

# SEISMOLOGICAL BULLETIN

OF THE

IMPERIAL MARINE OBSERVATORY

AND

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## SEISMOLOGICAL BULLETIN

of the Imperial Marine Observatory and the Kobe Meteorological Observatory of Japan.

$\phi = 34^{\circ} 41' 18''N$   $\lambda = 135^{\circ} 10' 51''E$   $h = 58.3$  m Underground: Diluvial Series.

Instruments: Omori's Seismograph.  
(Horizontal Pendulum)

Wiechert Seismograph.  
(Horizontal & Vertical)

### CONTENTS

	Page.
Seismological Bulletin of Kobe ... ..	155
Seismological Bulletin of Sumoto ... ..	175
Seismological Bulletin of Toyooka ... ..	199
The Observation of the Tilting of Earth ... ..	208

#### Oct.

	$T_o$	$\epsilon$	$\frac{r}{T_o^2}$	V
AE:	19.4		0.001	20
AN:	19.2		0.001	20

	$T_o$	$\epsilon$	$\frac{r}{T_o^2}$	V
AE:	6.3	8	0.006	115
AN:	6.6	11	0.006	105
AZ:	3.8	7	0.008	94

#### Nov.

	$T_o$	$\epsilon$	$\frac{r}{T_o^2}$	V
AE:	19.4		0.001	20
AN:	19.3		0.001	20

	$T_o$	$\epsilon$	$\frac{r}{T_o^2}$	V
AE:	6.7	10	0.006	102
AN:	6.5	11	0.007	103
AZ:	3.9	7	0.006	89

#### Dec.

	$T_o$	$\epsilon$	$\frac{r}{T_o^2}$	V
AE:	19.1		0.001	20
AN:	18.3		0.001	20

	$T_o$	$\epsilon$	$\frac{r}{T_o^2}$	V
AE:	6.3	10	0.008	104
AN:	6.8	9	0.007	94
AZ:	3.6	6	0.006	99

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		AE	AN	Az		
220	Oct. 2	ePE	5	35	53	29	$\pm 12$	$\mu$	$\mu$	km.	Off the Ottisi Cape, Hokkaidô. N 42° 9' E 145° 8'. Weak shocks were felt in eastern part of Hokkaidô. Felt in Pacific Coast of Hokkaidô and Oou district. Focal depth deeper than normal. Z component is accident.
		ePN	5	35	54						
		iPE	5	36	05						
		SE	5	38	07						
		SN	5	38	08						
		iE	5	38	41						
		LN	5	39	37						



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
		M <sup>1</sup> <sub>E</sub>	5 40 17	26.0	+30			434	South off the Sata Cape, Kagosima Prefecture, Kyûsyû. Focal depth about 120 km.
		M <sup>1</sup> <sub>N</sub>	5 40 12	21.0		+25			
		M <sup>2</sup> <sub>E</sub>	5 41 37	14.5	-30				
		M <sup>2</sup> <sub>N</sub>	5 41 27	16.0		-25			
		ScS <sub>N</sub>	5 48 39	4.5		-17			
		eScS <sub>E</sub>	5 48 58	5.2	+9				
		sScS <sup>?</sup> <sub>N</sub>	5 49 14	4.4		-15			
		eF	6 22 ±						
221	Oct. 2	iP <sub>EN</sub>	9 29 01		+1	+2		434	South off the Sata Cape, Kagosima Prefecture, Kyûsyû. Focal depth about 120 km.
		iS <sub>EN</sub>	9 30 00		-10	-7			
		M <sup>1</sup> <sub>EN</sub>	9 30 01	0.5	-10				
		M <sup>1</sup> <sub>N</sub>	9 30 03	0.4		-14			
		M <sup>2</sup> <sub>E</sub>	9 30 15	0.8	+13				
		M <sup>2</sup> <sub>N</sub>	9 30 14	0.8		-11			
		eF	9 42 ±						
222	Oct. 4	e <sub>N</sub>	5 23 07					4225	South off Mindanao, Philip- pine. Felt at Davao.
		S <sub>E</sub>	5 25 42		+5				
		S <sub>NZ</sub>	5 25 43			-4	+2		
		SM <sub>EN</sub>	5 25 44		-22	+9			
		SM <sub>Z</sub>	5 25 43				-6		
		eM <sub>N</sub>	5 26 57	2.9		+5			
		eM <sub>Z</sub>	5 26 56	2.8			±2		
		eM <sub>E</sub>	5 27 37	3.0	±4				
		i <sub>E</sub>	5 31 03	3.6	+5				
		eF	5 34 ±						
223	Oct. 5	e <sub>E</sub>	1 57 10					74	Lower basin of the Arita River, Wakayama Prefecture.
		e <sub>N</sub>	1 57 11						
		e <sub>Z</sub>	1 57 05						
		M <sub>E</sub>	1 57 13	0.9	±1				
		M <sub>N</sub>	1 57 17	0.8		+1			
		eM <sub>Z</sub>	1 57 12	0.9			+1		
		F	1 57 42						

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
224	Oct. 5	eP <sub>E</sub>	11 14 00					64	Lower basin of the Arita River, Wakayama Prefecture.
		P <sub>Z</sub>	11 14 00				+1		
		S <sub>E</sub>	11 14 09		+1				
		S <sub>N</sub>	11 14 10			+1			
		M <sub>E</sub>	11 14 11	0.6	+2				
		M <sub>N</sub>	11 14 11	0.4		-2			
		eM <sub>Z</sub>	11 14 10	1.4					
		eF	11 15 03						
225	Oct. 6	e <sub>E</sub>	3 36 30					4225	Near Miyake Isl, South off Izu Peninsula.
		e <sub>N</sub>	3 36 29						
		e <sub>Z</sub>	3 36 31						
		e <sub>Z</sub>	3 36 59						
		e <sub>E</sub>	3 37 45						
		eF	3 43 ±						
226	Oct. 11	eP <sub>E</sub>	22 23 20					4225	South far off Truk Isl, East Caroline Is.
		eP <sub>N</sub>	22 23 21						
		eS <sup>?</sup> <sub>N</sub>	22 29 20						
		e <sub>EN</sub>	22 32 20		+5	+5			
		M <sup>1</sup> <sub>N</sub>	22 34 51	19.0		+4			
		M <sup>2</sup> <sub>N</sub>	22 40 23	17.0		±2			
eF	22 59 ±								
227	Oct. 12	eP <sub>Z</sub>	16 15 44					74	Lower basin of the Arita River, Wakayama Prefecture.
		P	16 15 45				+1		
		i <sub>Z</sub>	16 15 46	0.5			-3		
		iS <sub>EN</sub>	16 15 54		+7	+5			
		S <sub>Z</sub>	16 15 54				-1		
		M <sup>1</sup> <sub>E</sub>	16 15 55	0.7	-8				
		M <sup>1</sup> <sub>N</sub>	16 15 55	0.5		-9			
		M <sup>2</sup> <sub>E</sub>	16 15 57	0.6	-7				
		M <sup>2</sup> <sub>N</sub>	16 15 57	0.5		±6			
		M <sub>Z</sub>	16 15 57				+3		
eF	16 18 02								



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks		
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$				
228	Oct. 12	ePz	16 47 23	2.1	+ 3			1020	NE off Miyako, Iwate Prefecture. Moderate Shocks were felt in Pacific Coast of Oou district. Felt in all over the NE Japan.		
		ePEN	16 47 26								
		Pz	16 47 26								
		PE	16 47 28								
		iE	16 47 39								
		iN	16 47 43								
		iz	16 47 55							-21	
		SE	16 49 12							-44	
		SN	16 49 10							+37	
		Sz	16 49 14							-13	
		iz	16 49 46							+45	
		ME	16 50 27							8.6	+270
		MN	16 50 40							7.8	+245
		MZ	16 51 17							15.0	-60
The end part overlaped by the following earthquake.											
229	Oct. 12	ePz	17 02 32	}	P phases in previous.			1020	An after shock of No. 228.		
		ePE	17 02 48								
		ePN	17 02 49								
		Sz	17 04 57							+ 9	
		ME	17 05 05							11.0	+ 40
		MN	17 05 33							11.0	+ 83
MZ	17 06 24	16.0	+ 10								
The end part overlaped by the following earthquake.											
230	Oct. 12	ez	18 09 13					1020	An after shock of No. 228.		
		eE	18 09 25								
		eF	18 10 10								
		eN	18 10 11								
The end part overlaped by the following earthquake.											
231	Oct. 12	ePE	18 16 14					1030	Ditto.		
		ePN	18 16 16								
		ePz	18 16 15								
		iE	18 16 24							+ 5	
		iN	18 16 30							- 4	

No.	Date	Phase	Time h m s	Period s	Amplitude			$\Delta$ km.	Remarks			
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$					
232	Oct. 13	iz	18 16 23	7.8	+ 5			990	Ditto.			
		SE	18 18 12									
		SN	18 18 06							+ 8		
		ME	18 20 27							+28		
		MN	18 20 21							5.7	+33	
		MZ	18 20 00									
		eF	18 57 ±								-14	
233	Oct. 13	ePE	1 59 37	6.5				990	Ditto.			
		ePz	1 59 34									
		ePN	1 59 42									
		eSN	2 01 14									
		eSE	2 01 22									
		eSz	2 01 21									
		ME	2 02 34							-66		
MN	2 02 34	7.0	+63									
MZ	2 02 20	7.0	+13									
eF	2 30 ±											
234	Oct. 14	eEN	3 55 53	0.4				354	Near Simotu, South of Wakayama City.			
		iS	3 55 54							- 4	- 2	- 3
		MEN	3 55 54							+ 8	- 5	
		F	3 56 34									
235	Oct. 15	eE	10 32 41					354	NE off Miyako, Iwate Prefecture.			
		eE	10 34 31									
		eN	10 34 34									
		ez	10 34 56									
eF	10 43 ±											
235	Oct. 15	PEZ	14 36 08.7		+ 2			354	NW off Noto Peninsula, Japan Sea. Abnormal felt Area in Kwantō district and Kusiro, Hokkaidō. Focul depth about 280 km.			
		PN	14 36 08.5							- 4		
		iPEZ	14 36 09.3							- 9		
		iPN	14 36 09.2							+12		
		iSE	14 36 56							-53		
		iSN	14 36 57							-66		



No.	Date	Phase	Time			Amplitude			$\Delta$	Remarks	
			G.	M.	T.	A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>			
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
236	Oct. 18	iSz	14	36	58				-15	1150	ENE off Miyako, Iwate Prefecture, 143°8E, 40°2N. Felt in Oou and Hokkaidô.
		M <sub>E</sub>	14	37	00	4.0	+87				
		M <sub>N</sub>	14	36	59	3.7		+113			
		M <sub>Z</sub>	14	37	03	3.7			+17		
		eF	14	49	±						
		eP <sub>N</sub>	0	13	59						
		eP <sub>Z</sub>	0	14	05						
		P <sub>E</sub>	0	14	14						
		S <sub>E</sub>	0	16	05		+47				
		S <sub>N</sub>	0	19	02			-30			
		S <sub>Z</sub>	0	16	04				-14		
		M <sup>1</sup> <sub>E</sub>	0	17	09	8.6	+360				
		M <sup>1</sup> <sub>N</sub>	0	17	13	6.0		+420			
		M <sub>Z</sub>	0	16	54	6.0			+97		
		i <sub>E</sub>	0	20	49	7.0	-97				
		i <sub>N</sub>	0	20	59	9.7		+110			
		C <sub>N</sub>	0	29	14	10.5		+23			
C <sub>E</sub>	0	29	30	10.5	+15						
C <sub>N</sub>	0	30	00	10.5		-27					
The end part overlaped by the following earthquake.											
237	Oct. 18	eP <sub>N</sub>	0	30	35					1020	An after shock of No. 236.
		eP <sub>E</sub>	0	30	46						
		e <sub>Z</sub>	0	30	46	9.8			± 5		
		e <sub>N</sub>	0	32	56	11.0		+16			
		e <sub>E</sub>	0	33	19						
		M <sub>E</sub>	0	34	15	7.3	-28				
		M <sub>N</sub>	0	34	08	7.8		-30			
eF	0	45	±								
238	Oct. 18	e <sub>N</sub>	5	55	38					Ditto.	
		e <sub>Z</sub>	5	56	03						
		e <sub>E</sub>	5	56	23						
		M <sub>E</sub>	5	56	57	6.4	+ 8				
		M <sub>N</sub>	5	56	45	6.2		- 6			

No.	Date	Phase	Time			Amplitude			$\Delta$	Remarks	
			G.	M.	T.	A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>			
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
239	Oct. 18	eF	6	02	±					Ditto.	
		e <sub>N</sub>	6	14	10						
		e <sub>E</sub>	6	14	47						
		e <sub>Z</sub>	6	14	49						
		M <sub>N</sub>	6	15	33	6.2		+ 4			
		eF	6	18	±						
240	Oct. 18	e <sup>2</sup> <sub>E</sub>	11	10	16					2810	L and M phases are not distinct. Middle part of Caroline IIs, Pacific Ocean.
		P <sub>EZ</sub>	11	10	29		+8		+ 6		
		i <sub>N</sub>	11	10	50	5.3		+43			
		i <sub>Z</sub>	11	10	50	5.6			-21		
		i <sub>E</sub>	11	11	51	4.9	±35				
		S <sub>E</sub>	11	14	43		+15				
		iS <sub>N</sub>	11	14	43			+38			
		S <sub>Z</sub>	11	14	47				- 7		
		i <sub>N</sub>	11	15	11	8.1		+90			
		i <sub>Z</sub>	11	15	35	7.1			-21		
		i <sub>E</sub>	11	16	04	6.3	-78				
		e <sub>Z</sub>	11	16	23						
		M <sub>Z</sub>	11	25	44	13.0			± 4		
		eF	12	34	±						
241	Oct. 18	eP <sub>E</sub>	14	56	02					1020	An after shock of No. 236.
		eP <sub>N</sub>	14	56	00						
		P <sub>Z</sub>	14	56	03				-15		
		i <sub>EN</sub>	14	56	16		+10	+ 5			
		i <sub>Z</sub>	14	56	15				- 7		
		eS <sub>E</sub>	14	57	49						
		eS <sub>NZ</sub>	14	57	50			+ 8			
		M <sub>E</sub>	14	59	00	7.6	+86				
		M <sub>N</sub>	14	59	09	9.4		+102			
		M <sub>Z</sub>	14	58	52	6.4			-18		
i <sub>N</sub>	15	02	16	9.5		±30					
eF	15	43	±								



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
242	Oct. 18	eP <sub>E</sub>	21	53	40					1130	Ditto.
		eP <sub>N</sub>	21	53	42						
		eP <sub>Z</sub>	21	53	35						
		S <sub>E</sub>	21	55	39		+10				
		S <sub>N</sub>	21	55	38			-15			
		S <sub>Z</sub>	21	55	36						
		M <sub>E</sub>	21	56	23	7.8	-45				
		M <sub>N</sub>	21	56	32	6.7		+50			
		M <sub>Z</sub>	21	56	19	6.0			$\pm 8$		
eF	23	18	$\pm$								
243	Oct. 19	eP <sub>N</sub>	0	53	42					1160	Ditto.
		eP <sub>Z</sub>	0	53	39						
		eE	0	53	58						
		eN	0	54	03						
		eS <sub>E</sub>	0	55	34						
		eS <sub>N</sub>	0	55	39						
		eS <sub>Z</sub>	0	55	42						
		M <sub>E</sub>	0	56	35	6.2	-6				
		M <sub>N</sub>	0	56	32	6.2		+6			
eF	1	16	$\pm$								
244	Oct. 19	eP <sub>E</sub>	2	41	07					980	Ditto.
		eP <sub>Z</sub>	2	41	06						
		eP <sub>N</sub>	2	41	13						
		eS <sub>E</sub>	2	42	55						
		eS <sub>N</sub>	2	42	52						
		eS <sub>Z</sub>	2	43	10						
		M <sub>Z</sub>	2	43	45	7.2			$\pm 2$		
		M <sub>E</sub>	2	44	23	13.0	-6				
		M <sub>N</sub>	2	44	23			+18			
eF	3	03	$\pm$								
245	Oct. 27	P	19	03	38					92	In the Kii Channel.
		iS <sub>E</sub>	19	03	50		+4				
		S <sub>NZ</sub>	19	03	50		+2	-2			

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
		M <sub>E</sub>	19	03	51	0.7	-8				
		M <sub>NZ</sub>	19	03	51	0.6		$\pm 6$	+2		
		F	19	04	56						
246	Oct. 28	eP <sub>E</sub>	17	24	43						Near Wakayama City.
		eE	17	24	46						
		eF	17	25	12						
247	Oct. 29	i <sub>Z</sub>	2	52	51	1.3					Off the Kumano-nada, SE off Kii Peninsula.
		i <sub>E</sub>	2	53	17	2.6	+7				
		i <sub>N</sub>	2	53	17	1.8			+2		
		eF	2	59	$\pm$				+4		
248	Oct. 30	eP <sub>EN</sub>	2	06	14						South off the Erimo Cape, Hokkaido. Felt in Hokkaido and eastern part of Oou district.
		eP <sub>Z</sub>	2	06	12						
		eE	2	08	11		+2				
		eN	2	08	19				-3		
		eF	2	16	$\pm$						
249	Oct. 31	P <sub>EN</sub>	19	53	58		-1.2	+1.1		69	In the Wakaura Bay. Kii channel.
		iP <sub>Z</sub>	19	53	57				+2.2		
		iS	19	54	07		+15	+8	+2		
		M <sub>EZ</sub>	19	54	07	0.5	-17		$\pm 2$		
		M <sub>N</sub>	19	54	07	0.7			-15		
eF	20	01	$\pm$								
250	Nov. 1	eN	7	00	48						Near the Lake of Timiskaming, NW of Ottawa, Canada. Felt in SE of Canada and NE of U. S. A. By Omori's seismograph.
		M <sub>N</sub>	7	05	10	12.5			$\pm 3$		
		eF	7	15	$\pm$						
251	Nov. 1	eP <sub>EN</sub>	16	28	49					3140	Northern part of Indo-China. Destructive at Near Tonkin.
		eP <sub>Z</sub>	16	28	52						
		eS <sub>Z</sub>	16	33	31						
		eS <sub>E</sub>	16	33	42						



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
252	Nov. 6	eN	16 35 03						
		M <sup>1</sup> <sub>N</sub>	16 39 42	9.9	+50				
		M <sup>1</sup> <sub>E</sub>	16 40 48	10.4	+40				
		M <sup>2</sup> <sub>N</sub>	16 41 07	10.4	+63				
		M <sub>Z</sub>	16 41 45	10.0			$\pm 13$		
		M <sup>2</sup> <sub>E</sub>	16 42 35	7.1	-38				
		cF	17 25 ±						
253	Nov. 7	SE <sub>N</sub>	12 35 55		+1	-1		Near Gobô, Mouth of the Hidaka River, Wakayama Prefecture. P phase is not di- stinct.	
		S <sub>Z</sub>	12 35 54				-0.5		
		M <sub>E</sub>	12 35 55	0.4	$\pm 1$				
		M <sub>N</sub>	12 35 56	0.4			-2		
		M <sub>Z</sub>	12 35 55	0.3			+1		
		F	12 36 15						
254	Nov. 9	eP <sub>EN</sub>	4 34 33				41	Local shock? Small movement.	
		S <sub>E</sub>	4 34 39		+1				
		iS <sub>N</sub>	4 34 39			+1			
		M <sub>E</sub>	4 34 40	0.3	$\pm 2$				
		M <sub>N</sub>	4 34 39	0.1		+3			
		eF	4 35 20						
255	Nov. 11	eP <sub>EZ</sub>	4 01 26				435	Near Kurosima, Northern part of Ryûkyû IIs.	
		eP <sub>N</sub>	4 01 24						
		eS <sub>EN</sub>	4 02 25		-1	-1			
		S <sub>Z</sub>	4 02 27				+1		
		M <sub>E</sub>	4 02 43	1.6	$\pm 2$				
		M <sub>N</sub>	4 02 41	1.2		$\pm 2$			
		M <sub>Z</sub>	4 02 40	1.4			$\pm 1$		
eF	4 09 ±								
256	Nov. 11	eE	18 59 06	1.0	$\pm 2$			Ditto.	
		eN	18 59 06	0.9		$\pm 3$			
		eZ	18 59 06	0.8			$\pm 2$		
		eF	18 59 57						
257	Nov. 12	iE	6 07 07		-1			Local shock.	
		iN	6 07 06				-2		
		iZ	6 07 05				+1		
		M <sub>E</sub>	6 07 09	0.5	$\pm 2$				
		M <sub>NZ</sub>	6 07 08	0.6		$\pm 1$	$\pm 2$		
258	Nov. 12	eN	21 40 47					Northern part of Sumatora.	
		M <sub>N</sub>	21 54 09	21.0		$\pm 2$			
		eF	22 21 ±						
259	Nov. 14	eP <sub>N</sub>	20 04 40				4755?	Near New Ireland, Melanesia?	
		eP <sub>Z</sub>	20 04 41						
		eE	20 05 58						
		eS <sub>E</sub>	20 10 59						
		eS <sub>N</sub>	20 11 02						
		eZ	20 14 06						
		M <sub>E</sub>	20 20 01	18.5	$\pm 2$				
		M <sub>N</sub>	20 20 22	22.0		$\pm 2$			
260	Nov. 15	M <sub>Z</sub>	20 18 53	22.0				South off Kinkwazan, Miya- gi Prefecture.	
		eF	20 58 ±				$\pm 2$		
		eE	9 59 51						
		eN	9 59 43						
		eM <sub>E</sub>	10 01 13	3.2	$\pm 2$				
261	Nov. 18	eF	10 05 ±					Upper Valley of the Naka River, Tokushima Prefecture.	
		P	23 40 07		-2	+2	130		
		iE	23 40 12	0.8	+10				
		iN	23 40 10	0.7		+10			
		iZ	23 40 12	0.7			+9		



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
262	Nov. 19	iS	23	40	25		+23	+17	+19	71	Lower basin of the Arita River, Wakayama Prefecture.
		M <sup>1</sup> <sub>E</sub>	23	40	27	0.8	+54				
		M <sub>N</sub>	23	40	26	0.8		-07			
		M <sup>1</sup> <sub>Z</sub>	23	40	26	1.1			-23		
		M <sup>2</sup> <sub>E</sub>	23	40	33	1.9	-73				
		M <sup>2</sup> <sub>Z</sub>	23	40	31	1.1			+32		
		eF	23	50	±						
		P <sub>E</sub>	10	38	53		+1				
		eP <sub>N</sub>	10	38	53						
		P <sub>Z</sub>	10	38	52				+0.5		
263	Nov. 19	S <sub>EN</sub>	10	39	02		-1	+2		253	Near Tokuyama, Middle basin of the Ooi River, Sizuoka Prefecture.
		M <sub>E</sub>	10	39	03	0.6	-4				
		M <sub>N</sub>	10	39	03	0.4		-5			
		M <sub>Z</sub>	10	39	03	0.5			-1		
		eF	10	39	41						
		P <sub>E</sub>	17	45	14						
		P <sub>N</sub>	17	45	15						
		P <sub>Z</sub>	17	45	13						
		i	17	45	17		+1	-2	-2		
		i <sub>E</sub>	17	45	39		+4				
264	Nov. 20	i <sub>N</sub>	17	45	34			+2		421?	Northern part of the Kasima-nada.
		i <sub>Z</sub>	17	45	32				+2		
		S <sub>EN</sub>	17	45	48		+5	+5			
		eS <sub>Z</sub>	17	45	49						
		M <sub>E</sub>	17	45	54	0.7	+20				
		M <sub>N</sub>	17	45	53	1.0		±8			
		M <sub>Z</sub>	17	45	53	0.8			-4		
		eF	17	52	±						
		e <sub>E</sub>	21	52	32						
		e <sub>E</sub>	21	52	59						
265	Nov. 21	e <sub>N</sub>	21	52	58					74	Lower basin of the Hidaka River, Wakayama Prefecture.
		e <sub>E</sub>	21	53	05	2.1	+3				
		e <sub>N</sub>	21	53	04	2.3		±3			
		e <sub>E</sub>	21	52	32						
		e <sub>N</sub>	21	52	59						
266	Nov. 22	e <sub>E</sub>	21	52	32					83	In the Kii Channel.
		e <sub>N</sub>	21	52	59						
		e <sub>Z</sub>	21	52	58						
		e <sub>E</sub>	21	53	05	2.1	+3				
		e <sub>N</sub>	21	53	04	2.3		±3			
		iP <sub>E</sub>	11	28	46		+2.9				
		P <sub>N</sub>	11	28	46			+2.0			
		iP <sub>Z</sub>	11	28	46	0.3			+4.4		
		iSM <sub>E</sub>	11	28	57	0.4	+16				
		iS <sub>N</sub>	11	28	57				-6		
267	Nov. 25	iS <sub>Z</sub>	11	28	57				-3	74	Lower basin of the Hidaka River, Wakayama Prefecture.
		M <sub>N</sub>	11	29	00	0.8		+13			
		eF	11	35	±						
		iP <sub>Z</sub>	2	29	18	0.3			+3.7		
		iP <sub>EN</sub>	2	29	19	1.0	+4.9	+13.6			
		PM <sub>Z</sub>	2	29	19	0.5			-25		
		iS <sub>EN</sub>	2	29	29		+56	-34			
		iS <sub>Z</sub>	2	29	28				-20		
		M <sub>E</sub>	2	29	30	0.8	+57				
		M <sub>N</sub>	2	29	31	0.8		-74			
268	Nov. 25	M <sub>Z</sub>	2	29	29	0.4			+25	421?	Northern part of the Kujū-kuri-hama, Tiba Prefecture.
		eF	2	35	±						
		eP <sub>E</sub>	4	20	07						
		eP <sub>N</sub>	4	20	08						
		e <sub>EN</sub>	4	20	17						
		e <sub>Z</sub>	4	20	19						
		eS <sub>E</sub>	4	21	12						
		S <sub>N</sub>	4	21	04						
		eS <sub>Z</sub>	4	21	03						
		M <sub>E</sub>	4	21	37	2.6	+7				
269	Nov. 25	M <sub>N</sub>	4	21	24	4.0		-5		421?	Northern part of the Kujū-kuri-hama, Tiba Prefecture.
		M <sub>Z</sub>	4	21	35	2.4			±2		



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
269	Nov. 25	eF	4 31 ±					NW of Sumatora.	
		ePz	10 11 25						
		eE	10 12 38						
		eN	10 13 18						
		eE	10 17 52						
		eN	10 17 28						
		eZ	10 17 08						
		eN	10 21 21						
		eN	10 26 12						
		M <sub>E</sub>	10 32 32	19.0	±3				
		M <sub>N</sub>	10 31 31	16.5		±3			
		M <sub>Z</sub>	10 32 20	18.5		±3			
eF	10 52 ±								
270	Nov. 30	eE	3 36 08	3.9	-4		In the Bashee Channel.		
		eN	3 36 01			-2			
		eF	3 41 ±						
271	Dec. 1/2	eP <sub>E</sub>	23 47 12				1210 Off the Amami-ōsima, northern part of Ryūkyū IIs.		
		eP <sub>N</sub>	23 47 09						
		eP <sub>Z</sub>	23 47 08						
		eS <sub>N</sub>	23 49 14						
		eS <sub>Z</sub>	23 49 17						
		eZ	23 49 47						
		M <sup>1</sup> <sub>E</sub>	23 50 03	11.6	-15				
		M <sup>1</sup> <sub>N</sub>	23 50 16	10.3		+15			
		M <sup>2</sup> <sub>N</sub>	23 51 39	8.6		+17			
		M <sub>Z</sub>	23 51 52	10.0		±5			
M <sup>2</sup> <sub>E</sub>	23 53 44	11.0	-17						
eF	0 07 ±								
272	Dec. 2	eP <sub>E</sub>	16 44 36				Off the Amami-ōsima, northern part of Ryūkyū IIs.		
		eP <sub>N</sub>	16 44 33						
		eS <sub>E</sub>	16 46 17						
		eS <sub>N</sub>	16 46 16						

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
273	Dec. 3	M <sub>E</sub>	16 47 38	11.7	-10			66 Near Azumi, Upper Valley of the Ibo River, Hyōgo Prefecture.	
		M <sub>N</sub>	16 47 46	11.2		+9			
		eF	17 04 ±						
		P <sub>E</sub>	8 33 50		+1				
		P <sub>NZ</sub>	8 33 49			-1.5	+1		
		i <sub>Z</sub>	8 33 50				+2		
		iS <sub>EN</sub>	8 33 58		-6	-5			
		S <sub>Z</sub>	8 33 58				-2		
		M <sub>EN</sub>	8 33 59	0.8	-9	+6			
		M <sup>1</sup> <sub>Z</sub>	8 33 59	0.9			+5		
M <sup>2</sup> <sub>Z</sub>	8 34 02	0.8			±4				
eF	8 35 27								
274	Dec. 7	P <sub>EN</sub>	17 06 02				65 Near Wakayama City.		
		iP <sub>Z</sub>	17 06 02			+1.9			
		i <sub>E</sub>	17 06 05	0.6	+9				
		i <sub>N</sub>	17 06 05	0.7		-12			
		i <sub>Z</sub>	17 06 04					-6	
		i <sub>E</sub>	17 06 10		-8				
		iS <sub>EN</sub>	17 06 11		+48	+30			
		iS <sub>Z</sub>	17 06 10					-10	
		M <sup>1</sup> <sub>N</sub>	17 06 12	0.5		+32			
		M <sub>E</sub>	17 06 17	0.6	-60				
		M <sup>2</sup> <sub>N</sub>	17 06 17	0.5		±40			
		M <sub>Z</sub>	17 06 23	2.9				±11	
		i <sub>E</sub>	17 07 12	3.1	±20				
i <sub>N</sub>	17 07 16	2.9		+20					
i <sub>Z</sub>	17 07 16	2.6			±10				
eF	17 13 ±								
275	Dec. 14	i <sub>N</sub>	1 49 48			-3	Upper Valley of the Amazon River, near border of Peru and Brazil.		
		i <sub>Z</sub>	1 49 48	4.4		+15			
		i <sub>E</sub>	1 49 54		-11				
		i <sub>E</sub>	1 51 10	2.5	-10				
		eF	1 56 ±						



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
276	Dec. 14	ePz	12 50 51.5					1560	South far off Bonin Isl. Felt in Bonin Isl.
		P <sub>E</sub>	12 50 53.0		+3				
		P <sub>N</sub>	12 50 54.7			-1			
		iP <sub>NZ</sub>	12 50 55.0			+7	+7		
		i <sub>E</sub>	12 51 59	4.8	-17				
		i <sub>N</sub>	12 52 01			-15			
		i <sub>N</sub>	12 52 10	3.2		+25			
		iS <sub>E</sub>	12 53 36		+33				
		iS <sub>N</sub>	12 53 35			-15			
		eS	12 53 32						
		M <sub>E</sub>	12 54 20	4.9	+27				
		M <sub>N</sub>	12 53 53	4.2		-25			
		M <sub>Z</sub>	12 53 54	3.1			$\pm 8$		
		eF	13 11 $\pm$						
277	Dec. 14	e <sub>E</sub>	22 34 24						Near Guatemala, Central America.
		e <sub>N</sub>	22 34 34						
		e <sub>Z</sub>	22 34 41						
		e <sub>Z</sub>	23 07 43						
		e <sub>E</sub>	23 08 30	27.0					
		e <sub>Z</sub>	23 29 09	20.0			$\pm 1$		
		eF	0 04 $\pm$						
278	Dec. 15	eP <sub>N</sub>	7 16 49					5750	Near Solomon IIs. Melanesia.
		eP <sub>Z</sub>	7 16 51						
		i <sub>E</sub>	7 17 13	4.0	+16				
		e <sub>Z</sub>	7 18 14				+10		
		e <sub>N</sub>	7 18 27			+14			
		P <sub>R1N</sub>	7 19 27	3.7		+15			
		P <sub>R1Z</sub>	7 19 23				+11		
		P <sub>R2E</sub>	7 20 01	4.5	+20				
		e <sub>Z</sub>	7 22 49						
		eS <sub>E</sub>	7 24 11						
		eS <sub>N</sub>	7 24 31						
		eS <sub>Z</sub>	7 24 29						
e <sub>Z</sub>	7 26 31								

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks				
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$						
		L <sub>E</sub>	7 29 46	43.0	-27								
		L <sub>N</sub>	7 29 49	43.0		+20							
		cL <sub>Z</sub>	7 31 08										
		M <sub>E</sub>	7 36 11	15.3	+85								
		M <sub>N</sub>	7 35 40	14.5		+210							
		M <sub>Z</sub>	7 35 55	17.0			$\pm 15$						
		eF	9 20 $\pm$										
		279	Dec. 17	eP <sub>EN</sub>	19 20 49							1720	South far off Miyako Isl, Southern part of Ryūkyū IIs.
				eP <sub>Z</sub>	19 20 54								
				i <sub>EN</sub>	19 21 10		+16			+20			
i <sub>Z</sub>	19 21 12						-16						
i <sub>E</sub>	19 22 49			3.0	+23								
eS <sub>E</sub>	19 23 47												
eS <sub>Z</sub>	19 23 52												
L <sub>N</sub>	19 24 19			39.0									
cL <sub>Z</sub>	19 24 21												
M <sup>1</sup> <sub>E</sub>	19 26 00			19.5	-50								
M <sup>1</sup> <sub>N</sub>	19 26 01	21.0		-20									
M <sup>2</sup> <sub>N</sub>	19 29 28	11.5		+50									
M <sub>Z</sub>	19 28 40	16.5			$\pm 8$								
M <sup>2</sup> <sub>E</sub>	19 30 49	10.0	-48										
eF	20 15 $\pm$												
280	Dec. 18	e <sub>N</sub>	7 24 28						Upper valley of the Yangtz River, Destructive at Ma- Pien, Szechwan, China.				
		M <sub>N</sub>	7 26 08	14.0		$\pm 8$							
		M <sub>E</sub>	7 28 03	12.0	$\pm 9$								
		eF	7 40 $\pm$										
281	Dec. 18	e <sub>N</sub>	17 12 00						Ditto.				
		e <sub>E</sub>	17 12 50										
		e <sub>Z</sub>	17 13 06										
		M <sub>E</sub>	17 17 25	8.5	$\pm 2$								
		M <sub>Z</sub>	17 18 02	8.1	.		+2						
		eF	17 30 $\pm$										



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
282	Dec. 20	eE	5 48 48					Northern part of the Kasimada, Felt in Kwanto and southern part of Oou districts.	
		eZ	5 48 49						
		eN	5 48 55						
		SN	5 49 23						
		eSz	5 49 18						
		ME	5 50 53	2.7	+1.4				
		eF	6 05 ±						
283	Dec. 20	ePN	18 45 43				Near Solomon IIs. Melanesia.		
		ePE	18 45 56						
		ePZ	18 45 54						
		ME	19 04 45	16.0	±4				
		MN	19 04 31	15.0		±3			
		MZ	19 04 23	23.0				±1	
		eF	19 28 ±						
284	Dec. 21	ePEN	0 16 38				123 Near Sisaka Isl, Ehime Prefecture.		
		ePZ	0 16 48						
		eSE	0 16 54						
		SN	0 16 55						
		eSz	0 16 55						
		ME <sub>N</sub>	0 16 59	0.7	-6	+7			
		MZ	0 17 02	0.9				-4	
		eF	0 21 ±						
285	Dec. 21	SE	0 34 26		+4		Middle basin of the Hidaka River, Wakayama Prefecture.		
		SN	0 34 27			-4			
		eSz	0 34 27						
		ME	0 34 29	0.6	-13				
		MN	0 34 29	0.7				-5	
		MZ	0 34 31	0.8				+2	
		eF	0 37 ±						
286	Dec. 21	P	6 17 24		+2	-2	-1.5	112 Near Komono, northern part of Mie Prefecture.	
		iPEN	6 17 25		-7	+7			
		iPZ	6 17 24				+5		

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
287	Dec. 23	S	6 17 40		-4	-3		161 Near Ohara, upper basin of the Yahagi River, Aiti Prefecture.	
		eSz	6 17 39						
		ME	6 17 42	1.0	+10				
		MN	6 17 42	0.6			-10		
		MZ	6 17 43						±3
		eF	6 21 ±						
		eP	0 29 45						
		iEN	0 29 53	0.8	-6	-6			
288	Dec. 28	iz	0 29 52	0.9				5380 Destructive at Batoe Isl. 97°9E 0°3S. Felt in North and West Sumatora, according to Batavia's report.	
		iSE	0 30 06		+16				
		SN	0 30 06				+5		
		Sz	0 30 05						+3
		ME	0 30 21	1.0	±15				
		MN	0 30 22	1.4			-19		
		MZ	0 30 21	1.5					±4
		eF	0 38 ±						
ePNZ	2 44 06								
ePE	2 44 13								
iPZ	2 44 16					+11			
iE	2 44 28	4.5	+46						
iN	2 44 29	4.2			+37				
iz	2 44 27	4.3				+35			
PR <sub>1</sub> E	2 45 41		+35						
PR <sub>2</sub> E	2 46 07	4.1	-25						
PR <sub>2</sub> N	2 46 06	3.5			+16				
eN	2 49 49								
eZ	2 49 52								
eSEZ	2 51 09								
eSN	2 51 16								
iz	2 51 37	36.0				±12			
iE	2 51 43	39.0	±6.5						
iN	2 51 42	38.0			±60				
iE	2 55 19	18.0	±40						
iN	2 55 18	20.0			±45				



# SUMOTO JAPAN.

## SEISMOLOGICAL BULLETIN

A Branch Station of the Kobe Meteorological Observatory of Japan.  
 $\varphi = 34^\circ 21'$   $\lambda = 134^\circ 53'$   $h = 109.0$  m. Underground: Cretaceous.

Instrument: Omori's Seismograph.  
 (Horizontal Pendulum.)

Wiechert Seismograph.  
 (Horizontal & Vertical)

### Oct.

	$T_0$	$\varepsilon$	$\frac{r}{T_0^2}$	V
AE:	16.6	2.0	0.001 <sup>(-)</sup>	20
AN:	19.6	2.5	0.001 <sup>(-)</sup>	20

	$T_0$	$\varepsilon$	$\frac{r}{T_0^2}$	V
AE:	4.6	Aperiodic	0.002	118
AN:	4.5	"	0.003	98
AZ:	4.3	"	0.002	60

### Nov.

	$T_0$	$\varepsilon$	$\frac{r}{T_0^2}$	V
AE:	17.0	3.1	0.001 <sup>(-)</sup>	20
AN:	19.8	3.2	0.001 <sup>(-)</sup>	20

	$T_0$	$\varepsilon$	$\frac{r}{T_0^2}$	V
AE:	4.8	Aperiodic	0.003	114
AN:	4.6	"	0.003	93
AZ:	4.2	"	0.002	62

### Dec.

	$T_0$	$\varepsilon$	$\frac{r}{T_0^2}$	V
AE:	17.5	2.8	0.001 <sup>(-)</sup>	20
AN:	19.5	3.1	0.001 <sup>(-)</sup>	20

	$T_0$	$\varepsilon$	$\frac{r}{T_0^2}$	V
AE:	4.9	Aperiodic	0.003	107
AN:	4.5	"	0.002	102
AZ:	4.2	"	0.002	60

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		AE	AN	Az		
275	Oct. 2	cPEN	2	56	37	0.5	-1	±1	km.	75	Southern part of the Kii Channel.
		SEN	2	56	47						
		ME	2	56	49						
		MN	2	56	50						
		F	2	57	02						
276	Oct. 2	ePEN	5	35	58	+0.8	+1.0			Off the Ottisi Cape,	

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		AE	AN	Az		
289	Dec. 29/30	iz	2	55	15	20.0			+20	km.	Western part of New Guinea. Felt in Ceram and Amboina. Dutch east Indas.
		ME	3	00	31	33.0	-70				
		MN	3	02	54	24.0		+90			
		MZ	3	02	06	27.0			±25		
		eF	4	40	±						
		cPZ	23	44	39						
		PN	23	44	46			+3			
		PE	23	44	53		+4				
		PZ	23	44	50				-4		
		eS?N	23	50	54						
		eE	23	53	54						
		eLN	23	56	17						
		eLZ	23	56	07						
		MN	0	00	47	18.0		±3			
		MZ	0	02	31	18.0			±2		
eF	0	20	±								



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
		cPz	5 35 59				(+)	Hokkaido, 145°8 E 42°9 N. Weak shocks were felt in eastern part of Hokkaido. Focus deeper than normal.	
		eSEN	5 38 46						
		eSz	5 38 55						
		eLN	5 39 53						
		eLE	5 39 55						
		eLz	5 40 22						
		M <sub>N</sub>	5 40 23	8.2	+3				
		M <sub>E</sub>	5 41 53	15.5	-14				
		M <sub>Z</sub>	5 41 04	19.4		±5			
		ScSEN	5 48 39						
eF	6 33 ±								
277	Oct. 2	iP	9 28 56		+2.1	+1.1	+2.5	394	South off the Sata Cape, Kagosima Prefecture, Kyû- syû. Focal depth about 120 km.
		iSEN	9 29 50						
		iSz	9 29 46						
		M <sub>E</sub>	9 29 50	0.6	-11				
		M <sub>N</sub>	9 29 50	0.8		+15			
		M <sub>Z</sub>	9 29 53	0.8			-5		
		F	9 34 23						
278	Oct. 3	eEN	4 32 17					Near Kitakawa NE of Miya- zaki Prefecture.	
		ez	4 32 19						
		eSEN	4 32 25						
		F	4 33 36						
279	Oct. 3	ePEN	7 00 27					50 Near Wakayama City.	
		SEN	7 00 34						
		MEN	7 00 35	0.4	±1	±2			
		F	7 01 17						
280	Oct. 4	eP	5 21 08		+0.8	-1.0	-1.7	2770	South off Mindanao, Phil- ippine. Felt at Davao.
		S	5 25 34						
		M <sub>E</sub>	5 25 38	4.5	-5				
		M <sub>N</sub>	5 25 38	2.9		-5			
		M <sub>Z</sub>	5 25 40	2.1					
		iE	5 30 59				±1		
								ScS Wave?	

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
		i <sub>N</sub>	5 31 01					102	ScS Wave?  Local shock?
		eF	5 44 ±						
281	Oct. 5	ePEN	0 13 17					102	Local shock?
		SEN	0 13 31						
		M <sub>E</sub>	0 13 31	0.3	±1				
		M <sub>N</sub>	0 13 32	0.3		±1			
		F	0 14 22						
282	Oct. 5	ePEN	1 57 09					54	In the Ise Bay.  Near Gobô, mouth of the Hidaka River, Wakayama Prefecture.
		S	1 57 15						
		M <sub>E</sub>	1 57 16	1.0	+1				
		M <sub>N</sub>	1 57 20	0.8		+1			
		F	1 58 02						
283	Oct. 5	ePEN	10 35 18					54	Near Gobô, mouth of the Hidaka River, Wakayama Prefecture.
		SEN	10 35 21						
		MEN	10 35 22	0.4	-1	±2			
		F	10 35 52						
284	Oct. 5	ePEN	11 13 49					54	Lower basin of the Arita R., Wakayama Prefecture.
		S	11 13 56						
		M <sub>E</sub>	11 13 57	0.5	-4				
		M <sub>N</sub>	11 13 56	0.5		±5			
		M <sub>Z</sub>	11 13 56				±2		
285	Oct. 5	ePEN	21 20 30					54	In the Nara basin.
		S	21 20 37						
		M <sub>E</sub>	21 20 37		-4				
		M <sub>N</sub>	21 20 37	0.5		+6			
		M <sub>Z</sub>	21 20 37				±8		
		F	21 22						
286	Oct. 5	SEN	23 46 51		+2	-1		54	Near Gobô, mouth of the Hidaka River, Wakayama Prefecture.
		M <sub>E</sub>	23 46 51	0.5	-1				



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		AE	AN	Az		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
287	Oct. 6	MN	23	46	52	0.4		-2		Ditto.	
		F	23	47	25						
		SEN	1	04	21						
		ME	1	04	21	0.5	-1				
		MN	1	04	22	0.6		$\pm 1$			
		F	1	04	40						
288	Oct. 6	eEN	3	36	34					Near Miyake Isl, south off Izu Peninsula.	
		eF	3	43	$\pm$						
289	Oct. 6	ePEN	5	27	08					29 Local shock,	
		SEN	5	27	12						
		MEN	5	27	12		-1	-2			
		F	5	27	38						
290	Oct. 7	e	15	42	52		-1	-1	(+)	West off Hatidyô Isl.	
		eN	15	43	04						
		eF	15	45	$\pm$						
291	Oct. 11	ePEN	4	45	31					29 Near Wakayama City.	
		SEN	4	45	35						
		ME	4	45	35		-2				
		MN	4	45	35	0.4		-2			
		F	4	46	04						
292	Oct. 11	PE	22	23	17					4245 South far off Truk Isl, East Caroline IIs.	
		PNZ	22	23	16						
		eSEN	22	29	17						
		LE	22	32	05						
		LN	22	32	16						
		MN	22	32	26	12.2		-20			
		ME	22	34	41	15.0	-50				
		MZ	22	35	35	16.9			$\pm 25$		
		eF	23	23	$\pm$						

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		AE	AN	Az		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
293	Oct. 12	iP	16	15	40		+1.7	-5.1	-5.0	46 Lower basin of the Arita R., Wakayama Prefecture.	
		iS	16	15	46						
		ME	16	15	47	0.5	-6				
		MN	16	15	47	0.6		-10			
		MZ	16	15	51				$\pm 3$		
		F	16	16	56						
294	Oct. 12	PEN	16	47	34					1000 NE off Miyako, Iwate Prefecture. Moderate shocks were felt in Pacific coast of Oou district.	
		PZ	16	47	32						
		SE	16	49	21						
		SN	16	49	18						
		Sz	16	49	26						
		ME	16	50	49	14.5	-1008				
		MN	16	50	49	10.9		+400			
		MZ	16	51	19	14.1			-450		
		The end part overlapped by the following earthquake.									
295	Oct. 12	ePZ	17	02	50					1150 An after shock of No. 294	
		ePE	17	02	57						
		ePN	17	02	56						
		eSz	17	04	41						
		eSE	17	05	03						
		eSN	17	05	09						
		ME	17	05	26	7.4	-41				
		MN	17	05	48	15.6		-250			
		MZ	17	05	41	16.9			-200		
		The end part overlapped by the following earthquake.									
296	Oct. 12	PEN	18	16	29		+0.8	+1.0	+?	1130 Ditto.	
		PZ	18	16	30						
		eSE	18	18	31						
		eSN	18	18	28						
		ME	18	20	46	10.1	-43				
		MN	18	20	25	10.0		-44			
		MZ	18	21	27	10.6			-10		
				eF	18	60	$\pm$				



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
297	Oct. 13	PE	1 59 44				1130	Ditto.	
		PNZ	1 59 45						
		SEN	2 01 47						
		SZ	2 01 42						
		ME	2 02 29	6.8	-27				
		MN	2 02 44	7.5		-44			
		MZ	2 02 28	3.8					-5
		eF	2 30 ±						
298	Oct. 14	PEN	3 55 38				36	Near Simotu, south of Wakayama City.	
		S	3 55 43						
		MEN	3 55 45	0.4	+3	+7			
		MZ	3 55 48						±1
		F	3 56 42						
299	Oct. 15	iP	14 36 11		+1.7	-7.1	+3.3	377	NW off Noto Peninsula, Japan Sea. Abnormal felt area in Kwantô and Kusiro, Hokkaidô. Focal depth about 280km.
		iSEN	14 37 01						
		iSZ	14 37 03						
		ME	14 37 04	2.1	+15				
		MN	14 37 04	2.6		-31			
		MZ	14 37 04	1.9			-12		
		eF	14 47 ±						
300	Oct. 17	SN	3 48 39				0.5	Near Gobô, mouth of the Hidaka River Wakayama Prefecture.	
		MN	3 48 39			±1			
		F	3 49 15						
301	Oct. 17	LN	14 58 12					Felt in North Sumatra.	
		LE	15 04 12						
		LZ	15 04 34						
		eF	15 18 ±						
302	Oct. 18	PEN	0 14 19		+2.5	+2.0	1060	ENE off Miyako, Iwate Prefecture. 143°SE 40°2N. Felt in Oou and Hokkaidô.	
		ePz	0 14 19						
		SE	0 16 12						
		SN	0 16 14						

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks			
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$					
303	Oct. 18	SZ	0 16 13				6.8	-220				
		ME	0 17 08									
		MN	0 17 13			9.8			-669			
		MZ	0 17 22			4.6				+37		
		The end part overlapped by the following earthquake.										
		ePEN	0 31 36									
		ePz	0 31 53									
		SEN	0 34 14									
304	Oct. 18	ME	0 34 22				9.0	+39				
		MN	0 34 28			8.3			-31			
		eF	1 51 ±									
		S	5 45 03									
305	Oct. 18	ME	5 45 03				5.6	-2				
		MN	5 45 04						+3			
		MZ	5 45 05							±1		
		F	5 45 34									
		ePE	5 54 00									
306	Oct. 18	ePN	5 54 08				7.5	-2				
		ez	5 55 59									
		eSE	5 56 04									
		eSN	5 56 08									
		ME	5 56 43			5.6			-2			
		MN	5 56 57			7.5			-2			
		F	6 13 ±									
307	Oct. 18	ePE	6 12 02					1200				
		ePN	6 12 00									
		ez	6 13 06									
		eSN	6 15 08									
307	Oct. 18	eF	6 23 ±					2550				
		PN	11 10 22						+1.0			
PEZ	11 10 25							-1.7				
Middle part of Caroline IIs, Pacific Ocean.												



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
308	Oct. 18	SE	11 14 34					1080	An after shock of No. 302. Felt in Pacific Coast of Oou and Hokkaidô.
		SN	11 14 38						
		SZ	11 14 27						
		SME	11 15 05	6.0	+17				
		SMN	11 15 04	6.0		+31			
		LE	11 15 48						
		ME	11 16 06	10.3	-104				
		LNZ	11 16 23						
		MN	11 16 31	18.0		+213			
		MZ	11 16 36	18.8		+200			
		eF	12 42 ±						
		eP	14 56 06						
SEN	14 58 02								
SZ	14 58 01								
MEN	14 58 07	7.5	+39	-51					
MZ	15 00 04	11.8		-60					
F	15 53 ±								
309	Oct. 18	PE	21 53 42		+0.8		1030	Ditto.	
		PN	21 53 45			-1.0			
		PZ	21 53 47						
		SEN	21 55 34						
		SZ	21 55 38						
		ME	21 56 30	8.4	-14				
		MN	21 56 42	5.3		-20			
		MZ	21 56 17	5.0		-3			
eF	22 22 ±								
310	Oct. 19	PE	0 53 54				1090	Ditto.	
		PN	0 53 50			+1.0			
		ez	0 53 59						
		SE	0 55 50						
		SN	0 55 48						
		ME	0 56 50	6.0	±2				
		MN	0 56 50	7.5		-5			

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
311	Oct. 19	eF	1 13 ±				1190	Ditto.	
		cPEN	2 41 12						
		ez	2 41 20						
		eSEN	2 43 20						
		eSZ	2 43 28						
		ME	2 44 05	10.3	+3				
		MN	2 44 21	7.0		+4			
		MZ	2 43 57	9.0		-2			
		eF	3 03 ±						
		312	Oct. 21	PEN	13 38 04				
S	13 38 10								
MEN	13 38 12			0.4	-3	+8			
MZ	13 38 12					±1			
F	13 38 11								
313	Oct. 22	ePEN	14 04 02				36	Local shock.	
		SEN	14 04 07						
		MEN	14 04 07		±1	±1			
		F	14 04 26						
314	Oct. 23	ePEN	23 02 00				54	Near Goryô, Middle basin off the Arita River, Waka- yama Prefecture.	
		SEN	23 02 02						
		ME	23 02 03		+1				
		MN	23 02 03	0.4		+4			
		F	23 02 28						
315	Oct. 27	P	19 03 33			-1.5	54	In the Kii Channel.	
		S	19 03 41						
		MEN	19 03 41	0.4	-9	+20			
		MZ	19 03 42	0.6		-7			
		F	19 04 37						
316	Oct. 28	ePEN	4 10 02				106	In the Kii Channel.	
		S	4 10 16						



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
317	Oct. 28	M <sub>E</sub>	4	10	17	0.6	$\pm 1$			99	Southern part of the Kii Channel.
		M <sub>N</sub>	4	10	17	0.7		-3			
		F	4	10	53						
		eP <sub>E</sub>	17	24	20						
		P <sub>N</sub>	17	24	20			-1.0			
		S <sub>EN</sub>	17	24	33						
		M <sub>E</sub>	17	24	36	0.4	+2				
M <sub>N</sub>	17	24	35	0.4		-5					
F	17	25	16								
318	Oct. 29	eP <sub>EN</sub>	14	57	03					1080	Near Gobô, mouth of the Hidaka River, Wakayama Prefecture.
		S <sub>EN</sub>	14	57	05						
		M <sub>EN</sub>	14	57	06	0.4	+1	$\pm 2$			
		F	14	57	36						
319	Oct. 30	eP	2	06	08					1080	South of the Erimo Cape, Hokkaidô, Felt in Hokkaidô and eastern part of Oou district.
		eS <sub>EN</sub>	2	08	04						
		eF	2	16	$\pm$						
320	Oct. 30	e <sub>EN</sub>	4	22	50					1080	Local shock.
		S <sub>EN</sub>	4	22	55						
		M <sub>N</sub>	4	22	55			$\pm 0.1$			
		F	4	23	39						
321	Oct. 31	iP	19	57	42		+2.6	-4.8	-4.0	36	Time is uncertain. In the Wakaura bay, Kii channel.
		S	19	57	46						
		M <sub>E</sub>	19	57	47	0.6	+2.6				
		M <sub>N</sub>	19	57	47	0.5		+4.3			
		M <sub>Z</sub>	19	57	52	0.4			-8		
		F	20	01	42						
322	Nov. 1	P <sub>E</sub>	16	28	18					3500	Northern part of Indo-China. Destructive in near Tonkin.
		eP <sub>N</sub>	16	28	24						
		P <sub>Z</sub>	16	28	23				-0.8		
		S <sub>E</sub>	16	33	34						

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
323	Nov. 2	S <sub>N</sub>	16	33	42					28	Near Wakayama City.
		eZ	16	34	34						
		L <sub>N</sub>	16	38	12						
		LEZ	16	39	28						
		M <sub>N</sub>	16	39	30	11.8		-188			
		M <sub>E</sub>	16	41	37	12.0	-210				
		M <sub>Z</sub>	16	41	41	11.6			-122		
Fe	17	17	$\pm$								
324	Nov. 2	eP <sub>EN</sub>	15	36	27					28	Near Wakayama City.
		S <sub>EN</sub>	15	36	31						
		M <sub>E</sub>	15	36	32	0.4	-2				
		M <sub>N</sub>	15	36	32	0.4		-3			
F	15	47	00								
325	Nov. 4	eP <sub>EN</sub>	16	19	02					53	Near Tanabe, Wakayama Prefecture.
		S <sub>EN</sub>	16	19	09						
		M <sub>EN</sub>	16	19	09	0.4	+3	+4			
		F	16	19	45						
326	Nov. 6	P <sub>EN</sub>	12	35	39					45	Near Gobô, mouth of the Hidaka River, Wakayama Prefecture.
		S <sub>EN</sub>	12	35	45						
		M <sub>EN</sub>	12	35	46		+2	-3			
		F	12	36	16						
327	Nov. 9	P	4	01	20					404	Near Kurosima, northern part of Ryûkyû IIs.
		S <sub>EN</sub>	4	02	15						
		eS <sub>Z</sub>	4	02	13						
		M <sub>E</sub>	4	02	31	1.5	$\pm 2$				
		M <sub>N</sub>	4	02	47	1.8		$\pm 3$			
		M <sub>Z</sub>	4	02	29	1.5			$\pm 1$		
F	4	07	$\pm$								
328	Nov. 10	S <sub>EN</sub>	18	49	29					404	Basin of the Arita River Wakayama Prefecture.
		M <sub>E</sub>	18	49	29		-1				
		M <sub>N</sub>	18	49	29	0.4		-2			



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
328	Nov. 11	F	18	49	49					51	Basin of the Hidaka River, Wakayama Prefecture.
		P <sub>EN</sub>	2	25	45						
		S	2	25	52						
		M <sub>E</sub>	2	25	53	0.5	-3				
		M <sub>N</sub>	2	25	53	0.6		+5			
		M <sub>Z</sub>	2	25	53				$\pm 2$		
		F	2	26	34						
329	Nov. 11	S <sub>EN</sub>	12	10	44					Near Wakayama City.	
		M <sub>N</sub>	12	10	44			$\pm 1$			
		F	12	10	53						
330	Nov. 12	S <sub>EN</sub>	3	09	39					Local shock.	
		M <sub>E</sub>	3	09	39		$\pm 1$				
		M <sub>N</sub>	3	09	40			$\pm 1$			
		F	3	10	04						
331	Nov. 13	eP <sub>EN</sub>	1	02	46					53	Basin of the Arita River, Wakayama Prefecture.
		S <sub>EN</sub>	1	02	54						
		M <sub>E</sub>	1	02	54	0.4	-3				
		M <sub>N</sub>	1	02	54	0.5		-3			
		F	1	03	23						
332	Nov. 14	eP <sub>E</sub>	20	04	37					Near New Ireland, Melanesia.	
		eP <sub>N</sub>	20	04	38						
		P <sub>Z</sub>	20	04	37						
		e <sub>EN</sub>	20	06	32						
		e <sub>EN</sub>	20	10	52						
		L <sub>E</sub>	20	14	19						
		L <sub>N</sub>	20	14	21						
		F	20	35	$\pm$						
333	Nov. 15	eP	4	13	50					25	Near Wakayama City.
		S	4	13	53						
		M <sub>E</sub>	4	13	54	0.5	-5				

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
		M <sub>N</sub>	4	13	54	0.4		-8			
		M <sub>Z</sub>	4	13	54				$\pm 1$		
		F	4	14	48						
334	Nov. 15	e <sub>EN</sub>	5	50	51					Near Tadono, middle basin of the Arita River, Waka- yama Prefecture.	
		S <sub>EN</sub>	5	50	52						
		M <sub>E</sub>	5	50	53	0.9	$\pm 1$				
		M <sub>N</sub>	5	50	53	0.7		$\pm 1$			
		F	5	51	24						
335	Nov. 17	eP <sub>EN</sub>	5	21	02					42	Ditto.
		S	5	21	08						
		M <sub>E</sub>	5	21	09	0.4	-3				
		M <sub>N</sub>	5	21	10	0.4		-4			
		M <sub>Z</sub>	5	21	09				$\pm 1$		
336	Nov. 17	eP <sub>EN</sub>	10	09	51					Near Yuasa, Wakayama Prefecture.	
		S <sub>EN</sub>	10	09	55						
		M <sub>E</sub>	10	09	56		$\pm 1$				
		M <sub>N</sub>	10	09	56	0.4		-2			
		F	10	10	18						
337	Nov. 17	eP <sub>EN</sub>	14	23	40					45	Near Gobô, mouth of the Hidaka River, Wakayama Prefecture.
		S <sub>EN</sub>	14	23	46						
		M <sub>E</sub>	14	23	46	0.4	$\pm 1$				
		M <sub>N</sub>	14	23	47	0.4		-2			
		F	14	24	11						
*338	Nov. 18	iP	23	39	58		-0.9	+2.2	-0.8 (+3.2)	85	Perceptible. Upper valley of the Naka River, Tokushima Prefecture.
		S <sub>EN</sub>	23	40	10						
		S <sub>Z</sub>	23	40	09						
		M <sub>E</sub>	23	40	13	0.6	-79				
		M <sub>N</sub>	23	40	13	0.7		+263			
		M <sub>Z</sub>	23	40	13	0.8			+32		
		cF	23	48	$\pm$						



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
339	Nov. 19	P	10 38 47					46	Lower basin of the Arita R., Wakayama Prefecture.
		S	10 38 53						
		M <sub>E</sub>	10 38 54	0.7	-6				
		M <sub>N</sub>	10 38 55	0.4		-10			
		M <sub>Z</sub>	10 38 54	0.6			-2		
		F	10 39 48						
340	Nov. 19	eP <sub>EN</sub>	13 44 34					35	Ditto.
		S <sub>EN</sub>	13 44 39						
		M <sub>E</sub>	13 44 39	0.6	$\pm 2$				
		M <sub>N</sub>	13 44 39	0.4		-3			
		F	13 45 28						
341	Nov. 19	eP <sub>EN</sub>	17 45 19					203	Near Tokuyama, middle basin of the Ooi River, Sizuoka Prefecture.
		eP <sub>Z</sub>	17 45 22						
		eS <sub>EN</sub>	17 45 46						
		e <sub>E</sub>	17 45 57						
		e <sub>N</sub>	17 45 58						
		M <sub>E</sub>	17 45 59	1.4	$\pm 1$				
		M <sub>N</sub>	17 46 09	1.5		$\pm 4$			
		M <sub>Z</sub>	17 46 07	1.1			$\pm 1$		
342	Nov. 20	P <sub>N</sub>	1 18 00					47	In the Kii Channel.
		S	1 18 06						
		M <sub>E</sub>	1 18 06	0.4	+4				
		M <sub>N</sub>	1 18 07	0.4		-10			
		M <sub>Z</sub>	1 18 08	0.6			+2		
343	Nov. 20	e <sub>E</sub>	21 52 49						SE off Inubô Cape, Tiba Prefecture.
		e <sub>N</sub>	21 52 47						
		e <sub>E</sub>	21 53 19						
		e <sub>N</sub>	21 53 18						
		e <sub>Z</sub>	21 53 23						
		e <sub>F</sub>	22 03 $\pm$						

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
*344	Nov. 22	iP <sub>EN</sub>	11 28 41		$\pm 1.8$	+3.2?	+4.8	45	Perceptible. In the Kii Channel.
		iP <sub>Z</sub>	11 28 42						
		iS <sub>EN</sub>	11 28 47						
		iS <sub>Z</sub>	11 28 48						
		M <sub>EN</sub>	11 28 48	0.4	-18	-34			
		M <sub>Z</sub>	11 28 49				+8		
		F	11 31 13						
*345	Nov. 25	iP	2 29 13		+6.6	-11.8	-11.3	46	Perceptible. Lower basin of the Hidaka River, Wakayama Prefecture.
		S	2 29 19						
		M <sub>EZ</sub>	2 29 20	0.7	-184		-39		
		M <sub>N</sub>	2 29 20	0.5			-189		
		e <sub>F</sub>	2 49 $\pm$						
346	Nov. 25	e <sub>E</sub>	4 20 16						Northern part of the Kujû- kuri-hama. Tiba Prefecture.
		e <sub>N</sub>	4 20 24						
		e <sub>Z</sub>	4 20 38						
		S <sub>E</sub>	4 21 26						
		S <sub>N</sub>	4 21 22						
		S <sub>Z</sub>	4 21 30						
		M <sub>E</sub>	4 21 35	3.8	-2				
		M <sub>N</sub>	4 21 39	2.3			$\pm 2$		
		e <sub>F</sub>	4 27 $\pm$						
		347	Nov. 25	e <sub>Z</sub>	10 11 52				
e <sub>E</sub>	10 13 22								
e <sub>N</sub>	10 13 23								
e <sub>E</sub>	10 18 40								
e <sub>N</sub>	10 21 28								
L <sub>EN</sub>	10 28 54								
L <sub>Z</sub>	10 29 10								
M <sub>E</sub>	10 34 28			13.3	$\pm 27$				
M <sub>N</sub>	10 34 18			18.1			$\pm 31$		
M <sub>Z</sub>	10 34 32			14.5				$\pm 25$	
e <sub>F</sub>	10 55 $\pm$								



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
348	Nov. 28	eE	3	13	38						Near Hukuti, Yamanashi Prefecture.
		eN	3	13	39						
		ME	3	14	04	2.1	-1				
		MN	3	13	55	2.4		-1			
		eF	3	16	±						
349	Nov. 30	eN	3	35	09						In the Bashee Channel. South of Formosa.
		eE	3	35	14						
		SEZ	3	35	55						
		SN	3	35	56						
		ME	3	36	14	2.4	-1				
		MN	3	36	10	2.6		±2			
		MZ	3	36	05	2.6			-2		
		eF	3	39	±						
350	Nov. 30	ePEN	12	44	44					39	Near Wakayama City.
		SEN	12	44	49						
		MEN	12	44	50	0.5	+3	+2			
		F	12	45	25						
351	Dec. 1	iPEN	3	08	11		+0.9	-2.0		33	Ditto.
		ePz	3	08	11						
		SEN	3	08	15						
		MEN	3	08	15	0.4	-3	+6			
		F	3	09	03						
352	Dec. 1	iPEZ	23	47	01		+2.8		-1.7	1460	Off the Amami-ōsima, Ryūkyū IIs.
		PN	23	47	00			+1.4?			
		SEZ	23	49	35						
		SN	23	49	34						
		ME	23	50	19	11.0	-57				
		MN	23	50	27	9.2		-71			
		MZ	23	51	43	8.1			-18		
		eF	0	46	±						
353	Dec. 2	PEZ	16	44	37		-1.4		-1.7	1400	Ditto.

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
		PN	16	44	34				-1.5		
		SEN	16	47	02						
		SZ	16	47	04						
		ME	16	47	30	12.7	+47				
		MN	16	47	38	12.0			-73		
		MZ	16	48	14	12.7				-38	
		eF	17	14	±						
354	Dec. 3	PEN	8	33	52					82	Near Azumi, upper valley of the Ibo River, Hyōgo Prefecture.
		S	8	34	03						
		ME	8	34	03	0.4	+4				
		MN	8	34	03	0.3		+5			
		MZ	8	34	03				±1		
F	8	34	44								
355	Dec. 3	eE	16	18	35						Near Tateno, Ibaraki Prefecture.
		eN	16	18	54						
		eN	16	19	10						
		eE	16	19	15						
		eF	16	21	±						
356	Dec. 5	P	6	02	42						Lower basin of the Arita River, Wakayama Prefecture.
		S	6	02	45						
		ME	6	02	45	0.4	+4				
		MN	6	02	46	0.4			-7		
		MZ	6	02	45	0.6			+3		
The end part overlapped by the following earthquake.											
357	Dec. 5	PEN	6	03	12					28	Ditto.
		SEN	6	03	16						
		ME	6	03	16		+2				
		MN	6	03	16	0.4			-4		
		F	6	03	48						
358	Dec. 5	eN	11	45	01						Local shock.
		eE	11	45	15						



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			g.	m.	s.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
359	Dec. 6	SE	11	45	19	0.4	+1	-2		35	Near Wakayama City.
		SN	11	45	18						
		ME	11	45	19						
		MN	11	45	19						
		F	11	46	16						
359	Dec. 6	PEN	16	15	44	0.4	-2	-5		35	Near Wakayama City.
		S	16	15	49						
		ME	16	15	49						
		MN	16	15	49						
		F	16	16	33						
360	Dec. 7	iPEN	17	05	59	0.8	+2.8	-3.9	-3.3	45	Ditto.
		iPz	17	06	00						
		iSEZ	17	06	06						
		SN	17	06	05						
		ME	17	06	06						
		MN	17	06	08						
		MZ	17	06	11						
F	17	13	33								
361	Dec. 9	ce	1	20	22	0.8	-21	-18	-12	45	Near Yuasa, Wakayama Prefecture.
		en	1	20	42						
		eF	1	24	±						
362	Dec. 9	ePEN	1	37	04	0.8	-21	-18	-12	30	Near Wakayama City.
		SEN	1	37	08						
		MEN	1	37	08						
		F	1	37	43						
363	Dec. 9	ePEN	2	15	47	0.8	-21	-18	-12	14	Local shock.
		eSEN	2	15	49						
		MEN	2	15	50						
		F	2	16	13						
364	Dec. 9	ePN	10	44	16				49	Near Yuasa, Wakayama Prefecture.	

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			g.	m.	s.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
365	Dec. 11	SEN	10	44	22	0.4	-2	-3		33	Near Gobò, mouth of the Hidaka River, Wakayama Prefecture.
		MEN	10	44	23						
		F	10	44	55						
365	Dec. 11	SEN	13	07	40	0.4	-1	-2		33	Near Gobò, mouth of the Hidaka River, Wakayama Prefecture.
		MEN	13	07	40						
		F	13	08	10						
366	Dec. 13	ePEN	17	19	35	0.4	-1	-2		33	Near Gobò, mouth of the Hidaka River, Wakayama Prefecture.
		SEN	17	19	40						
		MEN	17	19	40						
367	Dec. 14	PEN	1	49	45	3.4	-1	+2		1510	Upper valley of the Amazon River, near border of Peru and Brazil.
		ee	1	52	10						
		en	1	52	07						
368	Dec. 14	eME	1	53	21	3.4	-1	+2		1510	Upper valley of the Amazon River, near border of Peru and Brazil.
		eMN	1	53	34						
		eF	2	01	±						
368	Dec. 14	cP	12	50	52	3.1	+18	+19	+4	1510	South far off Bonin Isl. Felt in Bonin Isl.
		iP	12	50	54						
		SEN	12	53	31						
		SZ	12	53	30						
		ME	12	53	35						
369	Dec. 14	MN	12	53	37	3.5	+18	+19	+4	1510	South far off Bonin Isl. Felt in Bonin Isl.
		MZ	12	53	37						
		cF	13	08	±						
		ce	22	34	06						
		en	22	34	10						
369	Dec. 14	ce	22	34	06	3.5	+18	+19	+4	1510	South far off Bonin Isl. Felt in Bonin Isl.
		en	22	34	10						
		en	23	08	02						
		ee	23	08	28						
		en	23	29	37						
369	Dec. 14	eF	23	48	±	3.5	+18	+19	+4	1510	South far off Bonin Isl. Felt in Bonin Isl.
		eF	23	48	±						
369	Dec. 14	ce	22	34	06	3.5	+18	+19	+4	1510	South far off Bonin Isl. Felt in Bonin Isl.
		en	22	34	10						
		en	23	08	02						
		ee	23	08	28						
		en	23	29	37						
369	Dec. 14	eF	23	48	±	3.5	+18	+19	+4	1510	South far off Bonin Isl. Felt in Bonin Isl.
		eF	23	48	±						



No.	Date	Phase	Time		Period	Amplitude			Δ	Remarks			
			G. M. T.			AE	AN	Az					
			h	m		s	μ	μ			μ	km.	
370	Dec. 15	PE	7	16	47	-0.9	+1.5	-0.8	5770	Near Solomon IIs. Melanesia			
		PN	7	16	44								
		Pz	7	16	48								
		SE	7	24	09								
		SN	6	23	59								
		Sz	7	24	21								
		LE	7	30	01								
		LN	7	29	47								
		Lz	7	29	58								
		M <sup>1</sup> E	7	32	57						19.4	±429	
		M <sup>1</sup> N	7	34	39						19.0		-683
		Mz	7	34	55						18.2		+433
		M <sup>2</sup> E	7	35	22						15.0	+600	
		M <sup>2</sup> N	7	37	58						13.5		-333
		eE	7	39	43								
eE	7	47	02										
eN	7	47	14										
eF	9	53	±										
371	Dec. 16	ePEN	5	21	03	-4	-2		37	Basin of the Arita River Wakayama Prefecture.			
		SEN	5	21	08								
		ME	5	21	09						0.3		
		MN	5	21	08						0.5		
		eF	5	21	46								
372	Dec. 17	PEN	19	20	52	-2.8	-2.0		1540	South far off Miyako Ryūkyū IIs.			
		SE	19	23	31								
		SN	19	23	36								
		LN	19	25	18								
		ME	19	28	15						10.5	+115	
		MN	19	29	00						11.3		+167
eF	20	22	±										
373	Dec. 17	ePEN	19	58	54	-3			35	Near Wakayama City.			
		SEN	19	58	59								
		ME	19	58	59						0.4		
374	Dec. 18	MN	19	58	59	+22	-31		2210	Upper valley of the Yangtze River, China. Destructive at Ma- Pien, Szechwan, China.			
		F	19	59	31								
375	Dec. 18	ePE	7	20	46	-8	+4			Ditto.			
		ePN	7	20	57								
		SE	7	24	34								
		SN	7	24	30								
		LN	7	25	41								
		ME	7	28	02						10.3		
		MN	7	26	04						13.1		
eF	7	37	±										
376	Dec. 18	eE	17	10	25	-8	+4			Ditto.			
		eN	17	10	40								
		eE	17	13	44								
		eN	17	13	46								
		eN	17	14	47								
		ME	17	18	53						8.8		
377	Dec. 19	MN	17	16	59	-8	+4			In the Bungo Channel.			
		F	17	28	±								
		eE	3	55	55								
		eN	3	55	59								
		eN	3	56	18								
378	Dec. 20	eE	3	56	24	-3	+3			Northern part of the Kasi- ma-nada. Felt in southern part of Oou and Kwantô district.			
		F	3	57	18								
		PE	5	48	52								
		PN	5	48	51								
		SE	5	49	33								
379	Dec. 20	SN	5	49	31	-3	+3			Near Solomon IIs. Melanesia.			
		ME	5	49	56						2.7		
		MN	5	49	55						2.1		
		F	5	54	28								
		ePE	18	45	56								







# TOYOOKA JAPAN.

## SEISMOLOGICAL BULLETIN

A Branch Station of the Kobe Meteorological Observatory of Japan.  
 $\varphi=35^{\circ} 32'$   $\lambda=134^{\circ} 49'$   $h=32.2$  m. Underground: Tertiary.

Instruments: Omori's Seismograph.  
 (Horizontal Pendulum)

Wiechert Seismograph.  
 (Horizontal & Vertical)

	$T_0$	$\epsilon$	$\frac{r}{T_0^2}$	V		$T_0$	$\epsilon$	$\frac{r}{T_0^2}$	V
A <sub>E</sub> :	21.0	3.0	0.001 <sup>(-)</sup>	20	A <sub>E</sub> :	5.9	10.0	0.006	95
A <sub>N</sub> :	19.2	3.0	0.001 <sup>(-)</sup>	20	A <sub>N</sub> :	5.1	10.0	0.006	94
					A <sub>Z</sub> :	3.8	4.8	0.003	75

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks							
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>									
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.								
389	Dec. 29	SEN	3	50	11	0.4	+1	+2		53	of the Arita R., Wakayama Prefecture.							
		MEN	3	50	11													
		F	3	50	54													
		ePN	15	35	19													
		SEN	15	35	26													
389	Dec. 29	ME	15	35	27	-2				53	Basin of the Arita River, Wakayama Prefecture.							
		MN	15	35	26													
		F	15	36	15													
		ePEN	19	59	20													
		SEN	19	59	24													
390	Dec. 29	MEN	19	59	25	0.4	-1	-3		53	Near Matuyama City, Sikoku district.							
		F	20	00	02													
		PEN	23	44	42													
		iPz	23	44	42													
391	Dec. 29	eSE	23	51	40	-0.9	-1.5			5275	Western part of New Guinea Felt in Ceram and Amboina Dutch east Indies.							
		eSN	23	51	39													
		eSz	23	51	38													
		LE	23	54	16													
		LN	23	54	20													
		ME	23	55	03							6.4	$\pm 4$	+8			5275	Western part of New Guinea Felt in Ceram and Amboina Dutch east Indies.
		MN	23	58	31							9.7						
		Mz	23	59	10							20.0						
		eF	0	26	$\pm$								$\pm 33$					

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks	
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>			
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.		
127	Oct. 2	PEN	5	35	51	17.3	-21				1180	Off the Ottisi Cape, Hokkaido, 145°8E 42°9N. Weak shocks were felt in eastern part of Hokkaido. Felt in the Pacific coast of Hokkaido and Oou district.
		Pz	5	35	50							
		i	5	36	00							
		S	5	37	57							
		eLE	5	39	06							
		ME	5	40	48							
		ScSEN	5	48	37							
		eF	6	10	$\pm$							
128	Oct. 2	P	9	29	06	0.9	-11	+8	+11		455	South off the Sata C., Kagosima Prefecture, Kyosyu. Focal depth about 120 km.
		SEN	9	30	08							
		Sz	9	30	09							
		MEZ	9	30	10							
		MN	9	30	09							
		eF	9	33	$\pm$							
129	Oct. 9	P	15	56	13		-9	+9			23	Near Yamada, NW of Miyazu, Kyoto Prefecture.
		S	15	56	16							
		M	15	56	16							
		F	15	56	33							



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks					
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$							
130	Oct. 11	P <sub>E</sub>	22 23 31					5280	South far off Truk Isl. East Caroline IIs.					
		P <sub>N</sub>	22 23 30											
		P <sub>Z</sub>	22 23 28											
		S <sub>E</sub>	22 29 35											
		L <sub>E</sub>	22 32 35											
		cF	23 06 ±											
131	Oct. 12	P <sub>EN</sub>	16 47 22				990	NE off Miyako, Iwate Prefecture. Moderate shocks were felt in the Pacific coast of Oou district.						
		P <sub>Z</sub>	16 47 21											
		i <sub>Z</sub>	16 47 34											
		S <sub>E</sub>	16 49 07											
		S <sub>N</sub>	16 49 10											
		S <sub>Z</sub>	16 49 11											
		L <sub>E</sub>	16 49 39											
		M <sub>E</sub>	16 51 19	13.7	+228									
		M <sub>N</sub>	16 50 44	15.0		+184								
		M <sub>Z</sub>	16 51 23	15.6					-68					
		The end part overlapped by the following earthquake.												
132	Oct. 12	P <sub>E</sub>	17 02 39				13.3	-44	+23	-14	1020	Ditto.		
		P <sub>N</sub>	17 02 40											
		P <sub>Z</sub>	17 02 42											
		S	(in long wave of previous earthquake)											
		L <sub>E</sub>	17 05 05											
		M <sub>E</sub>	17 06 18											
		M <sub>N</sub>	17 05 52											
M <sub>Z</sub>	17 06 13													
cF	18 00 ±													
133	Oct. 13	P	18 16 10				-12							
		i <sub>Z</sub>	18 16 21											
		S <sub>E</sub>	18 17 57											
		S <sub>N</sub>	18 18 07											
		M <sub>E</sub>	18 20 59											
		cF	18 40 ±											

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks	
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$			
134	Oct. 13	P <sub>EZ</sub>	1 59 32				12.4	+22	1010	Ditto.
		P <sub>N</sub>	1 59 31							
		S <sub>E</sub>	2 01 25							
		S <sub>N</sub>	2 01 26							
		S <sub>Z</sub>	2 01 27							
		L <sub>E</sub>	2 02 05							
		M <sub>E</sub>	2 03 35							
		cF	2 20 ±							
		135	Oct. 15	P <sub>EN</sub>	14 35 39					
P <sub>Z</sub>	14 35 40									
i <sub>E</sub>	14 35 44									
S <sub>EN</sub>	14 36 22									
S <sub>Z</sub>	14 36 21									
M <sub>E</sub>	14 36 25									
M <sub>N</sub>	14 36 24			1.9		+99				
M <sub>Z</sub>	14 36 26			2.1			+29			
F	14 44 ±									
136	Oct. 17	cL <sub>N</sub>	14 57 46							Felt in northern part of Sumatora.
		M <sub>N</sub>	15 01 46							
		cF	15 08 ±							
137	Oct. 18	P <sub>EZ</sub>	0 14 02				13.2	+228	1050	ENE off Miyako, Iwate Prefecture 143°8 E 40°2 N. Felt in Oou and Hokkaidô.
		P <sub>N</sub>	0 14 04							
		S <sub>E</sub>	0 15 57							
		S <sub>N</sub>	0 15 56							
		S <sub>Z</sub>	0 15 55							
		L <sub>EN</sub>	0 16 29							
		L <sub>Z</sub>	0 17 17							
		M <sub>E</sub>	0 18 02							
		M <sub>N</sub>	0 18 29	7.5		-102				
		M <sub>Z</sub>	0 17 56							
cF	1 25 ±									
138	Oct. 18	P <sub>EN</sub>	0 31 32							An after shock of No. 137.



No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
139	Oct. 18	ePz	0 31 29					2705	Middle part of Caroline Is., Pacific Ocean.
		eF	1 25 ±						
		P <sub>E</sub>	11 10 38						
		P <sub>NZ</sub>	11 10 37						
		eS <sub>E</sub>	11 14 56						
		S <sub>N</sub>	11 14 59						
		eS <sub>Z</sub>	11 14 59						
		eF	12 00 ±						
140	Oct. 18	P <sub>EN</sub>	14 55 58	12.9	-65			1150	An after shock of No. 137.
		P <sub>Z</sub>	14 55 59						
		S <sub>EN</sub>	14 58 01						
		eS <sub>Z</sub>	14 58 06						
		M <sub>E</sub>	15 00 09						
		M <sub>N</sub>	14 59 32						
		M <sub>Z</sub>	14 58 57						
eF	15 40 ±								
141	Oct. 18	P <sub>EZ</sub>	21 53 31					1050	Ditto.
		P <sub>N</sub>	21 53 32						
		eS <sub>E</sub>	21 55 25						
		eS <sub>N</sub>	21 55 29						
		S <sub>Z</sub>	21 55 23						
		L <sub>E</sub>	21 56 32						
		L <sub>N</sub>	21 56 37						
		eF	22 13 ±						
142	Oct. 19	eP <sub>E</sub>	2 41 07					1120	Ditto.
		eP <sub>N</sub>	2 41 04						
		S <sub>E</sub>	2 43 08						
		S <sub>N</sub>	2 43 00						
		eF	2 54 ±						
143	Nov. 1	eP <sub>E</sub>	16 29 50						Northern part of North Indo-China. Destructive at near Tonkin.
		eS <sub>E</sub>	16 36 02						

No.	Date	Phase	Time G. M. T.	Period s	Amplitude			$\Delta$ km.	Remarks
					A <sub>E</sub> $\mu$	A <sub>N</sub> $\mu$	A <sub>Z</sub> $\mu$		
144	Nov. 12	S <sub>Z</sub>	16 38 54	11.6	-52				Northern part of Sumatora. By Omori's Seismograph.
		i <sub>N</sub>	16 39 22						
		M <sub>1E</sub>	16 41 26						
		M <sub>1N</sub>	16 40 55						
		M <sub>1Z</sub>	16 41 22						
		M <sub>2E</sub>	16 42 03						
		M <sub>2N</sub>	16 42 03						
		M <sub>2Z</sub>	16 42 02						
eF	17 08 ±								
145	Nov. 18	L <sub>E</sub>	21 52 38	17.2					Upper valley of the Naka River, Tokushima Prefecture. Horizontal component by Omori's portable seismograph.
		eL <sub>N</sub>	21 52 50						
		M <sub>N</sub>	21 56 24						
		eF	22 10 ±						
146	Nov. 19	P <sub>Z</sub>	23 40 14		-12	+8			Near Tokuyama, middle basin of the Ooi River, Sizuoka Prefecture. Horizontal component by Omori's portable seismograph.
		eP <sub>EN</sub>	23 40 21						
		S	23 40 42						
		M <sub>EN</sub>	23 40 55						
		M <sub>Z</sub>	23 40 56						
		eF	23 43 ±						
147	Nov. 25	P <sub>Z</sub>	17 45 24	0.6	-20	-10			Lower basin of the Hidaka River, Wakayama Prefecture. Horizontal component by Omori's portable seismograph.
		S <sub>EZ</sub>	17 45 59						
		M <sub>E</sub>	17 46 01						
		M <sub>Z</sub>	17 46 02						
		F	17 47 50						
		eF	2 31 30						
148	Nov. 25	eP <sub>N</sub>	2 29 32						Northwestern part of Suma-
		P <sub>Z</sub>	2 29 32						



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
		L <sub>N</sub>	10	29	09						tora. By Omori's seismograph.
		M <sup>1</sup> <sub>N</sub>	10	30	39						
		M <sup>2</sup> <sub>N</sub>	10	32	20						
		eF	11	00	±						
149	Dec. 1	P <sub>Z</sub>	23	47	14					Off the Amami-ōsima, Ryū- kyū IIs. By Omori's seismograph.	
		eS <sub>Z</sub>	23	50	14						
		L <sub>E</sub>	23	50	31						
		L <sub>N</sub>	23	50	33						
		L <sub>Z</sub>	23	50	49						
		M <sub>E</sub>	23	51	20	13.8	+205				
		M <sub>N</sub>	23	52	09	9.9		+180			
		eF	0	09	±						
150	Dec. 2	P <sub>Z</sub>	16	44	56				960	Ditto.	
		S <sub>Z</sub>	16	46	40						
		L <sub>E</sub>	16	47	12						
		L <sub>N</sub>	16	47	10						
		L <sub>Z</sub>	16	47	45						
		M <sub>E</sub>	16	48	03	13.3	+130				
		M <sub>N</sub>	16	47	48	12.8		+140			
		eF	17	02	±						
151	Dec. 3	P <sub>Z</sub>	8	33	47				52	Near Azumi, upper valley of the Ibo River, Hyōgo Prefecture.	
		S	8	33	54						
		M	8	33	55		±8	±18	±6		
		F	8	34	52						
152	Dec. 7	P	17	06	20				137	Near Wakayama City.	
		SEN	17	06	38						
		eS <sub>Z</sub>	17	06	33						
		M <sub>E</sub>	17	06	41		+23				
		M <sub>N</sub>	17	06	42			+16			
		M <sub>Z</sub>	17	06	41				+5		
		F	17	08	18						

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
153	Dec. 14	P <sub>EN</sub>	1	49	46					Upper valley of the Amazon River, near border of Peru and Brazil.	
		P <sub>Z</sub>	1	49	43						
		iz	1	49	47						
		eF?	1	52	±						
154	Dec. 14	P <sub>EN</sub>	12	51	05				1550	South far off Bonin Isl. Felt in Bonin Isl.	
		P <sub>Z</sub>	12	51	03						
		S <sub>E</sub>	12	53	42						
		S <sub>N</sub>	12	53	51						
		S <sub>Z</sub>	12	53	54						
		eM <sub>E</sub>	12	54	00		-7				
		M <sub>N</sub>	12	54	07			-4			
		M <sub>Z</sub>	12	54	09				-8		
		eF	12	58	±						
155	Dec. 15	P <sub>Z</sub>	7	16	55				6030		Near Solomon IIs, Melanesia.
		P <sub>EN</sub>	7	17	01						
		S <sub>E</sub>	7	24	41						
		S <sub>N</sub>	7	24	36						
		S <sub>Z</sub>	7	24	51						
		L <sub>E</sub>	7	29	41						
		L <sub>N</sub>	7	29	20						
		M <sub>E</sub>	7	36	48	15.5	-77				
		M <sub>N</sub>	7	36	09	14.6		+241			
		M <sup>1</sup> <sub>Z</sub>	7	36	38	15.8			+20		
		M <sup>2</sup> <sub>Z</sub>	7	39	48	19.0			-23		
		eF	8	28	±						
156	Dec. 17	P	19	21	09				1890	South far off Miyako Isl, southern part of Ryūkyū IIs.	
		SE <sub>Z</sub>	19	24	23						
		S <sub>N</sub>	19	24	19						
		L <sub>N</sub>	19	25	12						
		eL <sub>Z</sub>	19	25	29						
		M <sub>E</sub>	19	27	35	17.5	-51				
		M <sub>N</sub>	19	26	47	13.6		+63			
		M <sub>Z</sub>	19	27	40	15.8			+24		



No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
157	Dec. 18	eF	20	02	±						Upper valley of the Yangtze River. Destructive at Ma-Pien, Szechwan, China. By Omori's seismograph.
		eL <sub>E</sub>	7	24	55						
		L <sub>N</sub>	7	25	06						
		M <sub>N</sub>	7	29	59	15.0		+44			
		M <sub>E</sub>	7	28	26	11.6	+20				
		eF	7	36	±						
158	Dec. 18	eL <sub>E</sub>	17	13	45						Ditto.
		eL <sub>N</sub>	17	14	21						
		eF	17	22	±						
159	Dec. 20	P <sub>E</sub>	5	48	18						379 Northern part of the Kasimada. Felt in southern part of Oou and Kwantô districts.
		eP <sub>N</sub>	5	48	28						
		S <sub>EN</sub>	5	49	09						
		M <sub>E</sub>	5	49	32	1.8	+3				
		M <sub>N</sub>	5	49	45			-9			
		F	5	52	26						
160	Dec. 21	P	0	16	37						188 Near Sisaka Isl, Ehime Prefecture.
		S <sub>E</sub>	0	17	03						
		S <sub>N</sub>	0	17	02						
		S <sub>Z</sub>	0	17	04						
		M <sub>E</sub>	0	17	11	1.4	-5				
		M <sub>N</sub>	0	17	12			+7			
		F	0	18	06						
161	Dec. 21	P <sub>EN</sub>	6	17	30						139 Near Komono, northern part of Mie Prefecture.
		P <sub>Z</sub>	6	17	31						
		S	6	17	49						
		M <sub>E</sub>	6	17	50		±4				
		M <sub>N</sub>	6	17	51	3.0		+7			
		M <sub>Z</sub>	6	17	55						
		F	6	19	06				+4		
162	Dec. 23	eP <sub>E</sub>	0	29	49						174 Near Ohara, upper basin of

No.	Date	Phase	Time			Period	Amplitude			$\Delta$	Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>	A <sub>Z</sub>		
			h	m	s	s	$\mu$	$\mu$	$\mu$	km.	
163	Dec. 28	P <sub>Z</sub>	0	29	50						5690 Destructive at Batoe Isl. 97°9E 0°3S. Felt in North and West Sumatora. (according to Batavia's report)
		P <sub>E</sub>	0	29	55						
		P <sub>N</sub>	0	29	53						
		S	0	30	18						
		M <sub>EN</sub>	0	30	22		-5	-7			
		M <sub>Z</sub>	0	30	28				+6		
		F	0	31	53						
164	Dec. 29	eP <sub>Z</sub>	2	44	14						Western part of New Guinea. Felt in Ceram and Amboina.
		P <sub>EN</sub>	2	44	17		+2.2				
		P <sub>Z</sub>	2	44	18				+4.8		
		S <sub>E</sub>	2	51	39						
		S <sub>N</sub>	2	51	34						
		i <sub>E</sub>	2	55	34						
		i <sub>N</sub>	2	55	33						
		L <sub>E</sub>	2	59	55						
		L <sub>N</sub>	2	59	51						
		L <sub>Z</sub>	2	59	43						
		M <sub>E</sub>	3	04	41	21.0	+185				
		M <sup>1</sup> <sub>N</sub>	3	03	23	23.4		-142			
		M <sub>Z</sub>	3	04	35	21.7			-70		
M <sup>2</sup> <sub>N</sub>	3	06	34	16.0		-117					
M <sup>3</sup> <sub>N</sub>	3	11	25	18.0		-102					
M <sup>4</sup> <sub>N</sub>	3	14	27	14.0		+108					
eF	4	30	±								
164	Dec. 29	P <sub>N</sub>	23	45	01						
		eS <sub>N</sub>	23	51	52						
		eF	0	10	±						

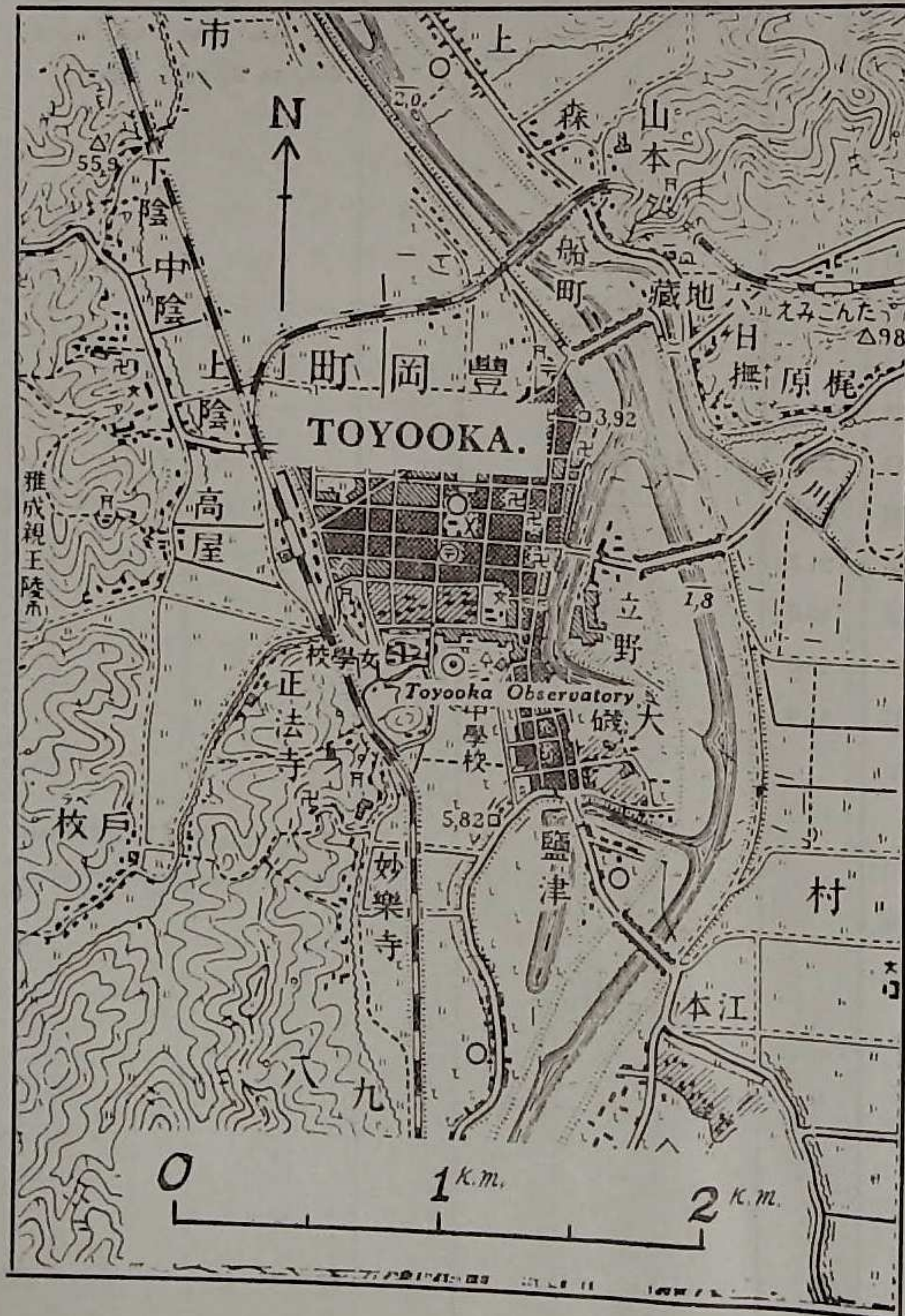


# TOYOOKA JAPAN

## The Observation of the Tilting of the Earth Crust

### at the Toyooka Observatory.

On the 23rd May, 1925 there occurred a great earthquake at the northern part of the Tazima province, the epicenter was 13 kilometers north of Toyooka, and on the 7th March, 1927 again a destructive earthquake occurred at the northern part of the Tazima and Tango Provinces and its epicenter was about 22 kilometers east of Toyooka. To investigate the after effects of those earthquakes, the observations of the tilting of the earth surface were made at the Toyooka observatory by the Ishimoto's tiltmeter. The details of the instrument was described by Dr. M. Ishimoto in Jap. Journ. of Astro. and Geophys. Vol. 6, p. 83, (1928). The Toyooka



observatory is the branch office of the Kobe Met. Observatory, and is situated at the western part of the hill Zimmu-yama, Toyooka. The instruments were installed in the seismometre house of the observatory, in which the temperature is kept nearly constant. Topographical features of the neighbourhood of Toyooka can be seen in the figure, in which the site of the observatory is indicated by ⊙. The next tables are the results of the observations, which were made by Mr. Hyôzirô Yamazaki, the superintendent of the Toyooka observatory.

# TOYOOKA JAPAN.

## Tilting of Earth at Toyooka (1935)

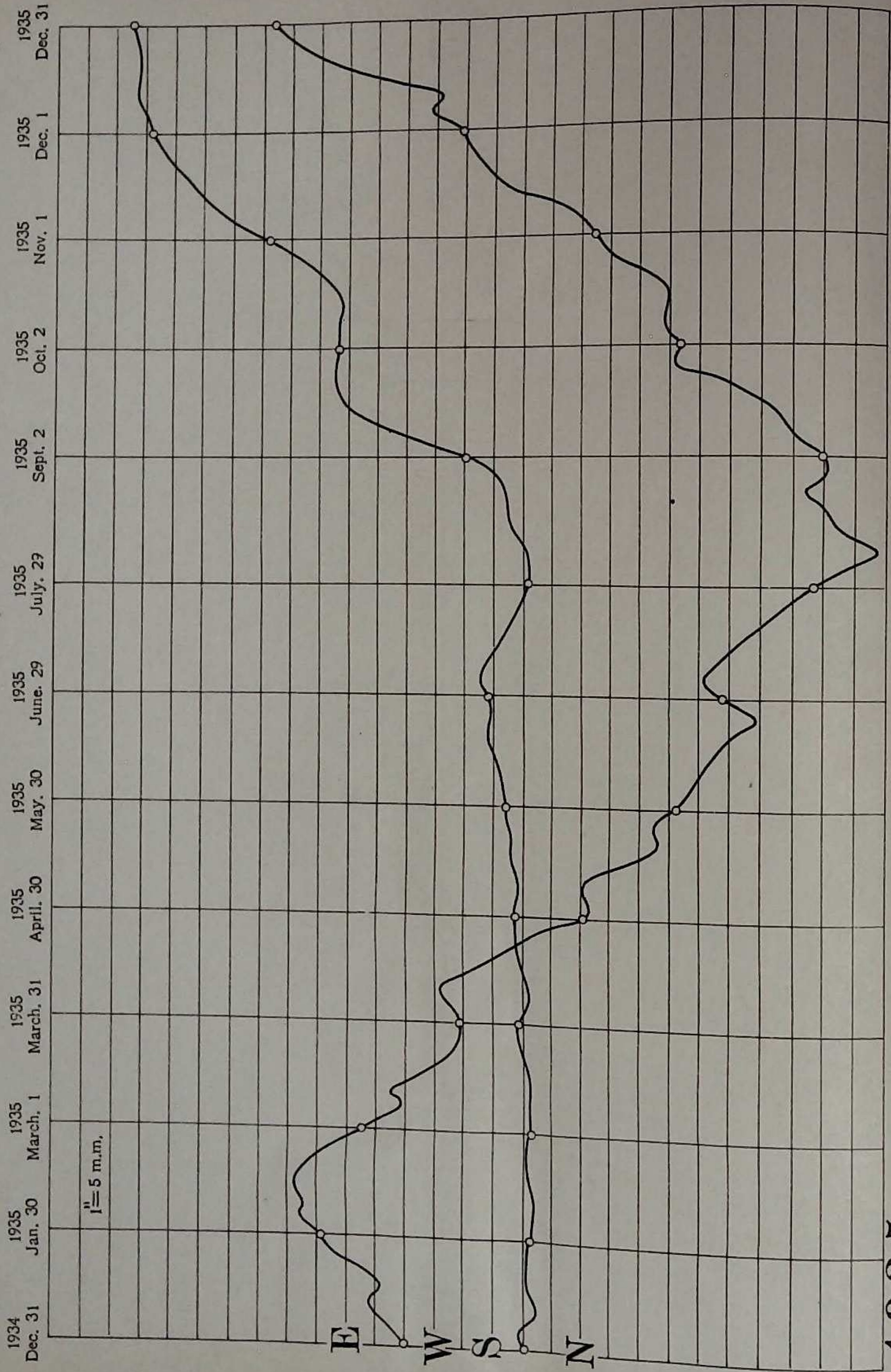
$\phi = 35^{\circ} 32'$   $\lambda = 134^{\circ} 49'$   $h = 32.2m.$  Underground: Tertiary.

Constants.  
Instruments: Isimoto's Tiltmeter  
Component T°  
E—W 15.0s  
S—N 16.7s

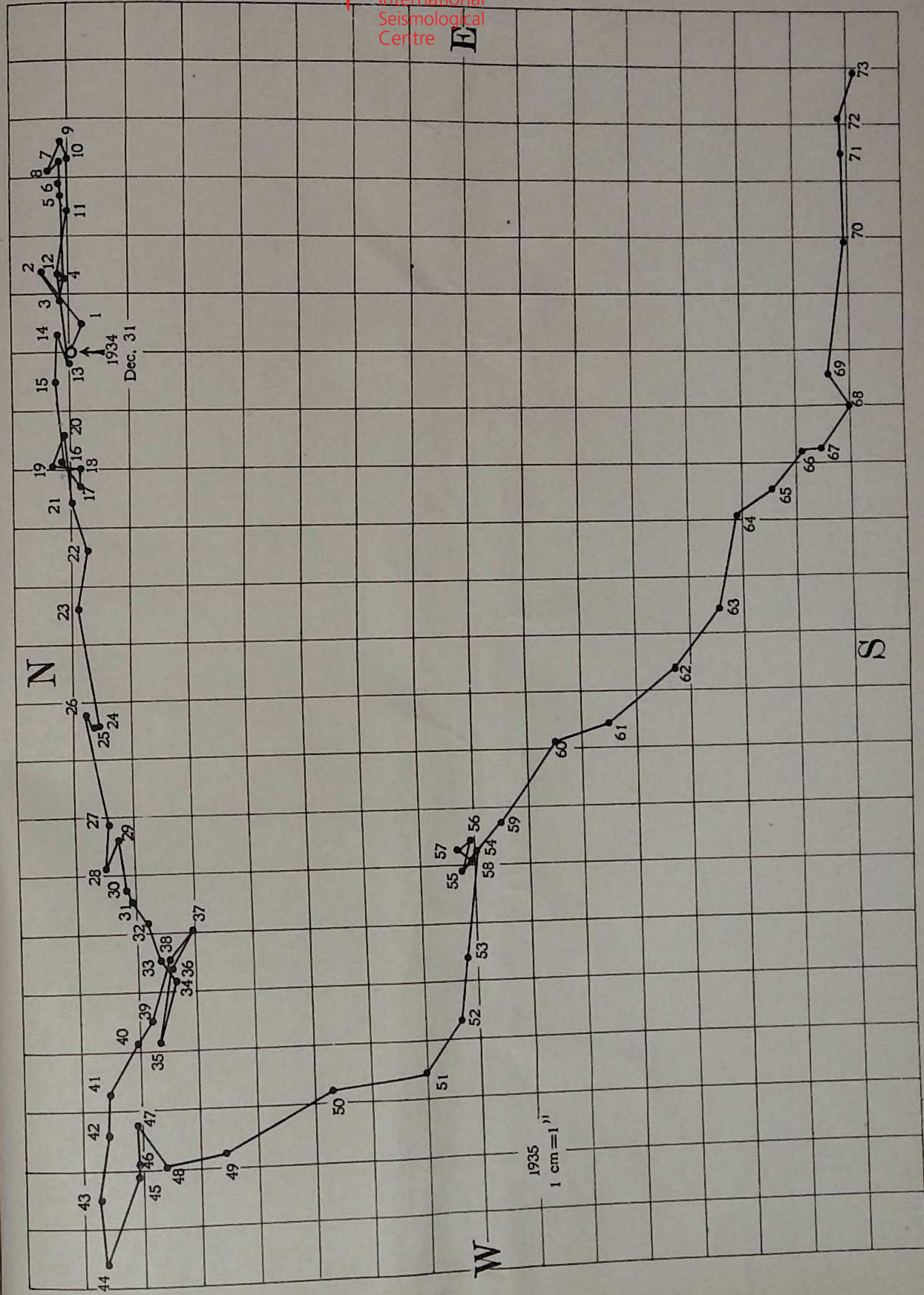
The reading are expressed in millimeters and 10m.m.corresponds to the Tilting of 1".

No.	Period	Component (downward)				Tilting	No.	Period	Component (downward)				Tilting
		E	W	N	S				E	W	N	S	
1	Dec. 1934 31-5	4.5	—	—	2.0	S 66° E 5.0	37	30-4	6.0	—	—	4.0	S 57° E 7.2
2	6-10	8.5	—	6.5	—	N 53° E 10.7	38	5-9	—	5.0	4.0	—	N 51° W 6.4
3	Jan. 11-15	—	4.0	—	3.0	S 53° W 5.0	39	10-14	—	10.0	3.5	—	N 71° W 10.6
4	16-20	3.5	—	—	0.0	E 3.5	40	15-19	—	4.0	2.5	—	N 58° W 4.8
5	21-25	14.0	—	—	0.0	E 14.0	41	20-24	—	8.5	5.0	—	N 60° W 9.9
6	26-30	2.0	—	—	0.0	E 2.0	42	25-29	—	7.0	0.5	—	N 86° W 7.0
7	31-4	4.0	—	—	0.0	E 4.0	43	30-3	—	10.5	1.5	—	N 82° W 10.6
8	5-9	—	1.5	2.0	—	N 38° W 2.5	44	4-8	—	10.5	—	1.0	S 85° W 10.6
9	10-14	4.5	—	—	2.0	S 66° E 5.0	45	9-13	14.5	—	—	6.0	S 68° E 15.7
10	15-19	—	3.5	—	1.0	S 74° W 3.6	46	14-18	2.0	—	—	0.0	E 2.0
11	20-24	—	9.0	—	0.0	W 9.0	47	19-23	—	7.0	—	—	E 7.0
12	25-1	—	10.0	1.5	—	N 82° W 10.2	48	24-28	—	7.0	—	4.5	S 53° W 8.3
13	2-6	—	15.0	—	1.5	S 85° W 15.1	49	29-2	2.0	—	—	10.5	S 11° E 10.7
14	7-11	4.5	—	1.0	—	N 77° E 4.6	50	3-7	9.5	—	—	19.0	S 27° E 21.2
15	12-16	—	8.0	0.5	—	N 86° W 8.1	51	8-12	2.0	—	—	17.5	S 7° E 17.6
16	17-21	—	13.5	—	1.0	S 86° W 13.6	52	13-17	9.5	—	—	7.0	S 54° E 10.8
17	22-26	—	4.0	—	2.5	S 58° W 4.7	53	18-22	11.0	—	—	1.5	S 82° E 11.1
18	27-31	2.5	—	—	0.0	E 2.5	54	23-27	18.0	—	—	2.0	S 84° E 18.2
19	1-5	1.0	—	4.0	—	N 14° E 4.2	55	28-2	—	3.5	2.0	—	N 60° W 4.1
20	6-10	5.0	—	—	1.5	S 73° E 5.3	56	3-7	5.0	—	—	1.5	S 74° E 5.3
21	11-15	—	11.5	—	1.5	S 83° W 11.6	57	8-12	—	1.5	2.0	—	N 37° W 2.5
22	16-20	—	8.5	—	2.5	S 74° W 8.6	58	13-17	—	1.5	—	2.0	S 37° W 2.5
23	21-25	—	10.0	1.5	—	N 82° W 10.2	59	18-22	6.5	—	—	5.5	S 50° E 8.5
24	26-30	—	20.0	—	3.0	S 82° W 20.3	60	23-27	13.5	—	—	10.0	S 54° E 16.8
25	1-5	—	0.0	1.0	—	N 1° E 1.0	61	28-1	3.0	—	—	10.0	S 17° E 10.4
26	6-10	2.0	—	1.0	—	N 64° E 2.3	62	2-6	7.5	—	—	13.5	S 38° E 15.7
27	11-15	—	19.5	—	3.5	S 80° W 19.8	63	7-11	11.0	—	—	8.5	S 53° E 13.9
28	16-20	—	7.5	1.0	—	N 83° W 7.6	64	12-16	16.5	—	—	3.5	S 78° E 16.9
29	21-25	4.0	—	—	2.0	S 64° E 5.0	65	17-21	4.5	—	—	6.5	S 38° E 7.9
30	26-30	—	8.5	—	1.0	S 83° W 8.6	66	22-26	7.0	—	—	6.0	S 50° E 9.2
31	31-4	—	2.0	—	0.5	S 75° W 2.1	67	27-1	0.0	—	—	3.5	S 17° E 3.5
32	5-9	—	4.0	—	2.5	S 58° W 4.7	68	2-6	13.0	—	—	1.5	S 83° E 13.1
33	10-14	—	6.0	—	2.0	S 72° W 6.3	69	7-11	—	6.0	—	4.0	S 57° W 7.2
34	15-19	—	4.0	—	2.5	S 58° W 4.7	70	12-16	29.5	—	—	0.5	N 89° E 29.5
35	20-24	—	10.0	3.0	—	N 74° W 10.5	71	17-21	15.5	—	—	0.5	N 88° E 15.5
36	25-29	12.0	—	—	2.0	S 81° E 12.2	72	22-26	6.0	—	—	0.0	E 6.0
							73	27-31	8.0	—	—	2.5	S 73° E 8.4





1935



1935