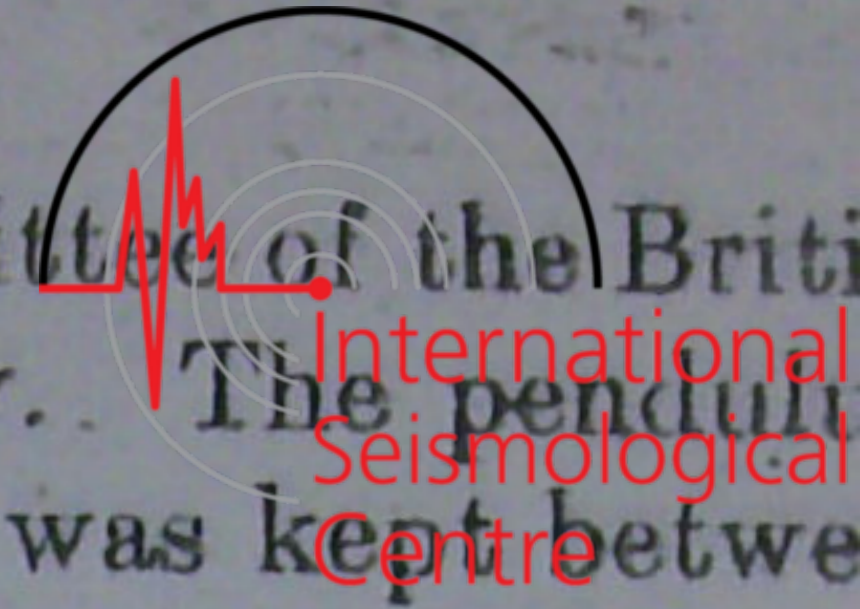


EARTHQUAKES.



In April, 1903, a Milne seismograph belonging to the Seismological Committee of the British Association was transferred from Oahu College to the magnetic observatory. The pendulum points north, thus recording east-west motion. The period of the pendulum was kept between 19 and 20 seconds. The sensitiveness, i. e., the amount of tilt corresponding to a displacement of 1mm. in the end of the pendulum, was determined at various times as follows:

1909.		"	1910.	
February 16.....	0.36	February 18.....	0.	0.
April 15.....	0.36	March 19.....	0.	0.
June 15.....	0.50	June 16.....	0.	0.
October 16.....	0.53	August 16.....	0.	0.
December 15.....	0.36	September 24.....	0.	0.
		October 15.....	0.	0.
		December 15.....	0.	0.

In May, 1903, the instrument was incased in a box made of one-fourth-inch felting, which very much reduced the disturbance due to air currents. At times, however, it was still sufficient to confuse the beginning and end portions of seismic disturbances.

The instrument was not recording for the following short periods:

Date.	G. M. T.				Cause.
	h.	m.	h.	m.	
1909.					
Mar. 28.....	17	11	to 18	57	Driving clock stopped.
Apr. 4.....	13	55	to 18	54	Do.
Apr. 25.....	17	35	to 19	05	Lamp out.
May 28-29.....	18	50	to 6	15	Disturbed by insect.
June 15.....	2	15	to 3	37	Driving clock stopped.

The following table is a register of the earthquakes recorded during 1909 and 1910. The phases are given in Greenwich mean time counted from midnight. It will be seen that the majority of the recorded disturbances are tremors of short duration and small amplitude, many cases a mere swelling of the line, without well-defined phases, and the beginning has been tabulated as the beginning of the principal portion.

Register of earthquakes recorded at the Honolulu Observatory.

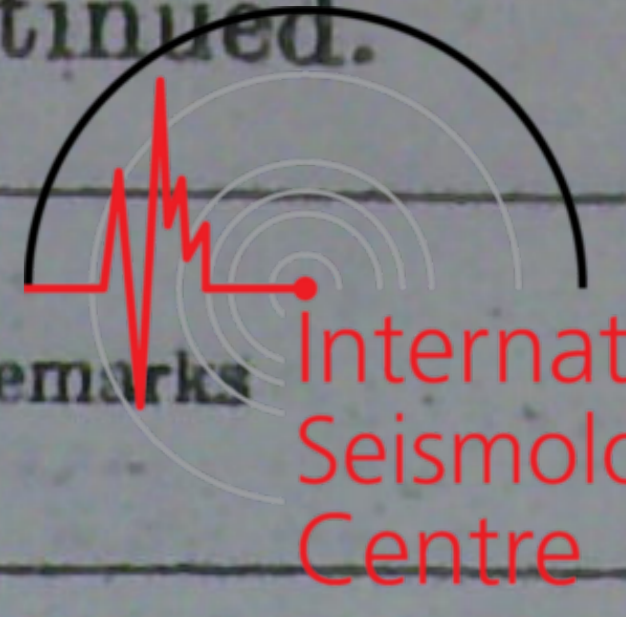
No	Date	First P. T. begin		Large waves begin		Maximum		End		Max. amplitude	Remarks
		h.	m.	h.	m.	h.	m.	h.	m.		
1909.											
574	Jan. 3	..	.....	3	28.8	3	31.8	3	37	0.1	Tremors.
575	17	3	15.9	3	24.8	3	29.8	3	57	0.8	
576	21	2	38.8	2	46.1	2	50.1	3	38	0.5	Second P. T. at 2 ^h 42.7 ^m .
577	23	3	23.2	3	38.5	3	56.3	6	03	0.7	
578	24	..	.....	17	38.3	17	46.3	17	52	0.2	Tremors.
579	26	..	.....	1	52.7	..	.....	2	11	0.1	Doubtful; tremors.
580	29	1	01.5	1	07.5	1	23.0	1	54	0.4	
581	Feb. 8	0	03.3	0	22.5	0	28.9	0	33	0.2	Tremors.
582	22	9	29.7	9	35.3	9	41.7	12	27	1.7	Second P. T. at 9 ^h 32.4 ^m .
583	26	17	05.8	17	15.1	17	18.6	18	29	0.8	
584	Mar. 7	..	.....	5	13.3	5	16.3	5	23	0.1	Doubtful.
585	8	11	31.9	11	47.0	11	52.7	..	..	1.5	Second P. T. at 11 ^h 39.1 ^m .
586	11	0	15.1	0	25.7	0	33.0	1	27	0.6	Second P. T. at 0 ^h 18.4 ^m .
587	12	23	29.2	23	42.5	23	54.7	25	15	1.4	Second P. T. at 23 ^h 36.9 ^m .
588	13	..	.....	14	02.6	..	.....	14	07	0.2	
589	13	14	40.2	14	46.5	15	03.2	..	..	4.2	
590	17	23	13.6	23	32.0	23	40.2	25	36	2.2	Second P. T. at 23 ^h 19.7 ^m .
591	22	4	44.3	4	52.5	4	56.6	5	40	0.7	
592	22	20	20.7	20	30.6	20	39.1	21	01	0.5	
593	22	..	.....	22	40.1	22	47.7	22	59	0.3	Tremors.
594	27	13	30.9	13	47.0	13	52.3	14	23	0.3	
595	Apr. 10	5	36.2	5	44.5	5	48.0	9	12	5.3	Second P. T. at 5 ^h 41.4 ^m .
596	10	18	27.4	..	.....	..	.....	..	..	..
597	10	..	.....	19	54.2	20	01.3	21	32	2.0	Second P. T. at 19 ^h 50.5 ^m .
598	11	..	.....	..	.....	14	27.7	..	..	0.4	Second P. T. at 14 ^h 15.5 ^m .

Register of earthquakes recorded at the Honolulu Observatory—Continued.

No	Date	First P. T. begin		Large waves begin		Maximum		End		Max. amplitude mm.	Remarks
		h.	m.	h.	m.	h.	m.	h.	m.		
	1909.										
599	Apr. 12	1	21.3	1	29.2	1	32.8	2	46	1.8	Second P. T. at 1 ^h 24.6 ^m .
600	13	22	58.3	23	13.7	23	20.1	23	30	0.1	Tremors.
601	14	20	15.4	20	28.6	20	38.8	21	24	0.5	
602	17	..	..	19	27.2	19	31.3	19	47	0.2	
603	25	22	09.3	..	..	22	28.5	..	..	0.3	
604	25	..	..	23	11.6	23	15.1	23	57	0.9	
605	27	12	53.2	13	01.9	13	25.1	15	57	1.4	
606	28	0	09.3	..	..	0	15.0	1	23	0.1	
607	28	7	21.5	..	..	7	46.5	7	53	0.2	
608	29	23	15.7	23	49.5	24	01.3	24	50	0.5	
609	May 2	7	05.4	7	18.6	7	26.2	8	09	0.5	Second P. T. at 7 ^h 13.2 ^m .
610	2	..	..	18	36.5	18	40.7	19	37	0.8	
611	5	..	..	2	46.3	..	..	2	54	0.1	Doubtful; tremors.
612	6	..	..	7	15.5	..	..	7	22	0.1	Do.
613	9	..	..	3	14.1	..	..	3	29	0.1	
614	10	..	..	21	27.1	..	..	21	45	0.1	
615	11	..	..	3	52.9	..	..	3	57	0.2	
616	11	13	15.2	13	18.3	13	24.3	..	..	0.8	
617	11	..	..	23	18.1	..	..	23	24	0.1	Tremors.
618	12	0	27.4	0	42.2	0	45.6	2	49	2.1	
619	12	..	..	5	48.3	5	51.1	5	59	0.2	Doubtful.
620	13	..	..	14	14.7	14	19.0	14	26	0.4	
621	14	..	..	0	42.3	..	..	1	03	0.1	Do.
622	14	..	..	6	50.6	..	..	6	56	0.1	Do.
623	17	8	16.4	8	26.3	8	54.8	11	19	1.1	Second P. T. at 8 ^h 20.4 ^m .
624	18	..	..	17	01.8	17	06.9	..	..	0.4	
625	18	..	..	18	26.2	18	28.7	18	52	0.3	
626	23	5	53.4	6	08.3	6	11.5	6	42	0.5	
627	23	..	..	11	20.6	..	..	11	36	0.1	Tremor.
628	25	..	..	5	17.7	5	27.3	6	09	0.6	Second P. T. at 5 ^h 07.8 ^m .
629	26	2	21.4	2	33.4	2	36.1	3	43	0.8	Second P. T. at 2 ^h 27.9 ^m .
630	30	21	12.9	21	35.1	21	46.0	23	43	0.7	Second P. T. at 21 ^h 22.5 ^m .
631	June 3	19	07.1	19	29.1	19	36.2	23	12	2.4	
632	6	5	11.7	5	21.5	5	26.0	6	26	0.9	Second P. T. at 5 ^h 17.5 ^m .
633	6	..	..	8	51.0	8	55.4	8	59	0.1	Tremor.
634	8	6	00.5	6	29.7	6	35.1	9	55	8.0	Second P. T. at 6 ^h 10.9 ^m .
635	9	0	51.2	1	12.2	1	16.4	2	54	1.0	Second P. T. at 0 ^h 59.1 ^m .
636	10	7	54.5	8	03.4	8	06.2	9	14	0.4	Second P. T. at 8 ^h 00.9 ^m .
637	11	20	59.0	21	33.2	21	36.2	21	41	0.1	Tremor.
638	12	20	45.3	21	02.5	21	09.5	23	31	1.4	Second P. T. at 20 ^h 51.1 ^m .
639	14	..	..	7	30.3	7	37.4	7	53	0.5	Tremor.
640	22	13	29.2	13	49.1	13	53.9	14	59	1.2	Second P. T. at 13 ^h 44.3 ^m .
641	25	..	..	3	36.5	3	37.4	3	51	0.1	Tremor.
642	27	7	24.7	7	35.1	7	43.3	10	20	4.5	Second P. T. at 7 ^h 31.6 ^m .
643	27	..	..	11	58.3	..	..	12	04	0.1	Tremor.
644	28	..	..	15	41.5	15	45.3	15	50	0.2	Do.
645	July 7	..	..	11	20.8	11	23.6	11	28	0.2	Do.
646	7	21	52.4	22	02.2	22	22.4	24	22	1.0	Second P. T. at 21 ^h 56.8 ^m .
647	21	..	..	4	20.8	4	23.2	4	28	0.2	Tremor.
648	25	..	..	8	13.4	8	17.2	8	23	0.4	Do.
649	27	15	54.2	15	56.2	16	01.2	16	18	0.3	
650	30	11	01.6	11	16.8	11	21.4	14	16	5.6	Second P. T. at 11 ^h 09.4 ^m .
651	31	19	44.3	19	52.8	19	58.4	21	12	0.6	
652	Aug. 7	..	..	17	05.3	17	06.3	17	32	1.5	
653	14	6	49.8	7	01.3	7	05.8	7	54	0.6	Second P. T. at 6 ^h 55.3 ^m .
654	16	7	18.6	7	32.3	7	47.3	8	28	0.3	
655	18	0	49.2	0	59.3	1	11.1	2	08	1.1	Second P. T. at 0 ^h 56.0 ^m .
656	26	..	..	20	54.3	20	58.3	21	02	0.2	Tremor.
657	31	12	00.0	12	02.8	12	05.3	13	02	0.5	
658	Sept. 8	16	54.3	17	04.5	17	08.8	18	32	2.3	Second P. T. at 17 ^h 00.3 ^m .
659	8	23	39.8	23	55.9	23	59.0	24	22	0.9	
660	11	..	..	11	00.8	11	28.8	11	50	0.3	Tremor.
661	16	19	40.3	20	03.3	20	10.1	20	27	0.4	Second P. T. at 19 ^h 56.3 ^m .
662	Oct. 18	..	..	8	44.3	8	47.8	8	55	0.4	Tremor.
663	21	0	10.3	0	41.8	0	50.0	2	09	0.4	Second P. T. at 0 ^h 32.3 ^m .
664	30	10	40.1	10	57.8	11	06.8	11	28	0.5	
665	31	10	33.3	10	48.8	10	50.3	12	27	1.4	Second P. T. at 10 ^h 41.3 ^m .
666	Nov. 8	..	..	21	11.0	21	14.3	21	50	0.2	Tremor.
667	10	6	23.2	6	38.3	6	39.3	8	59	4.5	Second P. T. at 6 ^h 31.1 ^m .
668	12	4	38.3	5	00.6	5	03.2	5	22	0.3	
669	20	..	..	13	05.3	13	12.3	13	27	0.5	Tremor.



Register of earthquakes recorded at the Honolulu Observatory—Continued.

International
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Centre

No	Date	First P. T. begin		Large waves begin		Maximum		End		Max. ampli- tude mm.	Remarks
		h.	m.	h.	m.	h.	m.	h.	m.		
	1909.										
670	Nov. 21	..	.....	8	11.1	8	18.8	8	29	1.7	
671	Dec. 3	..	.....	3	25.5	3	41.1	4	09	0.4	Tremors.
672	6	..	.....	18	13.8	18	26.5	18	32	0.5	Do.
673	8	9	09.7	9	27.3	9	32.3	10	14	1.0	Second P. T. at 9 ^h 17.1 ^m .
674	9	15	28.3	15	57.8	16	04.3	20	17	7.8	Second P. T. at 15 ^h 51.3 ^m .
675	9	21	23.0	21	32.3	21	37.8	22	07	1.3	Second P. T. at 21 ^h 28.8 ^m .
676	9	22	09.8	22	26.1	22	31.3	23	11	1.3	
677	9	23	39.8	23	58.6	24	00.8	25	00	2.7	Second P. T. at 23 ^h 47.8 ^m .
678	22	13	05.3	13	14.5	13	18.3	13	52	0.8	Second P. T. at 13 ^h 10.3 ^m .
679	23	..	.....	22	11.3	22	47.3	23	18	0.4	Tremors.
680	28	..	.....	19	56.8	20	08.8	20	13	0.2	Do.
681	30	..	.....	21	47.3	21	47.6	21	58	0.3	Do.
	1910.										
682	Jan. 1	11	12.8	11	36.3	11	39.8	12	53	5.5	Second P. T. at 11 ^h 21.3 ^m .
683	15	..	.....	22	39.8	23	04.0	23	14	0.3	Tremors.
684	16	23	12.2	23	16.6	23	17.4	23	25	1.5	
685	19	..	.....	15	08.2	15	09.2	15	12	0.3	Do.
686	22	9	12.6	9	24.2	9	25.6	11	34	1.5	Second P. T. at 9 ^h 18 ^m .
687	23	..	.....	19	14.2	19	50.6	21	31	0.5	Tremors.
688	26	..	.....	1	12.2	1	13.8	1	50	0.1	Do.
689	26	..	.....	16	46.0	16	47.8	16	51	0.2	Do.
690	29	5	10.4	5	12.6	5	15.4	6	03	1.2	
691	30	..	.....	4	09.6	4	30.8	6	27	0.8	Do.
692	Feb. 2	..	.....	11	11.8	11	12.6	11	48	0.2	Do.
693	3	..	.....	10	12.2	10	16.2	10	24	0.4	Tremor.
694	4	14	09.6	14	22.2	14	30.6	17	02	3.0	Second P. T. at 14 ^h 16.8 ^m .
695	4	17	46.2	18	03.2	18	06.8	19	29	2.8	Second P. T. at 17 ^h 54.6 ^m .
696	9	..	.....	8	08.2	8	14.2	8	23	0.5	Tremor.
697	12	18	19.0	18	36.6	18	42.6	..	..	1.5	
698	28	21	12.6	21	14.6	21	15.0	22	22	1.2	
699	Mar. 1	..	.....	11	45.4	11	45.8	12	20	0.4	Tremors.
700	11	17	48.6	..	.....	18	08.0	18	12	0.5	
701	14	..	.....	3	58.2	4	06.4	4	12	0.3	Tremor.
702	15	19	15.8	..	.....	19	17.2	19	25	0.5	
703	19	..	.....	0	26.0	0	29.8	0	35	0.4	Do.
704	22	20	57.5	21	02.0	21	02.0	21	09	0.4	Do.
705	25	15	49.7	16	08.5	16	13.2	17	12	3.7	Second P. T. at 16 ^h 04.8 ^m .
706	30	17	05.8	17	21.3	17	26.5	20	11	16.8	Second P. T. at 17 ^h 13.2 ^m .
707	31	18	59.0	19	35.5	19	39.7	20	52	0.4	Second P. T. at 19 ^h 12.3 ^m .
708	Apr. 1	14	24.0	14	33.5	14	36.3	14	52	0.5	Second P. T. at 14 ^h 29.5 ^m .
709	2	..	.....	12	35.0	12	37.5	12	44	0.4	
710	3	..	.....	19	18.0	19	24.0	19	30	0.3	Tremor.
711	8	..	.....	16	48.0	16	49.0	17	46	0.4	Do.
712	12	0	34.0	0	57.3	1	02.0	2	21	2.9	Second P. T. at 0 ^h 43.2 ^m .
713	12	..	.....	19	16.0	19	29.0	19	34	0.4	Tremor.
714	16	12	53.0	13	16.0	13	19.3	13	39	0.9	Second P. T. at 13 ^h 08 ^m .
715	17	..	.....	1	49.0	1	52.0	2	10	0.4	Tremors.
716	18	..	.....	7	31.0	7	32.5	7	38	0.3	Tremor.
717	20	..	.....	22	35.8	22	36.3	22	50	0.4	Do.
718	May 1	18	41.0	18	57.2	19	00.3	21	48	6.2	
719	4	..	.....	16	02.5	16	07.5	16	15	0.2	Do.
720	4	..	.....	18	16.5	18	21.0	18	26	0.2	Do.
721	5	0	49.0	..	.....	1	05.0	1	16	0.2	Second P. T. at 1 ^h 01.5 ^m .
722	10	..	.....	17	26.5	17	27.2	..	..	0.4	Possibly air tremors.
723	13	8	07.0	8	12.0	8	13.3	10	10	1.9	Second P. T. at 8 ^h 11 ^m .
724	15	..	.....	4	57.5	5	01.5	5	10	0.4	Tremor.
725	18	..	.....	10	33.7	10	42.5	10	51	0.3	Do.
726	20	12	24.5	12	39.0	12	41.7	13	22	0.7	Second P. T. at 12 ^h 37.5 ^m .
727	22	6	32.7	6	44.7	6	52.0	8	30	3.2	Second P. T. at 6 ^h 40.2 ^m .
728	23	19	02.5	19	14.5	19	16.3	19	48	0.3	Second P. T. at 19 ^h 10 ^m .
729	31	5	04.5	5	22.3	5	25.0	6	46	2.8	Second P. T. at 5 ^h 12.3 ^m .
730	June 1	6	04.3	6	21.0	6	25.0	9	37	8.1	Second P. T. at 6 ^h 12.3 ^m .
731	3	..	.....	23	46.0	23	50.0	23	56	0.4	Tremor.
732	9	12	06.0	12	16.2	12	20.0	13	00	1.6	Second P. T. at 12 ^h 13.5 ^m .
733	14	..	.....	19	56.0	20	37.5	20	42	0.2	Tremors.
734	16	6	39.0	6	46.5	7	00.0	10	37	19.5	
735	17	..	.....	5	48.0	6	08.0	6	24	0.2	Do.
736	17	..	.....	17	02.5	17	10.3	17	23	0.4	Tremor.
737	22	..	.....	19	38.7	19	42.0	19	46	0.2	Do.
738	23	..	.....	3	28.0	3	35.0	3	40	0.2	Do.