.1	0.06	0.09	"	"
69		15	15	50.2	—	—	—	—	—	—	—	—	—	2.4 <sup>P</sup>	0.02	0.03	"	"
70		15	17	48	55	49.2	—	—	—	—	—	—	—	2.4	0.02	0.01	"	"
71		15	18	41	01	—	—	—	—	—	—	—	—	1.6	0.02	—	"	"
72		15	19	39.7	—	—	—	—	—	—	—	—	—	1.5 <sup>P</sup>	00.0	—	"	"
73		15	22	30	12	—	—	—	—	—	—	—	—	1.2	0.01	—	"	"
74		16	0	32.4	—	—	—	—	—	—	—	—	—	1.2 <sup>P</sup>	0.00	—	"	"
75		16	10	45	36	45.6	—	10	46	12	—	—	—	2.7	0.01	0.01	"	"
76		16	14	50.1	—	—	—	—	—	—	—	—	—	0.6 <sup>P</sup>	0.00	—	"	"
77		16	21	18	49	19.0	—	21	19	22	—	—	—	3.1	0.01	0.01	"	"
78		16	22	26	14	—	—	—	—	—	—	—	—	1.8	0.01	—	"	"
79		16	23	28	—	—	—	—	—	—	—	—	—	1.2 <sup>P</sup>	0.01	0.01	"	"
80		17	8	48.0	—	—	—	—	—	—	—	—	—	1.7 <sup>P</sup>	0.01	—	"	"
81		17	9	24	26	24.6	—	9	24	46	—	—	—	2.8	0.02	0.01	"	"
82		18	0	30	57	30.9	—	0	31	20	—	—	—	3.8	0.03	0.04	"	"
83		18	0	48	28	48.6	—	0	48	50	—	—	—	3.7	0.04	0.05	"	"
84		18	5	01.9	—	—	—	—	—	—	—	—	—	1.3 <sup>P</sup>	0.00	—	"	"
85		18	7	13	24	13	24	7	14	06	14	04	—	9.1	0.14	0.16	"	"
86		18	11	41	25	—	—	—	—	—	—	—	—	2.2	0.00	—	"	"
87		19	3	06	10	06.4	—	3	06	42	—	—	—	7.6	0.02	0.02	"	"
88		19	4	57	10	57.4	—	4	57	41	—	—	—	7.8	0.03	0.04	"	"
89		19	5	07	13	—	—	5	08	17	—	—	—	4.8	0.01	—	"	"
90		19	21	48	21	—	—	21	48	29	—	—	—	0.6	0.01	—	"	"
91		19	22	39.8	—	—	—	—	—	—	—	—	—	1.9 <sup>P</sup>	0.00	—	"	"
92		20	10	37	53	37	53	10	38	22	38	23	—	7.8	0.17	0.20	"	"
93		20	11	18	51	18.9	—	11	19	19	19	19	—	3.3	0.03	0.03	"	"
94		20	11	34	27	34.7	—	11	34	55	—	—	—	2.4	0.01	0.01	"	"
95		24	14	22	00	21	59	—	—	—	—	—	—	1.9	0.01	0.01	"	"
96		24	20	58	47	58	47	20	58	58	58	58	—	0.9	0.03	0.04	"	"
97		29	3	24	22	24	22	3	25	08	25	10	—	6.1	0.03	0.03	"	"
98		29	3	59	16	59.2	—	4	00	04	—	—	—	6.0 <sup>*</sup>	0.01	0.01	"	"
99	Apr.	1	3	04	49	05.3	—	—	—	—	—	—	—	5.7	0.02	0.02	"	"
100		1	10	41.9	—	—	—	10	42	34	42	34	—	3.4	0.02	0.03	"	"
101		7	17	55	41	55	45	17	56	07	—	—	—	2.8	0.03	0.03	"	"
102		8	9	54	08	54	08	9	54	25	54	24	—	2.3	0.03	0.03	"	"
103		11	2	47.2	—	—	—	—	—	—	—	—	—	0.9	0.00	—	"	"
104		12	11	59.8	—	—	—	—	—	—	—	—	—	1.0	0.00	—	"	"
105		12	12	08	53	—	—	—	—	—	—	—	—	?	?	—	"	"
106		12	20	26.5	—	—	—	—	—	—	—	—	—	0.5 <sup>P</sup>	0.01	—	"	"
107		15	19	31	05	—	—	19	31	28	—	—	—	2.9	0.01	—	"	"
108		15	22	55	53	—	—	—	—	—	—	—	—	1.9	0.01	—	"	"
109		17	19	39.7	—	—	—	—	—	—	—	—	—	1.3 <sup>P</sup>	0.00	—	"	"
110		18	14	50	49	50.6	—	14	51	06	—	—	—	2.1	0.01	0.01	"	"

**TABLE A.**  
(Earthquakes)



No.	Date		Time of Occurrence †				Beginning of the Principal Portion				Duration of Total Earthquake (mean)	Maximum Range of Motion		Character of Motion	Intensity	Remarks	
	1917		E	W	N	S	E	W	N	S		E	W				N
111	Apr.	21	h	m	s	m	51	h	m	s	m	s	m	m	0.02	Slow	Feeble
112		21	9	58	53	58	51	10	08	19*	08	15*	P	P	1.50	Quick	"
113		21	12	53	22	53	22	12	53	56	53	55	19.3	P	—	Slow	"
114		22	21	52.7		—	—	—	—	—	—	—	2.9P	0.00	—	"	"
115		23	15	34	30	34	29	15	35	08	—	—	3.8	0.01	0.01	"	"
116		26	7	44.3		—	—	—	—	—	—	—	1.8P	0.00	—	"	"
117		28	0	51	44	51	44	0	52	02	52	00	3.4	0.03	0.04	"	"
118	May	2	22	55	58	56.2		22	57	47	57	48	8.1	0.09	0.15	"	"
119		2	3	38	41	33	42	3	48	32*	48	33*	194.8	P	3.26	"	"
120		2	5	36.2		36.5		—	—	—	—	—	6.3P	0.00	0.00	"	"
121		2	6	03.4		03.4		—	—	—	—	—	4.1P	0.00	0.00	"	"
122		6	6	11.4		—	—	—	—	—	—	—	5.1P	0.00	—	"	"
123		7	12	19.1		19.3		—	—	—	—	—	3.0P	0.02	0.02	"	"
124		7	8	01	39	01	39	6	06	25*	06	21*	41.1	P	0.15	"	"
125		9	11	54	51	54	52	11	55	30	—	—	3.4	0.01	0.01	"	"
126		10	2	09	30	09.8		—	—	—	—	—	2.3	0.01	0.01	"	"
127		12	1	00	46	00	49	1	05	37*	05	25*	45.8	P	2.40	"	"
128		12	3	46	25	46.6		—	—	—	—	—	2.2	0.01	0.00	"	"
129		12	21	40	34	40	34	21	41	17	41	17	4.7	0.02	0.01	"	"
130		14	1	28	33	28	33	1	28	45	28	45	2.9	0.05	0.09	Quick	"
131		15	21	55		—	—	—	—	—	—	—	0.8P	0.00	—	Slow	"
132		15	23	33	48	33.8		23	34	01	—	—	1.9	0.02	0.01	"	"
133		18	4	07	56	07	56	4	09	00	08	58	15.1	0.37	0.56	"	"
134		18	19	15	28	15	29	19	16	00	15	59	3.6	0.05	0.05	"	"
135		21	12	08.3		—	—	—	—	—	—	—	1.2P	0.01	—	"	"
136		21	17	52	54	52.8		17	53	05	—	—	1.9	0.01	0.01	"	"
137		22	11	15	54	15	55	11	16	23	16	22	5.2	0.11	0.16	"	"
138		26	14	56	43	—	—	14	56	52	—	—	2.6	0.01	—	"	"
139		29	4	12	28	12	28	4	12	46	12	46	3.6	0.09	0.14	Quick	"
140		31	5	02	18	02.3		5	02	39	—	—	2.6	0.01	0.01	Slow	"
141		31	15	07	29	07	29	15	08	20	08	19	12.6	0.14	0.14	"	"
142	June	31	17	55	22	55	17	18	01	37	01	47	103.4	0.63	2.40	"	"
143		4	6	38	53	39.0		6	39	13	—	—	4.0	0.01	0.00	"	"
144		6	1	27	22	27	21	1	27	44	27	44	6.6	0.13	0.20	Quick	"
145		6	12	19	03	19.1		12	19	18	19	18	1.2	0.02	0.02	"	"
146		7	19	51	24	—	—	19	51	52	51.9		3.0	0.00	0.00	Slow	"
147		8	21	46	20	46	21	21	47	34	47	34	8.4	0.10	0.15	"	"
148		9	9	23	20	—	—	9	24	18	24	19	6.1	0.01	0.01	"	"
149		9	12	10	06	—	—	12	11	14	11	13	4.3	0.03	0.05	"	"
150		9	20	08	43	08.8		20	10	16	10	17	6.1	0.01	0.01	"	"
151		9	22	56.9		—	—	22	58	13	—	—	4.9P	0.00	—	"	"
152		9	23	59	56	—	—	24	00	53	00	52	6.2	0.02	0.02	"	"
153		10	6	48		—	—	—	—	—	—	—	P	P	—	"	"
154		10	7	41	36	41	35	7	42	09	42	09	13.4	0.29	0.35	Quick	"
155		13	15	53	48	53	50	16	03	56*	03	42*	73.0	0.01	0.31	Slow	"
156		14	22	21	15	21	15	22	21	37	21	37	16.6	0.70	0.87	Quick	"
157		15	13	41	04	41	04	13	43	02	43	01	6.2	0.02	0.02	Slow	"
158		17	4	10	07	10	04	4	10	36	10	34	4.2	0.02	0.02	"	"
159		17	6	39	09	39	08	6	39	53	39	52	3.5	0.01	0.01	"	"
160		19	1	34	59	34	53	—	—	—	—	—	12.3	0.00	0.00	"	"
161		19	7	18	18	18	11	—	—	—	—	—	14.6	0.01	0.01	"	"
162		19	7	57	28	57.5		7	57	46	—	—	2.7	0.01	0.01	"	"
163		21	21	10.9		10.8		21	11	43	—	—	4.7P	0.01	0.01	"	"
164		25	5	00	14	00	13	5	09	17*	09	24*	54.3	P	0.02	"	"
165		26	15	00	48	00	48	15	09	48*	09	28*	181.9	P	P	"	"
165		30	9	04	09	04.2		9	04	58	—	—	4.9	0.01	0.01	"	"

## TABLE A.

(Earthquakes)

No.	Date 1917	Time of Occurrence †				Beginning of the Principal Portion				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	
166	July.	1	h 2	m 06	s 44	m 06.8	s	h 2	m 07	s 31	m —	s —	m 6.7	m m 0.04	m m 0.03	Slow	Feeble	
167		1	9	48.2	48.5			9	51	27*	51	29*	30.2P	?	0.01	"	"	
168		3	12	—	—	49	07	12	—	—	49	39	9.0	—	0.40	Quick	"	Felt
169		4	9	42	40	42	40	9	—	—	46	05*	79.5	?	?	Slow	"	
170		4	14	40	50	40	50	14	44	19*	44	19*	47.8	0.03	0.25	"	"	
171		10	3	21	36	21	36	—	—	—	—	—	5.5	0.02	0.02	"	"	
172		11	0	18.9	19.9			0	21	28*	21	27*	22.6P	?	0.01	"	"	
173		14	1	45	49	45.7		1	47	20	47	19	5.9	0.00	0.00	"	"	
174		17	4	13	44	13.7		4	14	11	14	09	5.9	0.03	0.05	"	"	
175		17	13	15	36	15.7		13	15	58	—	—	5.4	0.02	0.01	"	"	
176		18	16	52	09	52	10	16	53	03*	53	11*	43.6	0.14	0.26	"	"	
177		18	19	16	06	16.2		—	—	—	—	—	12.8	0.02	0.02	"	"	
178		19	2	54	40	51	40	2	55	14	—	—	6.1	0.02	0.01	"	"	
179		20	15	53	07	—	—	15	53	29	—	—	1.2	0.00	—	"	"	
180		20	15	58	44	58	42	15	59	21	59	21	10.7	0.11	0.13	"	"	
181		21	20	01	27	01	27	20	01	49	01	51	7.5	0.10	0.09	"	"	
182		23	18	52.0	52.6			18	52	44	—	—	4.2P	0.01	0.00	"	"	
183		25	12	26	57	26	57	—	—	—	—	—	?	?	0.01	"	"	
184		25	16	31	45	31	43	16	32	45	32	46	12.3	0.18	0.30	"	"	
185		27	10	20.5	22.0			—	—	—	—	—	105.9P	?	0.05	"	"	
186		27	12	11	41	11	28	—	—	—	—	—	130.6	0.01	0.04	"	"	
187		27	15	41.4	41.7			15	42	12	—	—	3.2P	0.01	0.01	"	"	
188		28	8	43.9	—	—	—	—	—	—	—	—	3.1P	0.01	—	"	"	
189		29	9	18	57	18	56	9	19	34	19	34	8.0	0.11	0.14	"	"	
190		29	10	57	51	57	51	10	58	22	58	21	12.5	0.31	0.35	"	"	
191		29	12	39	24	39	23	12	39	56	39	57	4.8	0.02	0.02	"	"	
192		29	13	10	58	10	53	13	11	26	11	26	3.6	0.01	0.01	"	"	
193		29	23	33	02	33	03	23	33	32	33	33	?	?	?	Quick	"	Felt
194		29	23	44	12	44	11	23	44	42	44	42	?	0.25	0.31	"	"	
195		29	23	57	24	57.6		23	57	52	—	—	4.0	0.04	0.04	Slow	"	
196		30	0	10	46	10	46	0	11	12	11	15	6.4	0.08	0.07	"	"	
197		30	0	30	21	30.7		0	30	43	—	—	3.7	0.01	0.01	"	"	
198		30	1	35	54	35	55	1	36	25	36	25	9.6	0.25	0.26	"	"	
199		30	4	41.8	—	—	—	4	—	—	41	54	2.1P	0.00	0.00	"	"	
200		30	7	00	21	00	18	7	06	39*	06	31*	?	?	2.75	"	"	
201		30	9	31	43	31	43	9	32	16	32	13	13.8	0.10	0.10	"	"	
202		30	12	53	27	53	31	12	55	09	55	13	6.6	0.02	0.02	"	"	
203		30	20	26.5	—	—	—	20	26	40	26	37	1.5P	0.01	0.01	"	"	
204		31	1	29.4	30.3			—	—	—	—	—	?	?	?	"	"	
205		31	7	28.4	—	—	—	—	—	—	—	—	0.8P	0.00	—	"	"	
206		31	7	53.1	53.8			—	—	—	—	—	?	?	?	"	"	
207		31	9	—	—	01	25	9	05	47	05	55	84.6	0.86	1.25	"	"	
208		31	12	21	21	21	23	—	—	—	—	—	67.1	?	0.05	"	"	
209		31	12	25	13	25	12	12	26	55	26	55	?	?	0.95	"	"	
210	Aug.	3	14	43	54	43.9		—	—	—	—	—	1.3	0.00	0.00	"	"	
211		6	2	48	24	48	25	2	48	54	48	56	3.9	0.06	0.09	"	"	
212		6	3	42	40	42	42	3	46	10*	46	10*	15.0	?	0.02	"	"	
213		8	1	14	11	14.2		1	14	33	14	32	6.1	0.05	0.09	"	"	
214		8	7	18	00	—	—	7	18	23	18	22	1.9	0.00	0.01	"	"	
215		8	14	27.4	27.3			—	—	—	—	—	4.8P	0.00	0.00	"	"	
216		8	15	13.0	13.0			—	—	—	—	—	3.5P	0.00	0.00	"	"	
217		8	15	16.9	17.2			—	—	—	—	—	6.8P	0.00	0.01	"	"	
218		8	17	17.2	18.1			17	18	38	—	—	12.9P	0.01	0.01	"	"	
219		9	4	42.4	42.8			—	—	—	—	—	5.5P	0.01	0.02	"	"	
220		10	3	25.2	25.2			3	25	50	25	50	4.6P	0.00	0.01	"	"	



## TABLE A.

(Earthquakes)



No.	Date		Time of Occurrence †				Beginning of the Principal Portion				Duration of Total Earthquake (mean)	Maximum Range of Motion		Character of Motion	Intensity	Remarks	
	1917		E	W	N	S	E	W	N	S		E	W				N
221	Aug.	10	h	m	s	m	s	h	m	s	—	—	m	m	Slow	Feeble	
			6	30.7		30.0		6	31	06			3.2P	0.01	0.01		
222		10	10	17.8		18.2		10	18	20			3.4P	0.01	0.00	"	"
223		10	20	18.9		18.7		20	19	58	19	47	P	0.02	0.03	"	"
224		10	—	—	—	—	—	20	27	58	—	—	P	0.01	—	"	"
225		10	21	00.2		00.9		21	01	17	—	—	5.7P	0.01	0.01	"	"
226		10	22	43	07	—	—	—	—	—	—	—	1.2	0.00	—	"	"
227		11	5	15.1		15	42	5	15	40	16	15	3.0	0.01	0.01	"	"
228		11	7	13	46	13	46	7	19	52*	19	57*	P	P	0.00	"	"
229		11	15	06	40	—	—	—	—	—	—	—	2.1	0.00	—	"	"
230		13	14	33	20	33.4		14	33	53	—	—	2.9	0.01	0.01	"	"
231		14	19	11.6		—	—	19	11	41	—	—	1.8P	0.01	—	"	"
232		15	14	59	24	59	24	15	00	12	00	12	4.4	0.05	0.05	"	"
233		16	17	45	46	45	46	17	46	12	46	15	3.0	0.02	0.02	"	"
234		16	20	41	52	42.0		20	42	21	—	—	3.2	0.01	0.02	"	"
235		19	4	59	44	59	44	5	00	05	00	05	4.7	0.11	0.14	"	"
236		20	23	18.9		19.1		23	19	35	—	—	3.1P	0.01	0.01	"	"
237		23	3	47	49	—	—	—	—	—	—	—	1.0	0.00	—	"	"
238		23	6	12	31	12.5		—	—	—	—	—	2.6	0.01	0.01	"	"
239		23	14	44	07	44	08	14	45	06	45	06	6.4	0.11	0.11	"	"
240		24	22	28	22	28	28	22	29	05	29	11	9.1	0.07	0.08	"	"
241		26	11	41	19	42.0		11	42	09	—	—	5.3	0.01	0.01	"	"
242		29	3	41	22	41	22	3	41	54	41	54	6.7	0.01	0.04	"	"
243		30	4	32	41	32	41	4	33	04	33	06	7.8	0.12	0.21	"	"
244		30	13	15	46	—	—	13	22	42*	—	—	111.2	0.05	—	"	"
245	Sept.	3	4	43	14	43	14	4	43	39	43	40	3.9	0.04	0.10	"	"
246		4	11	41	56	—	—	11	42	48	—	—	5.4	0.06	—	"	"
247		6	8	48	47	48.6		—	—	—	—	—	1.9	0.00	0.00	"	"
248		9	18	14	18	14	20	18	14	44	14	46	5.0	0.03	0.05	"	"
249		12	22	46	33	46	34	22	47	33	47	34	4.9	0.02	0.02	"	"
250		14	2	32	57	33.2		2	33	38	—	—	2.9	0.02	0.01	"	"
251		15	20	44	45	44.9		20	45	20	—	—	5.8	0.01	0.01	"	"
252		18	23	43	30	43.5		23	44	00	44	04	4.8	0.01	0.01	"	"
253		22	2	08	05	—	—	2	08	46	—	—	3.3	0.01	—	"	"
254		25	5	16	07	15.7		5	16	41	—	—	11.3	0.01	0.04	"	"
255		29	12	05	15	05	14	12	06	14	06	13	5.7	0.06	0.09	"	"
256		30	0	36.2		—	—	—	—	—	—	—	2.3P	0.00	—	"	"
257		30	15	19	41	19	41	15	19	53	19	54	3.9	0.09	0.09	"	"
258	Oct.	1	20	11	46	11	45	20	12	33	12	29	4.6	0.07	0.07	"	"
259		2	23	21	15	21	15	23	21	29	21	27	5.8	0.28	0.30	Quick	"
260		4	19	28.1		28.4		19	28	31	—	—	2.0P	0.01	0.01	Slow	"
261		6	17	01	41	01.9		17	01	54	—	—	2.6	0.02	0.02	Quick	"
262		7	2	47	01	47.2		2	47	18	47	18	1.9	0.01	0.01	"	"
263		7	9	19	54	20.1		9	20	06	—	—	4.0	0.02	0.02	Slow	"
264		16	20	11.9		12.0		—	—	—	—	—	2.1P	0.01	0.01	"	"
265		17	3	04	21	04	22	3	04	59	04	59	7.2	0.11	0.15	"	"
266		17	22	54	27	54.5		22	54	53	54	54	2.9	0.02	0.01	"	"
267		19	20	12	26	12.4		20	12	56	—	—	3.7	0.01	0.01	"	"
268		22	7	00	45	00.8		7	00	56	00	56	1.7	0.01	0.01	"	"
269		22	23	49	32	49.8		23	50	25	50	41	5.0	0.02	0.02	"	"
270		25	7	00	37	00	37	7	01	34	01	36	4.7	0.01	0.02	"	"
271		26	2	07.6		07	30	2	—	—	07	52	1.8	0.01	0.02	"	"
272		26	3	24.2		24.4		—	—	—	—	—	1.4P	0.01	0.00	"	"
273	Nov.	1	0	11	58	11	58	0	15	03	15	02	8.4	0.03	0.03	"	"
274		3	4	07	40	—	—	4	08	12	—	—	3.2	0.01	—	"	"
275		4	21	13	06	13	07	21	20	43*	20	55*	52.3	0.01	0.13	"	"

SEISMOLOGICAL OBSERVATIONS AT MIZUSAWA.

**TABL A.**  
(Earthquakes)

No.	Date		Time of Occurrence †				Beginning of the Principal Portion				Duration of Total Earthquake (mean)	Maximum Range of Motion		Character of Motion	Intensity	Remarks	
	1917		E	W	N	S	E	W	N	S		E	W				N
276	Nov.	5	h	m	s	m	s	h	m	s	m	s	m	m	m	m	
			11	24	20	24	25	—	—	—	—	—	4.4	0.03	0.05	Slow	Feeble
277		6	2	41.9		41.8		—	—	—	—	—	2.4P	0.02	0.02	"	"
278		8	19	30.0		—	—	19	31	08	—	—	2.2P	0.00	—	"	"
279		10	7	42	47	42	46	7	43	14	43	14	6.6	0.07	0.07	"	"
280		10	8	17.5		17.5		8	17	42	—	—	3.7P	0.01	0.00	"	"
281		15	4	57	01	57.4		4	57	32	—	—	4.3	0.01	0.01	"	"
282		15	11	49.7		—	—	—	—	—	—	—	2.7P	0.01	—	"	"
283		16	0	01	03	01	04	0	01	31	01	31	21.4	0.37	0.45	Quick	"
284		16	12	31	32	—	—	12	41	06*	—	—	91.8	0.14	—	Slow	"
285		16	23	55.7		55.8		—	—	—	—	—	1.0P	0.01	0.02	"	"
286		17	7	24	14	24	05	7	29	32*	29	29*	37.1	0.01	0.05	"	"
287		18	12	04	47	04	40	12	10	03*	10	25*	52.2	0.02	0.31	"	"
288		18	16	00.8		01	02	—	—	—	—	—	3.0	0.01	0.01	"	"
289		21	18	38.7		38.7		18	38	48	—	—	1.6P	0.01	0.01	"	"
290		24	20	16.5		16	30	20	20	37*	20	49*	31.0	P	0.07	"	"
291		30	2	31.6		31.6		2	31	43	—	—	1.9P	0.01	0.00	"	"
292	Dec.	3	20	31	56	31	56	20	32	10	32	10	4.3	0.24	0.24	Quick	"
293		6	20	37	50	37	50	20	38	02	38	02	14.5	P	1.50	"	Weak
294		6	22	28.2		28.0		—	—	—	—	—	1.3P	0.01	0.00	Slow	Feeble
295		6	22	32	30	32	30	22	32	41	32	42	3.7	0.03	0.05	Quick	"
296		7	4	19	39	19.6		4	19	50	—	—	3.9	0.01	0.01	Slow	"
297		9	2	55	41	55	41	2	55	51	55	52	2.5	0.03	0.04	"	"
298		15	22	46.5		46.9		—	—	—	—	—	2.3P	0.01	0.01	"	"
299		17	18	07	59	07.9		18	08	14	08	14	2.9	0.03	0.05	"	"
300		18	7	21.5		21.0		—	—	—	—	—	4.9P	0.02	0.02	"	"
301		20	2	29	00	29.0		2	29	13	29	14	2.1	0.01	0.01	"	"
302		22	3	02	54	02	55	3	09	40*	09	22*	72.5	0.01	0.12	"	"
303		23	19	20	52	—	—	19	21	17	—	—	1.7	0.00	—	"	"
304		24	11	23.2		23.2		11	23	26	23	27	1.2P	0.01	0.01	"	"
305		26	2	39.8		—	—	2	40	13	—	—	5.2P	0.03	—	"	"
306		28	0	54	55	—	—	0	55	08	—	—	P	0.04	—	Quick	"
307		28	0	56	59	—	—	0	57	11	—	—	9.2	0.22	—	"	"
308		28	1	13	27	—	—	1	13	38	—	—	P	0.01	—	Slow	"
309		28	1	14	48	—	—	1	15	02	—	—	2.5	0.02	—	"	"
310		28	15	53.1		—	—	—	—	—	—	—	3.8P	0.02	—	"	"
311		30	1	57	11	57	11	1	57	22	57	23	2.9	0.03	0.04	Quick	"
312		30	20	12.2		12.5		—	—	—	—	—	3.3P	0.01	0.01	Slow	"

## TABLE B.

(Pulsatory Oscillation EW Component.)



Beginning		Ending		Maximum					
Date 1917	Hour	Date 1917	Hour	Date 1917	Hour	Double Amplitude			
	h		h	January	5	<sup>h</sup> 8-13 <sup>m</sup> 0.02			
January	2	21	January	12	6	9	5-11	0.03	
	14	14		16	16	10	22-23	0.01	
	18	6		24	4	15	15-16	0.01	
	24	8		27	4	19	10-16	0.04	
February	1	8	February	6	2	21-22	23- 1	0.01	
	12	18		16	19	24	15-16	0.01	
	18	12		21	19	February	3	11-13	0.01
	22	2		24	18		13	13-17	0.02
	28	7	March	3	18		19	2- 4	0.01
March	4	6		7	14	March	2	7- 9	0.00
	9	23		12	3		4	17-18	0.01
	14	17		18	2		10	16-23	0.03
	21	8		28	9		15	18-23	0.01
April	4	12	April	9	19	April	7	7-10	0.02
	10	22		12	2		25	4- 9	0.04
	16	3		18	6		11	22-23	0.01
	24	10		26	18		16	11-13	0.01
	28	10	May	1	2		24	20-22	0.00
May	6	10		11	22	May	7	17-18	0.01
	22	10		24	9		29	11-15	0.03
	28	16		29	13		10	15-19	0.01
June	11	9	June	3	21	June	2	4- 7	0.02
	20	9		15	6		22	17-19	0.01
July	5	4		22	2		28	21-23	0.00
	2	8	July	9	16	July	7	13-14	0.01
	12	2		7	14		13	21-23	0.01
	20	18	August	17	18		20	16-18	0.01
September	2	11		25	9	August	5	17-18	0.01
	12	1	September	8	23		15	5- 9	0.01
	16	16		13	21		22	11-13	0.01
	19	9		18	17	September	5	12-14	0.00
	25	8		21	18		12	11-13	0.00
October	7	2	October	3	15	October	1	9-10	0.00
	18	8		13	9		17	12-14	0.00
	25	8		19	7		20	12-14	0.00
	28	6		27	21		25	16-17	0.01
November	3	2	November	8	2	November	5	7-12	0.04
	9	7		10	4		11	12-15	0.01
	11	4		14	7		18	15-17	0.00
	16	9		27	21		26-27	21- 0	0.04
	21	5		31	9		28	21-23	0.02
	25	21		8	2	November	5	12-14	0.02
December	3	11	December	5	22	December	4	14-16	0.01
	8	4		14	20		9	3- 5	0.01
	15	9		24	19		10	18-20	0.01
	26	8		29	21		16	1- 2	0.01
	30	6	January	1	21		22	17-19	0.01
							27	9-10	0.01
							31	5- 8	0.01
								17-19	0.01
								10-16	0.01
								13-14	0.01
								13-15	0.01