

SEISMOLOGICAL BULLETIN

OF THE

IMPERIAL MARINE OBSERVATORY

AND

KOBE METEOROLOGICAL OBSERVATORY.

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SEISMOLOGICAL BULLETIN

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

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

Instruments: Omori's Seismograph.
(Horizontal Pendulum)

Wiechert Seismograph.
(Horizontal & Vertical)

Oct.

	T_o	ε	$\frac{r}{T_o^2}$	V
A_E :	18.8		0.0005	20
A_N :	20.3		0.0005	20

	T_o	ε	$\frac{r}{T_o^2}$	V
A_E :	6.6	Aperiodic	0.005	110
A_N :	6.4	„	0.005	107
A_Z :	3.8	„	0.004	89

Nov.

	T_o	ε	$\frac{r}{T_o^2}$	V
A_E :	19.2		0.0004	20
A_N :	21.0		0.0005	20

	T_o	ε	$\frac{r}{T_o^2}$	V
A_E :	6.4	Aperiodic	0.006	106
A_E :	6.6	„	0.005	89
A_Z :	3.8	5	0.006	94

Dec.

	T_o	ε	$\frac{r}{T_o^2}$	V
A_E :	18.9		0.0005	20
A_N :	18.6		0.0005	20

	T_o	ε	$\frac{r}{T_o^2}$	V
A_E :	6.6	Aperiodic	0.007	100
A_N :	6.7	„	0.006	92
A_Z :	3.9	4	0.005	82

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
234	Oct. 1	P_{EN}	h	m	s	s	μ	μ	μ	km.	Lower basin of the Ane R., Siga Prefecture.
		iP_Z	2	21	56		+0.4	-1.0		120	
			2	21	55				+2.8		Weak Shocks were felt in Siga and Gifu Prefecture.
		i_N	2	22	07	0.8		± 8			
		i_Z	2	22	05	1.4			+9		
		eS_E	2	22	08						
		eS_N	2	22	09						
		iS_Z	2	22	12						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		M _E	2	22	16	2.1	-28				
		M _N	2	22	14	2.1		+36			
		M _Z	2	22	15	2.1			+28		
		i _E	2	22	40		+21				
		e _E	2	23	39	2.0	± 13				
		eF _E	2	37	$\pm$						
		eF _N	2	35	$\pm$						
		eF _Z	2	31	$\pm$						
235	Oct. 1	eP _E	14	36	58						In the Kasima-nada.
		eP _{NZ}	14	36	57						Felt in Kwanto district.
		P _Z	14	36	58						
		eS _E	14	37	56						
		M _E	14	39	35	2.9	± 8				
		M _N	14	38	18	5.0		± 8			
		M _Z	14	38	13	2.1			± 3		
		eF _E	14	49	$\pm$						
		eF _N	14	48	$\pm$						
		eF _Z	14	44	$\pm$						
236	Oct. 1	i _{ENZ}	19	25	02						Eastern foot of Mt. Aso.
		S _{EN}	19	25	43		+4	+4			Felt in Kyûsyû district.
		M _E	19	25	44	0.9	± 4				
		M _N	19	25	45	1.4		-5			
		M _Z	19	25	45				± 3		
		eF	19	28	$\pm$						
237	Oct. 2	e _Z	3	35	53						In the Kasima-nada.
		M _E	3	36	23	1.7	± 1				
		M _N	3	36	11	1.9		-3			
		eF _{EN}	3	40	$\pm$						
		eF _Z	3	39	$\pm$						
238	Oct. 2	eP?z	15	48	23						A distant earthquake.
		e _Z	15	48	42	4.4			± 1		Near Ecuador, South Ame-
		e _Z	15	51	07	5.0			+1		rica.
		e _E	15	52	09						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		eN	15	52	12	5.6		± 3			
		eZ	15	51	57	5.5			-2		
		M _E	17	35	51						
		M _Z	17	35	21	21.-			± 1		
		eF	17	48	$\pm$						
239	Oct. 3	eP _{EZ}	18	39	54					415	Middle basin of the Sinano River, Niigata Prefecture. Strong shocks were felt in the epicentral region. Felt in Hokuriku, Tyûbu and Kwantô district.
		i _E	18	40	03		+6				
		S _{EZ}	18	40	50		+16		-9		
		M _{1E}	18	41	07	5.0	+120				
		M _N	18	41	22	5.0		-85			
		M _Z	18	41	19	2.6			-65		
		M _{2E}	18	41	46	6.8	+105				
		eF	18	58	$\pm$						
240	Oct. 5	P _E	9	33	26					97	Southern part of the Kii Channel.
		eP _N	9	33	24						
		S _{EN}	9	33	39						
		M _{EN}	9	33	40	1.0	+3	+2			
		M _Z	9	33	38	0.8			± 1		
		F _{EN}	9	34	28						
		F _Z	9	34	08						
241	Oct. 5	en	13	48	33	5.9					A distant earthquake. Turkestan region?
		eL _E	14	03	56						
		eL _N	14	03	44						
		M _E	14	08	43	14.7	-2				
		M _N	14	08	47	16.6		+3			
		M _Z	14	11	37	13.0			± 1		
		eF _E	14	28	$\pm$						
		eF _N	14	32	$\pm$						
		eF _Z	14	27	$\pm$						
242	Oct. 9	P	12	07	24					374	Upper Valley of the Dôsi River, Northern foot of Mt Fuji.
		i _{EZ}	12	07	31		+5		-3		
		S _E	12	08	03						
		iS _{EN}	12	08	15		-16	-13			

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		iS _Z	12	08	16				+23		
		M _{EN}	12	08	18	2.4	+44	± 24			
		M _Z	12	08	19	2.7			-28		
		eF	12	19	$\pm$						
243	Oct. 11	P	13	44	02					68	In the Kii Channel.
		iS _N	13	44	11			+2			
		M _E	13	44	14	0.6	± 2				
		M _Z	13	44	22	1.1			± 1		
		eF _{EN}	13	46	$\pm$						
		eF _Z	13	45	31						
244	Oct. 11	ez	14	00	05						East off Kinkazan, Miyagi
		eE	14	00	42						Prefecture. Felt in the
		eN	14	00	44						Pacific coast of Oou and
		ez	14	01	06						Kwanto district.
		M _E	14	01	28	4.2	-3				
		M _N	14	01	28	4.2		± 2			
		M _Z	14	01	36	2.8			± 2		
		eF _{EN}	14	09	$\pm$						
		eF _Z	14	06	$\pm$						
245	Oct. 13	S _E	17	48	42						In the Wakaura Bay, Kii
		M _E	17	48	47	1.2	± 2				Channel.
		M _N	17	48	45	1.2		-3			
		M _Z	17	48	47	1.1			± 1		
		F _{EN}	17	50	00						
		F _Z	17	49	30						
246	Oct. 15	iN	1	57	22						Local shock.
		ez	1	57	21	0.7					
		M _{iN}	1	57	22	1.3		± 4			
		F _{EN}	1	58	00						
		F _Z	1	57	40						
247	Oct. 21	iz	2	45	48						SE far off Nozima cape,
		S _E	2	46	50						Tiba Prefecture.

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
		eSN	2	46	8						
		eLE	2	47	41						
		eLN	2	47	36						
		eLz	2	47	47						
		ME	2	48	49	17.0	+15				
		MN	2	48	09	18.0		-20			
		MZ	2	49	19	11.4			-8		
		eFEN	3	06	$\pm$						
		eFz	3	09	$\pm$						
248	Oct. 22	ePz	11	58	26					2360	SE far off Kurile IIs.
		eSN	12	02	20						
		eE	12	02	37						
		eN	12	02	39						
		eZ	12	02	30						
		ME	12	07	40	18.0	± 2				
		MN	12	07	20	18.0		± 1			
		MZ	12	07	35	19.0			± 1		
		eFEN	12	22	$\pm$						
		eFz	12	17	$\pm$						
249	Oct. 23	S?E	8	17	20		+2				Local Shock.
		ME	8	17	21	0.7	-3				
		MN	8	17	22	0.6		± 1			
		MZ	8	17	20	0.7			± 1		
		FE	8	17	42						
		FNZ	8	17	32						
250	Nov. 1	ePE	8	22	55					600	Northern part of Kujû-kuri shore, Pacific coast of Tiba Prefecture.
		ePN	8	23	02						
		ePz	8	22	52						
		eSE	8	23	53						
		eSN	8	23	48						
		SZ	8	23	57						
		ME	8	24	37	2.3	± 6				
		M ₁ N	8	24	17	5.0		-5			
		M ₂ N	8	24	35	3.5		-7			

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		M _Z	8	24	32	2.2			+5		
		eF _{EN}	8	33	±						
		eF _Z	8	32	±						
251	Nov. 2	eP _{EN}	12	34	20						A distant earthquake.
		eP _Z	12	34	21						South off Aleutian IIs.
		M _E	12	48	00	20.0	-2				
		M _N	12	45	48	22.0		+2			
		M _Z	12	47	28	22.0			±2		
		eF	13	00	±						
252	Nov. 5	i _E	17	19	00	2.8	+5				NW off Hatidyô Isl.
		i _N	17	19	00	2.0		±3		s?	Deep focus earthquake.
		i _Z	17	18	57	1.3			+2		
		eF	17	22	±						
253	Nov. 5	e _N	20	35	13						A distant earthquake.
		M _E	20	46	46	17.6	±2				Tibet?
		M _N	20	47	12	13.5		±2			
		M _Z	20	47	12	13.5			±2		
		eF _E	21	04	±						
		eF _N	21	02	±						
		eF _Z	20	55	±						
254	Nov. 6	eP _E	15	22	19						Off the Kujûkuri shore,
		eP _Z	15	22	34						Tiba Prefecture.
		eF _E	15	24	±						
		eF _{NZ}	15	25	±						
255	Nov. 7	ep _Z	6	42	50						A distant earthquake.
		eS _N	6	44	15						
		eS _Z	6	44	13						
		M _N	6	45	31	2.9		±4			
		M _Z	6	44	57	2.7			+3		
		eF	6	51	±						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
256	Nov. 7	eP _{EN}	17	00	36						Middle part of the Kujû-kuri shore, Tiba Prefecture.
		e _E	17	00	58						
		eS _N	17	01	24						
		M _E	17	01	42	3.8	+4				
		M _N	17	01	37	3.8		±2			
		eF _E	17	07	±						
		eF _N	17	06	±						
257	Nov. 8	S	17	39	38		+2	+1	-1		Near Mitake, southeastern part of Gifu Prefecture.
		M _E	17	39	39	0.5	-7				
		M _N	17	39	42	0.5		±4			
		M _Z	17	39	40	0.9			-2		
		F _E	17	41	01						
		F _N	17	40	41						
		F _Z	17	40	51						
258	Nov. 10	eP _{?E}	5	43	45						A distant earthquake. Faint record.
		eP _{?N}	5	43	42						
		eP _{?Z}	5	43	49						
		e _N	5	46	59						
		e _Z	5	46	56						
		eF _E	5	54	±						
		eF _N	5	55	±						
259	Nov. 12	eP _{?E}	2	29	09						Local shock.
		M _E	2	29	27	0.5	±4				
		F _E	2	30	46						
		F _N	2	30	26						
		F _Z	2	29	56						
260	Nov. 13	P _E	5	01	55					94	Local shock.
		iS	5	02	08		+1	-2			
		M _{EN}	5	02	08	0.3	-5	+4			
		M _Z	5	02	09	0.3			±1		
		M ² _N	5	02	09	0.5		+3			
		F	5	02	54						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
261	Nov. 16	eP _{EN}	13	54	57					148	South off Sima Peninsula, Mie Prefecture.
		eP _Z	13	54	59						
		S _{EN}	13	55	17		-2	+2			
		M _N	13	55	19	1.0		-7			
		F _E	13	56	09						
		F _N	13	56	19						
		F _Z	13	55	59						
262	Nov. 16	eP _E	13	57	56					162	Ditto.
		P _{NZ}	13	57	57						
		iS _E	13	58	18		+13				
		M _E	13	58	25	1.3	+28				
		M _N	13	58	21	1.6		-16			
		M _Z	13	58	24	1.3			-6		
		eF _{EN}	14	01	±						
		eF _Z	14	02	±						
263	Nov. 16	P _E	20	33	27					131	Off the month of Kaibu R., Tokushima Prefecture.
		P _{NZ}	20	33	26						
		S _E	20	33	44		+2				
		iS _{EN}	20	33	46		+14	+13			
		S _Z	20	33	45						
		M _{EN}	20	33	46	0.7	+20	+17			
		M _Z	20	33	49	1.4			-7		
		F _E	20	35	33						
		F _N	20	35	38						
		F _Z	20	34	58						
264	Nov. 19	eP _{?N}	3	19	54						A distant earthquake. NW off Fiji IIs, South Pacific Ocean.
		eP _Z	3	20	10						
		eP _{R2E}	3	24	40						
		eS _{EN}	3	29	30						
		e _{EN}	3	31	21						
		eS _{R1N}	3	33	15						
		eL _E	3	38	18						
		eL _N	3	36	54						
		M _E	3	44	44						
		M _N	3	42	53	16.0					

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
265	Nov. 20/21	eF _E	4	05	±						
		eF _N	4	02	±						
		eF _Z	3	47	±						
		eP _E	23	32	51					7660	A distant earthquake.
		P _N	23	32	51			-4			In the Baffin Bay, West
		P _Z	23	32	53				+7		of Greenland.
		PM _Z	23	32	56				-13		Epicenter 72.°4N 69.°9W
		iz	23	32	05				-14		Epicenter time 23 ^h 31 ^m 36 ^s
		e _N	23	33	27	4.7		-11			Depth is normal.
		e _E	23	34	54	4.1	+10				By Oxford, Saint. Louis,
		P _{R2N}	23	37	25						Totosa, Pasadena, Malaga,
		eS _E	23	41	55						Belgrade, Helouan, Sapporo
		eS _N	23	41	53						and Mizusawa.
		eS _Z	23	41	59						
		e _E	23	46	25						
		e _N	23	46	34						
		e _E	23	50	01						
		e _Z	23	50	03						
		eL _E	23	53	29						
		eL _N	23	55	28						
		eL _Z	23	53	55						
		P'P' _Z	0	00	45						
		M _{1E}	23	58	48	23.3	-16				
		M _{2E}	0	05	22	16.8	+29				
		M _{1N}	0	04	25	20.7		-14			
		M _Z	0	07	47	15.6			±13		
		M _{2N}	0	07	53	14.7		+35			
		eF _{EN}	1	29	±						
		eF _Z	1	19	±						
266	Nov. 22	eP _E	12	50	20					3810	A distant earthquake.
		eP _N	12	50	19						Eastern part of New Guinea.
		P _Z	12	50	20				+2		
		e _Z	12	52	41						
		eS? _Z	12	55	56						
		e _Z	12	59	16						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		i _E	13	00	05						
		i _N	12	59	52						
		i _E	13	01	29	23.0	-10				
		i _N	13	02	02	20.0		+7			
		M _N	13	04	40	19.5		+6			
		M _Z	13	04	39	20.5			±3		
		M _E	13	06	16	20.0	±5				
		M _{2N}	13	06	27	22.5		±6			
		eF _E	13	30	±						
		eF _N	13	37	±						
		eF _Z	13	34	±						
267	Nov. 22	eP _N	19	01	22					660	Near Amami-Osima Ryûkyû IIs.
		eP _Z	19	01	21						
		eS [?] _E	19	02	39						
		eS [?] _N	19	02	24						
		eS _Z	19	02	33						
		M _E	19	04	21	9.8	±1				
		M _N	19	04	23	9.8		+2			
		M _Z	19	05	23	8.2			±1		
		eF _E	19	11	±						
		eF _{NZ}	19	13	±						
268	Nov. 22	eP _{EN}	22	33	49					640	Ditto.
		P _Z	22	33	52				-1.8		
		eS _E	22	35	04						
		eS _{NZ}	22	35	03						
		M _E	22	36	51	12.2	±3				
		M _N	22	36	55	10.5		±4			
		M _Z	22	37	51	11.2			+3		
		eF _E	22	54	±						
		eF _N	23	01	±						
		eF _Z	22	51	±						
269	Nov. 27	eP [?] _N	7	51	26						In the Kasima-nada. Felt in the Pacific coast of Kwanto district.
		eS _E	7	52	26						
		eF _{EN}	7	57	±						
		eF _Z	7	58	±						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
270	Nov. 27	eP	19	16	20						East off Miyako, Iwate Prefecture.
		e _N	19	16	29						
		M _E	19	20	16	3.2	+2				
		M _N	19	19	10	2.8		-2			
		M _Z	19	20	38	3.7			±1		
		eF _{EN}	19	25	±						
		eF _Z	19	26	±						
271	Nov. 28	eL _{EN}	11	44	12						A distant earthquake. Persia.
		M _N	11	48	11	16.0		±3			
		M _E	11	51	37	14.7	±3				
		M _Z	11	51	33	16.5			-2		
		eF _{EN}	12	04	±						
		eF _Z	12	00	±						
272	Dec. 1	eP _Z	17	46	07						Off the Ariake Bay, Kago-sima, Kyûsyû.
		eS? _{EN}	17	47	17						
		eS? _Z	17	47	19						
		M _E	17	47	30	1.7	±5				
		M _N	17	47	33	1.8		-6			
		M _Z	17	47	28	2.1			±3		
		eF _E	17	54	±						
		eF _N	17	53	±						
		eF _Z	17	51	±						
273	Dec. 2	eZ	8	47	18						Strong shocks were felt in Batan IIs, North off Luzon.
		eE	8	47	26						
		e _N	8	47	25						
		e _{EN}	8	51	01						
		eZ	8	50	58						
		eE	8	51	15	5.2	-3				
		eZ	8	51	16	5.3		-2			
		eF _E	9	00	±						
		eF _{NZ}	8	59	±						
274	Dec. 3	P _E	2	08	25					55	Near Wakayama City.
		P _{NZ}	2	08	26						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		iS	2	08	33		+11	-10	-2		
		M _E	2	08	33	0.5	-15				
		M _N	2	08	34	0.6		-20			
		M _Z	2	08	34	0.5			-4		
		eF _{EN}	2	15	±						
		eF _Z	2	13	±						
275	Dec. 3	eP?EN	7	06	57						Near Wakayama City.
		eS?N	7	07	05						
		eZ	7	07	00						
		M _{EN}	7	07	09		+2	+2			
		eF	7	08	23						
276	Dec. 3	P _{EN}	22	35	43					53	Ditto.
		iP _Z	22	35	42						
		iS _{EN}	22	35	50		+36	+11			
		iS _Z	22	35	48				+7		
		M _{EN}	22	35	51	0.6	+36	-65			
		M _Z	22	35	49	0.3			-13		
		eF _{EN}	22	48	±						
		eF _Z	22	43	±						
277	Dec. 4	P	19	36	58		-1	+1	+1	1540	NE off Hokkaido, 144°E
		i	19	36	59		+4	-4	-5		45.°2N Abnormal felt area
		PM _E	19	37	01	3.0	+31				in Pacific coast of Hakkaido
		PM _Z	19	37	02	2.9			-38		and NE Japan.
		iS _E	19	39	25		+34				Focal depth about 300 km.
		iS _N	19	39	26			-32			
		iS _Z	19	39	27				-23		
		M _E	19	39	35	5.5	+90				
		M _N	19	39	32	5.7		+196			
		M _Z	19	39	34	5.8			-103		
		ScS _E	19	48	33	4.2	+10				
		eF _E	20	01	±						
		eF _N	20	04	±						
		eF _Z	20	00	±						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
278	Dec. 7	P _{EN}	18	36	14					275	Northeastern part of the Izu Peninsula. Felt in Kwanto and Tyôbu district.
		iS _E	18	36	52		+14				
		iS _N	18	36	51			+3			
		iS _Z	18	36	50				+8		
		M _E	18	37	10	1.3	-28				
		M _N	18	37	09	1.7		±5			
		M _Z	18	37	08	2.0			-15		
		eF _E	18	46	±						
		eF _N	18	47	±						
		eF _Z	18	42	±						
279	Dec. 9	S _Z	3	39	30						Near Mt. Ôdaigahara, Nara Prefecture.
		M _E	3	39	30	0.6	+5				
		M _N	3	39	30	0.7		±5			
		M _Z	3	39	31	0.5			±1		
		F _{EN}	3	40	15						
		F _Z	3	39	45						
280	Dec. 12	eP _{EN}	14	18	53						A distant earthquake. North off Fiji IIs, South Pacific Ocean? .
		eP _Z	14	18	52						
		e _E	14	28	35						
		e _N	14	28	47						
		e _N	14	34	17	21.3		+2			
		e _N	14	43	32	13.3		+1			
		eF _E	15	2	±						
		eF _N	15	08	±						
		eF _Z	14	48	±						
281	Dec. 16	P _{EN}	19	36	13					55	Near Wakayama City.
		iP _Z	19	36	13				-1.3		
		iS _{EN}	19	36	20		+16	-13			
		M _E	19	36	20	0.5	+16				
		M _N	19	36	20	0.7		-13			
		F _E	19	37	53						
		F _N	19	38	03						
		F _Z	19	37	33						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	η	μ	km.	
282	Dec. 18	iS _E	18	20	34		+3				Lower basin of the Heki R., Wakayama Prefecture.
		iS _N	18	20	34			-3			
		M _E	18	20	35	0.8	-3				
		M _N	18	20	35	0.6		+4			
		F _{EZ}	18	21	40						
		F _N	18	21	20						
283	Dec. 24	eP _E	10	53	34					3910	A distant earthquake. Faint record.
		eP _N	10	53	16						
		eP _Z	10	53	24						
		eS _E	10	59	06						
		eS _N	10	59	08						
		eS _Z	10	58	51						
		eE _N	11	02	37						
		M _E	11	07	36	15.0					
		M _N	11	07	22	14.0					
		M _Z	11	07	38	17.0			-1		
		eF _{EN}	11	16	±						
		eF _Z	11	18	±						

SUMOTO JAPAN.

SEISMOLOGICAL BULLETIN

A Branch Station of the Kobe Meteorological Observatory of Japan.

 $\varphi=34^{\circ} 21'N$ $\lambda=134^{\circ} 53'E$ $h=109.0$ m. Underground: Cretaceous.

Instrument: Omori's Seismograph.

(Horizontal Pendulum.)

Wiechert Seismograph.

(Horizontal & Vertical)

Oct.

	T_o	ε	$\frac{r}{T_o^2}$	V
AE:	15.3	1.9	0.0004	20
AN:	18.1	2.1	0.0002	20

	T_o	ε	$\frac{r}{T_o^2}$	V
AE:	4.9	Aperiodic	0.003	110
AN:	4.4	„	0.002	102
AZ:	4.8	„	0.003	92

Nov.

	T_o	ε	$\frac{r}{T_o^2}$	V
AE:	17.1	2.1	0.0002	20
AN:	18.1	3.6	0.0001	20

	T_o	ε	$\frac{r}{T_o^2}$	V
AE:	4.8	Aperiodic	0.002	114
AN:	4.4	„	0.002	113
AZ:	4.3	„	0.001	63

Dec.

	T_o	ε	$\frac{r}{T_o^2}$	V
AE:	17.0	2.3	0.0003	20
AN:	17.4	1.8	0.0002	20

	T_o	ε	$\frac{r}{T_o^2}$	V
AE:	4.8	Aperiodic	0.002	113
AN:	4.4	„	0.002	113
AZ:	4.2	„	0.001	63

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		AE	AN	AZ		
319	Oct. 1	iP	h	m	s	s	μ	μ	μ	km.	Lower basin of the Ane R., Siga Prefecture. Weak shocks were felt in Siga and Gifu Prefecture.
			2	22	01		-0.9	-1.5	+2.2	227	
		eSEZ	2	22	32						
		eSN	2	22	30						
		ME	2	22	40	1.9	-8				
		MN	2	22	33	1.1		+11			
		MZ	2	22	33	1.5			+4		
		FE	2	30	36						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
320	Oct. 1	F _N	2	29	52						
		F _Z	2	27	32						
		P _{EN}	14	37	05			+0.5		518	In the Kasima-nada.
		iz	14	37	15						Felt in Kwanto district.
		S _E	14	38	17						
		S _N	14	38	12						
		eS _Z	14	38	15						
		M _E	14	38	37	2.9	+5				
		M _N	14	38	30	2.5		+5			
		M _Z	14	38	31	2.2			+1		
321	Oct. 1	eF _{EN}	14	46	±						
		eF _Z	14	42	±						
		S	19	24	58		+0.9	-1.5	+1.1		Eastern foot of Mt. Aso.
		M _{EZ}	19	24	58	0.5	-1		-2		Felt in Kyûsyû district.
322	Oct. 1	M _N	19	24	58	0.6		+2			
		eF	19	28	±						
		P	19	25	30					28	Local shock.
		S	19	25	33						
		M _E	19	25	34	0.4	-5				
		M _N	19	25	37	0.4		-12			
323	Oct. 2	M _Z	19	25	37	0.5			±2		
		eF	19	28	±						
		eP _{EN}	3	35	15					412	In the Kasima-nada.
		S	3	36	11						
		M _E	3	36	25	2.1	±1				
		M _N	3	36	19	2.3		+1			
		M _Z	3	36	21	1.9			±1		
324	Oct. 2	eF _{EN}	3	39	±						
		eF _Z	3	37	±						
		eP _n	7	29	25					116	Aki-nada, middle part of
		S _{EN}	7	29	40						Inland sea.
		M _E	7	29	47	1.5	-1				

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		Mn	7	29	46	0.4		-1			
		F	7	30	31						
325	Oct. 2	i _E	15	47	05						Near Ecuador, South America.
		i _N	15	47	34						
		i _{ENZ}	15	52	13						
		eF _{EN}	17	49	±						
		eF _Z	16	01	±						
326	Oct. 3	P _{EN}	18	40	03		+0.5?	+0.5?	(+)	521	Middle basin of the Sinano R., Niigata Prefecture. Strong shocks were felt in the epicentral region. Felt in Hokuriku, Tyûbu and Kwanto district.
		P _Z	18	40	04						
		S _{EN}	18	41	13						
		S _Z	18	41	14						
		M _E	18	41	18	3.9	+42				
		M _N	18	41	33	3.9		-31			
		M _Z	18	41	26	3.6			+11		
		eF _{EN}	19	02	±						
		eF _Z	18	53	±						
327	Oct. 4	eP _{EN}	11	01	16						In the Hyûga-nada, east off Miyazaki Prefecture.
		i _Z	11	01	27						
		S _E	11	01	54						
		S _N	11	01	52						
		S _Z	11	01	56						
		M _E	11	02	10	1.5	+1				
		M _N	11	02	09	1.5		-2			
		M _Z	11	02	05	1.9			±1		
		F _E	11	04	11						
		F _N	11	03	53						
		F _Z	11	03	±						
328	Oct. 5	eP _{NZ}	9	33	10					124	Southern part of Kii Channel.
		eS _{EN}	9	33	27						
		M _E	9	33	29	0.9	-1				
		M _N	9	33	29	0.5		±1			
		F	9	34	07						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
329	Oct. 5	eE	13	48	32						A dissant earthquake.
		eN	13	48	39						'Turkestan ?
		eLE	14	04	32						
		eLN	14	04	05						
		ME	14	11	51	13.6	± 7				
		MN	14	09	51	13.6		± 6			
		ez	14	10	$\pm$						
		eF	14	24	$\pm$						
330	Oct. 7	ePEN	10	33	30					29	Near Wakayama City.
		S	10	33	34						
		ME	10	33	34	0.3	+1				
		MN	10	33	35	0.4		-3			
		F	10	33	52						
331	Oct. 7	ePEN	11	53	51					16	Local shock.
		SEN	11	53	53						
		MEN	11	53	54	0.4	+2	+2			
		F	11	54	08						
332	Oct. 9	ePEN	12	07	29					306?	Upper Valley of the Dōsi
		Pz	12	07	28						River, northern foot of Mt.
		SEN	12	08	09						Fuji.
		Sz	12	08	11						
		ME	12	08	16	1.7	+6				
		MN	12	08	29	1.9		+7			
		Mz	12	08	23	2.1			-3		
		FE	12	14	21						
		FN	12	14	03						
		Fz	12	12	00						
333	Oct. 11	ePN	13	43	56					38	In the Kii Channel.
		S	13	44	01						
		ME	13	44	01	0.4	± 2				
		MN	13	44	02	0.4		-7			
		Mz	13	44	01				± 1		
		F	13	44	51						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
334	Oct. 11	eP _E	13	59	23					754	East off Kinkazan, Miyagi Prefecture. Felt in the Pacific coast of Oou and Kwanto district.
		eP _N	13	59	30						
		iz	14	00	45						
		eS _E	14	01	07						
		S _N	14	01	09						
		M _E	14	01	10	2.4	± 1				
		M _N	14	01	12	2.2		± 2			
		M _Z	14	01	34	1.6			± 1		
		eF _{EN}	14	05	$\pm$						
		eF _Z	14	03	$\pm$						
335	Oct. 13	eP	17	48	30					27	In the Wakaura Bay, Kii Channel.
		S	17	48	34						
		M _E	17	48	36	0.6	-4				
		M _N	17	48	34	0.9		+7			
		M _Z	17	48	37	0.8			± 2		
		F	17	49	33						
336	Oct. 19	P _{EN}	6	25	46					52	Near Wakayama City.
		S	6	25	53						
		M _E	6	25	53	0.4	± 3				
		M _N	6	25	54			+5			
		F	9	26	24						
337	Oct. 21	eP _E	2	45	51				+0.9	1350?	SE far off Nozima Cape, Tiba Prefecture.
		eP _N	2	45	54						
		P _Z	2	45	49						
		i _{EN}	2	48	15						
		e _E	2	49	49						
		e _N	2	49	14						
		M _E	2	49	58	11.3	+36				
		M _N	2	51	09	8.3		-29			
		M _Z	2	50	12	11.0			-36		
		eF _E	3	06	$\pm$						
		eF _Z	3	02	$\pm$						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
338	Oct. 22	eEN	12	02	46						SE far off Kurile IIs?
		eSZ	12	06	06						
		eSE	12	06	39						
		ME	15	07	41	14.5	± 8				
		MN	12	08	58	14.5		± 5			
		eFEN	12	15	$\pm$						
		eFz	12	14	$\pm$						
339	Oct. 23	ePEN	17	17	21					27	Near Wakayama City.
		SEN	17	17	25						
		ME	17	17	26	0.3	± 1				
		MN	17	17	27	0.2		± 1			
		F	17	17	42						
340	Oct. 24	PEN	1	33	52					36	Ditto.
		S	1	33	56						
		ME	1	34	59	0.6	-2				
		MN	1	33	57	0.5		+4			
		MZ	1	33	58				± 1		
		F	1	34	51						
341	Oct. 25	ePE	23	47	57						A distant earthquake. Bolivia, South America.
		ePz	23	47	48						
		eN	23	48	21						
		ME	0	18	23	12.7	+5				
		eF	0	31	$\pm$						
342	Nov. 1	ePEN	8	23	28						Northern part off Kujūkuri shore, Pacific coast of Tiba Prefecture.
		ePz	8	23	31						
		eSE	8	24	17						
		SN	8	24	24						
		ME	8	24	49	2.0	-2				
		MN	8	24	46	2.2		+2			
		MZ	8	25	07	2.2			± 1		
		eFEN	8	32	$\pm$						
		eFz	8	29	$\pm$						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
343	Nov. 4	SEN	4	34	43		+0.9	+0.9			Near Tadono, Middle basin of the Arita River, Wakayama Prefecture.
		ME	4	34	44		-2				
		MN	4	34	44	0.3		-2			
		F	4	35	03						
344	Nov. 5	ePEN	3	06	00					277	SW off Yaku Isl, Ryûkyû Is.
		eSEN	3	06	37						
		ME	3	07	04	2.4	-1				
		MN	3	06	41	2.4		+1			
		eF	3	09	±						
345	Nov. 5	iE	17	18	28						NW off Hatidyo Isl. Deep focus earthquake.
		iN	17	18	35						
		eSEN	17	19	01						
		eF	17	21	±						
346	Nov. 5	iE	20	43	44						A distant earthquake. Tibet?
		iN	20	44	45						
		LE	20	46	25						
		LN	20	45	29						
		ME	20	47	58	13.5	±12				
		MN	20	47	03	13.5		±7			
		eF	20	55	±						
347	Nov. 7	eEN	6	44	12						A distant earthquake.
		eS?N	6	47	40						
		eS?E	6	47	45						
		ME	6	47	58	3.8	±2				
		MN	6	47	48	3.8		+1			
		eF	6	51	±						
348	Nov. 7	ePEN	17	01	08					298	Middle part of the Kujû-kuri shore, Tiba Prefecture.
		SE	17	01	49						
		SN	17	01	47						
		ME	17	01	55	2.4	±1				
		MN	17	02	37	2.3		±1			
		eF	17	05	±						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
349	Nov. 10	eP _{EZ}	5	44	13						A distant earthquake.
		eP _N	5	44	15						
		eE	5	47	46						
		eF _{EN}	5	55	±						
		eF _Z	5	50	±						
350	Nov. 16	eP _E	13	55	01					168	South off Sima Peninsula, Mie Prefecture.
		P _N	13	54	59						
		S	13	55	21						
		M _E	13	55	22	0.8	+1				
		M _N	13	55	22	0.6		-1			
		F	13	56	04						
351	Nov. 16	P _{EZ}	13	58	00					186	Ditto.
		P _N	13	58	01						
		S _{EZ}	13	58	25						
*352	Nov. 16	P _{EN}	20	33	18					96	Perceptible. Off the North of the Kaibu River, Tokushima Prefec- ture.
		P _Z	20	33	19						
		S	20	33	31						
		M _{EN}	20	33	33	0.4	+24	-18			
		M _Z	20	33	33	0.6			-5		
		F _{EN}	20	35	38						
		F _Z	20	34	35						
353	Nov. 19	P	1	34	35		-0.9	-0.9	+1.6	332	SW off Hatidyo Isl. Deep focus earthquake.
		S _{EN}	1	35	20						
		M _{EN}	1	35	21	2.4	+1	+1			
		eF _{EN}	1	38	±						
		eF _Z	1	37	±						
354	Nov. 20/21	P _E	23	32	55		-0.9			8375	A distant earthquake. Baffin Bay, west off Green- land. Epicenter 72.°4N 69.°9W. Epicenter time 23 ^h 21 ^m 36 ^s Depth is normal.
		iP _N	23	32	55			-3.5			
		iP _Z	23	32	54				+4.8		
		eE	23	39	43						
		eN	23	39	55						
		eS _N	23	42	09						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		eSE	23	42	58						By Oxford, St. Louis, Totosa, Pasadena, Malaga, Belgrade, Helouan, Sapporo and Mizusawa.
		eLE	23	50	09						
		eLN	23	50	54						
		ME	0	07	34	15.0	-150				
		MN	0	07	26	15.9		-133			
		MZ	0	09	22	14.1			-100		
		eFEN	1	11	±						
		eFZ	0	41	±						
355	Nov. 22	PEZ	12	22	59						Amami-Osima, Ryûkyû IIs
		PN	12	22	56						
		eE	12	26	28						
		eF	12	38	±						
356	Nov. 22	PEN	12	50	18		-0.9	+0.9	+0.8		Eastern part of New-Guinea.
		PZ	12	50	19						
357	Nov. 22	PEN	19	01	16					1540	Near Amami-Ôsima Ryû- kyû IIs.
		PZ	19	01	18						
		eSE	19	03	57						
		ME	19	05	06	8.2	-3				
		eF	19	19	±						
358	Nov. 22	P	22	33	47		+1.8	+1.8	+2.4	1510	Ditto.
		SE	22	36	25						
		SN	22	36	24						
		MN	22	36	52	8.4		-10			
		ME	22	37	37	8.4	-8				
		MZ	22	37	35	9.3			+9		
		eFEN	22	50	±						
		eFZ	22	46	±						
359	Nov. 25	PEN	1	41	39					33	Basin of the Arita R., Wakayama Prefecture.
		SEN	1	41	44						
		ME	1	41	44		-3				
		MN	1	41	45	0.4		-4			
		F	1	42	13						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
360	Nov. 27	eP _E	19	16	32					1400	East off Miyako, Iwate Prefecture.
		eP _N	19	16	34						
		S _E	19	19	03						
		S _N	19	18	57						
		M _E	19	19	10	3.0	+1				
		M _N	19	19	26	3.0		-2			
		eF	19	25	±						
361	Nov. 28	eP _N	11	28	39						A distant earthquake. Persia.
		eS?	11	40	38						
		eL	11	45	32						
		eF	12	31	±						
362	Dec. 1	eP _E	17	45	48					553	Off the Ariake Bay, Kago-sima, Kyûsyû.
		eP _N	17	45	46						
		Z	17	46	51						
		S _E	17	47	02						
		S _N	17	47	01						
		S _Z	17	47	03						
		M _E	17	47	13	2.1	-4				
		M _N	17	47	28	2.1		-4			
		M _Z	17	47	11	2.4			-3		
		eF _{EN}	17	51	±						
		eF _Z	17	50	±						
363	Dec. 2	eP	8	47	18						Strong shocks were felt in Batan Isl., north of Luzon.
		eF _{EN}	9	07	±						
		eF _Z	8	56	±						
364	Dec. 3	eP _{EN}	0	13	23					31	Local shock?
		S _{EN}	0	13	27						
		M _E	0	13	27	-	±0.4				
		M _N	0	13	27	0.4		±1			
		F	0	13	54						
365	Dec. 3	iP	2	08	21		+3.5	-2.7	-1.8	31	Near Wakayama City.
		iS	2	08	25						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		M _E	2	08	32	0.4	-18				
		M _N	2	08	34	0.4		+14			
		M _Z	2	08	31	1.4			-4		
		F _{EN}	2	10	00						
		F _Z	2	09	00						
366	Dec. 3	eP _{EN}	3	50	23						Near Wakayama City.
		S _{EN}	3	50	27						
		M _E	3	50	28	0.4	± 1				
		M _N	3	50	28			-1			
		F	3	50	48						
367	Dec. 3	P _{EN}	7	06	53					42	Near Wakayama City.
		S _{EN}	7	06	58						
		M _E	7	07	00	0.6	-2				
		M _N	7	07	00	0.4		-4			
		e _N	7	07	04						
		F	7	07	50						
368	Dec. 3	P	22	35	37		+8.0	-6.2	-9.5	32	Near Wakayama City.
		iS	22	35	41						
		M _E	22	35	44	0.6	-42				
		M _{NZ}	22	35	43	0.6		-52	+16		
		F _{EN}	22	41	01						
		F _Z	22	38	47						
369	Dec. 4	eP _{EN}	8	32	28					374	Southern part of Hyûga-
		S _E	8	33	18						nada, SE off Miyazaki
		eS _N	8	33	19						Prefecture.
		eS _Z	8	33	17						
		M _E	8	33	38	2.0	-0.4				
		M _N	8	33	38	1.6		+1			
		F _{EN}	8	37	$\pm$						
		F _Z	8	35	$\pm$						
370	Dec. 4	eP _N	10	02	49					24	Near Wakayama City.
		S _{EN}	10	02	52						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
371	Dec. 4	M_E	10	02	52		± 0.4				
		M_N	10	02	52	0.4		-2			
		F_{EN}	10	03	06						
		S_{EN}	18	57	27						
		M_E	18	57	27		+1				
372	Dec. 4	M_N	18	57	27	0.2		± 1			
		F_{EN}	18	57	45						
		iP_E	19	37	02		+0.9			1600	
		P_{NZ}	19	37	02						
		S_E	19	39	30			+1.8	-1.5		
373	Dec. 7	S_N	19	39	34						
		S_Z	19	39	35						
		M_E	19	39	36	6.2	-44				
		M_N	19	36	43	6.5		+53			
		M_Z	19	29	39	5.8			-25		
		ScS_E	19	48	34						
		ScS_N	19	48	35						
		eF_{EN}	20	02	$\pm$						
		eF_Z	19	54	$\pm$						
		eP	18	36	24					319	
374	Dec. 9	S_E	18	37	01						
		S_N	18	37	08						
		S_Z	18	37	13						
		M_E	18	37	26	1.9	+9				
		M_N	18	37	24	1.9		-12			
		M_Z	18	37	26	1.7			-3		
		eF_{EN}	18	45	$\pm$						
		eF_Z	18	41	$\pm$						
374	Dec. 9	S_{EN}	3	39	28						
		M_E	3	39	28	1.0	+1	± 1			
		M_N	3	39	21	0.3					
		F	3	39	44						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
375	Dec. 11	eP _{EN}	2	10	25					36	Near Wakayama City.
		S _{EN}	2	10	30						
		M _E	2	10	32	0.3	± 1				
		M _N	2	10	30	-		± 1			
		F	2	11	03						
376	Dec. 12	P	7	00	07					25	Ditto.
		S	7	00	11						
		M _E	7	00	12	0.4	+6				
		M _N	7	00	12	0.4		-10			
		M _Z	7	00	12	-			± 2		
		F	7	00	51						
377	Dec. 12	eP _E	14	19	00						A distant earthquake. North off Fiji, South Pacific.
		eP _N	14	19	06						
		P _Z	14	19	05						
		L _E	14	28	18						
		L _N	14	28	11						
		M _E	14	28	47	11.3	+8				
		M _N	14	29	12	9.4		± 5			
		eF	14	40	$\pm$						
378	Dec. 16	e _{EN}	15	11	58						Near Wakayama City.
		S _{EN}	15	11	59						
		M _E	15	11	59	-	+2				
		M _N	15	11	59	0.4		-3			
		F	15	12	19						
379	Dec. 16	iP	19	37	42		+2.7	-2.7	-4.8	28	Near Wakayama City. Time is uncertain.
		S	19	37	46						
		M _E	19	37	47	0.5	-20				
		M _N	19	37	48	0.4		+15			
		M _Z	19	37	47	1.1			-4		
		F	19	39	21						
380	Dec. 16	S _{EN}	19	44	09						Near Wakayama City. Time is uncertain.
		M _N	19	44	09	-		± 0.9			
		F _{EN}	19	44	22						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
381	Dec. 18	P	18	20	15					101	The lower basin of Heki River, Wakayama Prefecture.
		S	18	20	28						
		M _E	18	20	29	0.5	-4				
		M _N	18	20	29	0.4		-4			
		M _Z	18	20	29				-2		
		F	18	21	00						
382	Dec. 19	P	16	13	44			-0.4		27	Near Wakayama City.
		S	16	13	48						
		M _{EN}	16	13	48	0.4	-3	+4			
		M _Z	16	13	48	-			± 0.8		
		F	16	14	32						
383	Dec. 21	eP _{EN}	2	27	51					30	The lower basin of Arita River. Wakayama Prefecture.
		S _{EN}	2	27	55						
		M _{EN}	2	27	55	0.3	± 1	± 2			
		F _{EN}	2	28	13						
384	Dec. 24	eP _E	10	53	41					3910	A distant earthquake.
		eP _N	10	53	42						
		eP _Z	10	53	54						
		S _E	10	59	25						
		S _N	10	59	23						
		eF _{EN}	11	15	$\pm$						
385	Dec. 28	P	21	18	46		-0.9	-2.6	(-)	19	Local shock.
		S	21	18	48						
		M _{EN}	21	18	49	0.4	+4	-10			
		M _Z	21	18	49				-1		
		F	21	19	06						
386	Dec. 31	eP _{EN}	6	55	38					48	Local shock?
		S _{EN}	6	55	45						
		M _E	6	55	45	0.3	+2	-3			
		F	6	56	09						
387	Dec. 31	e _{EN}	12	46	05						SSE off Hatidyô Isl.
		e _Z	12	46	07						

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)**Oct.**

	T_o	ε	$\frac{r}{T_o^2}$	V
A _E :	20.7	3.0	0.001	20
A _N :	20.8	3.0	0.001	20

	T_o	ε	$\frac{r}{T_o^2}$	V
A _E :	5.9	10.0	0.004	95
A _N :	6.2	10.0	0.005	93
A _Z :	3.4	2.0	0.003	63

Nov.

	T_o	ε	$\frac{r}{T_o^2}$	V
A _E :	20.8	3.0	0.001	20
A _N :	20.8	3.0	0.001	20

	T_o	ε	$\frac{r}{T_o^2}$	V
A _E :	5.5	10.0	0.006	104
A _N :	6.3	10.0	0.005	87
A _Z :	3.1	4.1	0.004	74

Dec.

	T_o	ε	$\frac{r}{T_o^2}$	V
A _E :	20.8	3.0	0.001	20
A _N :	21.4	3.0	0.001	20

	T_o	ε	$\frac{r}{T_o^2}$	V
A _E :	5.8	10.0	0.006	92
A _N :	6.3	10.0	0.005	94
A _Z :	3.5	4.1	0.003	62

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
134	Oct. 1	P _{ENZ}	h	m	s	s	μ	μ	μ	km.	The lower basin of Ane River, Siga Prefecture. Weak shocks were felt in Siga and Gifu Prefecture.
		S	2	21	55		-3.6	+0.4	+3.8	122	
		M _E	2	22	12		-48				
		M _N	2	22	12			-34			
		M _Z	2	22	13				+88		
		F _E	2	25	33						
		F _N	2	25	40						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
135	Oct. 1	F _Z	2	24	23						
		P _E	14	36	58					581	In Kasima-nada, Felt in Kwanto district.
		P _N	14	36	56						
		P _Z	14	36	57						
		S _{NZ}	14	38	16						
		M _E	14	38	42		+4				
		M _N	14	38	30			-8			
		M _Z	14	38	23				-5		
		F _E	14	41	35						
		F _N	14	41	34						
		F _Z	14	40	28						
136	Oct. 1	eP _E	19	25	06					324	Eastern foot of Mt. Aso. Felt in Kyûsyû district.
		P _N	19	25	05						
		S _{EN}	19	25	49						
		M _E	19	25	51		-3				
		M _N	19	25	53			-5			
		F _E	19	27	15						
		F _N	19	27	17						
137	Oct. 3	P	18	39	50		+1.1	+1.1	+2.4	438	Middle basin of Sinano River, Niigata Prefecture. Strong shocks were felt in the expicentral region, Felt in Hokuriku, Tyûbu, and Kwanto districts
		S _N	18	40	49						
		S _Z	18	40	46						
		i _N	18	40	57						
		M _E	18	41	18		+34				
		M _N	18	41	02			+64			
		M _Z	18	41	28	2.0			+24		
		eF _E	18	54	±						
		eF _N	18	59	±						
		F _Z	18	49	±						
138	Oct. 5	eP _{EN}	13	50	47						A distant earthquake. Turkestan?
		eL _E	14	04	13						
		M _E	14	04	13		-2				
		F _{EN}	14	17	±						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
139	Oct. 9	P	12	07	34					345	The upper valley of Dôsi River, northern foot of Mt. Fuji.
		iz	12	07	42						
		S	12	08	21						
		M _E	12	08	25		-19				
		M _N	12	08	24			-65			
		M _Z	12	08	24				-18		
		F _E	12	12	07						
		F _N	12	12	07						
		F _Z	12	09	51						
140	Oct. 11	eP	13	59	17						East off Kinkazan, Miyagi Prefecture. Felt in the Pacific coasts of Oou and Kwanto districts.
		S _{EN}	14	00	23						
		M _E	14	00	41	2.1	+5				
		M _N	14	00	42			+3			
		F _E	14	02	57						
		F _N	14	02	36						
		F _Z	14	01	18						
141	Oct. 21	eP _E	2	46	13						SE far off Nozimazaki, Tiba Prefecture. Disturbed by microseisms.
		eP _N	2	46	09						
		eP _Z	2	46	12						
		S _N	2	47	36						
		S _Z	2	47	43						
		M _E	2	49	41		+9				
		M _N	2	49	56			-28			
		F _E	2	58	±						
		F _N	2	55	34						
142	Nov. 2	eL _E	12	44	39						A distant earthquake. South off Aleutian IIs. By Omori's Seismograph.
		eL _N	12	44	46						
		M _E	12	47	50		+2				
		M _N	12	47	27			+3			
		eF _E	12	56	±						
		eF _N	12	57	±						
143	Nov. 5	eL _E	20	45	45						Faint record. A distant earthquake.
		eL _N	20	44	40						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
		eFN	20	58	$\pm$						
144	Nov. 8	P _{EN}	17	39	14					176	Near Mitake, southeastern part of Gifu Prefecture.
		P _Z	17	39	15						
		S _{EN}	17	39	37						
		M _E	17	39	40		+ 8				
		M _N	17	39	38	0.6		- 13			
		M _Z	17	39	40				- 3		
		F _{EN}	17	40	22						
		F _Z	17	40	17						
145	Nov. 16	P	13	58	13					220	South off Sima Peninsula, Mie Prefecture.
		S	13	58	43						
		M _E	13	58	46	0.6	+ 17				
		M _{1N}	13	58	46	1.0		+ 15			
		M _Z	13	58	47	0.9			+ 8		
		M _{2N}	13	58	53			+ 12			
		F _E	13	59	51						
		F _N	14	00	02						
		F _Z	14	00	38						
146	Nov. 20	P _{NZ}	23	32	47				+ 2.7	7860	A distant earthquake. In the Baffin Bay, Epicenter, 72.°4N 69.°9W. Epicenter time, 23 ^h 21 ^m 36 ^s . Depth is normal By, Oxford, St. Louis, Totosa, Pasadena, Malaga, Belgrade, Helouan, Sapporo, and Mizusawa.
		P _E	23	32	51						
		eS?E	23	42	00						
		S _N	23	42	00						
		eL _E	23	57	04						
		M _E	0	04	37	15.4	- 16				
		M _{1N}	0	07	11	14.5		- 47			
		M _{1Z}	0	06	59	15.9			- 16		
		M _{2N}	0	09	01	14.5		- 54			
		M _{2Z}	0	08	57	14.1			- 14		
		eF _E	0	32	$\pm$						
		eF _N	0	44	$\pm$						
		eF _Z	0	28	$\pm$						
147	Nov. 22	eL _E	13	01	39						Eastern part of New-Guinea. Faint record.
		eL _E	13	21	$\pm$						

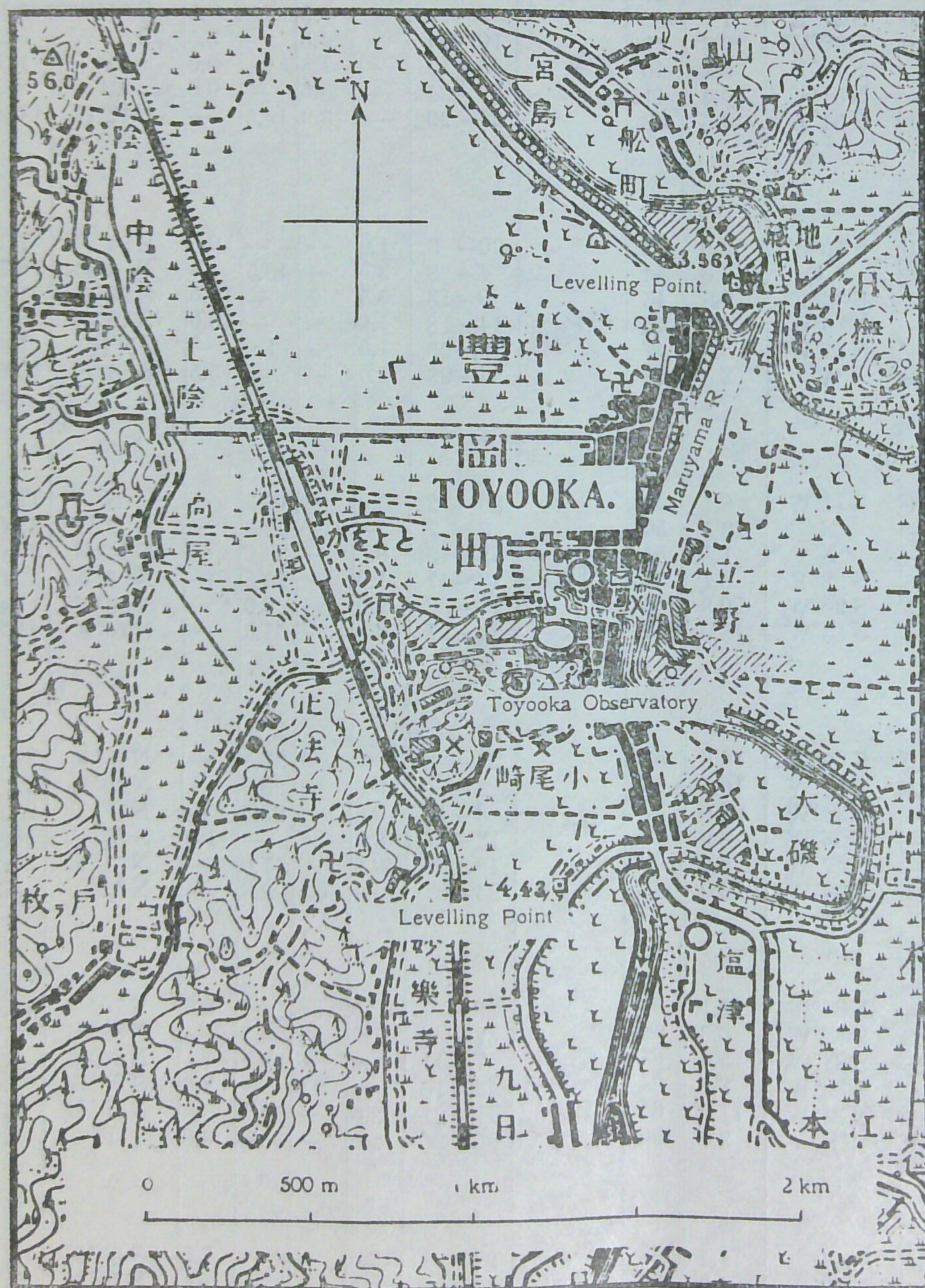
No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A _E	A _N	A _Z		
			h	m	s	s	μ	μ	μ	km.	
148	Nov. 22	S _E	22	36	05						Near Amami-Osima, Ryû-kyû IIs.
		e _E	22	38	00						
		eF _E	22	52	±						
149	Dec. 1	eP _E	17	46	11					492	Off the Ariake Bay, Kago-sima, Kyûsyû.
		P _N	17	46	18						
		S _N	17	47	24						
		eS _Z	17	47	24						
		M _E	17	47	33		-5				
		M _N	17	47	35			-7			
		M _Z	17	47	30				-2		
		eF	17	49	±						
150	Dec. 3	eP _E	2	08	47					111	Near Wakayama City.
		P _N	2	08	43						
		S _{EN}	2	08	58						
		M _E	2	09	02		-4				
		M _N	2	09	01			-3			
		F _E	2	09	36						
		F _N	2	09	52						
151	Dec. 3	P _{EN}	22	35	58					116	Near Wakayama City.
		P _Z	22	35	57						
		S _E	22	36	13						
		S _{NZ}	22	36	14						
		M _{EN}	22	36	14		-10	-12			
		M _Z	22	36	16				+5		
		F _E	22	37	23						
		F _N	22	37	00						
		F _Z	22	36	53						
152	Dec. 4	eP _{EN}	19	36	50.7		+1.6	-1.6		1500	NE off Hokkaido, 144°E 45.°2N. Abnormal felt area in the Pacific coast of Hokkaido and NE Japan. Focal depth about 300 km.
		eP _Z	19	36	50.4				+1.6		
		P _N	19	36	50.9			+4.2			
		P _Z	19	36	51.1				-5.5		
		iP _{EN}	19	36	51.8		-10.8	-26.6			
		iP _Z	19	36	51.9				+27.4		
		S _E	19	39	13						

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G.	M.	T.		A_E	A_N	A_Z		
			h	m	s	s	μ	μ	μ	km.	
		S _N	19	39	14						
		S _Z	19	39	18						
		M _E	19	39	21	5.4	+125				
		M _N	19	39	24	6.0		+256			
		M _Z	19	39	22				-57		
		ScS _E	19	48	31						
		eF _E	19	54	±						
		eF _N	19	53	±						
		eF _Z	19	50	±						
153	Dec. 7	eP _{EN}	18	36	18					382	Northern part of Izu Peninsula. Felt in Kwanto district.
		eP _Z	18	36	15						
		P _{EZ}	18	36	22						
		P _N	18	36	25						
		i _E	18	36	57						
		i _N	18	36	56						
		S _{EZ}	18	37	09						
		S _N	18	37	10						
		M _E	18	37	16	1.8	-33				
		M _N	18	37	17	1.8		-45			
		M _Z	18	37	11	1.9			-36		
		F _E	18	39	37						
		F _N	18	40	27						
		F _Z	18	40	01						

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 were described by Dr. M. Ishimoto in Jap. Journ. and Astro. 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 (1933)

$\varphi = 35^{\circ} 32'$ $\lambda = 134^{\circ} 49'$ $h = 32.2\text{m.}$ Underground: Diluvial Series.



Constants.

Instruments: Isimoto's Tiltmeter

Component T°
E—W 15.0_s
S—N 16.7_s

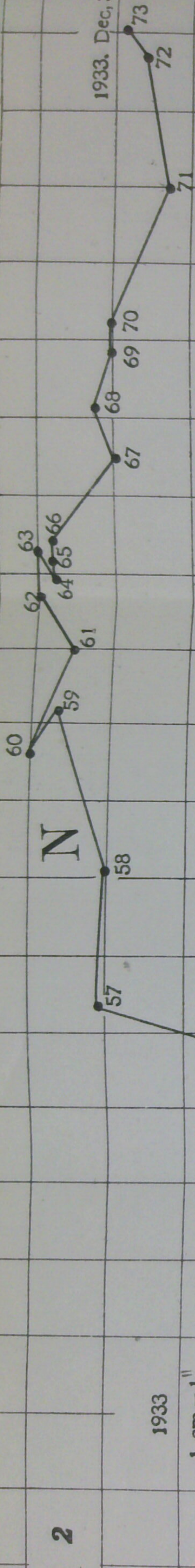
The reading are expressed in millimeters and 10m.m corresponds to the Tilting of 1".

No.	Period	Component (downward)				Tilting	No.	Period	Component (downward)				Tilting			
		E	W	N	S				E	W	N	S				
1	Dec. 1932	31 - 5	m.m 3.5	m.m —	m.m —	m.m 12.0	S 16° E	12.5	37	30 - 4	m.m —	m.m 20.0	m.m —	m.m 1.0	S 87° W	20.0
2	Jan.	6 - 10	0.5	—	—	1.0	S 27° E	1.1	38	5 - 9	—	5.5	—	0.5	S 85° W	5.5
3		11 - 15	—	4.5	—	5.0	S 42° W	6.7	39	10 - 14	—	4.5	—	2.5	S 61° W	5.2
4		16 - 20	9.5	—	2.0	—	N 78° E	9.8	40	15 - 19	—	1.5	—	0.0	W	1.5
5		21 - 25	8.0	—	6.5	—	N 51° E	10.4	41	20 - 24	—	5.5	—	0.0	W	5.5
6		26 - 30	4.0	—	—	2.0	S 54° E	4.5	42	25 - 29	—	3.0	14.5	—	N 12° W	14.9
7	Feb.	31 - 4	—	0.5	—	3.0	S 10° W	3.0	43	30 - 3	1.0	—	—	0.5	S 64° E	1.1
8		5 - 9	3.5	—	—	3.5	S E	5.0	44	4 - 8	2.5	—	18.5	—	N 8° E	18.7
9		10 - 14	1.5	—	—	2.5	S 32° E	2.9	45	9 - 13	5.5	—	—	10.5	S 28° E	11.9
10		15 - 19	—	4.0	1.0	—	N 76° W	4.1	46	14 - 18	1.0	—	—	6.0	S 10° E	6.1
11		20 - 24	—	3.5	4.0	—	N 41° W	5.3	47	19 - 23	1.0	—	1.0	—	N E	1.4
12		25 - 1	—	3.5	0.0	0.0	W	3.5	48	24 - 28	1.0	—	—	15.5	S 4° E	15.6
13	Mar.	2 - 6	—	1.5	—	8.0	S 11° W	8.1	49	29 - 2	0.0	—	17.5	—	N	17.5
14		7 - 11	—	0.0	13.5	—	N	13.5	50	3 - 7	—	1.0	22.5	—	N 2° W	22.6
15		12 - 16	—	0.0	1.5	—	N	1.5	51	8 - 12	8.5	—	35.0	—	N 14° E	36.0
16		17 - 21	3.0	—	—	7.5	S 22° E	8.1	52	13 - 17	1.0	—	12.5	—	N 5° E	12.6
17		22 - 26	—	7.0	—	19.5	S 20° W	20.8	53	18 - 32	9.5	—	6.0	—	N 56° E	11.5
18		27 - 31	—	4.0	17.5	—	N 13° W	18.0	54	23 - 27	26.0	—	31.5	—	N 40° E	41.2
19	April	1 - 5	—	15.5	—	6.0	S 69° W	16.6	55	28 - 2	10.0	—	37.5	—	N 15° E	39.0
20		6 - 10	—	15.5	—	5.5	S 71° W	16.5	56	3 - 7	9.5	—	20.0	—	N 26° E	22.5
21		10 - 15	—	10.0	17.5	—	N 30° W	22.0	57	8 - 12	6.5	—	22.0	—	N 17° E	23.0
22		16 - 20	—	3.5	7.5	—	N 25° W	8.3	58	13 - 17	18.0	—	—	1.0	S 87° E	18.0
23		21 - 25	—	6.5	6.0	—	N 47° W	8.9	59	18 - 22	20.0	—	7.0	—	N 71° E	21.2
24		26 - 30	—	12.0	0.5	—	N 88° W	12.0	60	23 - 27	—	5.5	3.0	—	N 62° W	6.3
25	May	1 - 5	—	24.0	2.5	—	N 84° W	24.1	61	28 - 1	13.5	—	—	5.0	S 70° E	14.4
26		6 - 10	—	6.5	—	1.0	S 82° W	6.6	62	2 - 6	7.0	—	4.5	—	N 58° E	8.4
27		11 - 15	—	5.0	—	0.5	S 84° W	5.0	63	7 - 11	6.0	—	0.5	—	N 86° E	6.1
28		16 - 20	—	7.5	—	4.0	S 59° W	8.5	64	12 - 16	—	3.0	—	2.0	S 57° W	3.6
29		21 - 25	—	11.0	3.5	—	N 73° W	11.6	65	17 - 21	2.0	—	0.5	—	N 76° E	2.1
30		26 - 30	—	0.0	—	3.0	S	3.0	66	22 - 26	2.0	—	—	0.0	E	2.0
31	June	31 - 4	—	1.0	—	1.0	S W	1.4	67	27 - 1	12.0	—	—	7.5	S 58° E	14.2
32		5 - 9	—	4.0	0.5	—	N 83° W	4.0	68	2 - 6	5.5	—	2.0	—	N 70° E	5.9
33		10 - 14	—	1.5	—	1.0	S 56° W	1.8	69	7 - 11	6.5	—	—	1.5	S 74° E	7.3
34		15 - 19	—	4.0	1.0	—	N 77° W	4.1	70	12 - 16	4.5	—	—	0.0	E	4.5
35		20 - 24	—	6.0	—	0.0	W	6.0	71	17 - 21	18.0	—	—	7.5	S 68° E	19.5
36		25 - 29	—	10.0	—	2.5	S 76° W	10.3	72	22 - 26	17.5	—	3.5	—	N 79° E	17.9
								73		27 - 31	3.5	—	2.5	—	N 55° E	4.4

Pl. 2

1933

1 cm = 1"



1933. Dec, 31

E

W

