

EARTHQUAKES.

In April, 1904, a Bosch-Omori seismograph consisting of two horizontal pendulums, one recording north-south motion (N) and the other recording east-west motion (E), was mounted in an addition to the astronomic observatory. The following table is a register of the earthquakes recorded up to the end of 1906. The times are Greenwich mean time counted from midnight.

Period of pendulums..... 13-14 sec.
 Magnification..... 10.
 Steady mass..... 10-12 kg.

Register of earthquakes recorded at Sitka.

No.	Component	Date	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End of principal portion	End	Maximum amp.
		1904.	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
1	N	May 2	.. ..	.. ..	10 13 46	.. ..	10 17	.. ..	0.1
	E	2	.. ..	.. ..	10 13 45	.. ..	10 17	.. ..	0.1
2	N	June 25	.. ..	14 58 57	15 09 00	.. ..	.. ..	15 16	0.1
	E	25	14 54 08	14 59 38	15 08 00	.. ..	.. ..	15 35	0.1
3	N	25	21 09 11	21 18 00	21 22 00	.. ..	21 33	21 46	0.1
	E	25	21 09 16	21 15 16	21 25 16	.. ..	21 33	22 00	0.5
4	N	27	0 23 28	.. ..	0 31 00	.. ..	0 38	0 54	0.6
5	N	Aug. 24	21 21 00	.. ..	.. ..	.. ..	.. ..	22 28	0.1
	E	24	21 11 15	.. ..	.. ..	.. ..	.. ..	22 43	0.1
6	N	27	22 01 07	.. ..	22 03 43	22 05 07	.. ..	24 07	55.0
	E	27	22 00 50	.. ..	22 03 26	22 05 26	.. ..	23 51	52.0
7	N	30	12 23 30	.. ..	12 27 00	12 29 30	.. ..	12 40	1.0
	E	30	12 23 30	.. ..	12 27 00	12 29 30	.. ..	12 58	0.7
8	N	Sept. 11	6 26 12	.. ..	6 29 00	.. ..	.. ..	6 44	0.1
	E	11	6 20 00	.. ..	.. ..	.. ..	.. ..	6 49	0.1
9	N	18	23 51 20	.. ..	.. ..	.. ..	.. ..	25 01	0.1
	E	18	23 57 00	.. ..	.. ..	.. ..	.. ..	25 06	0.1
10	N	19	18 19 24	.. ..	.. ..	18 21 24	.. ..	18 34	..
	E	19	18 20 19	.. ..	.. ..	18 21 37	.. ..	18 32	..
11	N	24	5 27 36	.. ..	.. ..	.. ..	.. ..	5 38	0.1
	E	24	5 27 41	.. ..	.. ..	.. ..	.. ..	5 38	0.1
12	N	Oct. 3	3 30 27	.. ..	.. ..	.. ..	.. ..	4 39	0.1
	E	3	3 30 32	.. ..	.. ..	.. ..	.. ..	4 41	0.1
13	N	9	14 10 32	.. ..	14 16 30	14 18 40	.. ..	14 40	0.8
	E	9	.. ..	.. ..	14 18 00	.. ..	.. ..	.. ..	0.1
14	N	Dec. 2	2 42 37	.. ..	.. ..	.. ..	.. ..	3 15	0.1
	E	2	2 41 16	.. ..	.. ..	.. ..	.. ..	3 14	0.1
15	N	20	.. ..	.. ..	6 24 48	.. ..	.. ..	6 51	0.1
	E	20	5 53 00	.. ..	6 20 00	6 30 00	.. ..	6 53	0.1
		1905.							
16	N	Jan. 22	3 00 45	3 08 29	.. ..	3 08 42	.. ..	4 00	0.2
	E	22	3 00 31	3 07 42	3 31 05	3 10 31	.. ..	3 59	0.2
17	N	Mar. 7	10 33 ..	.. ..	.. ..	10 41 ..	.. ..	11 08	0.3
	E	7	10 34 ..	.. ..	.. ..	10 42 ..	.. ..	11 13	0.2
18	N	19	0 11 02	0 21 20	0 33 10	0 56 40	.. ..	1 36	0.3
	E	19	0 11 07	0 21 38	0 34 08	0 40 18	.. ..	1 21	0.3
19	N	22	3 45 44	3 50 20	3 55 28	4 00 52	.. ..	5 05	1.2
	E	22	3 45 10	.. ..	.. ..	4 01 08	.. ..	5 27	1.0
20	N	Apr. 4	1 03 16	1 13 20	1 34 08	1 47 20	1 55	3 49	2.0
	E	4	1 02 40	1 13 20	1 33 37	1 48 10	1 52	3 53	1.2
21	N	May 18	.. ..	14 09 03	14 27 32	14 31 25	.. ..	14 59	0.1
	E	18	13 58 36	14 08 56	14 26 16	14 33 16	14 41	15 35	0.3
22	N	June 12	5 31 10	.. ..	6 09 ..	6 02 54	.. ..	6 25	0.1
23	N	30	.. ..	.. ..	17 44 ..	.. ..	.. ..	18 20?	0.1
	E	30	17 31 53	.. ..	17 48 33	.. ..	.. ..	18 45?	0.2
24	N	30	20 31 20	.. ..	.. ..	20 35 40	.. ..	20 48	0.2
	E	30	20 25 45	.. ..	.. ..	20 33 45	.. ..	20 49	0.2
25	N	July 6	.. ..	16 37 00	16 43 17	16 57 24	.. ..	17 17	0.1
	E	6	16 31 00	16 38 30	16 47 30	17 00 02	.. ..	17 47	0.4
26	N	9	9 50 46	10 00 01	10 13 54	10 23 02	10 34	12 16	11.8
	E	9	9 52 05	10 00 45	10 13 53	10 27 34	10 37	12 38	9.9
27	N	14	8 52 53	8 54 37	8 56 36	8 58 34	9 02	10 00	17.5
	E	14	8 52 59	.. ..	8 56 33	8 58 36	9 04	10 05	23.2
28	N	23	2 57 05	3 06 20	3 18 55	3 28 40	3 43	6 20	34.3
	E	23	2 57 40	3 06 24	3 18 36	3 27 10	3 43	6 45	32.4

Register of earthquakes recorded at Sitka—Continued.

No.	Component	Date	First P. T. begin	Second P.T. begin	Large waves begin	Maximum	End of principal portion	End	Maximum amp.
		1905.	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
29	N	Sept. 8	2 05 48	.. .. .	2 21 08	2 31 28	.. ..	2 52	0.1
	E	8	2 05 13	.. .. .	2 20 45	2 33 13	.. ..	3 12	0.3
30	N	14	19 53 16	.. .. .	19 59 13	20 01 42	.. ..	20 30	0.2
	E	14	19 48 40	19 54 35	19 59 36	20 03 15	.. ..	21 12	1.0
31	N	15	6 08 56	6 15 02	6 19 33	6 20 48	6 30	8 50	10.7
	E	15	6 08 51	6 15 11	6 18 48	6 32 00	6 34	10 28	21.4
32	N	15	13 29 ..	.. .. .	.. .. .	.. .. .	.. ..	13 31	0.1
	E	15	13 27 ..	.. .. .	.. .. .	13 32 ..	.. ..	13 39	0.1
33	N	15	23 15 ..	.. .. .	.. .. .	.. .. .	.. ..	23 30	..
	E	15	23 14 ..	.. .. .	.. .. .	.. .. .	.. ..	23 28	..
34	N	Oct. 15	22 10 17	.. .. .	22 13 52	22 14 42	.. ..	22 26	1.4
	E	15	22 08 43	.. .. .	22 14 04	22 15 00	22 18	22 43	0.5
35	N	24	17 59 ..	.. .. .	.. .. .	18 08 ..	.. ..	18 28	0.4
	E	24	17 59 ..	.. .. .	.. .. .	18 04 ..	.. ..	18 45	0.2
36	E	Nov. 3	.. .. .	.. .. .	18 51 09	18 53 15	18 59	.. ..	0.2
37	N	8	22 29 27	.. .. .	.. .. .	22 57 03	.. ..	23 13	0.1
	E	8	22 30 04	.. .. .	22 44 14	22 55 12	23 02	23 24	0.5
38	N	Dec. 10	12 41 39	.. .. .	.. .. .	12 48 23	.. ..	14 16	1.3
	E	10	12 38 32	.. .. .	12 42 52	12 44 12	.. ..	14 29	1.6
39	N	17	5 36 41	.. .. .	5 50 12	5 54 53	6 01	7 01	0.8
	E	17	5 37 16	5 44 00	5 50 04	5 53 24	6 00	7 03	1.4
40	N	17	9 37 37	.. .. .	9 55 33	9 59 33	10 02	10 37	0.4
	E	17	9 45 32	9 49 04	9 55 04	9 57 56	10 05	10 49	0.5
		1906.							
41	N	Jan. 24	6 48 46	.. .. .	.. .. .	6 49 40	.. ..	7 57	6.8
42	N	27	9 37 31	.. .. .	9 58 47	10 01 51	.. ..	10 17	0.4
43	N	31	15 58 02	.. .. .	16 18 30	16 23 42	.. ..	17 44	33.3
44	N	Feb. 19	2 22 58	.. .. .	2 39 32	2 42 26	.. ..	3 42	0.4
45	N	Mar. 3	8 52 39	8 59 36	9 13 42	9 15 00	9 19	9 47	2.0
46	N	19	8 05 26	8 12 26	8 25 34	8 26 34	.. ..	8 37	0.3
47	N	Apr. 10	21 32 34	21 36 12	21 43 40	21 45 20	21 55	22 37	4.4
48	N	18	13 17 01	.. .. .	13 20 55	13 23 50	14 00	16 55	63.0
49	N	June 23	.. .. .	.. .. .	19 26 08	19 36 12	19 43	.. ..	0.1
50	N	July 1	.. .. .	.. .. .	4 57 ..	.. .. .	5 20	.. ..	..
	E	1	.. .. .	.. .. .	4 57 ..	.. .. .	5 18	.. ..	..
51	N	Sept. 14	16 29 07	.. .. .	16 41 57	.. .. .	.. ..	18 46	..
	E	14	16 29 ..	.. .. .	.. .. .	.. .. .	.. ..	18 43	..
52	N	Nov. 14	18 00 30	.. .. .	18 12 14	18 22 08	.. ..	18 47	0.1
53	N	25	11 17 25	.. .. .	.. .. .	11 23 25	.. ..	11 33	0.3
	E	25	11 17 53	.. .. .	.. .. .	.. .. .	.. ..	11 32	0.1
54	N	Dec. 22	18 33 16	18 42 40	19 01 54	19 10 04	19 17	20 04	3.1
	E	22	18 32 56	18 42 30	19 02 20	19 09 04	19 13	20 06	0.5
55	N	23	7 05 30	.. .. .	7 12 16	7 15 10	.. ..	7 29	0.2
	E	23	7 05 26	.. .. .	7 11 54	.. .. .	.. ..	7 21	0.1
56	N	23	17 21 22	.. .. .	17 22 15	17 24 32	17 32	18 32	11.9
	E	23	.. .. .	.. .. .	17 20 18	17 32 14	17 33	18 00	4.0

REMARKS.

No. 4: Record of E indistinct.

No. 6: Both pointers went off the paper at 22h. 05m.

No. 13: E not in good adjustment.

No. 15: Beginning and end obscured by tremors.

Throughout the year 1905 the phases of the smaller disturbances were not well marked, especially the beginning and end. From September 15 to the end of 1905 the records are not distinct owing to the poor quality of oil available for smoking the paper.

Pendulum E was not recording from January 6 to May 3, 1906, nor from December 26 to the end of the year. There were also numerous short periods of a day or less when pendulum N was not recording. The instrument was overhauled, cleaned, and adjusted between September 2 and 7, 1906. The time-marking device was out of order throughout 1906 except for two or three months following the readjustment, and in order to time the phases of the recorded earthquakes it has been necessary to assume that the driving clocks ran at a uniform rate for twenty-four hours. Experience with this and other Bosch-Omori seismographs indicates that this assumption is not far from the truth.

No. 41: N was apparently not free from 6:51 to 7:27.

Nos. 42, 43, 45, 46, and 47: Beginning and end uncertain.

No. 48: Pointer off the paper from 13:23:46 to 13:25:26 and from 13:25:46 to 13:30:10.

Nos. 52 and 53: Phases not well defined.

No. 56, E: Apparently the preliminary tremors were not recorded.

Microseismic tremors were recorded on January 4, 16, 20, and 31; February 4, 7, 24, and 25; March 12, 20, 28, and 31; April 4, 5, 19, and 27; May 28; June 30; July 17 and 24; August 29 and 30; September 7 and 11; October 1; November 3, 15, and 16, 1905; January 26 and 27; March 1 and 3; April 10; September 19, 20, and 26; October 13, 15, 16, and 29; November 11 and 28, 1906.

EARTHQUAKES.

In April, 1904, a Bosch-Omori seismograph consisting of two horizontal pendulums, one recording north-south motion (N) and the other recording east-west motion (E), was mounted in an addition to the astronomic observatory. The building is a small wooden structure and the pendulum standards are less than 2 feet from the walls. It was found that the change in the position of the sun in the course of the day caused a tilting of the pendulum standards, so that the lines on the seismograms were at one time crowded close together and at another time spread far apart. This defect was almost eliminated in the summer of 1907 by the erection of an outer building with double walls, leaving a space of about 2 feet between the outside of the old building and the inside of the new. In addition, the pendulum standards were wrapped with felt and the piers boxed up.

In March, 1907, the seismograph was given a thorough overhauling and readjusted. For some months prior to that date pendulum E had failed to record and the time-marking device was out of order, so that in determining the time of occurrence of a seismic disturbance it was necessary to assume that the rate of the driving clock was uniform for 24 hours. Experience with other Bosch-Omori seismographs indicates that this assumption is not far from the truth.

The following table is a register of the earthquakes recorded during 1907 and 1908. The times are Greenwich mean time counted from midnight.

Period of pendulums.....	16-17 sec.
Magnification.....	10
Steady mass.....	10-12 kg.

Register of earthquakes at Sitka.

No.	Component	Date	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End of principal portion	End	Maximum amp.
		1907	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
57	N	Jan. 2	12 18 32	.. .. .	12 40 34	12 51 20	.. ..	13 52	0.2
58	N	4	5 38 21	5 48 53	6 13 25	6 24 49	.. ..	7 37	1.0
59	N	14	21 04 06	.. .. .	21 07 25	21 10 24	21 15	21 25	1.0
60	N	Apr. 15	6 17 11	6 24 13	6 32 23	6 40 13	6 42	8 24	53+
61	E	May 25	14 10 37	14 17 31	14 22 57	14 26 51	.. ..	15 01	0.2
62	N	June 1	.. .. .	.. .. .	9 01 15	9 25 31	9 41	.. ..	0.2
63	E	1	.. .. .	.. .. .	9 01 33	9 26 18	9 46	.. ..	0.1
	N	June 28	.. .. .	.. .. .	5 50 16	5 50 22	5 51	.. ..	0.6
	E	28	.. .. .	.. .. .	5 50 17	5 50 23	5 51	.. ..	0.7
64	N	July 1	13 22 11	.. .. .	13 41 22	13 47 16	13 58	14 18	1.0
	E	1	13 23 05	.. .. .	13 42 27	13 47 17	13 52	14 11	0.6
65	N	20	.. .. .	.. .. .	14 01 50	14 02 49	14 09	.. ..	0.1
	E	20	13 52 44	13 56 42?	14 01 48	14 02 40	14 11	.. ..	0.2
66	N	Aug. 17	17 35 02	17 40 42	17 49 40	17 43 56	17 56	18 20	2.5
	E	17	17 34 59	17 40 43	17 49 44	17 50 09	17 57	18 20	0.6
67	N	22	22 28 05	22 31 42	22 35 58	22 31 51	.. ..	22 55	0.8
	E	22	22 28 08	22 31 44	22 36 35	22 32 03	.. ..	23 03	0.6
68	N	Sept. 2	16 07 43	16 12 22	16 14 06	16 18 52	.. ..	19 44	40.5
	E	2	16 07 43	16 12 02	16 15 50	16 23 45	16 32	19 50	73+
69	N	23	.. .. .	.. .. .	22 00 10	22 03 00	22 15	.. ..	0.8
	E	23	.. .. .	.. .. .	22 00 20	22 01 53	22 17	.. ..	0.5
70	N	24	12 58 56	12 59 27	12 59 38	12 59 41	13 00	13 04	0.4
	E	24	12 58 56	12 59 25	12 59 36	12 59 41	13 01	13 04	1.1
71	N	Oct. 5	21 55 48	.. .. .	21 55 56	21 55 57	21 56	21 59	1.1
	E	5	21 55 48	.. .. .	21 55 56	21 55 57	21 56	21 59	1.0
72	N	16	14 03 48	14 09 12	14 14 14	14 18 02	14 21	15 21	6.4
	E	16	14 03 50	14 09 00	14 12 05	14 20 48	14 22	15 31	4.0
73	N	21	4 36 22	4 46 45	4 56 50	5 10 22	5 21	6 12	1.1
	E	21	4 36 22	4 46 46	4 56 55	5 12 34	5 29	6 28	0.8
74	N	Dec. 15	17 59 07	.. .. .	18 37 21	.. .. .	18 58	.. ..	0.1
	E	15	17 58 27	.. .. .	18 24 13	.. .. .	18 57	.. ..	0.1
75	N	30	5 36 59	5 46 07	5 58 11	6 06 ..	.. ..	7 07	1.9
	E	30	5 36 49	5 45 05	5 58 21	6 07 ..	.. ..	7 23	1.5
		1908.							
76	N	Feb. 1	23 45 ..	.. .. .	.. .. .	23 52 37	.. ..	24 23	0.3
	E	1	23 45 ..			23 53 25		24 25	0.4
77	N	9			18 59 ..	19 01 50		19 11	0.3
	E	9			18 59 ..	19 09 10		19 15	0.2

EARTHQUAKES.

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Register of earthquakes at Sitka—Continued.

No.	Component	Date	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End of principal portion	End	Maximum amp.
		1908.	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
78	N	Feb. 14	11 26 24	.. .. .	.. .. .	11 29 35	.. .. .	11 34?	0.3
	E	14	11 26 30	.. .. .	11 28 25	11 29 30	11 33	11 37	0.8
79	N	Mar. 1	20 29 08	.. .. .	.. .. .	20 30 55	.. .. .	20 37	0.1
	E	1	20 29 05	.. .. .	.. .. .	20 29 45	.. .. .	20 42	0.2
80	N	3	23 34 00	.. .. .	.. .. .	23 36 25	.. .. .	23 43	0.2
	E	3	23 33 17	.. .. .	.. .. .	23 34 05	.. .. .	23 41	0.3
81	N	5	2 40 30	.. .. .	.. .. .	2 41 20	.. .. .	?	...
	E	5	2 40 30	.. .. .	.. .. .	3 01 50	.. .. .	3 11	0.3
82	N	5	14 32 28	.. .. .	.. .. .	14 33 30	.. .. .	14 43	...
	E	5	14 31 32	.. .. .	.. .. .	14 32 36	.. .. .	14 41	0.2
83	N	26	23 12 21	23 19 20	23 28 04	23 32 30	.. .. .	.. .. .	22.8
	E	26	23 12 02	23 19 16	23 28 03	23 36 00	24 00	1 07	30.5
						23 31 09	.. .. .	.. .. .	48.0
						23 35 36	23 49	1 12	41.0
84	N	27	3 56 03	4 03 11	4 11 56	4 15 07	.. .. .	.. .. .	9.0
						4 18 20	.. .. .	.. .. .	8.0
	E	27	3 56 11	4 03 12	4 12 02	4 20 00	4 22	5 08	13.6
						4 14 57	.. .. .	.. .. .	8.3
						4 18 15	4 22	5 04	6.4
85	N	Apr. 23	1 15 ..	.. .. .	.. .. .	1 18 ..	.. .. .	1 58	0.2
	E	23	1 15 ..	.. .. .	.. .. .	1 31 ..	.. .. .	2 00	0.2
86	N	May 2	17 43 ..	.. .. .	.. .. .	17 44 40	.. .. .	17 53	0.2
	E	2	17 44 ..	.. .. .	.. .. .	17 47 20	.. .. .	17 54	...
87	N	5	6 35 20	.. .. .	6 42 10	.. .. .	.. .. .	7 02	...
	E	5	6 34 35	.. .. .	6 41 25	.. .. .	.. .. .	7 08	...
88	N	15	8 32 41	.. .. .	8 32 53	8 36 00	8 39	9 56	68.0
	E	15	8 32 38	.. .. .	8 32 50	8 35 00	.. .. .	.. .. .	71.0
89	N	June 14	5 49 50	.. .. .	5 50 04	5 50 20	5 51	.. .. .	1.4
	E	14	5 49 48	.. .. .	5 50 00	5 50 20	5 51	5 58	2.2
90	N	18	11 06 20	.. .. .	.. .. .	11 08 05	.. .. .	11 23	0.4
	E	18	11 07 26	.. .. .	.. .. .	11 07 50	.. .. .	11 20	0.2
91	N	July 7	19 28 00	.. .. .	.. .. .	19 32 44	.. .. .	19 55	0.1
92	N	8	13 03 23	.. .. .	.. .. .	13 16 ..	.. .. .	13 34	0.1
	E	8	.. .. .	.. .. .	13 10 55	13 13 15	.. .. .	13 39	0.3
93	N	Aug. 12	16 06 34	.. .. .	16 18 24	16 39 44	16 41	.. .. .	0.1
	E	12	16 06 34	.. .. .	16 22 29	.. .. .	.. .. .	16 51	0.1
94	N	14	0 57 17	.. .. .	.. .. .	1 08 03	.. .. .	1 36	0.3
	E	14	0 57 17	1 00 37	1 06 53	1 08 17	.. .. .	1 48	0.3
95	N	17	.. .. .	.. .. .	.. .. .	11 56 13	.. .. .	12 57	0.2
	E	17	11 01 15	.. .. .	.. .. .	11 54 05	.. .. .	12 57	0.2
96	N	20	10 33 26	.. .. .	.. .. .	10 48 10	.. .. .	11 19	0.2
	E	20	10 33 31	.. .. .	.. .. .	10 46 43	.. .. .	11 10	0.2
97	N	Sept. 13	.. .. .	.. .. .	8 01 50	8 05 10	8 10	.. .. .	0.5
	E	13	.. .. .	.. .. .	8 01 34	8 04 58	8 11	.. .. .	0.2
98	N	21	.. .. .	.. .. .	6 52 49	6 54 05	7 04	.. .. .	3.6
	E	21	.. .. .	.. .. .	6 52 28	6 54 06	7 03	.. .. .	2.3
99	N	Oct. 10	14 52 20	.. .. .	.. .. .	15 05 52	.. .. .	15 27	0.1
	E	10	15 05 04	.. .. .	.. .. .	15 21 34	.. .. .	15 45	0.2
100	N	13	5 15 40	5 22 23	5 31 26	5 34 38	5 44	7 37	23.3
	E	13	5 15 25	5 22 34	5 30 58	5 34 38	5 39	7 36	25.0
101	N	14	15 04 01	15 10 25	15 18 21	15 20 41	.. .. .	15 29	0.2
	E	14	15 06 11	15 10 25	15 19 01	15 21 21	.. .. .	15 40	0.2
102	N	Nov. 2	5 59 20	6 08 36	6 13 44	.. .. .	6 30	6 39	0.1
	E	2	.. .. .	.. .. .	6 14 00	.. .. .	.. .. .	6 37	0.1
103	N	4	20 14 16	.. .. .	.. .. .	20 30 16	.. .. .	20 43	0.1
	E	4	20 15 01	.. .. .	.. .. .	.. .. .	.. .. .	20 44	0.1
104	N	4	22 04 33	.. .. .	.. .. .	22 16 40	.. .. .	22 37	0.2
	E	4	22 05 23	.. .. .	.. .. .	22 20 14	.. .. .	22 38	0.1
105	N	6	.. .. .	7 25 01	7 35 23	7 38 43	.. .. .	8 00	0.8
	E	6	7 18 01	7 24 47	7 35 38	7 38 49	7 45	8 13	0.5
106	N	6	.. .. .	13 55 55	14 01 55	14 09 07	.. .. .	14 26	0.1
	E	6	.. .. .	.. .. .	14 01 05	14 05 37	14 12	14 26	0.4
107	N	11	13 41 49	.. .. .	.. .. .	13 42 36	.. .. .	14 21	0.2
108	N	30	21 37 37	.. .. .	21 38 23	21 39 03	21 40	22 34	9.3
	E	30	21 37 32	.. .. .	21 38 12	21 39 05	21 40	22 21	23.7
109	N	Dec. 12	.. .. .	.. .. .	13 37 24	13 41 31	13 51	14 11	0.6
	E	12	13 17 36	.. .. .	13 37 16	13 49 24	13 54	14 07	1.0
110	N	28	4 43 09	.. .. .	4 58 53	5 09 17	5 16	5 34	0.8
	E	28	4 43 04	.. .. .	4 58 52	4 59 42	5 12	5 58	1.0

REMARKS.

- No. 58: Phases not well defined.
No. 60: E not recording. Stylus of N went off the paper.
No. 61: Possibly the principal portion does not begin until 14:24:31.
No. 63: Felt by several residents of the town.
No. 66: Maximum of large waves at 17:51:40 on N. Amplitude 0.4 mm.
No. 67: This may really be the record of two near-by shocks, the second beginning at 22:31:43.
No. 68: N not working properly after 16:20. E stylus went off the paper several times.
No. 73: Distant. Possibly the principal portion does not begin until 5:04:30.
No. 74: Probably principal portion of distant earthquake.
Nos. 76-82: Confused by wind disturbances, making the initial phases uncertain.
No. 88: Both styluses left the paper at about 8:35. N returned at 8:37. The amplitudes given are the largest waves shown on the seismograms. The shock was felt at Sitka slightly and more strongly at places farther west.
Nos. 91, 92, 93, 95: N apparently not in good adjustment.
Nos. 97, 98, 103, 104, 105, 106: Beginning and end confused by microseismic tremors.

EARTHQUAKES.

In April, 1904, a Bosch-Omori seismograph, consisting of two horizontal pendulums—one recording north-south motion (N.) and the other recording east-west motion (E.)—was mounted in an addition to the astronomical observatory. The following table is a register of the earthquakes recorded during 1909 and 1910. The times are Greenwich mean time counted from midnight.

Period of pendulums..... N., 17 sec., E., 18-19 sec.
Magnification..... 10
Steady mass..... 10-12 kg.

Register of earthquakes.

No.	Com- ponent	Date	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End principle portion	End	Maximum amplitude
		1909.	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
111	E	Jan. 23	3 12 10	.. .. .	.. .. .	3 43 30	.. .. .	4 01	...
112	N	Feb. 16	16 34 46	.. .. .	16 35 09	16 35 25	16 36	16 51	8.5
	E	16	16 34 46	.. .. .	16 35 12	16 35 28	16 36	16 56	14.1
113	N	22	.. .. .	9 42 30	9 46 26	9 46 35	.. .. .	10 26	0.2
	E	22	9 36 17	9 42 36	9 46 25	9 46 37	.. .. .	10 31	0.5
114	E	Mar. 12	23 48 00	.. .. .	.. .. .	23 58 ..	.. .. .	24 31	0.1
115	E	13	14 38 49	14 42 37	14 46 51	14 59 20	15 06	16 11	0.4
116	E	17	23 40 ..	.. .. .	.. .. .	.. .. .	.. .. .	23 48	...
117	N	Apr. 10	5 49 09	.. .. .	6 02 50	6 03 50	.. .. .	6 15	0.1
	E	10	5 49 09	.. .. .	6 03 20	6 04 30	.. .. .	6 45	0.2
118	N	10	18 59 30	.. .. .	19 08 ..	19 14 ..	.. .. .	19 22	0.2
	E	10	18 59 45	.. .. .	19 06 ..	19 08 ..	.. .. .	19 32	0.2
119	N	10	.. .. .	.. .. .	19 53 ..	20 01 ..	.. .. .	20 19	0.2
	E	10	19 42 17	19 47 52	19 53 50	19 58 50	.. .. .	20 36	0.1
120	N	16	3 11 50	.. .. .	3 12 10	3 12 22	3 13	3 15	0.4
	E	16	.. .. .	.. .. .	3 12 ..	3 12 28	3 13	3 15	0.5
121	N	25	1 12 16	.. .. .	.. .. .	1 15 00	.. .. .	1 16	0.4
	E	25	1 12 20	.. .. .	.. .. .	1 14 25	.. .. .	1 25	1.0
122	N	May 5	2 31 16	.. .. .	2 32 04	2 32 24	2 33	2 33	0.5
	E	5	2 31 14	.. .. .	2 32 04	2 32 16	2 33	2 49	1.0
123	N	17	.. .. .	.. .. .	8 27 15	8 34 10	.. .. .	.. .. .	0.2
	E	17	8 19 49	.. .. .	8 26 40	8 35 20	.. .. .	9 18	0.1
124	N	18	16 49 20	.. .. .	.. .. .	16 52 36	.. .. .	17 03	1.0
	E	18	16 49 50	.. .. .	.. .. .	16 51 05	.. .. .	17 09	1.5
125	N	18	18 16 20	.. .. .	.. .. .	18 18 40	12 20	18 22	0.1
	E	18	18 16 38	.. .. .	.. .. .	18 17 52	18 20	18 31	0.5
126	N	June 3	19 28 ..	.. .. .	.. .. .	19 46 40	.. .. .	20 16	0.4
	E	3	19 04 ..	.. .. .	19 36 ..	19 51 28	.. .. .	21 17	0.8
127	N	8	6 18 ..	.. .. .	.. .. .	.. .. .	.. .. .	6 53	0.1
	E	8	6 10 ..	.. .. .	.. .. .	6 53 10	.. .. .	7 34	0.2
128	E	12	21 19 ..	.. .. .	.. .. .	.. .. .	.. .. .	21 30	...
129	E	27	6 37 ..	.. .. .	.. .. .	.. .. .	.. .. .	7 27	...
130	N	July 7	21 50 01	22 00 03	22 07 39	22 02 27	.. .. .	22 47	0.7
	E	7	21 50 01	22 00 06	22 07 01	22 02 03	.. .. .	22 51	0.5
131	N	11	2 02 18	.. .. .	.. .. .	2 02 28	.. .. .	2 03	1.1
	E	11	2 02 20	.. .. .	.. .. .	2 02 26	.. .. .	2 05	1.5
132	N	22	15 23 39	.. .. .	.. .. .	.. .. .	.. .. .	16 02	...
133	N	30	11 00 34	11 07 35	11 15 42	11 19 23	11 24	.. .. .	7.4
	E	30	11 00 34	11 07 42	11 15 30	11 19 24	11 24	.. .. .	25.1
	N	30	.. .. .	.. .. .	11 31 42	11 33 12	11 40	12 37	6.0
	E	30	.. .. .	.. .. .	11 30 38	11 33 58	11 40	13 08	13.4
134	N	30	14 04 ..	.. .. .	.. .. .	14 10 52	.. .. .	14 15	0.2
135	N	31	.. .. .	.. .. .	19 42 20	19 49 55	19 51	20 12	0.4
	E	31	.. .. .	.. .. .	19 42 20	19 49 25	19 51	20 46	1.7
136	E	Aug. 14	.. .. .	.. .. .	7 09 ..	7 10 40	.. .. .	7 35	0.1
137	N	16	7 33 ..	.. .. .	.. .. .	7 41 10	.. .. .	7 47	0.1
	E	16	7 09 30	.. .. .	.. .. .	7 40 30	.. .. .	8 03	0.2
138	N	31	.. .. .	.. .. .	11 51 00	11 55 15	.. .. .	12 15	0.7
	E	31	11 48 33	.. .. .	11 50 35	11 51 35	.. .. .	12 24	0.7
139	N	Sept. 8	16 53 49	16 57 47	17 01 55	16 58 07	17 09	18 40	3.1
	E	8	16 54 09	16 57 53	17 01 55	17 02 42	17 06	18 42	1.0
140	N	19	20 24 32	.. .. .	.. .. .	20 27 32	.. .. .	20 29	0.3
	E	19	20 23 36	.. .. .	20 25 30	20 28 00	20 29	20 44	0.3
141	N	Oct. 18	8 47 00	.. .. .	.. .. .	8 49 02	.. .. .	9 01	...
	E	18	8 44 00	.. .. .	.. .. .	8 51 55	.. .. .	9 00	0.1

Register of earthquakes—Continued.

No.	Component	Date	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End principal portion	End	Maximum amplitude
		1909.	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
142	N	Oct. 21	0 30 44	.. .. .	0 35 08	0 36 45	0 44	1 02	0.3
	E	21	0 27 05	.. .. .	0 30 54	0 31 35	0 48	1 03	0.2
143	N	27	4 56 41	.. .. .	.. .. .	.. .. .	4 58	.. .. .	.. .. .
	E	27	4 56 03	.. .. .	4 56 21	4 56 28	4 58	4 59	0.2
144	N	31	10 31 48	10 39 14	10 48 00	10 50 37	10 55	11 37	5.0
	E	31	10 31 54	10 39 10	10 46 05	10 50 46	10 52	11 48	3.5
145	N	Nov. 10	6 24 22	6 32 32	6 41 11	6 33 53	.. .. .	8 18	0.9
	E	10	6 24 00	6 32 40	6 39 50	6 32 56	.. .. .	7 24	0.5
146	N	Dec. 9	15 46 40	15 57 18	16 13 00	16 16 22	.. .. .	17 11	0.4
	E	9	15 46 40	15 57 12	16 12 18	16 18 12	.. .. .	17 21	0.3
147	N	9	23 50 00	.. .. .	.. .. .	24 00 20	.. .. .	25 25	0.2
	E	9	23 49 55	.. .. .	.. .. .	24 11 00	.. .. .	24 40	0.2
		1910.							
148	N	Jan. 1	11 11 30	11 19 13	11 26 45	11 42 42	11 53	13 11	2.2
	E	1	11 11 34	11 19 03	11 30 00?	11 42 58	11 54	13 10	2.7
149	N	21	17 28 10	.. .. .	.. .. .	17 36 34	.. .. .	18 20	0.1
150	N	21	22 34 41	.. .. .	.. .. .	22 39 57	.. .. .	22 59	0.2
151	N	22	8 56 30	9 03 06	9 11 20	9 17 55	9 23	10 45	4.0
	E	22	8 57 30	9 04 12	9 12 02	9 15 04	9 21	10 31	2.8
152	N	23	19 10 18	.. .. .	.. .. .	19 27 02	.. .. .	20 01	0.6
	E	23	19 10 20	.. .. .	.. .. .	19 33 01	.. .. .	20 01	0.2
153	N	Feb. 12	18 26 53	.. .. .	.. .. .	18 27 53	.. .. .	18 59	0.6
	E	12	18 19 40	.. .. .	.. .. .	18 27 44	.. .. .	18 53	0.2
154	N	21	3 27 00	.. .. .	.. .. .	.. .. .	.. .. .	3 49	0.1
	E	21	3 28 00	.. .. .	.. .. .	3 34 40	.. .. .	3 48	0.2
155	N	21	16 44 20	.. .. .	.. .. .	16 45 20	.. .. .	16 56	0.3
	E	21	16 42 20	.. .. .	.. .. .	16 45 35	.. .. .	16 57	0.4
156	N	21	21 16 20	.. .. .	.. .. .	21 22 00	.. .. .	21 34	0.2
	E	21	21 13 20	.. .. .	.. .. .	21 21 45	.. .. .	21 45	0.1
157	N	28	.. .. .	.. .. .	21 04 20	21 12 50	21 14	22 11	4.1
	E	28	20 56 27	21 02 27	21 04 35	21 09 48	21 20	22 05	2.7
158	N	Mar. 14	14 07 37	.. .. .	14 08 11	14 08 25	14 09	14 10	0.4
	E	14	14 07 44	.. .. .	14 08 14	14 08 26	14 09	14 10	0.6
159	N	19	0 01 02	.. .. .	0 23 56	0 27 20	0 28	0 36	0.1
	E	19	0 13 57	.. .. .	0 18 44	0 23 20	0 27	0 41	0.2
160	N	30	17 07 50	17 20 40	17 37 40	17 40 30	17 51	18 33	1.0
	E	30	17 07 52	17 19 55	17 37 10	17 40 10	17 48	18 52	1.5
161	N	31	.. .. .	.. .. .	19 37 43	19 41 23	.. .. .	.. .. .	0.2
	E	31	.. .. .	.. .. .	19 38 23	19 40 32	20 04	.. .. .	0.2
162	N	Apr. 12	0 09 49	0 33 50	0 43 05	0 43 45	0 45	1 42	1.0
	E	12	0 09 39	0 33 34	0 43 05	0 43 15	0 46	1 43	1.5
163	N	May 1	18 54 14	19 08 49	19 16 25	19 18 32	19 26	19 52	0.3
	E	1	18 53 22	19 08 07	19 12 10	19 18 04	19 25	19 53	0.3
164	N	13	.. .. .	8 01 26	8 06 10	8 12 10	8 35	9 36	0.4
	E	13	.. .. .	8 01 42	8 05 02	8 14 55	8 34	10 38	4.0
165	N	20	12 26 47	12 32 00	12 39 10	12 45 20	.. .. .	13 10	0.1
	E	20	12 26 57	12 34 00	12 41 23	12 46 37	.. .. .	13 29	0.2
166	N	22	6 32 56	6 39 49	.. .. .	6 45 40	7 04	8 18	0.4
	E	22	6 32 50	6 39 58	6 47 18	7 02 45	.. .. .	8 07	0.4
167	N	31	5 04 20	5 11 37	5 20 36	5 24 18	5 31	6 35	3.4
	E	31	5 04 24	5 11 33	5 20 33	5 23 41	5 34	6 35	3.4
168	N	June 1	6 19 16	.. .. .	6 37 25	6 39 13	6 51	.. .. .	0.4
	E	1	6 19 08	.. .. .	6 37 18	6 39 10	6 51	.. .. .	0.5
169	N	1	7 12 18	.. .. .	7 30 05	.. .. .	7 39	8 15	0.1
	E	1	7 12 05	.. .. .	7 29 35	7 32 35	7 39	8 27	0.3
170	N	7	.. .. .	.. .. .	19 20 00	19 21 00	19 26	.. .. .	0.1
	E	7	.. .. .	.. .. .	19 19 00	19 20 50	19 24	.. .. .	0.2
171	N	9	.. .. .	.. .. .	12 16 40	12 19 ..	12 26	.. .. .	0.1
172	N	16	6 43 35	6 54 03	7 11 01	6 56 51	7 20	9 20	2.3
	E	16	6 43 25	6 54 05	7 11 03	6 56 39	7 20	9 16	4.9
173	N	17	16 53 52	16 57 26	17 02 ..	.. .. .	.. .. .	17 44	.. .. .
174	N	27	5 48 40	.. .. .	.. .. .	5 49 30	5 50	5 52	0.1
	E	27	5 48 50	.. .. .	.. .. .	5 49 05	5 50	5 52	0.3
175	N	29	8 26 41	.. .. .	8 29 40	8 32 10	8 39	10 15	0.5
	E	29	8 25 58	.. .. .	8 29 50	8 34 30	8 39	10 15	0.4
176	N	29	11 09 50	.. .. .	11 32 25	11 34 10	11 44	.. .. .	0.2
	E	29	11 09 50	.. .. .	11 31 50	11 34 10	11 44	.. .. .	0.4
177	N	July 2	17 04 57	.. .. .	17 12 25	17 13 05	17 14	17 17	0.4
	E	2	.. .. .	.. .. .	17 11 21	17 11 33	17 16	17 21	0.2

No.	Component	Date	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End principal portion	End	Maximum amplitude
		1910.	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
178	N	July 3	9 12 00		9 12 48	9 13 25	9 14	9 17	0.7
	E	3	9 11 10		9 12 05	9 12 50	9 20	9 26	0.4
179	N	7	4 38 40		4 39 00	4 40 20	4 42	5 14	5.6
	E	7	4 38 40		4 39 10	4 40 24	4 42	5 14	9.8
180	N	29	10 48 53	10 50 53					
	E	29		10 50 33	11 08 ..	11 12 ..		11 57	0.1
181	N	Aug. 5	1 35 39		1 41 03	1 42 35	1 50	2 35	0.6
	E	5	1 35 39		1 39 19	1 40 12	1 50	2 50	1.0
182	N	11			17 03 00	17 04 20		17 22	0.2
	E	11	16 48 20			17 06 50		17 22	0.1
183	N	21	5 50 04	5 53 20	5 59 30	5 59 42	6 06	6 48	0.8
	E	21	5 50 02	5 53 24	5 59 30	5 59 40	6 00	6 55	0.6
184	N	Sept. 6	21 51 ..			22 03 40		22 26	0.1
	E	6	21 51 ..		22 01 30	22 07 30	22 16	22 32	0.1
185	N	7	7 25 30	7 34 24	7 52 20	7 53 50			0.2
	E	7	7 23 55	7 34 12	7 50 40	7 58 30	8 10	8 23	0.5
186	N	7	10 37 05		10 39 00	10 45 00		11 25	0.2
	E	7	10 34 12		10 39 45	10 53 10		11 54	0.4
187	N	9	1 18 15		1 23 06	1 31 10	1 36	3 40	2.2
	E	9	1 18 32	1 21 05	1 25 42	1 31 10	1 33	3 32	2.5
188	N	24	3 40 30		3 58 45	4 01 30	4 03	4 34	0.5
	E	24	3 41 44	3 49 05	3 56 24	4 00 50	4 03	4 45	1.1
189	N	Oct. 5	21 27 55			21 28 02		21 29	0.1
	E	9	21 45 43		21 47 43	21 47 50		22 10	0.3
190	N	9	21 46 00					22 05	
	E	9	20 32 40		20 34 31	20 35 31	20 38	21 50	10.7
191	N	Nov. 6	20 32 55		20 34 62	20 35 52	20 38	21 50	31.2
	E	6	6 15 08	6 25 40	6 43 10	7 15 55			0.2
192	N	9	6 15 10	6 25 38	6 42 36	7 16 06			0.6
	E	9		8 10 20	8 21 42	8 28 56	8 30	9 25	0.4
193	N	9			8 16 00	8 29 40	8 36	9 30	0.7
	E	9	12 42 55		13 00 20	13 07 00	13 12	13 46	0.1
194	N	14	8 16 13	8 18 51	8 22 21	8 22 51	8 30		0.1
	E	14		8 18 35	8 20 39	8 27 23	8 28		0.3
196	N	15			15 33 30	15 37 00	15 52		0.1
	E	26	4 53 57	5 04 24	5 16 33	5 29 14	5 50	7 15	1.0
197	N	26	4 53 57	5 04 24	5 16 53	5 42 34	5 49	7 25	0.9
	E	4	11 59 55		12 06 00	12 26 ..	12 28	12 40	0.1
198	N	Dec. 10		9 49 47	10 02 47	10 06 35	10 15	11 48	1.0
	E	10	9 39 17	9 49 45	10 03 15	10 12 50	10 17	11 48	1.5
200	N	13	11 58 33		12 40 40	12 56 20	13 12		

REMARKS.

- Nos. 111, 114, 115, 116, 128, 129: Not distinguishable on N.
 No. 112: Felt slightly at Sitka, Valdez, and Juneau, and more strongly at Skagway.
 No. 116: About 20 long waves of very small amplitude.
 No. 128: About 25 long waves of very small amplitude.
 No. 131: Distinctly felt locally.
 Nos. 132, 136: Doubtful. Not recorded on N.
 No. 133: Two well-defined maxima.
 No. 134: Possibly a recurrence of No. 133.
 Nos. 137, 138: Confused by microseismic tremors.
 No. 143: Local. Distinctly felt at Juneau and Skagway.
 No. 148: Beginning of large waves not well defined on E.
 Nos. 149, 150: Nothing on E.
 No. 151: Second p. t. doubtful.
 No. 157: Preliminary tremors doubtful.
 No. 158: Local; felt at Juneau.
 Nos. 161, 164, 176: Confused by wind tremors.
 Nos. 168, 169: The end of No. 168 overlaps the beginning of No. 169.
 No. 173: The maximum probably occurred during the morning inspection of the instrument.
 No. 177: Possibly artificial disturbance.
 No. 179: Local; felt in Juneau and Skagway.
 Nos. 180, 182, 184, 186, 190, 198, 200: Phases not well defined.
 No. 189: Local; not recorded on N.
 Nos. 192, 193: The initial phases of No. 192 are confused by microseismic tremors. The end overlaps the beginning of No. 193.
 Nos. 195, 201, 202: Beginning confused by microseismic tremors.
 Pendulum N was out of adjustment for part of the day on July 9, 18, October 17, December 6 and 7, 1910.
 Microseismic tremors were recorded on January 21, 26-30; February 14, 15, 25, 27; March 18-24, 26, 27; April 5; May 4, 12, 13; June 18, 19; July 4, 9, 31; August 6, 11, 15, 22, 30; September 1, 11, 12, 15, 23, 25, 30; October 1, 4, 11, 13, 31; November 1, 21, 27; December 20, 23, 28, 1909; January 7, 8, 11, 16, 17, 19, 26, 28, 29, 30; February 4, 9, 10, 23, 25; March 8, 21, 22, 24, 25; April 8, 9, 16, 17, 20, 28; May 4, 27; June 1, 9, 10; July 4, 14, 16, 25, 28, 31; August 4, 17, 29; September 17, 29; October 2, 3, 12, 19, 22; November 4, 7, 13, 14, 17, 21, 22, 26; December 16, 18, 22, 23, 26, 1910.

EARTHQUAKES.

A Bosch-Omori seismograph consisting of two horizontal pendulums—one recording north-south motion (N) and the other recording east-west motion (E)—has been in operation since April, 1904. In the following table the times are Greenwich mean time counted from midnight.

Period of pendulums: N, 16-17 sec.; E, 18-19 sec.
Magnification, 10.
Steady mass: 10-12 kg.

Register of earthquakes.

No.	Date	Component	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End of principal portion	End	Maximum amplitude
			<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
324	1913. Jan. 11	E	.. ..	.. ..	13 43 10	13 48 50	14 29	15 50	0.2
325	Feb. 20	E	.. ..	9 15 30	9 25 50	9 27 30	9 29	9 40	0.2
326	Mar. 8	E	16 10 35	16 13 50	16 23 45	16 26 05	16 29	16 50	0.2
327	14	N	8 59 15	9 08 50	9 21 ..	9 23 40	9 33	10 06	0.8
		E	8 58 22	9 08 30	9 21 ..	9 29 10	9 48	10 50	1.8
328	31	N	3 47 ..	3 51 50	3 56 10	3 57 20	4 07	5 57	3.0
		E	3 46 35	3 51 ..	3 56 00	3 57 00	4 07	6 12	2.1
329	Apr. 25	N	.. ..	18 20 04	.. ..	18 48 50	19 00	19 43	0.1
		E	.. ..	18 19 57	.. ..	.. ..	.. ..	19 28	0.1
330	29	N	.. ..	.. ..	23 46 ..	23 52 35	24 00	.. ..	0.3
331	30	N	11 38 40	11 44 05	11 47 00	11 51 40	11 53	12 40	0.4
		E	11 39 40	11 43 48	11 46 40	11 50 30	11 54	12 35	0.7
332	May 16	N	.. ..	.. ..	11 51 50	11 52 12	11 57	12 11	0.2
		E	.. ..	.. ..	11 50 40	11 54 00	11 59	12 21	0.6
333	30	N	.. ..	.. ..	12 22 00	12 30 24	12 35	12 57	0.2
		E	12 10 15	.. ..	12 22 30	12 31 40	12 36	13 05	2.8
334	June 14	E	8 46 10	8 53 25	9 02 30	9 05 40	9 12	9 27	0.2
335	14	E	.. ..	.. ..	10 09 10	10 13 30	10 15	10 45	0.2
336	22	N	.. ..	14 01 12	14 05 06	14 12 06	14 15	14 40	2.7
		E	13 56 00	13 59 20	14 03 30	15 08 50	14 22	15 38	2.7
337	26	N	5 10 00	5 20 40	5 35 30	5 36 05	5 55	6 37	0.6
		E	5 10 00	5 20 40	5 33 00	5 37 20	5 55	6 48	1.7
338	July 9	N	.. ..	.. ..	0 08 40	0 09 56	0 12	0 38	1.7
		E	0 02 00	.. ..	0 08 20	0 09 10	0 12	0 48	2.6
339	Aug. 1	N	17 18 40	17 24 50	.. ..	.. ..	.. ..	.. ..	.. ..
		E	17 18 45	17 24 50	17 31 20	17 32 00	17 38	17 50	0.1
340	5	N	1 53 30	.. ..	1 55 40	1 56 20	2 00	2 30	0.2
		E	1 53 ..	.. ..	1 56 00	1 56 40	2 00	2 31	0.2
341	6	N	22 27 55	22 38 08	22 55 40	23 08 12	23 12	23 33	2.0
		E	22 27 30	22 38 00	22 57 20	23 02 30	23 17	23 35	0.6
342	Sept. 3	E	21 15 05	21 23 05	21 29 54	21 31 30	21 34	21 55	0.1
343	Oct. 2	N	4 44 45	4 51 40	4 58 25	5 04 30	5 06	5 23	0.6
		E	4 44 22	4 52 00	4 58 ..	5 04 15	5 08	5 20	0.4
344	11	N	.. ..	.. ..	4 47 25	4 49 40	4 58	5 15	0.3
		E	.. ..	.. ..	4 47 00	4 50 00	4 59	5 12	0.5
345	14	N	.. ..	8 31 52	.. ..	8 46 18	9 01	.. ..	0.5
		E	.. ..	8 31 38	.. ..	8 46 45	9 00	.. ..	0.2
346	26	N	.. ..	.. ..	22 58 05	23 00 50	23 05	23 18	0.2
		E	.. ..	.. ..	22 58 45	23 01 50	23 06	23 21	0.3
347	Nov. 10	N	.. ..	.. ..	21 54 00	22 07 35	22 10	22 18	0.1
		E	.. ..	.. ..	21 54 10	22 01 30	22 08	22 20	0.1
348	Dec. 21	N	.. ..	.. ..	16 21 50	16 25 50	16 27	16 36	0.3
		E	.. ..	.. ..	16 21 50	16 24 15	16 27	16 51	0.3
349	1914 Feb. 7	E	.. ..	.. ..	17 38 25	17 39 40	17 50	.. ..	0.1
350	28	N	.. ..	5 33 06	5 35 28	5 37 30	5 39	5 43	0.1
		E	5 28 00	5 33 04	5 37 50	5 38 15	5 40	5 47	0.5
351	Mar. 28	N	.. ..	.. ..	1 39 20	1 39 25	1 40	1 41	0.1
		E	1 38 10	.. ..	1 39 10	1 39 30	1 40	1 42	0.1
352	30	N	.. ..	0 58 02	1 09 14	1 11 26	1 16	1 31	0.9
		E	0 50 20	0 57 50	1 06 54	1 11 14	1 16	1 56	5.7
353	Apr. 11	N	.. ..	16 53 05	17 07 55	17 14 30	17 34	.. ..	0.2
		E	16 39 03	16 53 31	17 07 43	17 18 15	17 38	18 15	1.0
354	19	N	.. ..	.. ..	17 45 54	17 45 56	17 46	17 47	0.2
		E	17 45 38	.. ..	17 45 58	17 46 01	17 46	17 47	0.1
355	20	E	13 38 50	13 50 20	14 07 30	14 14 50	14 21	14 32	0.2

Register of earthquakes—Continued.

No.	Date	Com- ponent	First P. T. begin	Second P. T. begin	Large waves begin	Maximum	End of prin- cipal portion	End	Maximum amplitude
	1914.		<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
356	May 26	N	.. .. .	14 46 55	14 53 08	15 19 40	.. ..	16 00	0.5
		E	14 35 35	14 46 45	14 53 16	15 16 30	15 32	15 54	0.5
357	June 25	N	.. .. .	.. .. .	20 11 35	20 22 09	20 28	.. ..	0.6
		E	.. .. .	.. .. .	20 12 42	20 16 30	20 33	.. ..	0.6
358	July 17	N	.. .. .	7 16 58	7 22 10	7 25 30	7 33	7 43	0.6
		E	7 12 07	.. .. .	7 19 56	7 22 24	7 27	7 43	0.2
359	21	N	.. .. .	.. .. .	22 35 06	22 36 30	22 44	22 53	1.0
		E	.. .. .	.. .. .	22 34 52	22 35 52	22 46	22 56	2.6
360	Aug. 4	N	.. .. .	.. .. .	23 20 28	23 26 19	23 35	23 48	1.5
		E	23 08 53	23 15 42	23 20 40	23 29 24	23 33	23 49	7.4
361	22	N	5 31 42	.. .. .	5 34 20	5 36 48	5 47	6 25	0.6
		E	5 31 56	.. .. .	5 34 28	5 36 30	5 41	6 20	0.5
362	Oct. 3	N	.. .. .	17 42 20	17 55 32	17 57 12	18 11	18 47	0.6
		E	17 33 08	17 42 10	17 55 23	18 01 45	18 12	18 44	0.7
363	3	N	.. .. .	.. .. .	22 47 35	23 00 20	23 06	.. ..	0.1
		E	.. .. .	.. .. .	22 49 00	22 55 36	23 04	.. ..	0.1
364	23	E	.. .. .	.. .. .	7 01 00	7 04 44	7 07	.. ..	0.6
365	Nov. 10	N	.. .. .	.. .. .	11 03 42	11 04 25	11 07	11 13	1.8
		E	.. .. .	.. .. .	11 03 48	11 04 42	11 07	11 20	1.2
366	24	N	.. .. .	.. .. .	12 12 40	12 12 46	12 25	12 54	1.8
		E	12 04 00	12 08 04	12 12 40	12 12 50	12 18	13 11	3.0

REMARKS.

- Nos. 324, 325: Preliminary phases indistinct.
 No. 327: Actual maximum amplitude on E, 3.7 mm. occurred at 9:12:02. The phases are somewhat mixed, as though there were two disturbances overlapping.
 No. 328: Beginning and end confused by other tremors.
 No. 330: Only a few long waves on N.
 No. 331: Actual maximum on N, 0.8 mm. occurred at 11:44:20.
 No. 334: Only a few long waves on E.
 No. 342: N disturbed by wind tremors so as to mask all phases.
 Nos. 344, 346, 347, 348: Preliminary phases not distinguishable.
 No. 349: Only a few long waves on E; nothing on N.
 No. 350: The actual maximum on N (0.5 mm.) occurred at 5:33:12, during second P. T.
 No. 353: Phases indefinite on N on account of wind tremors.
 No. 364: Barely perceptible on N; only a few well-defined long waves on E.
 No. 365: Local shock felt distinctly at Sitka. Recorded also on the traces of the D and H variometers.
 Microseismic tremors were present on January 1, 2, 3, 20, 21; February 13; March 7; April 21; November 2, 20, 22; December 2, 22, 1913; January 12, 28; February 24, 25; March 3, 7; September 27, 28; October 22; December 27, 1914.

EARTHQUAKES.

A Bosch-Omori seismograph, consisting of two horizontal pendulums, one recording north-south motion (N) and the other recording east-west motion (E), has been in operation since April, 1904. In the following table the times are Greenwich mean time counted from midnight.

Period of pendulums: N, 16-17 sec.; E, 18-19 sec.

Magnification: 10.

Steady mass: 10-12 kg.

Register of earthquakes.

No.	Date	Component	P	S	L	M	C	F	Maximum amplitude
			<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
367	1915 Jan. 5	N	.. .. .	.. .. .	23 43 ..	23 49 10	24 02	.. ..	0.2
		E	23 38 05	.. .. .	23 43 ..	23 49 26	24 00	.. ..	0.1
368	13	N	.. .. .	.. .. .	7 31 40	7 39 45	7 56	.. ..	0.1
		E	.. .. .	.. .. .	7 36 ..	7 39 45	.. ..	.. ..	0.1
369	May 1	N	5 07 52	5 14 07	5 22 00	5 27 26	5 30	7 25	2.8
		E	5 07 57	5 14 10	5 19 46	5 23 04	5 32	7 26	7.1
370	6	N	.. .. .	.. .. .	12 15 20	12 18 50	12 26	12 40	0.2
		E	.. .. .	.. .. .	12 16 35	12 17 23	12 22	12 38	0.9
371	June 1	N	14 53 34	14 58 04	15 05 44	15 07 40	15 12	15 36	1.0
		E	.. .. .	.. .. .	15 05 56	15 07 40	15 11	15 25	9.5
372	6	N	.. .. .	21 53 02	22 00 02	22 01 25	.. ..	22 47	0.2
		E	21 43 22	21 52 52	.. .. .	.. .. .	.. ..	.. ..	.. ..
373	23	N	.. .. .	.. .. .	4 15 ..	.. .. .	4 20	.. ..	.. ..
		E	.. .. .	.. .. .	4 15 ..	.. .. .	4 20	.. ..	0.1
374	23	N	.. .. .	.. .. .	5 12 05	5 12 45	5 17	.. ..	0.1
		E	.. .. .	.. .. .	5 12 07	5 12 40	5 16	.. ..	0.1
375	July 31	N	1 38 19	1 43 45	1 50 40	1 52 15	1 54	2 55	1.1
		E	1 38 19	1 43 47	1 50 14	1 51 42	1 54	2 56	9.7
376	Sept. 7	N	1 30 30	1 38 01	1 48 55	2 00 00	2 03	2 59	2.2
		E	1 30 40	1 38 10	1 49 26	1 53 10	2 03	2 59	4.1
377	Oct. 3	N	6 58 12	7 01 58	7 04 33	7 04 52	7 14	8 15	58.5
		E	6 58 09	7 01 57	7 04 42	7 05 02	7 14	8 28	46.5
378	Nov. 21	N	.. .. .	0 24 42	0 27 22	0 32 20	0 35	.. ..	1.7
		E	.. .. .	0 24 42	0 27 08	0 33 12	0 35	.. ..	4.6
379	Dec. 12	N	.. .. .	.. .. .	21 34 01	21 36 48	21 41	.. ..	0.2
	1916								
380	Jan. 1	N	13 33 25	13 43 37	13 52 38	14 01 30	14 06	15 35	3.0
		E	13 33 26	13 43 40	.. .. .	14 05 28	14 10	14 50	18.5
381	13	N	8 44 58	8 51 11	8 58 14	9 16 10	9 34	11 00	0.4
		E	8 44 56	.. .. .	9 06 18	9 07 28	9 20	11 06	1.2
382	Feb. 6	N	.. .. .	22 02 01	22 05 00	22 14 44	22 15	23 38	1.1
		E	21 58 12	.. .. .	22 06 14	22 07 38	22 17	23 24	3.7
383	15	E	11 37 41	.. .. .	11 39 42	11 40 44	11 47	12 15	2.0
384	20	N	.. .. .	17 55 50	18 00 00	18 02 22	18 08	18 54	1.0
		E	17 52 20	.. .. .	18 00 06	18 07 00	18 08	18 40	0.6
385	27	E	20 38 48	.. .. .	20 56 30	21 06 48	21 12	21 48	1.0
386	Mar. 16	N	.. .. .	.. .. .	22 47 00	22 48 00	23 04	.. ..	0.6
		E	.. .. .	.. .. .	22 46 44	22 47 16	23 06	.. ..	0.7
387	31	N	.. .. .	.. .. .	11 14 03	11 17 26	11 31	.. ..	0.2
		E	.. .. .	.. .. .	11 13 44	11 14 20	11 34	.. ..	0.4
388	Apr. 2	N	.. .. .	.. .. .	8 25 20	8 26 34	.. ..	8 40	0.6
		E	.. .. .	.. .. .	8 25 32	8 26 12	.. ..	8 36	0.5
389	18	N	3 06 12	3 09 58	3 12 06	3 12 36	3 24	4 14	1.1
		E	3 06 14	3 10 08	.. .. .	3 12 12	3 23	4 34	1.9
390	24	N	.. .. .	.. .. .	4 47 20	5 00 50	.. ..	5 39	0.5
		E	.. .. .	.. .. .	4 45 ..	.. .. .	.. ..	5 14	.. ..
391	24	N	8 17 44	.. .. .	8 29 00	8 41 03	8 45	9 31	0.7
		E	8 16 25	.. .. .	.. .. .	8 47 40	.. ..	9 18	0.2
392	26	N	.. .. .	.. .. .	2 49 49	3 00 08	3 07	3 39	0.6
393	June 30	N	.. .. .	.. .. .	3 41 15	3 44 36	3 52	.. ..	0.5
		E	.. .. .	.. .. .	3 41 ..	.. .. .	3 51	.. ..	.. ..

Register of earthquakes—Continued.

No.	Date	Com- ponent	P	S	L	M	C	F	Maxi- mum am- plitude
	1916		<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	<i>mm</i>
394	Aug. 3	N	.. .. .	1 53 17	.. .. .	1 54 41	.. ..	2 48	0.1
		E	1 46 56	1 53 14	.. .. .	1 53 42	.. ..	2 32	0.2
395	3	N	.. .. .	.. .. .	14 31 14	14 31 50	14 35	.. ..	0.2
		E	.. .. .	.. .. .	14 31 08	14 31 46	14 35	.. ..	0.1
396	28	N	6 52 36	7 03 02	7 28 22	7 36 24	7 40	7 59	0.5
		E	6 52 30	7 03 01	.. .. .	7 37 43	.. ..	7 48	0.2
397	Oct. 31	N	15 38 43	15 44 45	.. .. .	.. .. .	.. ..	16 14	.. ..
		E	.. .. .	15 44 40	15 47 30	15 56 10	.. ..	16 30	0.3
398	Nov. 10	N	.. .. .	.. .. .	9 25 37	9 26 15	9 28	9 32	0.4
		E	.. .. .	.. .. .	9 26 00	.. .. .	.. ..	9 30	.. ..
399	21	N	.. .. .	.. .. .	6 53 38	6 54 32	7 02	7 11	0.9
		E	.. .. .	.. .. .	6 53 30	6 54 10	6 55	7 04	1.0

REMARKS.

- No. 369. Actual maximum, 6.5 mm. occurred on N at 5:18:00.
 Nos. 373 and 374. Only a few waves of small amplitude.
 No. 378. Beginning and end obscured by microseismic tremors.
 No. 379. Nothing apparent on E.
 Nos. 383 and 385. N not working properly.
 No. 384. An amplitude of 1.7 mm. occurred on N at 17:55:58.
 No. 389. The actual maximums occurred during the second preliminary tremors, 5.2 mm. on N at 3:11:12 and 2.6 mm. on E at 3:10:16.
 Nos. 392 and 393. Barely perceptible on E.
 No. 394. Paper being changed from 2:05 to 2:12.
 No. 397. No long waves on N.
 No. 398. Mere tremor on E; no distinct phases.
 Microseismic tremors were present on January 1, 2, 8-11, 16; February 4-6; March 4, 16-19; April 5, 6, 11, 12, 24-27; September 24, 25, 29; October 11, 12, 30, 31; November 3, 4, 5, 15, 16, 20, 21; December 4, 11, 15-20, 28-31, 1915; January 5, 6, 19, 20; April 8-11, 13, 14; November 4, 16, 17, 20, 24-28; December 2-5, 30, 1916.

EARTHQUAKES.

A Bosch-Omori seismograph, consisting of two horizontal pendulums, one recording north-south motion (N) and the other recording east-west motion (E) has been in operation since April 1904. In the following table the times are Greenwich mean time counted from midnight:

Period of pendulums—

January 1, 1917, to November 22, 1918: N. 15.4 sec.; E. 16.6 sec.

November 23 to December 31, 1918: N. 16.6 sec.; E. 17.7 sec.

Magnification, 10.

Steady mass, 10 to 12 kg.

Register of earthquakes.

No.	Date.	Component.	P	S	L	M	C	F	Maximum.
	1917.		<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m.</i>	<i>h. m.</i>	<i>mm.</i>
400	Jan. 30	N	2 51 55	2 57 17	3 01 ..	3 05 41	3 18	6 25	53.0
		E	2 51 58	2 57 16	3 01 ..	3 09 11	3 18	5 32	41.0
401	Feb. 20	N	19 47 02	19 51 50	19 58 35	20 01 50	20 04	20 51	53.5
		E	19 48 00	19 51 35	19 59 28	20 02 17	20 05	20 46	7.0
402	Mar. 6	N	2 13 26	2 22 44	2 34 16	2 39 22	.. ..	2 54	0.4
		E	.. ..	2 22 46	2 35 14	2 36 02	.. ..	2 41	0.1
403	May 1	N	18 39 46	18 50 16	.. ..	.. ..	.. ..	.. ..	.. ..
		E	18 38 32	18 51 24	19 06 57	19 09 48	19 18	21 19	1.6
				18 57 48	.. ..	.. ..	.. ..	.. ..	.. ..
404	May 9	N	16 16 18	.. ..	16 24 31	16 30 30	16 42	21 24	1.6
405	May 31	N	8 50 51	.. ..	8 53 39	8 55 25	9 06	17 04	0.3
		E	8 50 56	.. ..	8 54 28	8 57 20	9 06	11 12	5.2
406	June 4	N	.. ..	.. ..	1 35 26	1 36 58	.. ..	10 23	16.2
		E	1 32 35	1 34 42	1 36 30	1 37 16	.. ..	2 37	0.1
407	June 8	N	1 14 40	.. ..	1 20 33	1 31 54	1 38	2 17	0.1
		E	.. ..	.. ..	1 20 31	1 25 30	1 34	2 00	1.0
408	June 10	N	4 31 12	4 35 52	4 38 50	4 40 42	4 47	1 46	0.2
		E	4 33 32	4 36 40	4 38 55	4 42 40	4 49	5 42	1.0
409	June 13	N	.. ..	.. ..	7 26 ..	7 40 ..	.. ..	5 11	0.2
410	June 24	N	20 02 04	20 11 32	.. ..	.. ..	20 54	8 17	0.1
		E	.. ..	20 11 30	.. ..	.. ..	.. ..	.. ..	.. ..
411	June 26	N	6 01 44	6 11 46	6 25 06	6 28 24	6 50	.. ..	.. ..
		E	6 01 42	6 11 42	6 25 02	6 33 02	6 49	9 00	9.2
412	July 1	N	13 18 43	.. ..	.. ..	13 20 13	.. ..	8 44	24.0
		E	13 18 44	.. ..	.. ..	13 20 07	.. ..	13 40	0.5
413	July 25	N	.. ..	.. ..	3 25 07	3 28 17	3 35	13 38	0.6
		E	.. ..	.. ..	3 26 24	3 27 44	3 30	4 16	0.2
414	July 27	N	1 11 54	1 20 02	1 32 40	1 37 35	1 43	3 49	0.1
		E	.. ..	.. ..	1 34 ..	1 44 22	1 45	2 44	1.0
415	July 27	N	3 19 04	.. ..	3 46 46	3 49 50	3 55	2 40	0.6
416	July 29	N	.. ..	22 16 08	22 28 10	22 38 00	22 46	4 28	0.2
		E	22 05 24	22 15 59	22 33 00	22 38 45	22 49	22 44	0.2
417	July 31	N	0 21 24	.. ..	0 39 08	0 43 38	0 47	23 29	0.2
		E	.. ..	.. ..	0 38 34	.. ..	.. ..	1 41	0.3
418	Aug. 5	N	.. ..	.. ..	16 42 22	.. ..	.. ..	0 57	.. ..
419	Aug. 30	N	.. ..	.. ..	4 34 45	4 40 20	.. ..	16 58	0.1
		E	4 25 07	.. ..	4 32 01	4 35 01	.. ..	5 35	0.2
420	Aug. 31	N	11 48 20	11 57 05	12 16 ..	12 20 02	12 27	4 50	0.4
		E	11 47 44	11 57 05	12 15 ..	12 28 42	12 29	13 02	0.6
421	Nov. 16	N	3 32 54	.. ..	3 50 30	4 02 56	.. ..	12 55	0.1
		E	.. ..	.. ..	3 31 34	.. ..	.. ..	5 38	0.2
422	Dec. 21	N	.. ..	.. ..	17 58 03	18 07 49	18 12	5 18	.. ..
		E	17 56 46	17 59 16	18 01 02	18 07 22	18 12	20 04	9.5
423	Dec. 21	N	20 56 16	.. ..	.. ..	21 03 28	.. ..	20 18	6.5
		E	20 57 04	.. ..	.. ..	.. ..	.. ..	21 35	0.6
424	Dec. 26	N	.. ..	.. ..	13 35 36	13 46 00	.. ..	21 18	0.1
425	Dec. 28	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	13 58	0.2
426	Dec. 29	N	22 59 30	23 07 06	23 15 40	23 20 20	23 26	23 50	6.0

Register of earthquakes—Continued.

No.	Date.	Component.	P	S	L	M	C	F	Maximum.
1918.									
427	Feb. 13	N	5 31 42	.. .. .	5 41 32	5 52 52	6 03	6 13	0.6
		E	5 31 13	.. .. .	.. .. .	5 54 53	.. ..	6 14	0.1
428	Apr. 14	N	8 32 42	.. .. .	.. .. .	8 32 46	.. ..	8 42	0.6
429	Apr. 21	N	22 38 10	22 42 58	22 45 36	22 49 46	22 50	23 58	3.5
430	May 20	N	15 00 01	.. .. .	15 12 45	15 19 05	15 31	16 08	0.6
431	May 23	N	12 05 03	12 10 06	12 15 00	12 20 11	12 22	13 16	2.8
432	June 17	N	16 28 24	.. .. .	.. .. .	.. .. .	16 30	.. ..	0.1
		E	16 28 26	.. .. .	.. .. .	16 28 42	.. ..	16 33	0.3
433	July 3	N	7 15 33	.. .. .	.. .. .	7 29 18	.. ..	8 11	0.2
		E	7 15 27	.. .. .	.. .. .	7 15 52	.. ..	8 11	0.1
434	July 8	N	10 45 56	.. .. .	11 06 15	11 11 16	11 22	11 38	0.2
		E	10 46 00	.. .. .	11 07 55	11 17 ..	.. ..	11 23	0.1
435	July 15	N	0 27 14	0 28 33?	0 30 37	0 31 52	0 37	1 00	0.4
		E	0 27 16	0 28 28?	0 30 45	0 31 30	0 33	0 59	0.3
436	July 21	N	6 39 11	.. .. .	.. .. .	.. .. .	.. ..	7 09	....
437	Aug. 15	N	12 32 15	12 42 23	12 55 05	12 57 57	12 59	14 09	1.2
		E	12 35 09	12 42 27	13 01 26	13 03 45	13 10	14 05	0.7
438	Sept. 7	N	17 24 40	17 31 19	17 45 44	17 46 42	17 50	20 23	11.1
		E	17 24 33	17 31 20	17 38 17	17 48 16	17 50	20 41	32.5
439	Sept. 12	N	18 06 24	.. .. .	18 08 06	18 09 54	18 11	18 19	0.2
		E	18 06 30	.. .. .	18 08 04	18 09 45	18 11	18 19	0.1
440	Oct. 11	N	.. .. .	14 33 40	14 47 31	14 50 21	14 54	15 56	6.1
		E	14 25 14	.. .. .	14 49 00	14 55 07	14 58	15 43	4.2
441	Nov. 8	N	4 46 22	4 56 34	5 00 30	5 05 25	5 17	6 38	2.6
		E	4 46 22	.. .. .	5 00 33	5 05 49	.. ..	5 38	0.3
442	Nov. 18	N	18 59 05	19 05 22	19 13 23	19 13 40	.. ..	19 46	0.5
		E	18 59 18	19 05 22	19 13 26	19 08 49	.. ..	19 43	0.4
443	Dec. 4	E	.. .. .	.. .. .	12 56 00	13 01 00	13 05	.. ..	0.1
444	Dec. 6	N	8 43 23	8 45 12	8 45 39	8 46 43	8 48	9 23	10.7
		E	8 43 15	8 45 10	8 45 32	8 46 15	8 48	9 34	8.7
445	Dec. 6	N	12 07 24	.. .. .	12 08 02	.. .. .	.. ..	12 28	0.1
		E	12 07 09	.. .. .	12 07 45	.. .. .	.. ..	12 26	0.1

REMARKS.

401. Preliminary phases uncertain. E drum apparently moving irregularly. Times less reliable than on N.
 402. P and S doubtful on account of microseisms. Only a few long waves are certain on E.
 403. Phases uncertain. Possibly the records of two earthquakes overlap.
 404. Barely perceptible on E.
 405, 406, 407, 408. Phases uncertain.
 409. Only long waves visible.
 416. An amplitude of 0.8 mm. occurred during S at 22^h 17^m 26^s.
 418, 423, and 424. Very faint.
 422. An amplitude of 6.7 mm. occurred during S at 18^h 00^m 01^s.
 425. On account of extreme weather conditions the records became so damp that the film of carbon loosened and ran when the sheets were hung up to dry after being run through the varnish, making it impossible to determine the time of any phases.
 426. E not operating.
 427. Phases indistinct on E.
 428. End obscured by microseismic tremors. E not in operation.
 429, 430, 431. E not in operation.
 432. Evidently local.
 433. No distinct phases.
 436. Very doubtful.
 437. Actual maximum on E (1.4 mm.) at 12:43:11.
 441. N not in good adjustment.
 442. Phases not well defined.
 443. Only a few long waves.
 444. Distance from epicenter 1040 km. Time at origin 8^h 41^m.
 445. Not far distant; no distinct maximum. N not in good adjustment.

EARTHQUAKES.

A Bosch-Omori seismograph consisting of two horizontal pendulums, one recording north-south motion (N) and the other recording east-west motion (E), has been in operation since April, 1904. During 1920 the seismograph was not in good adjustment part of the time. In the following table the times are Greenwich mean time counted from midnight.

Period of pendulums:

January to June, 1919: N. 16.6 sec.; E. 17.7 sec.

July, 1919, to June, 1920: N. 16.3 sec.; E. 17.7 sec.

July to December, 1920: N. 18 sec.; E. 18 sec.

Multiplication, 10.

Steady mass, 10 to 12 kg.

Register of earthquakes.

No.	Date.	Com- po- nent.	P	S	L	M	C	F	Maxi- mum ampli- tude.
	1919.		<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m.</i>	<i>h. m.</i>	<i>mm.</i>
446	Jan. 1.....	N	3 12 01	3 22 34	.. .. .	3 28 24	.. .. .	3 47	0.9
		E	3 12 12	3 22 37	.. .. .	3 22 48	.. .. .	3 44	1.0
447	Apr. 17.....	N	21 10 12	.. .. .	21 26 15	21 30 30	.. .. .	21 31	0.1
		E	21 10 06	.. .. .	21 21 30	21 27 20	.. .. .	21 36	0.2
448	Apr. 18.....	E	.. .. .	.. .. .	21 26 00	21 28 05	.. .. .	21 36	0.1
449	Apr. 30.....	N	7 29 37	7 40 49	8 04 42	8 19 48	8 20	9 03	0.6
		E	7 29 40	7 41 11	8 04 14	8 19 41	8 31	9 57	0.4
450	May 3.....	N	.. .. .	1 08 35	1 24 23	1 26 45	.. .. .	1 40	0.3
		E	1 01 08	1 08 30	1 22 10	1 25 44	.. .. .	2 07	0.2
451	May 6.....	N	20 06 25	.. .. .	20 20 00	20 23 26	20 24	20 40	0.8
		E	20 04 56	.. .. .	20 20 32	20 23 17	20 28	20 51	0.4
452	May 13.....	N	9 36 51	.. .. .	.. .. .	.. .. .	.. .. .	9 42	0.1
		E	9 37 00	.. .. .	.. .. .	9 37 12	.. .. .	9 45	0.6
453	May 18.....	N	10 24 14	.. .. .	.. .. .	10 24 57	.. .. .	10 27	1.2
		E	10 24 26	.. .. .	.. .. .	10 24 52	.. .. .	10 45	5.4
454	May 20.....	E	4 27 00	.. .. .	4 28 00	.. .. .	.. .. .	4 36	.....
455	Dec. 15.....	N	1 10 23	.. .. .	.. .. .	.. .. .	.. .. .	1 12	0.1
		E	1 10 24	.. .. .	.. .. .	1 11 02	.. .. .	1 12	0.1
	1920.								
456	Feb. 2.....	N	11 40 26	.. .. .	12 04 ..	12 07 26	.. .. .	12 50	0.1
		E	11 44 56	.. .. .	12 03 10	12 08 10	.. .. .	13 59	0.5
457	Feb. 10.....	N	22 22 45	.. .. .	22 40 26	22 44 06	23 07	23 17	0.2
		E	.. .. .	.. .. .	22 40 25	22 49 26	.. .. .	23 32	0.2
458	Mar. 20.....	E	.. .. .	.. .. .	19 17 45	.. .. .	19 23	19 31	0.2
459	Mar. 29.....	N	5 10 57	.. .. .	5 11 27	5 12 27	5 15	5 44	3.4
		E	5 09 55	.. .. .	5 10 35	5 11 32	5 17	6 04	10.8
460	Apr. 18.....	N	21 09 43	.. .. .	.. .. .	21 11 43	.. .. .	21 15	0.1
		E	21 08 39	.. .. .	21 09 30	21 10 42	.. .. .	21 15	0.4
461	May 7.....	N	21 54 19	.. .. .	22 07 25	22 13 00	22 14	22 27	0.4
		E	21 54 18	.. .. .	22 09 30	22 13 22	22 18	22 53	0.6
462	May 13.....	E	.. .. .	.. .. .	2 28 21	2 33 ..	.. .. .	2 53	0.1
463	June 5.....	E	4 33 24	4 43 18	4 59 30	.. .. .	5 19	5 31	0.1
464	July 7.....	N	18 42 49	.. .. .	18 44 17	18 44 26	18 45	18 49	4.6
465	Aug. 26.....	N	23 08 16	.. .. .	.. .. .	.. .. .	.. .. .	23 19	0.2
466	Nov. 16.....	N	8 34 32	.. .. .	.. .. .	.. .. .	.. .. .	8 42	.....
		E	8 37 40	.. .. .	.. .. .	.. .. .	.. .. .	8 43	.....
467	Dec. 16.....	N	12 17 31	12 27 01	12 39 14	.. .. .	.. .. .	13 33	84. +

REMARKS.

446. The phase tabulated as S is a single irregular large wave. Similar large waves (amplitude 0.5 to 1.0 mm.) occur on each component at about 3:22:35 and 3:28:16.

450. Phases not well defined.

451. P very faint and uncertain.

452, 453. Local shocks felt in Sitka. Pictures and furniture moved.

455. Very faint; felt at Juneau. Some defect in the seismograph rendered the record poor and the phases uncertain in 1920 prior to June. N not in operation in June.

464. Instrument in poor adjustment. E not in operation.

465. No distinct phases. E not in operation.

467. Record lost between 12:45:44 and 12:52:22. The tabulated amplitude is to the edge of the paper. E not in operation.