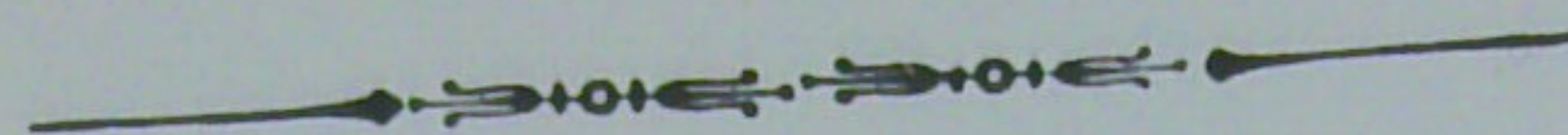


昭 和 六 年

朝 鮮 總 督 府 觀 測 所 年 報



ANNUAL REPORT

OF THE

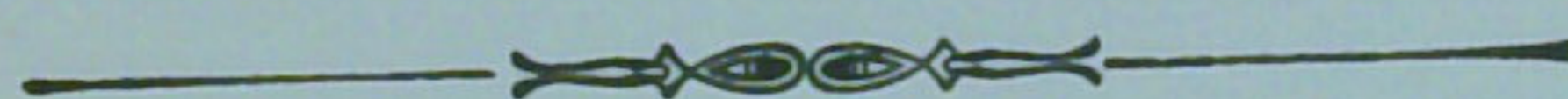
METEOROLOGICAL OBSERVATORY

OF THE

GOVERNMENT-GENERAL OF TYÔSEN

FOR THE YEAR

1931



COMPILED

BY

THE METEOROLOGICAL OBSERVATORY  
OF THE GOVERNMENT-GENERAL OF TYÔSEN

ZINSEN

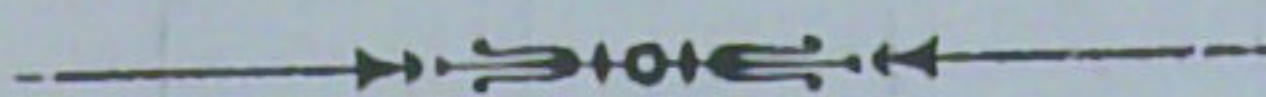
1933

昭和六年

仁川地震観測成績表

Seismic Bulletin for the Year 1931

Zinsen



北緯 37度 29分  
東經 126度 38分  
標高 69.7米  
時刻 グリニチ平時  
地質 灰色花崗片麻岩

$\varphi = 37^{\circ} 29' N$   
 $\lambda = 126^{\circ} 38' E$   
 $H = 69.7m$   
TIME : Gr. Mean Time  
LITHOLOGIC FOUNDATION : Grey Granite-gneiss

器械

振子ノ目方  
大森式微動計(南北動) 50<sup>目</sup>  
同 (東西動) 50<sup>目</sup>  
グキーヘルト地震計(水平動) 200<sup>目</sup>  
同 (上下動) 80<sup>目</sup>  
大森式簡單微動計(南北動) 12<sup>目</sup>  
同 (東西動) 12<sup>目</sup>  
強震計(東西・南北・上下動)

INSTRUMENTS

	Comp.	Mass
Oomori's Tromometer	N	50kg
"	E	50kg
Wiechert Seismograph	N and E	200kg
"	Z	80kg
Oomori's Portable Seismometer	N	12kg
"	E	12kg
Strong motion Seismometer.	N, E and Z	

記號

P 第一初期微動  
P̄ もほろびちつく相  
PP P波ノ地表ニテ一回反射セシ波  
S 第二初期微動  
SS S波ノ地表ニテ一回反射セシ波  
P<sub>4</sub>P 地球ノ心核ニテ反射セシ縦波  
S<sub>4</sub>S 地球ノ心核ニテ反射セシ横波  
PS 地表ニテ反射ノ際縦波ヨリ横波ニ變リタル波  
L 主要動ノ長波  
M 主要動ノ極大動  
C 終期微動  
W<sub>2</sub> 優弧ヲ傳リテ來レル表面波  
F 震動ノ終リ  
i 明瞭ナル相  
e 不明瞭ナル相  
μ 「ミクロン」 $\frac{1}{1000}$  耗  
A<sub>N</sub> 南北動振幅但シ北ヲ正(+)<sup>トス</sup>  
A<sub>E</sub> 東西動振幅但シ東ヲ正(+)<sup>トス</sup>  
A<sub>Z</sub> 上下動振幅但シ上ヲ正(+)<sup>トス</sup>  
Δ 震央距離

SYMBOLS AND NOTATIONS

P First preliminary tremors.  
P̄ Mohorovičić phase.  
PP Longitudinal waves once reflected at the earth's surface  
S Second preliminary tremors.  
SS Transverse waves once reflected at the earth's surface.  
P<sub>4</sub>P Longitudinal waves reflected at the core of the earth.  
S<sub>4</sub>S Transverse waves reflected at the core of the earth.  
PS Waves changed from longitudinal to transverse oscillation through reflection at the earth's surface.  
L Long waves of the beginning of the surface phase.  
M Greatest motion in the surface phase.  
C Tail or end portion.  
W<sub>2</sub> Surface waves traversed the major arc.  
F End of discernible movement.  
i Sudden beginning of the motion.  
e Gradual beginning of the motion.  
μ Micron,  $\frac{1}{1000}$  mm.  
A<sub>N</sub> N-S component of amplitude.  
A<sub>E</sub> E-W component of amplitude.  
A<sub>Z</sub> Vertical component of amplitude.  
Δ Distance of epicenter.

地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
1	Jan. 1	P	23 55 47							146)	N 2.4 E 0.0 U 2.2	Eastern off to the coast of Kwaren-kō, Formosa.
		S	23 58 20									
	2	L	0 0 2									
		ME	0 0 59		5			-14				
		MZ	0 2 28			8			+31			
		F	0 23 ±									
2	Jan. 15	ePE	2 4 34							690?		Destructive in southern part of Mexico.
		ePSE	2 18 11									
		SSE	2 25 12									
		SSSE	2 29 28									
		eLE	2 36 45									
		ME	2 53 50		23			+325				
		MN	2 54 0	22			+290					
		MZ	3 5 48			19			-20)			
		C	3 18 51									
		F	4 13 ±									
3	Jan. 15	ePN?	13 40 34							690?		Mouth of the River Sirakawa, Kumamoto Prefecture.
		SN	13 41 51									
		F	13 43 30									
4	Jan. 15	P	21 3 46							1100		Northeastern off to the Okinawa Island.
		S	21 5 44									
		MN	21 6 27	5			+200					
		ME	21 6 29		5			+173				
		MZ	21 6 30			5			+158			
		F	21 52 ±									
5	Jan. 21	P	9 1 38							1840		SSE-ern off to the cape of Otiisi, Hokkaidō.
		S	9 4 47									
		F	9 11 ±									
6	Jan. 24	ePz?	13 47 9							3280		Philippine Islands.
		eSE	13 52 12									
		eLE	13 55 19									
		F	14 13 0									
7	Jan. 24	e	15 9 54									Basin of the River Solun, Formosa.
		F	15 17 ±									
8	Jan. 27	P	20 15 7							3030		Neighbourhood of Marianne Islands.
		S	20 19 52									
		L	20 24 12									
		MN	20 25 5	10			+810					
		ME	20 27 13		13			-1370				
		MZ	20 27 18			12			-1500			
		C	20 35 18									
		F	21 18 ±									
9	Jan. 28	ePz	21 30 23							3195		Marianne Islands.
		i	21 30 34									
		PP	21 31 9									
		PPP <sub>N</sub> ?	21 31 33									
		eSE	21 35 18									
		eL	21 38 31									
		M <sub>1N</sub>	21 41 13	18			+216					
		M <sub>1EZ</sub>	21 41 34		18	18		+167	±125			

地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
10	Feb. 2	M <sub>2</sub> N	21 45 10	16			±167			9150 <sup>2</sup>	Very destructive at Napier and nearby towns in North Island, New Zealand. P obscured by time mark.	
		M <sub>2</sub> EN	21 45 39		16	16		±158	±158			
		C	21 48 3									
		F	22 20 ±									
		P	22 59 43 <sup>2</sup>									
		Sz	23 10 1									
		SS	23 16 31									
		eSSS	23 20 33									
		eLz	23 29 42									
		M <sub>1</sub> N	23 33 7	28			+6500					
		M <sub>1</sub> Z	23 33 14			26			+4800			
		M <sub>1</sub> E	23 33 35					-6300				
		M <sub>2</sub> E	23 38 11			30		+1600				
		M <sub>2</sub> Z	23 38 20			21			-4250			
M <sub>2</sub> N	23 38 23	19			+1600							
C	23 48 28											
F	0 42 30											
11	Feb. 4	e	19 38 41									
		F	19 39 30									
12	Feb. 10	e	1 35 ±							Trace of distant quake.		
		e	1 38 3									
		F	2 7 ±									
13	Feb. 10	P <sub>N</sub>	6 43 8						5180	Off the south coast of Sumatra. S-phase obscured by time mark.		
		P <sub>E</sub>	6 43 10									
		eS <sub>E</sub>	6 50 0 <sup>2</sup>									
		eSS <sub>N</sub>	6 53 7									
		eSS <sub>E</sub>	6 53 19									
		eL <sub>N</sub>	6 57 5									
		M <sub>1</sub> Z	7 3 39			23			-250			
		M <sub>1</sub> N	7 4 21	17			+230					
		M <sub>1</sub> E	7 5 25			15		+100				
		M <sub>2</sub> E	7 7 4			16		+180				
		M <sub>2</sub> N	7 8 4	15			+260					
		M <sub>2</sub> Z	7 9 0			10			+50			
		C	7 21 7									
F	8 1 30											
14	Feb. 13	P	0 43 59 <sup>2</sup>						1460	Northeastern off to the coast of Kwaren-Kô, Formosa. P obscured by time mark.		
		iN	0 44 3									
		eS <sub>Z</sub>	0 46 32									
		F	1 12 ±									
15	Feb. 13	eP <sub>Z</sub>	1 40 13						9290	New Zealand		
		eP <sub>N</sub>	1 40 14									
		eP <sub>E</sub>	1 40 16									
		S	1 50 38									
		eSS	1 58 2									
		eSSS <sub>N</sub>	2 0 32									
		eL <sub>N</sub>	2 5 46									
		F	3 27 10									
16	Feb. 14	eL <sub>Z</sub>	14 25 32 <sup>2</sup>							Southern off Sumatra? Records obscured by microseisms.		
		F	14 48 0									

地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
17	Feb. 16	PE	時h 分m 秒s 18 51 48							1360		Neighbourhood of Urakawa, Cape of Erimo, Hokkaidō.
		PN	18 51 51									
		PPN?	18 52 4									
		iPPe?	18 52 4									
		PPz?	18 52 4									
		eSE	18 54 12									
		eSz	18 54 33									
		eLN	18 55 8									
		C	19 1 54									
18	Feb. 19	F	19 18 0							5320?		The South Seas?
		ePz?	17 49 10									
		eSz?	17 56 10									
		eLz?	18 5 21									
		* ez	18 46 14									
		ez	18 53 15									
19	Feb. 20	Fz	19 20 0							1040	S 14.0 E 17.0 U 25.0	Northern part of Japan Sea.
		iP	5 35 45									
		iS	5 37 37									
		C	5 43 4									
		S <sub>4</sub> SN	5 47 53									
20	Feb. 27	F	6 38 40							2850?		Philippine Islands.
		ePN	9 44 36									
		ePz	9 44 37									
		eSN?	9 49 17									
		eLE?	9 53 32									
21	Mar. 1	F	10 15 10							1570	N 0.2 E 1.1	Southwestern off to the Toziri Island, Hokkaidō.
		P	14 26 19									
		eS	14 29 3									
22	Mar. 2	F	14 34 ±							7780		Solomon Islands.
		P	2 29 48									
		P <sub>4</sub> Pz	2 30 19									
		P <sub>4</sub> PN	2 30 21									
		SE?	2 38 57									
		PSN?	2 39 45									
23	Mar. 5	F	2 49 48									Trace of distant earthquake.
		eL?	18 20 31									
24	Mar. 8	F	18 32 50									Destructive in Greece and Serbia.
		eL?	2 30 23									
25	Mar. 9	F	2 56 40							-2680		Eastern off to the mouth of the River Mabuti, Aomori Prefecture.
		P	3 51 56									
		L	3 54 41									
		M <sub>N</sub>	3 56 7	17								
		M <sub>E</sub>	3 56 40		17			+4650				
		M <sub>Z</sub>	3 56 57			15			-3620			
26	Mar. 11	C	3 59 48							2220?		Marianne Islands, P superposed on micros. S obscured by time mark.
		F	4 59 ±									
		P	12 31 21?									
		PP	12 31 27									
		S	12 35 3?									
		eL	12 36 25									
		M <sub>1N</sub>	12 38 20	17						-142		
		M <sub>1Z</sub>	12 38 34			17						

地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
		M <sub>1</sub> E	時h 分m 秒s 12 38 40		20			-106				
		M <sub>2</sub> N	12 40 25	15			+152					
		M <sub>2</sub> Z	12 40 26			15						
		M <sub>2</sub> E	12 40 27		15			-121				
		C	12 47 43									
		F	13 6 ±									
27	Mar. 12	eP <sub>E</sub> ?	10 45 9						2410?	Marianne Islands		
		eS <sub>N</sub> ?	10 49 7									
		eL <sub>E</sub>	10 51 23									
		F	11 47 20									
28	Mar. 15	P	16 36 40						1480	Eastern off to the mouth of the River Mabuti, Aomori Prefecture.		
		eS	16 39 15									
		eL	16 40 28									
		F	16 50 0									
29	Mar. 18	eSS	8 46 24							Off the coast of Chile		
		eSSS	8 53 1									
		e	9 5 6									
		eL	9 22 15									
		F	10 20 50									
30	Mar. 18	eP	20 20 4						3205?	Off the SE-ern coast of Mindanao, Philippine.		
		eS?	20 25 1									
		eSS?	20 27 19									
		eL?	20 28 19									
		F	21 22 0									
31	Mar. 19	iP	6 29 38						2150	Off the NE-ern coast of Luzon.		
		PP <sub>NZ</sub>	6 29 55									
		iS	6 33 14									
		eL <sub>E</sub>	6 35 1									
		F	7 20 ±									
32	Mar. 28	iP	12 46 45						4705	N 1.1 E 0.1 U 1.7 Banda Sea, western off to the coast of Neuginea.		
		iS	12 53 11									
		SS	12 56 38									
		F	13 48 0									
33	Mar. 29	P	17 55 6						1690?	N 0.5 E 2.7 D 1.1 WSW-ern 80 km off to the coast of Kusiro, Hokkaido. eS <sub>Z</sub> obscured by time mark.		
		eS <sub>Z</sub>	17 58 1?									
		eL <sub>Z</sub> ?	18 0 1?									
		F	18 15 0									
34	Apr. 3	P	23 30 4							S 1.3 E 2.1 U 3.8		
		eL?	23 38 56									
		F	23 52 ±									
35	Apr. 9	eP?	14 4 20						245			
		L?	14 4 53									
		F	14 7 ±									
36	Apr. 9	eP	23 4 58						1830	Nemuro Strait, Hokkaido.		
		S	23 8 6									
		F	23 20 ±									
37	Apr. 19	eP	2 33 51						1290	WSW-ern off to the Yaku Island, Kagosina Prefecture.		
		S	2 36 8									
		F	2 53 ±									

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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
38	Apr. 24	P	時h 分m 秒s 17 31 21							5600	N 1.1 E 0.1 U 1.4	Eastern off to the coast of Neuguinea.
		i	17 31 28									
		i	17 31 42									
		P <sub>4</sub> P	17 32 27									
		PP	17 33 21									
		PPP	17 34 1									
		S	17 38 36									
		eL	17 45 47									
		M <sub>N</sub>	17 48 25	22			± 11					
		M <sub>Z</sub>	17 49 11			20			± 11			
F	18 4 ±											
39	Apr. 27	eN	17 9 21								Destructive in Transcaucasia. Microseisms obscured records.	
		eN	17 25 5									
		M <sub>N</sub>	17 30 42	14			± 12					
		F	17 43 ±									
40	Apr. 30	eP	12 2 41						208			
		L	12 3 9									
		M	12 3 13				± 2	± 1	± 1			
		F	12 5 ±									
41	May 1	P	21 7 11						111	N 0.5 W 0.2 U 0.6	Neighbourhood of Taiden, Korea. Felt at Taiden and nearby towns.	
		S	21 7 25									
		M	21 7 27				± 3	± 3	± 3			
		F	21 10 ±									
42	May 12	P	1 42 39						2745			
		S	1 47 3									
		F	2 10 ±									
43	May 13	iP	23 6 20						950	N 2.3 E 0.0 U 1.0	Northeastern off to the Okinawa Island.	
		i	23 6 36									
		S	23 8 3									
		eL	23 9 42									
		M <sub>N</sub>	23 11 9	8			± 3					
		F	23 25 ±									
44	May 17	eP?	9 35 31						1060		Obscured by microseisms.	
		S	9 37 25									
		F	9 46 ±									
45	May 20	eS?	2 49 52								Damage in Portugal and Madeira.	
		M <sub>1N</sub>	3 17 10	18			± 92					
		M <sub>2N</sub>	3 22 12	18			± 64					
		F	3 58 ±									
46	May 24	P	0 18 51						2650		Indo-China	
		S	0 23 8									
		M <sub>E</sub>	0 25 16		7			± 2				
		F	0 38 ±									
47	June 2	P	2 39 58						940	S 3.7 E 10.0 D 4.8	Middle Valley of the River Masuda, Gihu Prefecture.	
		S	2 41 40									
		L	2 42 2									
		M <sub>Z</sub>	2 43 44			4			± 1			
		M <sub>EN</sub>	2 45 18	5	5		± 2	- 3				
		eN	2 52 33									
		F	2 58 ±									

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				南北動 N	東西動 E	上下動 Z	南北動 A <sub>N</sub>	東西動 A <sub>E</sub>	上下動 A <sub>Z</sub>			
48	June 4	eP L F	時h 分m 秒s 9 57 36 9 58 26 10 3 ±						371			
49	June 5	eP S? M <sub>NE</sub> M <sub>Z</sub> F	20 19 54 20 20 57 20 21 5 20 21 20 20 28 ±	- 2	- 2	- 2	+ 5	± 3	468			
50	June 9	P S F	5 10 35 5 12 55 5 19 ±						1320		Eastern off to the mouth of the River Kuzi, Ibaragi Prefecture.	
51	June 11	P L M <sub>E</sub> F	6 18 35 6 21 50 6 22 24 6 30 ±		4			+ 1			Eastern foot of Mt. Huzi.	
52	June 12	P S F	1 47 50 1 49 48 1 55 ±						1100		Southern off to the Hatizyō Island.	
53	June 17	P eS L M <sub>E</sub> M <sub>N</sub> M <sub>EZ</sub> M <sub>N</sub> F	12 12 12 12 14 14 12 15 7 12 16 16 12 17 31 12 17 32 12 18 38 12 40 ±		4 6		4 ± 2	- 2 ± 6 ± 3	1144	S 0.9 E 2.2 D 1.0	Middle valley of the River Sagami, Kana- gawa Rrefecture.	
54	June 23	P S L F	6 17 52 6 20 20 6 21 12 6 28 ±						1410	N 0.9 W 5.6 U 2.9	Kasima-nada	
55	June 29	iP iS M F	16 45 24 16 47 6 16 47 10 16 58 ±	3	3	3	+ 66	+ 29 + 13	940	S 3.7 E 16.0 D 7.7	Kumano-nada, Deep focus type.	
56	June 29	eP eS? F	20 29 36 20 30 41 20 39 ±						590			
57	July 12	P eS <sub>Z</sub> eL <sub>Z</sub> M <sub>E</sub> M <sub>N</sub> M <sub>Z</sub> F	16 50 33 16 54 36 16 56 38 16 59 ± 17 0 ± 17 0 36 17 17 ±		18			± 75	2460		The South Seas.	
58	July 15	P PP S L? M <sub>E</sub> M <sub>N</sub>	16 32 32 16 33 4 16 37 4 16 41 16 16 45 7 16 43 40		12			± 40	2851			
				11			± 40					

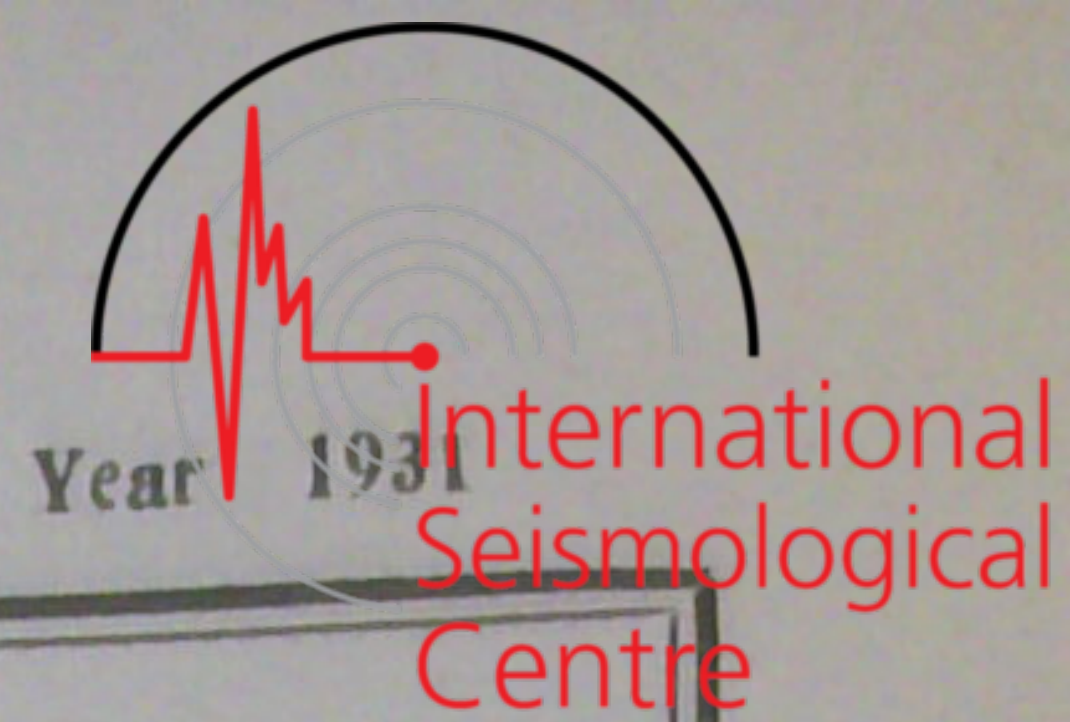


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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
			時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup>	秒 <sup>s</sup>	秒 <sup>s</sup>	μ	μ	± μ	km	μ		
59	July 18	MZ	16 43 42			10			± 40	3355		Kamtchaka
		F	17 8 30									
		ePE	11 29 4									
		ePPE?	11 29 47									
		S	11 34 12									
60	July 23	L	11 37 28							4645		Southern off to Caroline Islands.
		F	11 58 40									
		eP	14 29 27									
		i	14 29 33									
		PP?	14 31 29									
61	Aug. 6	S?	14 35 50							1890		
		F	14 53 ±									
		P	18 20 54									
		eS?	18 24 7									
		eL?	18 26 37									
		ME	18 28 0		3			± 2				
		MN	18 27 50	3			± 2					
		MZ	18 28 5			4			± 2			
62	Aug. 7	C	18 29 1							4883		Neighbourhood of Neuginea.
		F	18 47 ±									
		eP	2 19 34									
		ePP	2 21 19									
		eS	2 26 10									
		L	2 32 10									
		ME	2 36 25		16			± 70				
		MN	2 36 0	18			± 100					
		MZ	2 36 0			20			± 80			
63	Aug. 7	C	2 47 0							61		Local shock
		F	3 25 ±									
		P	7 9 53									
64	Aug. 10	S	7 10 1							3195		Great earthquake of Dzungaria.
		F	7 10 37									
		ePz	21 24 36									
		iP <sub>1</sub>	21 24 41									
		iP <sub>2</sub>	21 24 56									
		S	21 29 32									
		P <sub>4</sub> P?	21 27 59									
		L	21 34 0									
		MN	21 36 40	8			± 1250					
65	Aug. 11	C	21 58 0							74		China.
		F	23 10 ±									
66	Aug. 12	e	7 18 53							74		Southwestern off to the coast of Zinsen. Felt at Zinsen and neighbouring towns.
		F	7 29 ±									
66	Aug. 12	P	6 44 1							74		Southwestern off to the coast of Zinsen. Felt at Zinsen and neighbouring towns.
		S	6 44 11									
		MEZ	6 44 16		3	3		-167	+ 86			
		MN	6 44 17	2			-113					
		C	6 44 28									
		F	6 50 ±									

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地震觀測成績表  
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番號 No.	月 日 Date	相 Phase	時 刻 Time	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
67	Aug. 17	P	時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup> 17 51 21							1290	μ	Northeastern off to the Okinawa Island.
		S	17 53 38									
		L	17 55 19									
		C	17 58 5									
		F	18 8 30									
68	Aug. 18	P	14 27 1							3325	μ	Altai Mts.
		PP	14 27 41									
		PPP	14 28 6									
		S	14 32 7									
		L	14 36 7									
		M <sub>NZ</sub>	14 38 52	10		10	+ 41		+ 48			
		M <sub>E</sub>	14 38 54		10			- 64				
		C	14 44 4									
		F	15 19 ±									
69	Aug. 24	eP	21 44 6							5470	μ	Suleiman Mts. India.
		eS	21 51 14									
		eL	22 3 6									
		M <sub>EZ</sub>	22 8 40		14	15		± 50	± 50			
		C	22 19 0									
		F	22 33 ±									
70	Aug. 27	P	15 36 8							5472	μ	Destructive in Baluchistan.
		S	15 43 17									
		L	15 54 55									
		C	16 30 0									
		F	17 0 0									
71	Sep. 8	P	19 11 55								μ	Kasima-nada.
		L	19 15 59									
		C	19 20 30									
		F	19 32 50									
72	Sep. 9	P	20 43 32							2593	μ	Marianne Islands.
		S	20 47 44									
		L	20 52 24									
		C	21 5 20									
		F	21 47 0									
73	Sep. 16	P	12 45 42							1206	μ	Upper valley of the River Katura, Yamana-nasi Prefecture.
		eS	12 47 50									
		L	12 48 55									
		C	12 54 44									
		F	13 1 30									
74	Sep. 21	P	2 22 33							1210	μ	Epicenter near Mt. Sengen, Saitama Prefecture. Destructive in Kwantô.
		S <sub>N</sub>	2 24 42									
		M <sub>EN</sub>	2 25 44	16	16		+ 430	- 280				
		M <sub>Z</sub>	2 25 53			16			+ 80			
		C	2 32 22									
		F	3 10 0									
75	Sep. 21	P	10 32 4							2410	μ	Northern part of South China Sea.
		i	10 32 12									
		S	10 36 2									
		L	10 38 10									
		M <sub>1Z</sub>	10 39 15			4			- 36			
		M <sub>N</sub>	10 39 39	4			- 50					
		M <sub>E</sub>	10 39 43		4			+ 60				
		M <sub>2Z</sub>	10 41 11			9			+ 280			
		C	10 43 6									
F	11 33 30											



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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.			週 期 Period			半 振 幅 Amplitude			震央距離 Δ km	初 動 First Motion	記 事 Remarks
						南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
76	Sep. 25	eP	時 <sup>h</sup> 6	分 <sup>m</sup> 8	秒 <sup>s</sup> 27	秒 <sup>s</sup> 13	秒 <sup>s</sup> 15	秒 <sup>s</sup> 13	μ <sup>μ</sup> -410	μ <sup>μ</sup> +290	μ <sup>μ</sup> -170	km 5540	μ	Southwestern border of East Indies.
		i	6	8	54									
		eS	6	15	39									
		L	6	26	49									
		ME	6	32	6									
		MN	6	33	16									
		MZ	6	33	22									
		F	7	6	0									
77	Oct. 3	P	19	23	10	秒 <sup>s</sup> 24	秒 <sup>s</sup> 20	秒 <sup>s</sup> 34	μ <sup>μ</sup> -350	μ <sup>μ</sup> +300	μ <sup>μ</sup> -480	km 6440	μ	Solomon Islands. F lost in next quake.
		i	19	23	21									
		S	19	31	10									
		L	19	38	22									
		MZ	19	42	37									
		ME	19	43	7									
		MN	19	44	0									
		W <sub>2</sub>	21	47	4									
78	Oct. 3	P	22	5	56							km 6365	μ	Ditto. F lost in next quake.
		S	22	13	52									
		L	22	21	42									
79	Oct. 3	P	22	57	38							km 6440	μ	Ditto.
		S	23	5	38									
		L	23	13	30									
		C	23	39	30									
		F	0	10	50									
80	Oct. 5	eP	12	57	42								μ	
		F	13	2	10									
81	Oct. 5	P	22	39	13								μ	Mongoria.
		F	22	57	0									
82	Oct. 10	P	0	29	44	秒 <sup>s</sup> 22	秒 <sup>s</sup> 24	秒 <sup>s</sup> 18	μ <sup>μ</sup> -300	μ <sup>μ</sup> -210	μ <sup>μ</sup> +350	km 6350	μ	Solomon Islands. F lost in next quake.
		i	0	29	50									
		i	0	30	10									
		S	0	37	39									
		L	0	44	5									
		MN	0	50	8									
		ME	0	50	31									
		MZ	0	51	2									
83	Oct. 10	P	0	54	13							km 6310	μ	F lost in next quake.
		i	0	54	23									
		S	1	2	7									
84	Oct. 10	P	1	18	9							km 6630	μ	F lost in next quake.
		i	1	18	17									
		S	1	26	19									
85	Oct. 10	P	1	40	40							km 6515	μ	F lost in next quake.
		S	1	48	44									
		L	1	58	8									



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地震観測成績表  
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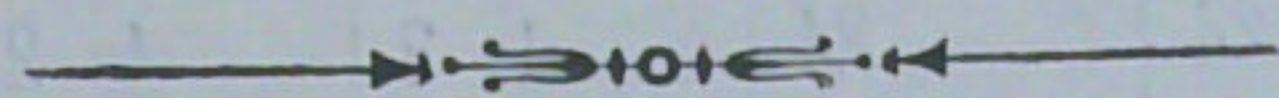
番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
96	Nov. 2	P	時h 分m 秒s 11 49 5	秒s	秒s	秒s	μ	μ	μ	690	After shock of No. 92	
		S	11 50 22									
		L	11 50 58									
		C	11 52 39									
		F	12 4 0									
97	Nov. 2	eP	12 14 35								Ditto.	
		F	12 18 30									
98	Nov. 3	eP	16 22 50								Kokuni, Iwate Prefecture.	
		L	16 26 16									
		C	16 31 52									
		F	16 47 40									
99	Nov. 5	P	12 25 32							3255		
		eS	12 30 33									
		L	12 34 51									
		C	12 43 19									
		F	13 5 30									
100	Nov. 20	P	14 26 24							6400	Solomon Islands.	
		S	14 34 22									
		L	14 44 18									
		F	15 14 0									
101	Nov. 24	L	9 12 4									
		F	9 29 0									
102	Nov. 25	P	7 45 37							85	Local shock	
		S?	7 45 48									
		L?	7 45 51									
		F	7 46 2									
103	Dec. 6	eL?	23 11 39								East China Sea.	
		F	23 21 0									
104	Dec. 18	eP?	10 5 16									
		eL	10 19 26									
		F	10 41 0									
105	Dec. 18	eL	17 49 25								ESE-ern off to the coast of Miyazaki.	
		F	17 53 0									
106	Dec. 21	eP	5 48 39							630	Ooyano Island, Kumamoto Prefecture.	
		eS	5 49 49									
		eL	5 50 9									
		C	5 51 7									
		F	6 1 30									
107	Dec. 22	eP	13 9 46							571	Ditto.	
		eL	13 11 2									
		F	13 23 0									
108	Dec. 26	eP	1 44 21							590	Ditto.	
		eS	1 45 26									
		eL	1 45 46									
		C	1 46 51									
		F	2 6 10									

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京城地震観測成績表

Seismic Bulletin for the Year 1931

Keizyô



北緯 37度 34分  
東經 126度 59分  
標高 29.2米  
時刻 グリニチ平時  
地質 花崗岩

$\varphi = 37^{\circ} 34'N$

$\lambda = 126^{\circ} 59'E$

H = 29.2m

TIME : Gr. Mean Time

LITHOLOGIC FOUNDATION: Granite

器械

大森式簡單微動計(南北及東西動) 振子ノ目方 12mm

INSTRUMENTS

Oomori's Portable Seismometer N and E. Mass 12kg

記號

P 第一初期微動  
 $\bar{P}$  もほろびちつく相  
 PP 地表ニテ一回反射セシ縦波  
 S 第二初期微動  
 SS 地表ニテ一回反射セシ横波  
 $P_4P$  地球ノ心核ニテ反射セシ縦波  
 $S_4S$  地球ノ心核ニテ反射セシ横波  
 PS 地表ニテ反射ノ際縦波ヨリ横波ニ變リタル波  
 L 主要動ノ長波  
 M 主要動ノ極大動  
 C 終期微動  
 F 震動ノ終リ  
 i 明瞭ナル相  
 e 不明瞭ナル相  
 $\mu$  (ミクロン),  $\frac{1}{1000}$  耗  
 $A_N$  南北動振幅但シ北ヲ正(+) $\mu$ トス  
 $A_E$  東西動振幅但シ東ヲ正(+) $\mu$ トス  
 $\Delta$  震央距離

SYMBOLS AND NOTATIONS

P First preliminary tremor.  
 $\bar{P}$  Mohorovičić phase.  
 PP Longitudinal waves once reflected at the earth's surface.  
 S Second preliminary tremor.  
 SS Transverse waves once reflected at the earth's surface.  
 $P_4P$  Longitudinal waves reflected at the core of the earth.  
 $S_4S$  Transverse waves reflected at the core of the earth.  
 PS Waves changed from longitudinal to transverse oscillation through reflection at the earth's surface.  
 L Long waves at the beginning of the surface phase.  
 M Greatest motion in the surface phase.  
 C Tail or end portion.  
 F End of discernible movement.  
 i Sudden beginning of the motion.  
 e Gradual beginning of the motion.  
 $\mu$  Micron,  $\frac{1}{1000}$  mm.  
 $A_N$  N-S component of amplitude.  
 $A_E$  E-W component of amplitude.  
 $\Delta$  Distance of epicenter.

京 城  
KEIZYÔ



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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude		震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	南北動 AN	東西動 AE			
1	Jan. 9	P F	時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup> 1 48 9 1 54 40							
2	Jan. 15	eP ePS? SS? M <sub>NE</sub> F	2 4 46 2 18 2 2 23 47 2 53 45 3 57 30	24	24	± 3	± 2			Destructive in southern part of Mexico
3	Jan. 15	eP? S M <sub>EN</sub> F	13 39 54 13 41 45 13 42 1 13 46 30	2	2	± 2?	± 1?	1030?		Mouth of the River Sirakawa, Kumamoto Prefecture.
4	Jan. 15	P i S M <sub>E</sub> M <sub>N</sub> F	21 3 50 21 4 2 21 5 43 21 6 50 21 6 56 21 51 30	4	4	-70	+145	1050		Northeastern off to Naha, Loochoo Islands.
5	Jan. 16	P F	1 28 54 1 31 30							Off the coast of Kwaren-kô, Formosa?
6	Jan. 21	P S F	9 1 39 9 4 40 9 8 20					1760		SSE-ern off to the cape of Otiisi, Hokkaidô.
7	Jan. 24	P S L F	13 46 51 13 51 58 13 56 7 14 15 10					3340		Philippine Islands.
8	Jan. 24	e S F	15 8 47 15 9 58 15 19 10							
9	Jan. 27	P S L M <sub>N</sub> M <sub>NE</sub> F	20 15 10 20 19 58 20 24 11 20 25 9 20 27 22 21 38 0	12 13	13	± 75 ± 28	± 45	3070		Neighbourhood of Marianne Islands.
10	Jan. 28	P i PP? S eL M <sub>E</sub> M <sub>N</sub> F	21 30 24 21 30 33 21 31 37 21 35 20 21 38 38 21 39 44 21 42 5 22 42 0	17	20	± 5	+ 4	3195		Marianne Islands.
11	Feb. 2	eP i S SS? M <sub>NE</sub>	22 59 47 22 59 53 23 10 3 23 15 27 23 33 36	26	26	- 6	+ 4	9110		Very destructive at Napier and nearby towns in North Island, New Zealand. The clockwork stopped at 23h 55m
12	Feb. 4	P S F	19 37 55 19 38 45 19 40 40					365		

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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude		震央距離 $\Delta$	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	南北動 A <sub>N</sub>	東西動 A <sub>E</sub>			
13	Feb. 10	e P	時 分 秒 1 38 46 1 52 30							Trace of distant quake.
14	Feb. 10	eP S L M <sub>NE</sub> F	6 42 54 6 49 38 6 54 32 7 8 32 7 36 30	14	14	$\pm 8$	$\pm 2$	5025		Off the south coast of Sumatra.
15	Feb. 13	P PP S F	0 44 0 0 44 5 0 46 40 1 8 30					1530		Northeastern off to the coast of Kwaren-kô, Formosa.
16	Feb. 13	P S SSS? F	1 40 13 1 50 59 2 0 26 2 37 30					9730		New Zealand.
17	Feb. 14	e e L F	14 19 52 14 24 50 14 27 24 14 38 20							Southern off to the coast of Sumatra?
18	Feb. 16	P PP S L F	18 51 45 18 51 59 18 54 33 18 55 31 19 14 20					1620		Neighbourhood of Ūrakawa, Cape of Erimo, Hokkaidô.
19	Feb. 19	P? S? eL? F	17 56 30 18 1 53 18 6 15 18 32 20					3585?		The South Seas?
20	Feb. 20	P S M <sub>E</sub> M <sub>N</sub> F	5 35 43 5 37 31 5 37 37 5 37 39 6 28 10	4	3	+144	-331	1000	S 35.0 W 33.0	Northern part of Japan Sea, Deep focus type.
21	Feb. 27	P PP S L F	9 44 34 9 45 50 9 50 10 9 54 5 10 11 10					3810		Philippine Islands.
22	Mar. 1	P PP? S eL? F	14 26 16 14 26 19 14 28 55 14 32 2 14 46 0					1520		Southwestern off to the Toziri Island, Hokkaidô.
23	Mar. 2	P S SS? F	2 29 50 2 39 2 2 45 2 3 6 0					7840		Solomon Islands.
24	Mar. 8	eS? e L F	2 12 27 2 22 7 2 31 17 2 57 0							Destructive in Greece and Serbia.





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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude		震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	南北動 AN	東西動 AE			
25	Mar. 9	P	時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup> 3 51 55	秒 <sup>s</sup> 18	秒 <sup>s</sup> 17	μ -102	μ +109	km 1450	μ	Eastern off to the mouth of the River Mabuti, Aomori Prefecture.
		PP	3 52 0							
		S	3 54 27							
		M <sub>N</sub>	3 56 0							
		M <sub>E</sub>	3 56 32							
		F	5 32 0							
26	Mar. 11	P	12 31 14	15	10	± 4	± 1	2220	μ	Marianne Islands.
		S	12 34 56							
		L	12 37 46							
		M <sub>1NE</sub>	12 40 5							
		M <sub>2NE</sub>	12 41 7							
		F	13 23 50							
27	Mar. 12	eP	10 45 7	15	18	± 3	± 1	2410	μ	Northern off to Marianne Islands.
		S	10 49 5							
		eL	10 51 0							
		F	11 26 50							
28	Mar. 12	eP	19 12 46	15	18	± 3	± 1	2985	μ	Eastern off to the mouth of the River Mobuti, Aomori Prefecture.
		S	19 17 28							
		eL	19 20 3							
		F	19 31 50							
29	Mar. 15	eP?	16 35 4	15	18	± 3	± 1	2985	μ	Eastern off to the mouth of the River Mobuti, Aomori Prefecture.
		S	16 39 10							
		eL	16 39 59							
		F	16 58 ±							
30	Mar. 18	e	8 36 49	15	18	± 3	± 1	2985	μ	Off the coast of Chile.
		e	8 40 38							
		e	8 44 29							
		F	9 10 30							
31	Mar. 18	P	20 20 2	15	18	± 3	± 1	3405	μ	Off the southeastern coast of Mindanao, Philippine.
		S	20 25 13							
		eL	20 29 28							
		F	21 35 30							
32	Mar. 19	P	6 29 39	10	10	± 2	± 1	2193	μ	Off the northeastern coast of Luzon.
		S	6 33 19							
		L	6 37 27							
		M <sub>N</sub>	6 43 58							
		F	7 12 30							
33	Mar. 28	P	12 46 47	15	15	± 2	± 1	4689	μ	Banda Sea, western off to the coast of Neuguinea.
		PP	12 48 17							
		S	12 53 12							
		SS?	12 56 16							
		M <sub>NE</sub>	13 7 30							
		F	13 39 0							
34	Mar. 29	P	17 55 2	15	15	± 2	± 1	4689	μ	WSW-ern off to the coast of Kuro, Hokkaidô.
		e	17 59 9							
		L?	18 2 59							
		F	18 12 0							
35	Apr. 3	P	23 30 4	15	15	± 2	± 1	4689	μ	S 1.0 W 0.5
		S?	23 38 54							
		F	23 47 ±							
36	Apr. 9	eP	14 3 58	15	15	± 2	± 1	356	μ	
		L	14 4 46							
		F	14 8 ±							

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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude		震央距離 $\Delta$	初 動 First Motion	記 事 Remarks				
				南北動 N	東西動 E	南北動 A <sub>N</sub>	東西動 A <sub>E</sub>							
37	Apr. 9	eP	時分秒 23 4 53	秒	秒	$\mu$	$\mu$	km 2220		Nemuro Straight, Hokkaidô.				
		S	23 8 46											
		L	23 9 40											
		M <sub>NE</sub>	23 10 55								14	14	$\pm 1$	$\pm 1$
		F	23 28 $\pm$											
38	Apr. 19	P	2 33 54	秒	秒	$\mu$	$\mu$	1550		WSW-ern off to Yaku Island, Kagosima Prefecture.				
		S	2 36 36											
		L	2 38 47											
		M <sub>E</sub>	2 38 55								8	8	$\pm 4$	+ 4
		M <sub>N</sub>	2 38 59											
		F	2 54 $\pm$											
39	Apr. 21	P	0 4 46	秒	秒	$\mu$	$\mu$							
		F	0 13 $\pm$											
40	Apr. 24	P	17 31 22	秒	秒	$\mu$	$\mu$	5525	N 0.8 E 0.5	Eastern off to the coast of Neuguinea.				
		P <sub>4</sub> P	17 32 13											
		PP	17 32 29											
		P <sub>4</sub> S	17 36 36											
		S	17 38 33											
		SS	17 43 53											
		M <sub>NE</sub>	17 49 37								14	14	$\pm 2$	$\pm 1$
		F	18 3 $\pm$											
41	Apr. 27	e	17 25 39	秒	秒	$\mu$	$\mu$			Transcaucasia?				
		F	17 37 $\pm$											
42	Apr. 30	P	12 2 45	秒	秒	$\mu$	$\mu$	228	E 0.5					
		S	12 3 16											
		M <sub>EN</sub>	12 3 19								0.3	0.3	$\pm 5$	$\pm 5$
		F	12 6 $\pm$											
43	May 1	P	21 7 10	秒	秒	$\mu$	$\mu$	107		Neighbourhood of Taiden, Korea. Felt at Taiden and nearby towns.				
		S	21 7 24											
		M <sub>N</sub>	21 7 25								+ 3	+ 6		
		M <sub>E</sub>	21 7 26											
		F	21 10 $\pm$											
44	May 12	P	1 42 36	秒	秒	$\mu$	$\mu$	2705						
		S	1 46 57											
		F	2 10 $\pm$											
45	May 13	P	23 6 21	秒	秒	$\mu$	$\mu$	1000		Northeastern off to the Okinawa Island, Loochoo Islands.				
		S	23 8 9											
		F	23 25 $\pm$											
46	May 17	eP	9 35 37	秒	秒	$\mu$	$\mu$	930						
		S	9 37 18											
		M <sub>1N</sub>	9 37 45								3	3	$\pm 2$	$\pm 2$
		M <sub>2N</sub>	9 38 41											
		F	9 46 $\pm$											
47	May 20	e	2 37 2	秒	秒	$\mu$	$\mu$			Damage in Portugal and Madeira.				
		M <sub>1NE</sub>	3 17 18								19	19	$\pm 23$	$\pm 23$
		M <sub>2E</sub>	3 19 19								18	19	$\pm 27$	$\pm 23$
		M <sub>2N</sub>	3 20 42											
		M <sub>3N</sub>	3 27 3								15		$\pm 23$	
		M <sub>3E</sub>	3 27 21								16		$\pm 18$	
		F	3 55 $\pm$											



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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude		震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	南北動 A <sub>N</sub>	東西動 A <sub>E</sub>			
48	June 2	P	時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup> 2 39 55	秒 <sup>s</sup> 3	秒 <sup>s</sup> 3	μ ± 3	μ + 1	km 940	S 2.0 E 4.0	Middle valley of the River Masuda, Gihu Prefecture.
		S	2 41 37							
		L	2 41 58							
		M <sub>NE</sub>	2 42 5							
		F	2 58 ±							
49	June 4	eP	9 57 21	3				475		
		S	9 58 24							
		M <sub>N</sub>	9 58 29							
		F	10 10 ±							
50	June 5	eP	20 19 15					788		
		S	20 20 40							
		F	20 32 ±							
51	June 9	eP	5 10 22	3				1250		Eastern off to the mouth of the River Kuzi, Ibaragi Prefecture.
		eS	5 12 35							
		M <sub>N</sub>	5 13 8							
		F	5 28 ±							
52	June 17	P	12 12 7	4	2			1160		Middle valley of the River Sagami, Kanagawa Prefecture.
		S	12 14 11							
		L	12 15 23							
		M <sub>N</sub>	12 15 36							
		M <sub>E</sub>	12 15 43							
		F	12 34 ±							
53	June 23	P	6 17 50					1330	N 0.4 W 3.0	Kasima-nada
		S	6 20 11							
		L?	6 21 51							
		F	6 50 ±							
54	June 29	P	16 45 21	4	2	±13	+ 7	920	S 5.0 E 10.0	Kumano-nada
		S	16 47 1							
		M <sub>NE</sub>	16 47 10							
		F	17 0 ±							
55	June 29	eP	20 30 42	3				208		
		S	20 31 10							
		M <sub>E</sub>	20 31 33							
		M <sub>N</sub>	20 31 36							
		F	20 39 ±							
56	July 12	eP	16 50 38	16	17			3180		The South Seas.
		eS	16 55 34							
		L	16 56 34							
		M <sub>E</sub>	16 58 41							
		M <sub>N</sub>	17 0 34							
		F	17 17 ±							
57	July 15	P	16 32 29	11				3030		
		S	16 37 14							
		L	16 42 18							
		M <sub>N</sub>	16 43 16							
		F	17 10 ±							
58	July 18	eP?	11 29 40							Kamtchaka?
		F	12 51 ±							
59	July 23	P	14 29 32					5165?		Southern off to Caroline Islands.
		S?	14 36 22							
		F	14 44 ±							

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				南北動 N	東西動 E	南北動 $A_N$	東西動 $A_E$				
60	Aug. 6	P	時h 分m 秒s 18 20 58								
		L	18 26 42								
		M <sub>E</sub>	18 27 51		3		+18				
		M <sub>N</sub>	18 28 6	4			±8				
		C	18 29 0								
		F	18 37 ±								
61	Aug. 7	eP	2 19 30					4265		Neighbourhood of Neuguina.	
		S	2 25 32								
		L	2 33 6								
		M <sub>N</sub>	2 35 36	18			±50				
		F	2 47 ±								
62	Aug. 10	P	21 24 43					3215		Great earthquake of Dzungaria.	
		S	21 29 41								
		L	21 34 11								
		M <sub>N</sub>	21 35 0	4			+231				
		M <sub>E</sub>	21 35 35		4		+191				
		C	21 43 0								
		F	22 58 ±								
63	Aug. 12	P	6 44 6					104	S 2.0	Southwestern of to the coast of Zinsen. Felt at Zinsen and nearby towns.	
		i	6 44 7						W 2.0		
		S	6 44 20								
		M <sub>NE</sub>	6 44 29	4	3		+13		-12		
		F	6 49 30								
64	Oct. 3	P	19 23 9					6682		Solomon Islands.	
		S	19 31 21								
		L	19 37 55								
		M <sub>N</sub>	19 40 6	33			±1091				
		M <sub>E</sub>	19 42 20		27		+407				
		F	21 9 ±								
65	Oct. 3	P	22 5 13					6550		Solomon Islands.	
		S	22 13 19								
		L	22 24 42								
		M <sub>N</sub>	22 27 20	17			±41				
		F	22 54 ±								
66	Oct. 3	P	22 57 36					6515		Ditto.	
		S	23 5 40								
		eL	23 13 16								
		M <sub>N</sub>	23 26 38	16			±37				
		F	23 54 ±								
67	Oct. 10	P	0 29 47					6310		Ditto. F lost in next quake.	
		S	0 37 40								
		L	0 41 47								
		M <sub>NE</sub>	0 45 56	30	30		±739		±161		
68	Oct. 10	P	1 18 17					6476		Ditto. F lost in next quake.	
		S	1 26 18								
		L	1 34 18								
		M <sub>N</sub>	1 37 58	15			±52				
69	Oct. 10	P	1 40 22					6500			
		S	1 48 25								
		L	1 52 41								
		M <sub>N</sub>	2 0 58	16			±41				
		M <sub>E</sub>	2 0 33		16				±68		
		F	2 25 ±								



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				南北動 N	東西動 E	南北動 AN	東西動 AE			
70	Oct. 24	P	時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup> 12 39 56	秒 <sup>s</sup>	秒 <sup>s</sup>	μ	μ	km 1585		
		i	12 40 28							
		S	12 42 41							
		F	12 53 0							
71	Nov. 1	P	18 54 56	4	3	-11	±13	790		Hyûga-nada.
		S	18 56 22							
		L	18 56 57							
		M <sub>E</sub>	18 57 7							
		M <sub>N</sub>	18 57 31							
		F	19 11 ±							
72	Nov. 2	P	10 4 42					710		Hyûga-nada, Destructive in Miyazaki and nearby towns.
		S	10 6 0							
		L	10 6 26							
		M <sub>E</sub>	10 7 0							
		F	10 48 ±							
73	Nov. 2	P	11 2 19	3	3	+39	+60	840		After shock of No. 72
		S	11 3 50							
		L	11 4 18							
		M <sub>NE</sub>	11 4 29							
		F	11 33 ±							
74	Nov. 2	P	11 49 4	3		±4		880		Ditto.
		S	11 50 40							
		L	11 51 3							
		M <sub>N</sub>	11 51 7							
		M <sub>E</sub>	11 51 10							
		F	12 4 ±							
75	Nov. 3	P	16 22 50					1230		Kokuni, Iwate Prefecture.
		S	16 25 0							
		L	16 26 30							
		F	16 38 ±							
76	Nov. 5	eP	12 25 33							
		eL	12 34 51							
		F	12 53 ±							
77	Nov. 24	L	9 12 8	3	2	±4	±3			
		M <sub>E</sub>	9 12 27							
		M <sub>N</sub>	9 12 40							
		F	9 22 ±							
78	Dec. 18	P	17 28 41							
		F	17 45 ±							
79	Dec. 21	P	5 48 42					690		Ooyano Island, Kumamoto Prefecture.
		S	5 49 58							
		L	5 50 17							
		F								
80	Dec. 22	P	13 9 43					550		Ditto.
		S	13 10 45							
		L	13 11 3							
		F	13 22 ±							
81	Dec. 26	P	1 44 22	3	3	±14	±8	760		Ditto.
		S	1 45 45							
		L	1 46 2							
		M <sub>E</sub>	1 46 5							
		M <sub>N</sub>	1 46 11							
		F	2 0 0							

# 大邱地震観測成績表

## Seismic Bulletin for the Year 1931

### Taikyû



北緯 35度 52分  
 東經 128度 36分  
 標高 50.5米  
 時刻 グリニチ平時  
 地質 泥岩

$\varphi = 35^{\circ} 52'N$   
 $\lambda = 128^{\circ} 36'E$   
 $H = 50.5m$   
 TIME : Gr. Mean Time  
 LITHOLOGIC FOUNDATION : Shale

### 器 械

振子ノ目方 200g  
 ヴキーヘルト地震計(南北及東西動)  
 大森式簡單微動計(南北及東西動)  
 強震計(南北、東西及上下動)

### INSTRUMENTS

	Comp.	Mass
Wiechert's Seismograph	N and E	200kg
Oomori's Portable Seismometer	N and E	
Strong motion Seismometer	N, E and Z	

### 記 號

P 第一初期微動  
 $\bar{P}$  もほろびちつく相  
 PP 地表ニテ一回反射セシ縦波  
  
 S 第二初期微動  
 SS 地表ニテ一回反射セシ横波  
  
 $P_4P$  地球ノ心核ニテ反射セシ縦波  
  
 $S_4S$  地球ノ心核ニテ反射セシ横波  
 PS 地表ニテ反射ノ際縦波ヨリ横波ニ變リタル波  
 L 主要動ノ長波  
 M 主要動ノ極大動  
 C 終期微動  
 F 震動ノ終リ  
 i 明瞭ナル相  
 e 不明瞭ナル相  
 $\mu$  (ミクロン)  $\frac{1}{1000}$  耗  
 $A_N$  南北動振幅但シ北ヲ正(+) $\mu$  ス  
 $A_E$  東西動振幅但シ東ヲ正(+) $\mu$  ス  
 $\Delta$  震央距離

### SYMBOLS AND NOTATIONS

P First preliminary tremor.  
 $\bar{P}$  Mohorovičić phase.  
 PP Longitudinal waves once reflected at the earth's surface.  
 S Second preliminary tremor.  
 SS Transverse waves once reflected at the earth's surface.  
 $P_4P$  Longitudinal waves reflected at the core of the earth.  
 $S_4S$  Transverse waves reflected at the core of the earth.  
 PS Waves changed from longitudinal to transverse oscillation through reflection at the earth's surface.  
 L Long waves at the beginning of the surface phase.  
 M Greatest motion in the surface phase.  
 C Tail or end portion.  
 F End of discernible movement.  
 i Sudden beginning of the motion.  
 e Gradual beginning of the motion.  
 $\mu$  Micron,  $\frac{1}{1000}$  mm.  
 $A_N$  N-S component of amplitude.  
 $A_E$  E-W component of amplitude.  
 $\Delta$  Distance of epicenter.



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番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
10	Feb. 10	P	6 35 58							5320	Off the south coast of Sumatra.	
		S	6 43 6									
		L	6 53 51									
		M <sub>1N</sub>	7 3 54	16			±16					
		M <sub>1E</sub>	7 4 26		16			±7				
		M <sub>2E</sub>	7 9 21		15			±12				
		M <sub>2N</sub>	7 9 25	12			±21					
		F	7 23 30									
11	Feb. 12	eP	6 3 43							1358	Probably after shock of No. 10	
		F	6 29 40									
12	Feb. 13	P	0 45 48							9555	New Zealand.	
		S	0 48 12									
		L	0 49 54									
		M <sub>N</sub>	0 50 8	9			±3					
		M <sub>E</sub>	0 50 13		9			±6				
		F	1 4 40									
13	Feb. 13	P	1 40 6							9555	New Zealand.	
		S	1 50 44									
		L	2 7 8									
		F	2 54 40									
14	Feb. 14	eP	14 2 43							1200	Neighbourhood of Urakawa, Cape of Erimo, Hokkaidō.	
		L	14 26 35									
		M <sub>N</sub>	14 32 56	13			±5					
		M <sub>E</sub>	14 33 45		14			±2				
		F	16 7 20									
15	Feb. 15	eP	23 13 30							1200	S 7.1 W 7.5	
		F	23 18 10									
16	Feb. 16	P	18 51 43							1200	S 7.1 W 7.5	
		PP?	18 51 56									
		S	18 53 52									
		L	18 55 10									
		M <sub>E</sub>	18 55 40		17			±5				
		M <sub>N</sub>	18 55 54	17			±3					
		F	19 13 10									
17	Feb. 19	eP	17 48 51							3485	The South Seas?	
		F	18 43 20									
18	Feb. 20	P	5 35 49							3485	Philippine Islands.	
		S	5 37 27									
		F	6 33 20									
19	Feb. 27	P	9 44 19							2117	SW-ern off to Toziri Island, Hokkaidō.	
		S	9 49 35									
		F	10 14 ±									
20	Mar. 1	P	14 22 47							2117	SW-ern off to Toziri Island, Hokkaidō.	
		S	14 26 21									
		L	14 29 3									
		F	14 36 20									
21	Mar. 2	P?	2 26 45							2117	Solomon Islands.	
		L?	2 38 44									
		F	3 7 10									



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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
22	Mar. 8	e F	時h 分m 秒s 2 31 44 3 0 0								Destructive in Greece and Serbia.	
23	Mar. 9	P i S L M <sub>1</sub> N M <sub>1</sub> E M <sub>2</sub> N M <sub>2</sub> E F	3 51 46 3 51 57 3 53 47 3 55 6 3 55 23 3 55 55 3 56 49 3 57 2 5 1 50	20 13	18 13		±91 ±76	±88 ±60	1130	S 8.5 W 9.0	Eastern off to the mouth of the River Mabuti, Aomori Prefecture.	
24	Mar. 11	P i S M <sub>E</sub> M <sub>N</sub> F	12 30 53 12 32 52 12 34 13 12 34 38 12 34 45 13 21 50	5	5		±58	±97	1970		Marianne Islands	
25	Mar. 12	P S L M <sub>N</sub> M <sub>E</sub> F	10 44 53 10 48 16 10 50 56 10 54 43 10 54 45 11 2 0	17	17		± 2	+ 2	2000		Northern off to Marianne Islands?	
26	Mar. 12	P S L F	19 12 3 19 16 13 19 19 20 19 29 30						2560			
27	Mar. 12	P S L F	21 2 23 21 23 10 21 26 8 21 30 20						2375			
28	Mar. 15	eP F	16 36 32 16 48 ±								Eastern off to the mouth of the River Mabuti, Aomori Prefecture.	
29	Mar. 18	e F	9 18 4 10 27 50								Off the coast of Chile.	
30	Mar. 18	P i S F	20 19 56 20 22 39 20 25 33 21 10 50						3825		Off the southeastern coast of Mindanao, Philippine.	
31	Mar. 19	P PP S SS <sub>E</sub> SS <sub>N</sub> L M <sub>N</sub> M <sub>E</sub> F	6 29 27 6 29 45 6 32 56 6 33 7 6 33 11 6 37 16 6 37 55 6 37 55 7 12 46	19	17		± 5	+ 5	2070	N 9.5 E 5.0	Off northeastern coast of Luzon.	
32	Mar. 28	P i S	12 46 31 12 49 39 12 52 45						4470		Banda Sea, western off to the coast of Neuguinea.	

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				南北動 N	東西動 E	上下動 Z	南北動 A <sub>N</sub>	東西動 A <sub>E</sub>	上下動 A <sub>Z</sub>			
			時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup>	秒 <sup>s</sup>	秒 <sup>s</sup>	秒 <sup>s</sup>	μ	μ	μ	km	μ	
33	Mar. 29	M <sub>E</sub>	12 56 39							1860		WSW-ern off to the coast of Kuro, Hokkaidō.
		M <sub>N</sub>	12 56 42	5			±10	+32				
		F	13 29 50									
		P	17 55 1									
		S	17 58 12									
34	Mar. 30	eP	7 29 35									
		F	7 42 ±									
35	Apr. 3	eP	12 11 52									
		F	12 15 20									
36	Apr. 3	eP	23 29 51									
		F	23 33 0									
37	Apr. 9	eP	5 34 4									
		F	5 36 40									
38	Apr. 9	P	23 4 42							1760		Nemuro Strait, Hokkaidō.
		S	23 7 43									
		F	23 27 30									
39	Apr. 19	P	2 33 36							800		WSW-ern off to Yaku Island, Kagosima Prefecture.
		S	2 35 3									
		L	2 35 28									
		M <sub>E</sub>	2 36 16		8			± 8				
		M <sub>N</sub>	2 36 40	8			± 5					
		F	2 56 0									
40	Apr. 21	P	0 3 33							519		
		L	0 4 43									
		F	0 16 10									
41	Apr. 24	eP	17 31 7									Eastern off to the coast of Neuguinea.
		F	18 30 40									
42	Apr. 27	e	17 23 27									Destructive in Transcaucasia.
		F	17 30 ±									
43	May 1	P	21 7 8							103		Felt at Taiden and nearby towns, Korea.
		L	21 7 22									
		M <sub>NE</sub>	21 7 23	0	0		± 1	± 5				
		F	21 8 40									
44	May 12	P	1 42 40							2840		
		S	1 47 11									
		F	2 2 50									
45	May 13	P	23 5 55							1040	N 1.4 E 0	NE-ern off to Okinawa Island, Loochoo Islands.
		S	23 7 47									
		F	23 23 ±									
46	May 17	eP	9 33 38									
		F	9 49 30									
47	May 20	eP	2 49 45									Damage in Portugal and Madeira.
		M <sub>N</sub>	3 19 28	18			±95					
		M <sub>E</sub>	3 21 54		16			±71				
		F	3 56 20									



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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
48	May 24	P	時 <sup>h</sup> 分 <sup>m</sup> 秒 <sup>s</sup> 0 18 27				μ	μ	μ	km 3008		Indo-China.
		S	0 23 10									
		L	0 27 44									
		F	0 35 10									
49	May 28	P	16 18 5							1140		
		S	16 20 7									
		L	16 23 16									
		F	16 30 50									
50	June 2	P	2 39 38	5			+39			606		Middle valley of the River Masuda, Gihu Prefecture.
		P?	2 39 59									
		S	2 40 22									
		L	2 41 0									
		M <sub>N</sub>	2 41 3									
		F	3 6 40									
51	June 5	P?	20 22 6							153?		
		L?	20 22 26									
		F	20 27 40									
52	June 9	P	5 10 15							1120		Eastern off to the mouth of the River Kuzi, Ibaragi Prefecture.
		S	5 12 15									
		F	5 21 20									
53	June 11	P	6 18 23							1180		Eastern foot of Mt. Huzi.
		S	6 20 29									
		F	6 26 0									
54	June 12	P	1 47 43							1220	S 4.7 E 4.0	Southern off to Hatizyō Island.
		S	1 49 53									
		F	1 56 0									
55	June 17	P	12 11 49							1262		Middle valley of the River Sagami, Kanagawa Prefecture.
		S	12 14 5									
		L	12 17 13									
		F	12 34 ±									
56	June 23	P	6 17 32	12			±25			1197	S 1.0 W 9.9	Kasuna-nada.
		S	6 19 40									
		L	6 21 30									
		M <sub>N</sub>	6 23 53									
		F	6 38 ±									
57	June 29	P	16 45 1							740	S 3.0 E 23.0	Kumano-nada.
		S	16 46 22									
		F	16 59 ±									
58	June 29	eP	20 31 49									
		F	20 39 20									
59	July 2	P	3 42 38	4	4		± 3			920		
		S	3 44 19									
		L	3 45 42									
		M <sub>E</sub>	3 45 57									
		M <sub>N</sub>	3 45 57									
		F	3 53 10									
60	July 4	eP	21 45 7				± 4					
		F	21 59 0									

大 邱  
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地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.			週 期 Period			半 振 幅 Amplitude			震央距離 $\Delta$	初 動 First Motion	記 事 Remarks
			時h	分m	秒s	南北動 N	東西動 E	上下動 Z	南北動 $A_N$	東西動 $A_E$	上下動 $A_Z$			
61	July 12	P	16	50	38							2720?	μ	The South Seas?
		S?	16	55	0									
		M <sub>E</sub>	16	55	9		7			±19				
		M <sub>N</sub>	16	55	9	5			±20					
		F	17	11	40									
62	July 15	P	16	32	41						2840			
		S	16	37	32									
		L	16	42	27									
		F	17	13	30									
63	July 23	eP	14	29	17								Southern off to Karolin Islands.	
		L	14	35	51									
		F	14	44	50									
64	Aug. 6	P	18	21	9						2110			
		S	18	24	42									
		L	18	28	17									
		C	18	30	52									
		F	18	38	±									
65	Aug. 7	P	2	19	18						4420		Neighbourhood of Neuguinea.	
		S	2	25	28									
		L	2	28	17									
		M <sub>N</sub>	2	45	10	20			±70					
		F	3	0	10									
66	Aug. 8	P	17	5	18									
		F	17	15	40									
67	Aug. 10	eP	14	36	34									
		S	14	37	28									
		F	14	45	30									
68	Aug. 10	P	21	24	1						3605		Great earthquake of Dzungaria.	
		S	21	29	25									
		L	21	34	7									
		C	21	48	25									
		F	22	34	0									
69	Aug. 11	eP	7	20	16									
		F	7	24	10									
70	Aug. 12	p	6	44	31						230		Southwestern off to the coast of Zinsen. Felt at Zinsen and neighbouring towns.	
		S	6	45	2									
		M <sub>N</sub>	6	45	11	4			±17					
		M <sub>E</sub>	6	45	11		3			±8				
		F	6	49	±									
71	Aug. 17	P	17	50	57								Northeastern off to Okinawa Island.	
		L?	17	52	42									
		F	17	58	±									
72	Aug. 18	eP	14	26	36						3959		Altai Mts.	
		S	14	32	21									
		L	14	37	12									
		M <sub>1E</sub>	14	38	3		4			±68				
		M <sub>1N</sub>	14	38	8	5			+117					
		M <sub>2E</sub>	14	38	35		4			±89				
		M <sub>2N</sub>	14	38	41	5			+83					
F	15	32	40											

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地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
73	Aug. 24	eP	時h 分m 秒s 21 44 22							5683	Suleiman Mts, India.	
		S	21 51 42									
		L	22 2 56									
		F	22 24 40									
74	Aug. 27	P	15 36 27						5313	Destructive in Baluchistan.		
		S	15 43 26									
		L	15 54 44									
		M <sub>1</sub> N	15 57 31	15			±60					
		M <sub>1</sub> E	15 58 0		16			±14				
		M <sub>2</sub> N	16 0 28	15			±56					
		M <sub>2</sub> E	16 1 7		15			±58				
F	16 53 50											
75	Sep. 8	P	19 11 35						1260	Kasima-nada.		
		S	19 13 49									
		L	19 15 32									
		F	19 27 40									
76	Sep. 9	P	20 43 11						2335	Marianne Islands.		
		PP	20 43 39									
		S	20 47 2									
		M <sub>NE</sub>	20 47 10	11	7		+124	-51				
		F	21 31 40									
77	Sep. 12	P	10 56 26						28	Local shock, Felt at Taikyū.		
		S	10 56 30									
		M <sub>NE</sub>	10 56 30				± 8	± 6				
		C	10 56 38									
		F	10 57 20									
78	Sep. 16	P	12 45 12						1461	Upper valley of the River Katura, Yamanasi Prefecture.		
		S	12 47 45									
		L	12 47 12									
		C	12 51 11									
		F	12 59 50									
79	Sep. 16	P	21 53 36									
		F	21 54 0									
80	Sep. 16	P	22 0 39						7	Local shock, Felt at Taikyū.		
		L	22 0 40									
		M <sub>E</sub>	22 0 40					±20				
		M <sub>N</sub>	22 0 40				±23					
		F	22 1 2									
81	Sep. 21	P	2 22 2						105	Neighbourhood of Mt. Sengen, Saitama Prefecture. Destructive in Kwantō.		
		S	2 23 55									
		L	2 24 53									
		M <sub>N</sub>	2 25 6	4			±169					
		M <sub>E</sub>	2 26 12		10			±137				
		C	2 32 10									
		F	3 11 50									
82	Sep. 21	P	10 32 2						2500	Northern part of South China Sea.		
		PP	10 32 8									
		S	10 36 7									
		L	10 38 7									
		M <sub>1</sub> E	10 39 5		4			±13				
		M <sub>1</sub> N	10 39 24	4			±27					
		M <sub>2</sub> E	10 39 44		4			±18				
		M <sub>2</sub> N	10 39 46	4			±48					

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地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 A <sub>N</sub>	東西動 A <sub>E</sub>	上下動 A <sub>Z</sub>			
			時 分 秒	秒	秒	秒	μ	μ	μ	km	μ	
		C	10 46 2									
		F	11 15 40									
83	Sep. 22	P	8 38 37									
		F	8 40 20									
84	Sep. 25	eP	6 8 28							5850		Southwest border of East Indies.
		S	6 15 56									
		L	6 26 14									
		M <sub>1E</sub>	6 30 38		19			-392				
		M <sub>1N</sub>	6 31 13	22			-384					
		M <sub>2E</sub>	6 33 38		11			-125				
		M <sub>2N</sub>	6 34 26	17			-231					
		F	7 2 ±									
85	Oct. 3	P	19 22 53							6140		Solomon Islands.
		S	19 30 37									
		L	19 37 5									
		M <sub>E</sub>	19 41 14		30			±54				
		M <sub>N</sub>	19 41 50	19			±64					
		F	20 57 0									
86	Oct. 3	eP	22 5 40									Ditto.
		F	22 51 0									
87	Oct. 3	S	23 5 11									P lost while changing record.
		L	23 11 31									
		F	23 51 0									
88	Oct. 10	P	0 29 14							6450		Solomon Islands.
		S	0 37 15									
		L	0 43 17									
		M <sub>1N</sub>	0 48 7	21			±25					
		M <sub>1E</sub>	0 48 19		16			±31				
		M <sub>2E</sub>	0 50 23		24			±28				
		M <sub>2N</sub>	0 51 22	17			±48					
		F	2 21 ±									
89	Oct. 10	eP	16 42 16									Sea of Okhotsk.
		F	17 7 40									
90	Oct. 17	P	15 37 21							1725		SSE-ern off to the Island of Titi, Bonin Islands.
		S	15 40 19									
		F	15 47 ±									
91	Oct. 24	P	12 39 50							1350		
		S	12 42 12									
		L	12 43 35									
		F	12 51 50									
92	Oct. 28	P	5 39 31							1990		Southern far off to the coast of Kōsyun, Formosa.
		S	5 42 53									
		L	5 45 52									
		F	6 7 30									
93	Nov. 1	P	18 54 24							571		Hyōga-nada.
		S	18 55 14									
		L	18 55 41									
		M <sub>1E</sub>	18 55 55		4			±51				



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地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period			半 振 幅 Amplitude			震央距離 Δ	初 動 First Motion	記 事 Remarks
				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
			時h 分m 秒 <sup>s</sup>	秒 <sup>s</sup>	秒 <sup>s</sup>	秒 <sup>s</sup>	μ	μ	μ	km	μ	
94	Nov. 2	M <sub>1N</sub>	18 55 55	4			±25			536		Hyūga-nada, Destructive in Miyazaki and neighbouring towns. F lost in next quake.
		M <sub>2N</sub>	18 56 19	4			±36					
		M <sub>2E</sub>	18 56 28		4			±36				
		C	18 58 12									
		F	19 18 0									
95	Nov. 2	P	10 4 13							467		After shock of No. 94
		L	10 5 25									
		M <sub>E</sub>	10 5 39		4			±1450				
		M <sub>N</sub>	10 5 41	5			±2250					
		C	10 18 25									
96	Nov. 2	P	11 1 50							458		Ditto.
		L	11 2 53									
		M <sub>E</sub>	11 3 11		5			±19				
		M <sub>N</sub>	11 3 39	4			±22					
		C	11 5 59									
97	Nov. 2	F	11 25 0							1500		Kokuni, Iwate Prefecture.
		P	11 34 41									
98	Nov. 2	F	11 41 0							5980		Solomon Islands.
		P	11 48 39									
99	Nov. 3	L	11 49 41							416		Ooyano Island, Kumamoto Prefecture.
		F	11 2 30									
		P	16 22 40									
100	Nov. 20	S	16 25 17							386		Ditto.
		L	16 26 47									
		F	16 39 0									
101	Nov. 24	eP	12 29 59							345		Ditto.
		L	12 36 13									
		F	13 2 ±									
102	Dec. 6	P	14 26 12							416		Ooyano Island, Kumamoto Prefecture.
		S	14 33 47									
		eL	14 42 12									
103	Dec. 18	F	15 14 40							386		Ditto.
		P	9 13 11									
		F	9 27 20									
104	Dec. 21	eP	23 9 11							386		Ditto.
		eL	23 12 35									
		F	23 22 10									
105	Dec. 18	P	17 47 18							386		Ditto.
		F	17 53 0									
		eP	17 47 18									
106	Dec. 21	P	5 48 13							386		Ditto.
		L	5 49 9									
		F	6 0 50									
107	Dec. 22	P	13 8 54							386		Ditto.
		S	13 9 46									
		F	13 21 40									
108	Dec. 26	P	1 44 2							345		Ditto.
		L	1 44 48									
		F	1 48 ±									

昭和六年

# 釜山地震観測成績表

## Seismic Bulletin for the Year 1931

### Husan



北緯 35度 6分  
東經 129度 1分  
標高 12.5米  
時刻 グリニチ平時  
地質 玢岩

$\varphi = 35^{\circ} 6' N$   
 $\lambda = 129^{\circ} 1' E$   
 $H = 12.5m$

TIME : Gr. Mean Time

LITHOLOGIC FOUNDATION : Grey Granite-gneiss

### 器械

### INSTRUMENTS

大森式地動計(南北動)

Oomori's Seismometer, N

### 記號

### SYMBOLS AND NOTATIONS

P 第一初期微動  
 $\bar{P}$  もほろびちつく相  
 PP P波ノ地表ニテ一回反射セシ波  
  
 S 第二初期微動  
 SS S波ノ地表ニテ一回反射セシ波  
  
 $P_4P$  地球ノ心核ニテ反射セシ縦波  
  
 $S_4S$  地球ノ心核ニテ反射セシ横波  
 PS 地表ニテ反射ノ際縦波ヨリ横波ニ  
 變リタル波  
 L 主要動ノ長波  
 M 主要動ノ極大動  
 C 終期微動  
 F 震動ノ終リ  
 i 明瞭ナル相  
 e 不明瞭ナル相  
 $\mu$  (ミクロン),  $\frac{1}{1000}$  耗  
 $A_N$  南北動振幅但シ北ヲ正(+)トス  
 $\Delta$  震央距離

P First preliminary tremor.  
 $\bar{P}$  Mohorovičić phase.  
 PP Longitudinal waves once reflected at the earth's surface.  
 S Second preliminary tremor.  
 SS Transverse waves once reflected at the earth's surface.  
 $P_4P$  Longitudinal waves reflected at the core of the earth.  
 $S_4S$  Transverse waves reflected at the core of the earth.  
 PS Waves changed from longitudinal to transverse oscillation through reflection at the earth's surface.  
 L Long waves at the beginning of the surface phase.  
 M Greatest motion in the surface phase.  
 C Tail or end portion.  
 F End of discernible movements.  
 i Sudden beginning of the motion.  
 e Gradual beginning of the motion.  
 $\mu$  Micron,  $\frac{1}{1000}$  mm.  
 $A_N$  N-S component of amplitude.  
 $\Delta$  Distance of Epicenter.





釜 山  
HUSAN

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地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.			週 期 Period		震 央 距 離 Δ	初 動 First Motion	記 事 Remarks
						南 北 動 N	南 北 動 AN			
1	Jan. 1	P	時h	分m	秒s	秒s	μ	新km 1420	μ	Eastern off to the coast of Kwaren-kō, Formosa.
		S	23	55	23					
		F	0	4	30					
2	Jan. 15	P	13	39	43			320		Mouth of the River Sirakawa, Kumamoto Prefecture.
		S	13	40	18					
		F	13	42	10					
3	Jan. 15	P	21	3	33			910		Northeastern off to the Okinawa Island.
		S	21	5	10					
		F	21	18	10					
4	Jan. 27	e	20	21	55					Neighbourhood of Marianne Islands.
		F	20	42	50					
5	Jan. 28	P	21	30	0			3040		Marianne Islands.
		S	21	34	46					
		F	21	50	±					
6	Feb. 2	e	23	35	56					
		F	23	38	20					
7	Feb. 13	P	0	43	41					Northeastern off to the coast of Kwaren-kō, Formosa.
		e	0	45	15					
		F	0	51	30					
8	Feb. 16	eP	18	51	43					Neighbourhood of Urakawa, Hokkaidō.
		F	18	55	30					
9	Feb. 20	P	5	35	37			1080		Northern part of Japan Sea.
		S	5	37	41					
		F	5	53	±					
10	Feb. 25	P	20	30	55					
		S	20	31	59					
		F	20	34	10					
11	Mar. 6	eP	16	54	58					
		F	17	0	20					
12	Mar. 6	eP	20	44	8					
		F	20	57	20					
13	Mar. 9	P	3	51	44			1420		Eastern off to the mouth of the River Mabuti, Aomori Prefecture.
		S	3	54	13					
		F	4	52	40					
14	Mar. 18	P	20	20	4					Off the SE-ern coast of Mindanao, Philippine.
		F	20	58	50					
15	Mar. 19	P	6	29	16			1910		Off the NE-ern coast of Luzon,
		S	6	32	32					
		L	6	35	3					
		F	6	58	20					
16	Mar. 28	P	12	46	23			4440		Banda Sea, western off to the coast of Neuguinea.
		S	12	52	35					
		F	13	17	20					

地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude		震 央 距 離 Δ	初 動 First Motion	記 事 Remarks
				南 北 N	動	南 北 N	動			
17	Apr. 9	P	時h 分m 秒s 23 4 57		秒s	μ		km 1530	μ	Nemuro Strait, Hokkaido.
		S	23 7 37							
		F	23 19 ±							
18	Apr. 19	P	2 33 49							WSW-ern off to the Yaku Island, Kagosima Prefecture.
		S	2 35 10							
		F	2 51 40							
19	May 12	P	1 42 43				2875			
		S	1 47 17							
		F	1 59 0							
20	May 13	P	23 5 46							NE-ern off to the Okinawa Island.
		S	23 7 11							
		F	23 15 0							
21	May 20	eP	2 49 24							
		F	2 57 50							
22	June 2	e	2 40 2							Middle Valley of the River Masuda, Gihu Prefecture.
		e	2 40 46							
		F	2 49 40							
23	June 11	eP	6 18 53							Eastern foot of Mt. Huzi.
		F	6 24 0							
24	June 12	P	1 47 42				1094			Southern off to the Hatizyo Island.
		S	1 49 40							
		F	1 54 20							
25	June 17	eP	12 12 17				880			Middle valley of the River Sagami, Kanagawa Prefecture.
		S	12 13 53							
		F	12 21 20							
26	June 23	eP	6 17 41				1090			Kasima-nada
		S	6 19 38							
		L	6 20 38							
		F	6 28 0							
27	June 29	P	16 44 56				750			Kumano-nada
		S	16 46 18							
		F	16 53 20							
28	Aug. 10	P	21 25 19				3620			Great earthquake of Dzungaria.
		S	21 30 44							
		L	21 35 45							
		F	23 26 0							
29	Aug. 12	P	6 44 45				297			SW-ern off to the coast of Zinsen, Felt at Zinsen and nearby towns.
		S	6 45 25							
		M <sub>N</sub>	6 45 37							
		F	6 47 50							
30	Aug. 17	P	17 50 47							Northeastern off to the Okinawa Island.
		F	17 53 50							
31	Aug. 18	P	14 38 0							
		L	14 47 10							
		F	14 59 40							

釜 山  
HUSAN



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地震觀測成績表  
RESULTS OF SEISMIC OBSERVATIONS

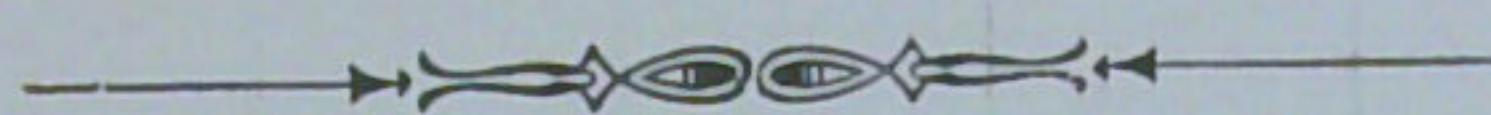
番號 No.	月 日 Date	相 Phase	時 刻 G.M.T.	週 期 Period		半 振 幅 Amplitude	震 央 距 離 Δ	初 動 First Motion	記 事 Remarks
				南 北 動 N	南 北 動 AN				
			時 分 秒	秒	μ	km	μ		
32	Aug. 19	P	1 29 2	1	±15				
		L	1 30 5						
		M <sub>N</sub>	1 30 8						
		F	1 32 50						
33	Sep. 3	P	6 6 52						
		F	6 7 50						
34	Sep. 4	eP	2 52 31						
		S	2 52 51						
		F	2 55 30						
35	Sep. 16	e	12 47 11					Upper valley of the River Katura, Yamanasi Prefecture.	
		e	12 47 30						
		F	12 52 20						
36	Sep. 21	P	2 21 47			1130		Neighbourhood of Mt. Sengen, Saitama Prefecture.	
		S	2 23 48						
		L	2 24 36						
		F	2 30 10						
37	Nov. 1	P	18 54 21			560		Hyûga-nada.	
		S	18 55 23						
		F	19 3 ±						
38	Nov. 2	P	10 4 1			430		Hyûga-nada. Destructive in Miyazaki and nearby towns. Felt slightly in a part of Husan.	
		S	10 4 59						
		F	10 26 50						
39	Nov. 2	P?	11 2 39						
		S	11 3 18						
		F	11 11 0						
40	Nov. 2	P	11 48 18			445			
		L	11 49 18						
		F	11 54 ±						
41	Dec. 18	P	17 46 52			453		ESE ern off to the coast of Miyazaki.	
		S	17 47 53						
		F	17 49 10						
42	Dec. 21	P	5 48 0			338		Ooyano Island, Kumamoto Prefecture.	
		S	5 48 45						
		F	5 52 40						
43	Dec. 22	P	13 8 20			264		Ditto.	
		S	13 8 55						
		F	13 11 50						
44	Dec. 26	P	1 43 20			200		Ditto.	
		S	1 43 47						
		F	1 49 40						

昭和六年

# 平壤地震観測成績表

## Seismic Bulletin for the Year 1931

### Heizyô



北緯 39° 2' 2分  
東經 125° 45' 45分  
標高 51.0米  
時刻 グリニチ平時  
地質 下部大同系

$\varphi = 39^{\circ} 2' N$   
 $\lambda = 125^{\circ} 45' E$   
H = 51.0m  
TIME: Gr. Mean Time  
LITHOLOGIC FOUNDATION: Lower Daidô System.

### 器械

中央氣象臺型簡單微動計 (南北動) 17.7<sup>g</sup>  
同 (東西動) 17.9<sup>g</sup>  
強震計 (南北・東西・上下動)

### INSTRUMENTS

	Comp.	Mass
Portable Seismometer of C. M. O.	N	17.7kg
"	E	17.9kg
Strong Motion Seismometer	N, E and Z	

### 記號

P 第一初期微動  
P̄ もほろびちつく相  
PP 地表ニテ一回反射セシ縦波  
  
S 第二初期微動  
SS 地表ニテ一回反射セシ横波  
  
P<sub>4</sub>P 地球ノ心核ニテ反射セシ縦波  
  
S<sub>4</sub>S 地球ノ心核ニテ反射セシ横波  
PS 地表ニテ反射ノ際縦波ヨリ横波ニ變リタル波  
L 主要動ノ長波  
M 主要動ノ極大動  
C 終期微動  
F 震動ノ終リ  
i 明瞭ナル相  
e 不明瞭ナル相  
 $\mu$  (ミクロン)  $\frac{1}{1000}$  耗  
A<sub>N</sub> 南北動振幅但シ北ヲ正(+)トス  
A<sub>E</sub> 東西動振幅但シ東ヲ正(+)トス  
A<sub>Z</sub> 上下動振幅但シ上ヲ正(+)トス  
Δ 震央距離

### SYMBOLS AND NOTATIONS

P First preliminary tremor.  
P̄ Mohorovičić phase.  
PP Longitudinal waves once reflected at the earth's surface.  
S Second preliminary tremor.  
SS Transverse waves once reflected at the earth's surface.  
P<sub>4</sub>P Longitudinal waves reflected at the core of the earth.  
S<sub>4</sub>S Transverse waves reflected at the core of the earth.  
PS Waves changed from longitudinal to transverse oscillation through reflection at the earth's surface.  
L Long waves at the beginning of the surface phase.  
M Greatest motion in the surface phase.  
C Tail or end portion.  
F End of discernible movement.  
i Sudden beginning of the motion.  
e Gradual beginning of the motion.  
 $\mu$  Micron,  $\frac{1}{1000}$  mm  
A<sub>N</sub> N-S component of amplitude.  
A<sub>E</sub> E-W component of amplitude.  
A<sub>Z</sub> Vertical component of amplitude.  
Δ Distance of epicenter.



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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
1	Jan. 1	P	23 56 4							1410	Eastern off to the coast of Kwaren-kō, Formosa.	
		S	23 58 33									
		L	0 0 24									
		M <sub>E</sub>	0 1 37		5			±12				
		F	0 22 ±									
2	Jan. 15	eP	2 5 19							1220	Destructive in southern part of Mexico.	
		PS	2 19 46									
		L	2 38 9									
		M <sub>1E</sub>	2 45 58		33			± 9				
		M <sub>2E</sub>	2 53 31		21			±20				
		M <sub>3E</sub>	3 1 36		21			±25				
		F	3 44 ±									
3	Jan. 15	e	13 42 ±							3215	Mouth of the River Sira, Kumamoto Prefecture.	
		F	13 43 ±									
4	Jan. 15	eP	21 4 6							1220	Northeastern off to Okinawa Island.	
		S	21 6 16									
		LE	21 6 47									
		M <sub>1N</sub>	21 7 30	6				-240				
		M <sub>1E</sub>	21 7 39		6				-1380			
		M <sub>2N</sub>	21 8 28	5					-182			
		F	21 52 ±									
5	Jan. 24	eP	13 47 4							3215	Philippine Islands.	
		S	13 52 2									
		L	13 56 11									
		F	14 13 ±									
6	Jan. 24	eP	15 8 32							560		
		S	15 9 35									
		F	15 17 ±									
7	Jan. 27	P	20 15 7							3030	Neighbourhood of Marianne Islands.	
		S	20 19 52									
		L	20 24 13									
		M <sub>N</sub>	20 25 6	8				+800				
		M <sub>E</sub>	20 25 19		9				+398			
		F	21 9 ±									
8	Jan. 28	P	21 30 41							3370	Marianne Islands.	
		i	21 30 56									
		S	21 35 50									
		L	21 39 44									
		M <sub>1E</sub>	21 43 32		21				±12			
		M <sub>2E</sub>	21 47 14	15					+18			
F	22 25 ±											
9	Feb. 2	eP	22 59 53							9270	Very destructive at Napier and nearby towns, North Island, New Zealand.	
		S	23 10 17									
		L	23 17 38									
10	Feb. 4	F	0 30 ±							145		
		P	19 38 10									
11	Feb. 10	L	19 38 29							5490	Off the southern coast of Sumatra.	
		F	19 40 ±									
		e	1 37 ±									
12	Feb. 10	F	2 5 ±							5490	Off the southern coast of Sumatra.	
		P	6 43 22									
		S	6 50 31									
12	Feb. 10	L	6 54 1							5490	Off the southern coast of Sumatra.	
		P	6 54 1									

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			時	分	秒	南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
13	Feb. 13	ME	7	5	0	18	18		±17	±20		1630		Northeastern off to the coast of Kwaren-kō, Formosa.
		MN	7	6	16									
		F	8	0	±									
		P	0	44	16									
14	Feb. 13	S	0	47	6	3	3		- 6	± 3		9580		New Zealand.
		L	0	48	30									
		MNE	0	49	42									
		F	1	10	±									
15	Feb. 14	eP	1	40	24									
		S	1	51	3									
		eL	2	0	45									
		ME	2	13	54									
16	Feb. 16	F	3	28	±		24			± 3				Neighbourhood of Urakawa, Hokkaidō.
		eF	14	6	±									
		F	14	50	±									
		P	18	51	42									
17	Feb. 20	iS	18	52	2	6	6		+338	+580		930	S 14.0 W 30.0	Northern part of Japan Sea. Deep focus type.
		S	18	54	56									
		L	18	55	42									
		ME	18	56	21									
		F	19	31	±									
		P	5	35	38									
18	Feb. 27	iS	5	35	41									Philippine Islands?
		S	5	37	20									
		MN	5	37	33									
		ME	5	37	38									
19	Mar. 1	F	6	22	±									Southwestern off to Toziri Island, Hokkaidō.
		eP	9	44	34									
		eL	9	50	35									
		F	9	57	8									
20	Mar. 2	P	14	26	17							1520		Solomon Islands.
		SS	14	28	56									
		S	14	30	56									
		F	14	40	±									
21	Mar. 5	P	2	30	0							8000		Destructive in Greece and Serbia.
		SS	2	34	55									
		S	2	39	20									
		F	3	3	±									
22	Mar. 8	M	18	21	17		15			± 3				Other phases lost while adjusting instrument.
		F	18	—	—									
		eP	2	1	53									
		PS	2	13	2									
23	Mar. 9	SR <sub>3</sub> ?	2	25	53									Marianne Islands.
		ME	2	34	2									
		F	3	19	±									
		F	5	20	±									
24	Mar. 11	P	12	31	38		18			±10		2400		
		S	12	35	35									
		L	12	38	36									
		ME	12	39	32									
		F	13	24	±									

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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
25	Mar. 12	eP S L ME F	時 分 秒 10 45 2 10 49 44 10 53 14 10 54 23 11 16 ±		18			± 3	2985		Marianne Islands.	
26	Mar. 15	P S L F	16 36 43 16 39 1 16 40 30 16 52 ±						1300		Eastern of to the mouth the River Mabuti, Aomori Prefecture.	
27	Mar. 18	P L ME F	20 20 18 20 28 3 20 31 22 21 27 ±		4			± 7			Off the SE-ern coast of Mindanao, Philippine.	
28	Mar. 19	P S ME F	6 29 55 6 33 48 6 45 19 7 27 ±		10			- 6	2230		Off the northeastern coast of Luzon.	
29	Mar. 28	P S ME F	12 47 1 12 53 34 12 59 52 13 37 ±		10			- 4	4830		Banda Sea, western off to Neuguinea.	
30	Mar. 29	P e F	17 55 8 17 59 22 18 15 ±								WSW-ern off to the coast of Kuro, Hokkaidō.	
31	Apr. 9	P eS F	23 4 58 23 8 1 23 20 ±						1780		Nemuro Strait, Hokkaidō.	
32	Apr. 19	eP eS L F	2 33 23 2 35 33 2 37 11 2 54 30						1220		WSW-ern off to Yaku Island, Kagosima Prefecture.	
33	Apr. 24	eP S F	17 31 22 17 38 25 18 8 30						5380		Eastern off to the coast of Neuguinea.	
34	Apr. 27	eP eS F	17 0 51 17 9 15 17 44 30						6900		Destructive in Transcaucasia.	
35	May 1	eP F	21 7 13 21 10 30								Neighbourhood of Taiden, Korea. Felt at Taiden and nearby towns.	
36	May 12	P S F	1 42 35 1 47 10 2 11 ±						2890			
37	May 13	P S L F	23 6 19 23 8 8 23 9 46 23 24 ±						1010		Northeastern off to the Okinawa Island.	
38	May 17	eP S F	9 35 30 9 37 43 9 47 ±						1250			







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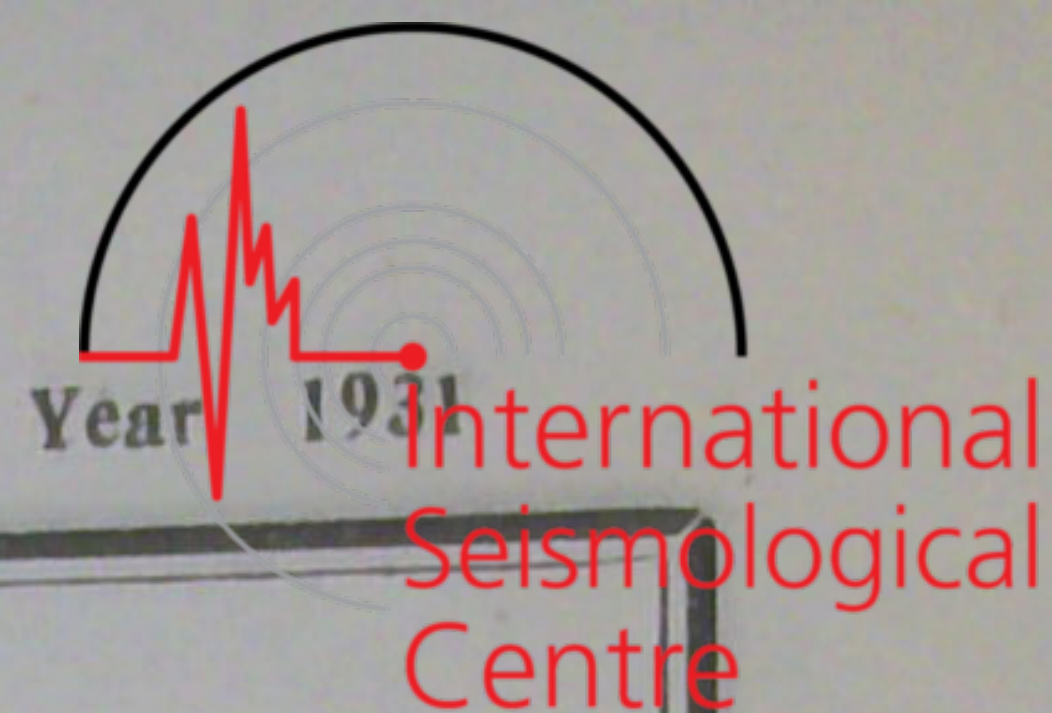
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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
52	Aug. 6	P	時h 分m 秒s 18 20 36	4	4		-60	+60		1834		
		S	18 23 44									
		L	18 26 27									
		M <sub>NE</sub>	18 26 47									
		F	18 54 ±									
53	Aug. 7	P	2 19 50	20	18	20	± 1	- 6	± 6	4795	Neighbourhood of Neuguinea.	
		S	2 26 22									
		L	2 31 34									
		M <sub>E</sub>	2 32 48									
		M <sub>NE</sub>	2 36 48									
		F	3 10 ±									
54	Aug. 10	P	21 24 29	5	4	5	-4100	-1550	± 70	3055	Great earthquake of Dzungaria.	
		S	21 29 17									
		L	21 33 6									
		M <sub>1NE</sub>	21 33 58									
		M <sub>1Z</sub>	21 34 33									
		M <sub>2N</sub>	21 35 35									
		M <sub>2E</sub>	21 35 46									
		M <sub>2Z</sub>	21 35 46									
		C	22 2 45									
F	23 50 ±											
55	Aug. 11	P	7 18 14							1240		
		S	7 20 26									
		L	7 22 35									
		F	7 36 ±									
56	Aug. 12	P	6 44 24	2	2		+ 8	± 6		214	Southwestern off to the coast of Zinsen, Felt at Zinsen and nearby towns.	
		S	6 44 53									
		M <sub>E</sub>	6 44 59									
		M <sub>N</sub>	6 45 8									
		F	6 52 ±									
57	Aug. 17	P	17 51 38								Northeastern off to the Okinawa Island.	
		F	18 7 30									
58	Aug. 18	P	14 26 51	7	7		+682	+340		3190	Altai Mts.	
		S	14 31 47									
		L	14 35 27									
		M <sub>NE</sub>	14 36 27									
		C	14 41 20									
		F	15 53 30									
59	Aug. 24	P	21 44 7					± 8		5320	Salehman Mts, Indla.	
		S	21 51 7									
		L	21 59 57									
		M <sub>E</sub>	22 7 44									
		F	22 44 ±									
60	Aug. 27	P	15 36 5					+60		4815	Destructive in Balchistan.	
		S	15 42 37									
		L	15 53 2									
		M <sub>E</sub>	15 59 51									
		F	17 14 ±									
61	Sep. 8	P	19 12 8					± 2		1340	Kasima-nada.	
		S	19 14 29									
		L	19 16 29									
		M <sub>E</sub>	19 17 23									
		F	19 30 ±									

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						南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
62	Sep. 9	P PP S eL F	時h 20	分m 43	秒s 48							km 2795		Marianne Islands.
63	Sep. 16	P cS L ME F	12	45	45							1195		Upper valley of the River Katura, Yamanasi Prefecture.
64	Sep. 17	P F	19 20	56 2	1 30									
65	Sep. 21	P S MN ME F	2	22	46	12						1260		Near Mt. Sengen, Saitama Prefecture. Destructive in Kwantō.
66	Sep. 21	P S L MNE F	10	32	16	7	7					2545		Northern part of the South China Sea.
67	Sep. 24	P S L ME F	6	7	38							5600		Southwestern border of East Indies.
68	Oct. 3	P S L MN ME C F	19	23	15	17						6940		Solomon Islands.
69	Oct. 3	eP? PP S L ME F	22	5	33							7090		Ditto
70	Oct. 3 4	P S L ME C F	22 23 23 23 23	57 6 14 17 28	49 1 5 44 43							6660		Ditto
71	Oct. 10	P S L MNE C F	0	29	58	18	18					6530		Ditto

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				南北動 N	東西動 E	上下動 Z	南北動 AN	東西動 AE	上下動 AZ			
72	Oct. 10	P F	時 分 秒 16 42 23 17 26 ±	秒	秒	秒	μ	μ	μ	μ	Okhotsk Sea.	
73	Oct. 17	P F	15 38 3 15 52 ±								SSE-ern off to the Titi Island, Bonin I-lands.	
74	Oct. 24	P L F	12 41 17 12 44 40 12 55 30									
75	Nov. 1	P L ME MN F	18 55 25 18 57 49 18 58 3 18 58 25 19 19 30	5	5		+60	+42			Hyûga-nada.	
76	Nov. 2	P S L MNE C	10 5 8 10 6 52 10 7 19 10 7 41 10 17 29	5	5		-1940	+2040	960		Hyûga-nada. Destructive in Miyazaki and nearby towns. F lost in next quake.	
77	Nov. 2	P S L MN ME C	11 2 46 11 4 40 11 5 5 11 5 22 11 5 29 11 7 52	5	5		+244	±416	1060		After shock of No. 76 F lost in next quake.	
78	Nov. 2	eP S MNE F	11 49 31 11 51 31 11 52 7 12 10 30	5	5		-18	±18	1120		Ditto	
79	Nov. 3	eP L F	16 22 59 16 26 26 16 41 30								Kokuni, Iwate Prefecture.	
80	Nov. 5	P L MNE C F	12 25 26 12 34 10 12 35 2 12 38 26 12 58 30	8	8		+38	+58				
81	Nov. 20	P F	14 26 36 14 43 30								Solomon Islands.	
82	Nov. 24	L F	9 11 20 9 25 30									
83	Dec. 21	L F	5 51 13 6 5 ±								Ooyano Island, Kumamoto Prefecture.	
84	Dec. 22	L F	13 12 32 13 31 ±								Ditto	
85	Dec. 26	L MNE F	1 46 37 1 47 4 2 5 ±		6		-40	±60				