

36. Seismometrical Report.

地震観測報告

(Earthquake Research Institute, Tōkyō, Japan.)

(April 1—June 30, 1931.)

(1) *Sensible earthquakes in Tkōyō for the period
April 1—June 30, 1931.*

List I.

Time=Central standard time of Japan (Civil mean time of the meridian 135°E).

Notation:

- Prel. tr. = Preliminary tremors.
- N.S. = North-South component.
- E.W. = East-West component.
- 2A = Range of motion.
- T = Period of earthquake motion.
- λ = Longitude.
- φ = Latitude.
- D = Depth of focus

Intensity: I (slight), II (rather weak), III (weak), IV (rather strong),
V (strong), VI (violent).

No.	Station	Date	Time of occurrence	Duration		Maximum motion				Direction of initial motion	Epicentre		D km	Intensity
				Prel. tr.	Total	N.S.		E.W.			λ (E)	φ (N)		
						2A	T	2A	T					
22	Tōkyō	April 4	^h 9 ^m 16 ^s 44.9	^s 9.9	^m 3	^μ 140	^s 0.56	^μ 180	^s 0.45		[°] 139.80	[°] 35.52	70	I
	Kamakura		19.1	3	40	0.69	20	0.97	I					
	Misaki		10.6	5	33	1.03	30	1.03	I					
	Kiyosumi		12.1	3	8	1.00	16	0.96						
	Titibu		13.8	3	8	1.30	16	2.00						
	Tōgane		9 16 38.5	7.2	1.3									
	Tukuba		9 16 40.7	9.6	3.5	64	0.80	43	0.40		I			
Mitaka														

(to be continued.)

List I. (continued.)

No.	Station	Date	Time of occurrence	Duration		Maximum motion				Direction of initial motion	Epicentre		D	Intensity
				Prel. tr.	Total	N.S.		E.W.			λ (E)	ϕ (N)		
						2A	T	2A	T					
23	Tôkyô	April 15	^h ^m ^s 7 24 43.5	^s 13.5	^m 8	^{μ} ^s 35 0.40	^{μ} ^s 38 0.55			140°70	35°32	60 ^{km}	I	
	Kamakura		15.6	7	68	0.69	80							0.58
	Misaki		15.0	8	56	0.54	46							0.54
	Kiyosumi		10.6	5	204	0.38	140							0.48
	Titibu		20.2	5	16	0.85	18							1.28
	Tôgane		10.6	5	140	0.47	94							0.47
	Tukuba		7 24 44.8	16.8	2.5									
Mitaka	7 24 45.0	17.9	4	48	0.39	112	0.38							
24	Tôkyô	24	12 34 00.3	24.6	8	132	0.59	76	0.59	141.87	36.92		I	
	Kamakura		28.6	6	58	0.69	70	0.69						
	Misaki		26.5	6	30	0.74	24	1.06						
	Kiyosumi		24.8	5	44	0.64	56	0.55						
	Titibu		21.3	7	44	0.85	70	0.82						
	Tôgane		12 34 19.0	11.5	4									
	Mitaka		12 34 04.3	29.4	6.5	133	1.00	75	1.90					
25	Tôkyô	May 4	23 48 28.6	8.1	4	80	0.49	120	0.49	S45°W. u.	139.84	36.16	40	I
	Kamakura		13.2	5	36	0.31	46	0.31						
	Misaki		14.1	5	31	0.47	32	0.47						
	Kiyosumi		23 48 32.4	14.2	5	10	0.72	8	0.72					
	Titibu		8.4	3	52	0.29	40	0.22						
	Tôgane		11.7	4	36	0.74	30	0.67						
	Mitaka		23 48 22.7	6.5	2									
26	Tôkyô	12	3 27 8.3	23.2	16	60	0.50	40	0.50	S26°W. u.	141.19	37.27		I
	Kamakura		29.8	10	110	2.61	80	2.20						
	Misaki		31.0	8	77	1.31	52	1.30						
	Kiyosumi		3 27 15.2	31.3	11	100	2.71	88	2.70					
	Titibu		28.2	7	64	1.11	60	0.74						
	Tôgane		26.3	12	130	2.51	92	2.00						
	Mitaka		3 26 56.9	16.1	12									
27	Tôkyô	25	15 49 36.9	29.9	6	171	2.4	73	1.5	141.40	37.90		I	
	Kamakura		34.2	10	149	2.4	72	2.2						
	Misaki		35.7	10	158	2.6	90	2.2						
	Kiyosumi		15 49 48.8	36.9	10	100	2.7	130	2.6					
	Titibu		38.8	6	136	1.4	118	1.2						
	Tôgane		31.7	7	190	2.6	104	2.6						
	Mitaka		15 49 26.3	22.3	10									
28	Tôkyô	25	19 27 51.5	9.8	3	72	0.35	128	0.34	139.10	35.32	20	I	
	Kamakura		6.0	3	115	0.47	70	0.43						
	Misaki		7.5	3	17	0.43	32	0.48						
	Kiyosumi		19 27 59.1	12.4	2	5	0.52	5	0.52					
	Titibu		8.9	1.5	36	0.35	40	0.32						
	Tôgane		14.8	2	10	0.47	16	0.47						
	Mitaka		19 27 58.3	14.5	2									
			19 27 48.3	8.2	2	41	0.20	105	0.20					

(to be continued.)

List I. (continued.)

No.	Station	Date	Time of occurrence	Duration		Maximum motion				Direction of initial motion	Epicentre		D km	Intensity
				Prel. tr.	Total	N.S.		E.W.			λ (E)	ϕ (N)		
						2A	T	2A	T					
29	Tôkyô	May 26	18 12 24.6	26.6	9	67	0.56	120	0.37	S 33° W u.	141.8	37.23	km	II
	Kamakura		30.2	9	130	1.16	76	1.16						
	Misaki		33.4	8	75	0.51	57	0.51						
	Kiyosumi		33.5	9			110	2.47						
	Titibu		29.3	7	40	1.52	40	1.12						
	Tôgane		28.4	9	96	1.79	110	1.50						
	Tukuba		18 12 12.4	19.0	11									
Mitaka	18 12 26.9	23.7	11	51	1.60	105	0.60							
30	Tôkyô	June 2	11 38 35.0	31.4	20	270	0.92	280	0.47	S 35° E	140-49	36.46	70	III
	Kamakura		11 38 37.7	32.8	20	760	2.05	660	1.40					
	Misaki			33.0	20									
	Kiyosumi		11 38 35.6	32.6	15	610	3.12	706	4.2					
	Titibu			30.0	10	2300		760	2.12					
	Tôgane			32.0	20	710	3.10	700	3.01					
	Tukuba		11 38 37.2	19.0										
Mitaka	11 38 33.4	28.8	20	910	2.00	550	2.00							
31	Tôkyô	9	14 8 9.0	14.5	16	970	0.92	920	1.00	N 45° E.d. N 42° E.d.	140-49	36.46	70	III
	Kamakura		14 8 15.1	20.5	10	1320	2.7	760	2.10					
	Misaki			22.0										
	Kiyosumi			20.0	14	1240	2.9	1840	3.8					
	Titibu			15.0	16	424	0.80	750	1.2					
	Tôgane			12.0	10									
	Tukuba		14 7 58.1	12.0	10									
Mitaka	14 8 11.1	14.7	20	925	2.70									
32	Tôkyô	11	15 16 19.9	11.3	30	2375	0.79	1600	0.79	N 81° E. u. S 65° E N 54° W S 17° W W slight S N 86° E	138-91	35-55	10	III
	Kamakura		15 16 17.7	9.2	30	4500	0.50	5500	0.50					
	Misaki			9.4										
	Kiyosumi			14.4	30	820	4.81	620	4.8					
	Titibu			7.5	12	600	1.21	840	0.71					
	Tôgane			16.5	30	640	1.30	284	1.70					
	Tukuba		15 16 27.2	12.1	17									
Mitaka	15 16 17.1	7.7	20											
33	Tôkyô	14	7 45 43.0	15.6	8	321	0.63	162	0.73	141-18	35-77	20	I	
	Kamakura		7 45 50.9	19.5	8	80	1.4	204	1.6					
	Misaki			18.2	9	59	0.9	73	1.0					
	Kiyosumi			12.0	8	230	2.8	130	2.05					
	Titibu			23.6	8	50	1.3	46	1.32					
	Tôgane			9.2	10	320	0.87	254	0.87					
	Tukuba		7 45 39.1	13.0	7									
Mitaka	7 45 50.6	19.2	7	197	3.30	150	1.50							
34	Tôkyô	17	21 9 50.3	6.8	25	42100	2.4	20200	2.4	N 72° W.d. N 21° W.d. N 19° W N 35° W N 56° W N 66° W S 16° W	139-57	35-74	45	V
	Kamakura		21 9 52.5	10.3	11	14500	2.5	5755	2.5					
	Misaki			10.2	20									
	Kiyosumi		21 9 55.3	13.5	20									
	Titibu			8.1	15									
	Tôgane			12.1										
	Tukuba		21 9 54.3	10.0	24									
Mitaka	21 9 49.0	3.7												

(to be continued)

List I. (continued.)

No.	Station	Date	Time of occurrence	Duration		Maximum motion				Direction of initial motion	Epicentre		D	Intensity
				Prel. tr.	Total	N.S.		E.W.			λ (E)	ϕ (N)		
						2A	T	2A	T					
35	Tôkyô Kamakura Misaki Kiyosumi Titibu Tôgane Tukuba Mitaka	June 17	22 53 13.2	7.9	3	56	0.25	144	0.49		139-41	35-82	45	I
				10.4	1.5	12	0.58	12	0.71					
				10.9	3	16	0.54	23	0.54					
				13.2	2	8	0.54	6	0.54					
				7.3	2			32	0.55					
				22 53 12.2	6.6	4	100	0.36	110					
36	Tôkyô Kamakura Misaki Kiyosumi Titibu Tôgane Tukuba Mitaka	17	23 59 30.8	7.3	2	134	0.33	150	0.43		139-49	35-87	45	I
				10.2	3	32	0.59	60	0.52					
				11.1	2.5	16	0.45	21	0.45					
				13.9	3	6	1.05	8	1.05					
				7.4	2.5			22	0.74					
				23 59 33.0	6.4	4	90	0.43	110					
37	Tôkyô Kamakura Misaki Kiyosumi Titibu Tôgane Tukuba Mitaka	23	15 15 26.2	19.2	60	6500	3.0	6000	2.0		141-42	36-20	45	II
				20.8	9.5	1250	2.5	6250	5.7					
				24.3										
				24.5	20									
				26.0	20	750	4.4	1800	5.0					
				15 14 41.2	3.50									
	15 14 54.5	34.3	30											
38	Tôkyô Kamakura Misaki Kiyosumi Titibu Tôgane Tukuba Mitaka	25	4 13 48.6	8.9	2.5	38	0.49	80	0.49		139-39	35-64	50	I
				8.7	2.5	14	0.37	18	0.64					
				10.3	2	10	0.53	8	0.53					
				12.1	2			4	0.41					
				7.1	2	26	0.19	18	0.19					
				4 13 50.0	9.9	2								
	4 13 47.5	7.3	2	90	0.16	346	0.16							
39	Tôkyô Kamakura Misaki Kiyosumi Titibu Tôgane Tukuba Mitaka	30	1 8 56.2	8.4	8	1200	0.50	2403	0.42		139-35	35-86	46	II
				9.0	5.5	440	0.80	280	0.90					
				12.1	10	188	0.55	125	0.55					
				12.7	7	36	0.66	54	0.72					
				17.1	3	270	0.88	130	0.88					
				13.3	7	90	0.50	110	0.47					
	1 8 58.7	10.0	5											
	1 8 53.5	6.6	10	1170	0.90	1290	0.5							
40	Tôkyô Kamakura Misaki Kiyosumi Titibu Tôgane Tukuba Mitaka	30	1 44 18.2	44.1	17	233	1.5	220	1.3		136-71	34-19		II
				44.8	7	270	1.6	130	0.95					
				45.2	12	258	2.63	132	1.70					
				45.9	10	156	2.63							
				50.0	12	260	3.0	530	3.0					
				1 44 20.6	52.5	11								
	1 44 15.4	44.7	15	413	2.6	250								

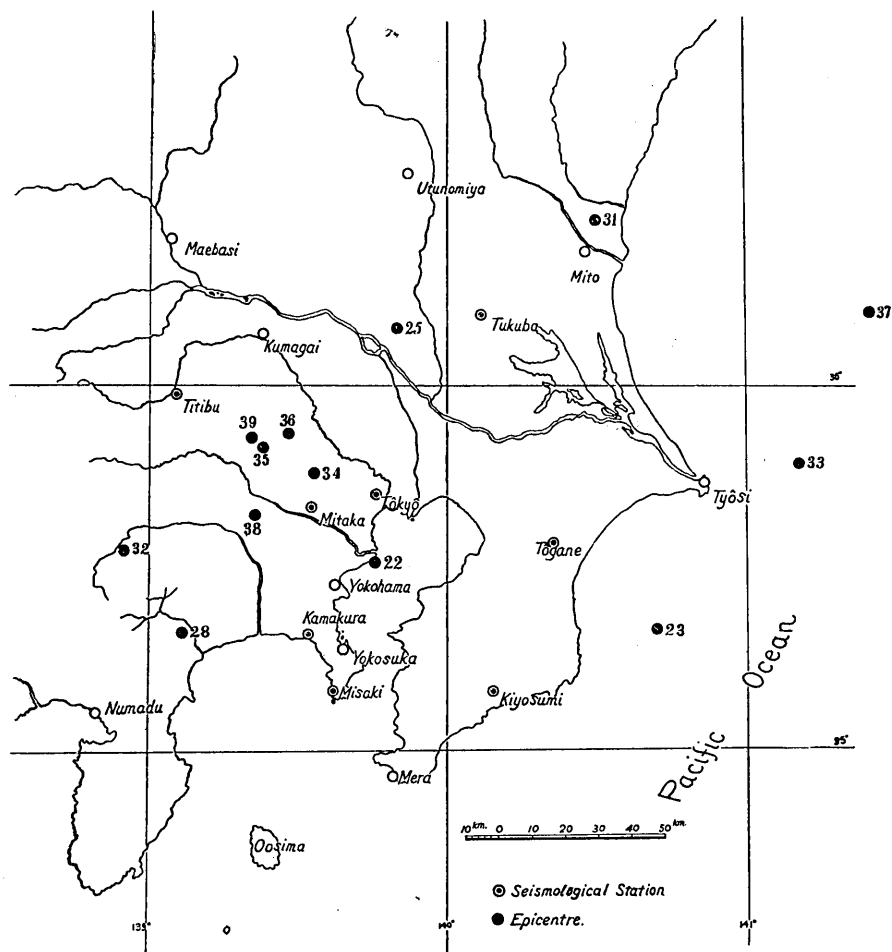


Fig. 1. Distribution of the earthquakes that originated within a distance of 160 kms. from Tōkyō and felt there, for the period April 1-June 30, 1931. (Figures attached to each epicentre indicate the earthquake number in List I.)

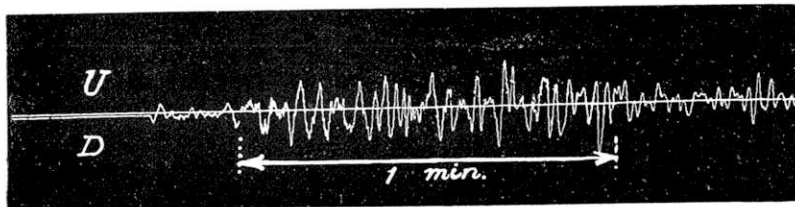
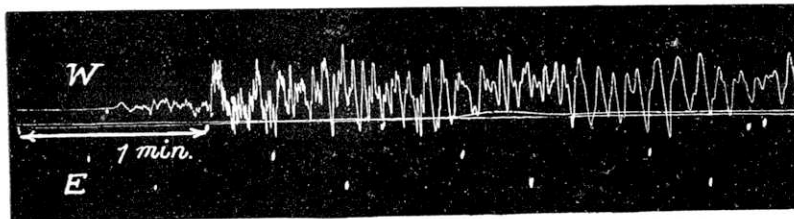
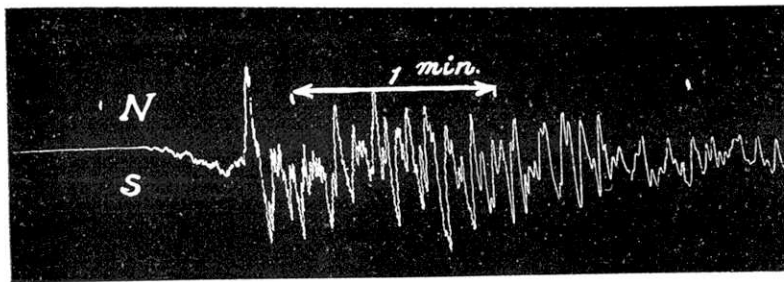
(2) *No important distant earthquake occurred during this period.*

(N. NASU and Ch. YASUDA are responsible for this report.)

Instrument: NS Component = No. 15, EW Component = No. 14,
 Vert. Component = No. 21.

Instrumental constants:

Component	Natural period	Magnification	Damping ratio
N.S.	sec. 60	20	2.0
E.W.	60	15	3.2
Vert.	15	20	1.7



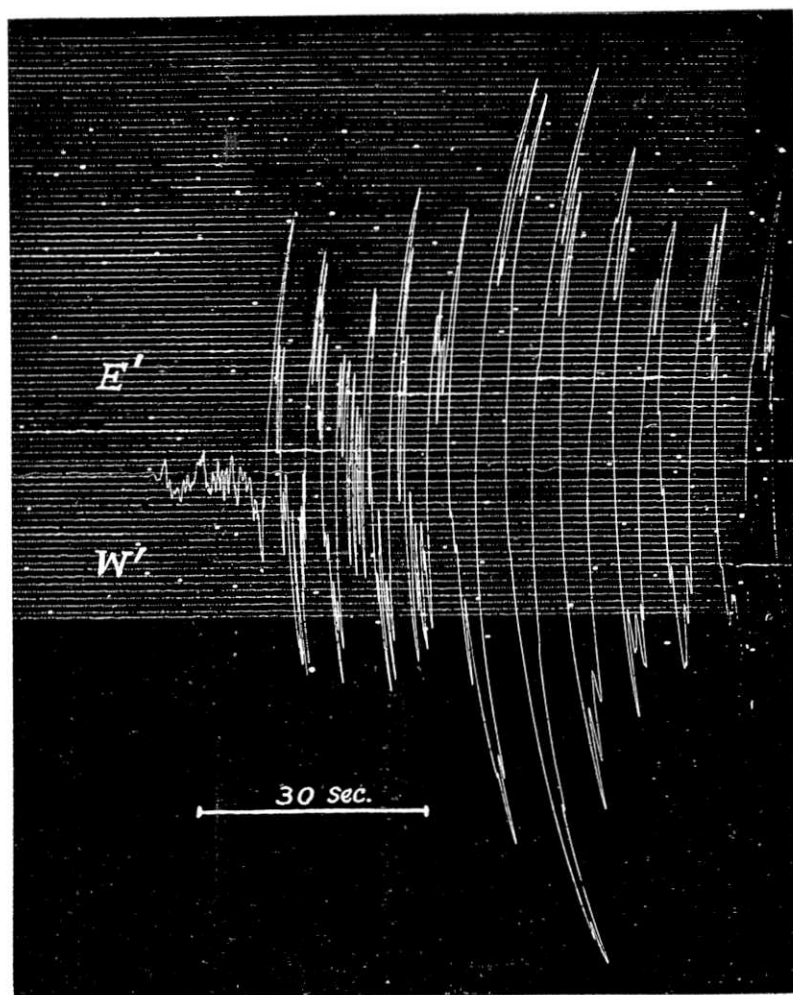
(Natural size of the original diagrams.)

Fig. 2. Tôkyô Observation of the Earthquake of June 2, 1931.

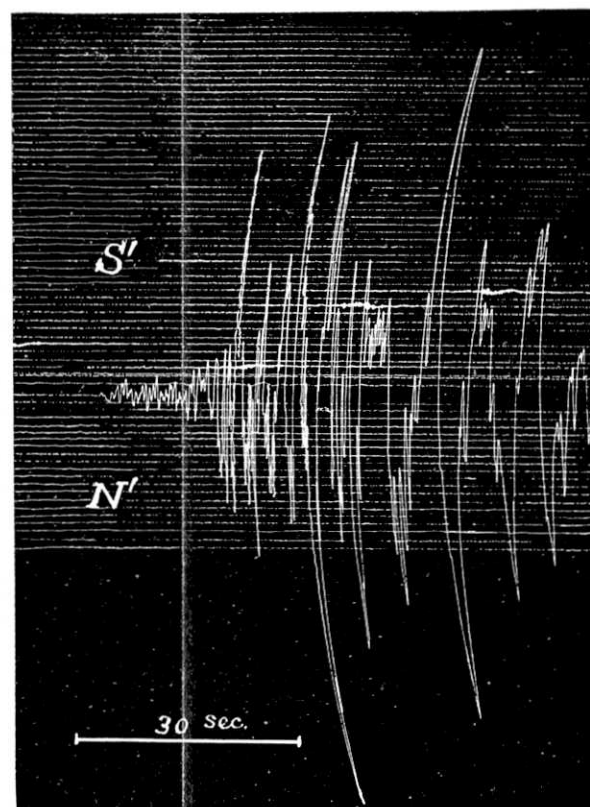
Instrument: No. 4.

Instrumental constants:

Component	Natural period	Magnification	Damping ratio
E.W.	7 sec.	50	1:30
N.S.	7	50	1:30



E.W. Component.



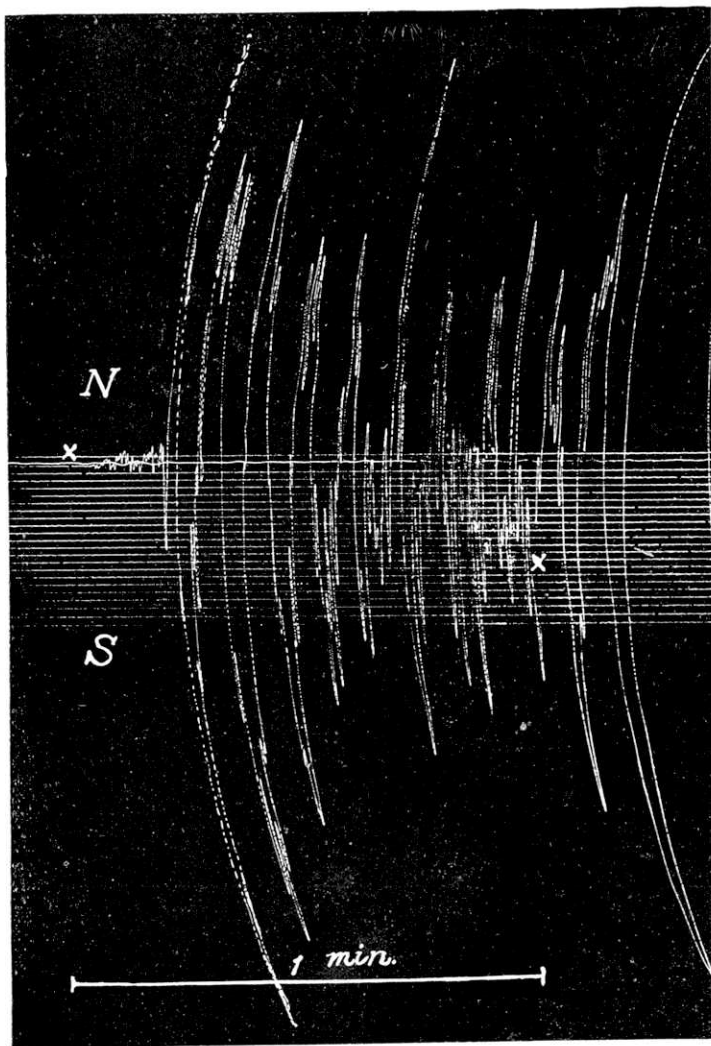
N.S. Component. (Natural size of the original Diagrams.)

$N' = N 13^\circ W$, $S' = S 13^\circ E$.
 $E' = N 77^\circ E$, $W' = S 77^\circ W$.

Fig. 3. Tôkyô Observation of the Earthquake of June 9, 1931.

Instrument: No. 7.

Instrumental constants: Magnification=50. Natural oscillation period=7 sec.
Damping ratio=1.50.



(震研彙報、第九號、圖版、震報)

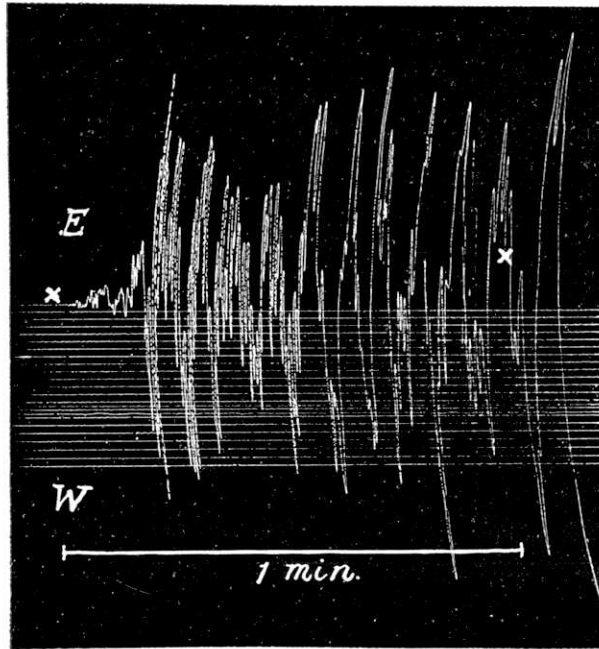
N.S. Component. (Natural size of the original diagram.)

Fig. 4. Tôkyô Observation of the Earthquake of June 11, 1931.

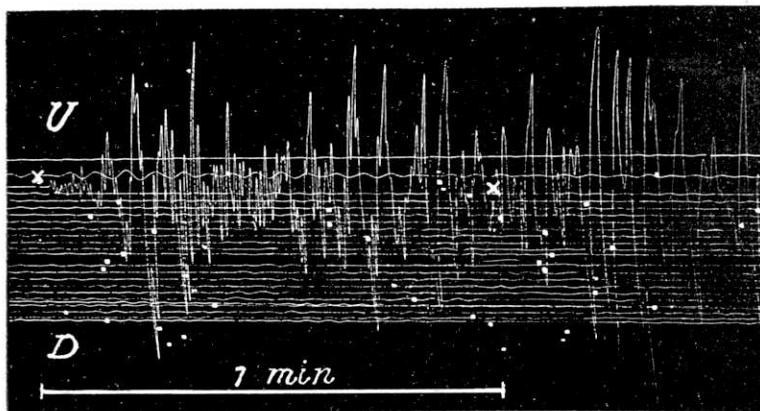
Instrument: No. 7.

Instrumental constants:

Component	Magnification	Natural period	Damping ratio
E.W.	50	7 sec.	1.50
Vert.	28	7	1.50



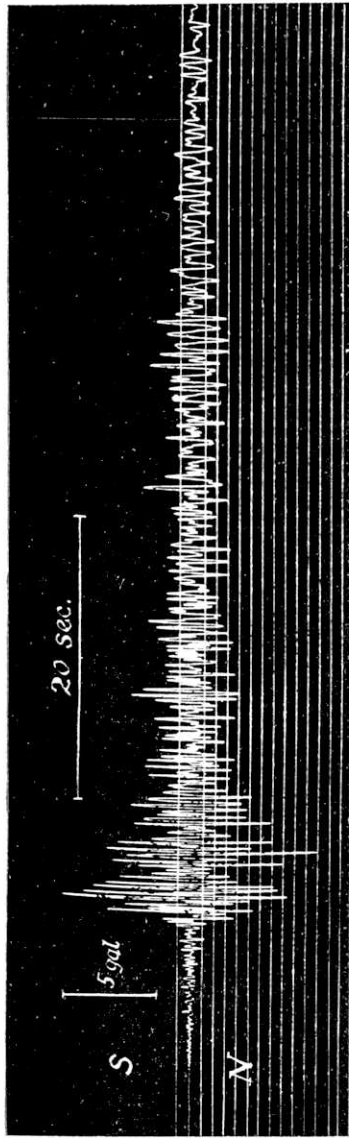
E.W. Component.



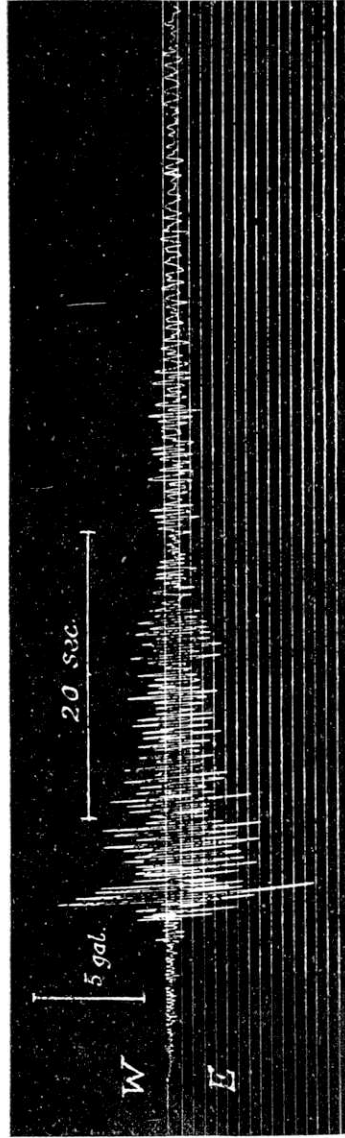
Vertical Component.

(Natural size of the original diagrams.)

Fig. 5 Tōkyō Observation of the Earthquake of June 11, 1931



N.S. Component.



E.W. Component.

(Two times magnified the original diagram.)

Fig. 6. Tōkyō Observation of the Earthquake of June 11, 1931.
Ishimoto Acceleration Seismograph Diagram.