

No. 1

January 1 to 31

 19<sup>13</sup>

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	$\epsilon : 1$	$\frac{r}{T_0^2}$
A <sub>N</sub> (1)	204	7.7 <sub>5</sub>	7.7	0.037
3	84	7.0	1.7	0.04
A <sub>E</sub> (1)	197	7.8	4.3	0.03
5	74	6.5	2.9	0.03
A <sub>Z</sub> (2)	74	3.5	2.3	0.08

No.	Date.	Char.	Phase	Time. (Greenwich).			Per.	Amplitude.			$\Delta$	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
							$\mu$	$\mu$	$\mu$	km.		
1	Jan. 5	I <sub>r</sub>	e	14	14	05	4				1200(?)	
			eS ?			16.6	7					
			eL			19.4	12					
			ME			20 58	10			2½		
			MN			21 07	10	2½				
2	" 9	I	F	14	40							
			e	3	14.2							
			eL			28.6	16					
			ME			31 41	15			3½		
3	" 11	III <sub>u</sub>	MN			32 04	15	3½				
			F	6	28							
			eP	13	25.1	3					4800	
					25 11	12	15	11				
			PR <sub>1</sub>		27 12							
					27 38	16	58	55				
			iS		31 39	8	-10	+4½				
			PS		32 08	12	43	31				
			iSR <sub>1</sub>		34 53	14	+72	-				
					35 17	16	100	98				
			eL		37.1	30						
			MN <sub>1</sub>		43 03	18	252					
ME <sub>1</sub>		43 32	18		262							
MZ		44 44				?						
ME <sub>2</sub>		44 52	16		268							
MN <sub>2</sub>		46 28	15	282								
F		17 45										
4	" 15	I	e	19	54.8							
			ME <sub>1</sub>			20 01 49	13			3½		
			MN			2 38	13	1½				
			ME <sub>2</sub>			9 41	12			2		
5	" 15	I	F	20	29							
			e	22	05.9							
			ME			10 47	15			4½		
6	" 16	I	MN			13 31	11	2½				
			F	22	30							
			e	13	17.1							
e			22.0									
MN <sub>1</sub>		25 08	10	2½								
ME		26 08	15		3½							
MN <sub>2</sub>		30 32	10	2½								
F		14 0										

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**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>o</sub>	ε : 1	r T <sub>o</sub> <sup>2</sup>
A <sub>N</sub>				
A <sub>E</sub>	(See last sheet)			
A <sub>Z</sub>				

No.	Date.	Char.	Phase	Time. (Greenwich).			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
7	Jan. 19	II <sub>u</sub>	eP ?	17	17.1					7200	? Shock felt on board N.D.L. steamer "Scharnhorst", latitude 1-18 S., and longit. 86-58 E.	
			eS		25.7	5						
			iPS		26 08	5	5	9½				
			eL		33.6	26?						
					35.2	40						
			MN		39.6	24	133	315				
8	" 20	I	MZ		44 57	18			35			
			F	20	17							
			eS	15	03.1							
			eL		5.0	16						
			ME		5 23	14		5½				
			MN		7 58	9	2					
9	" 23	I <sub>u</sub>	F	15	53							
			e(P?)	13	59.3					5800 ?		
			S	14	06 42	?						
			eL		10.6	16						
			MN <sub>1</sub>		11 21	16	19					
			ME <sub>1</sub>		12 42	13		14				
			ME <sub>2</sub>		15 25	13		11				
			MN <sub>2</sub>		16 46	13	16					
MZ		16 55	13			18						
10	" 24	I	F	15	14							
			e	5	59.0							
			MN	6	01 57	12	6½					
			ME		2 34	12		2				
11	" 26	I	F	6	29							
			i	19	10 38	3	+ 3½	-				
			e		13.1							
					13.5	9	2					
			i		15 52	8	- 4½	+ 6½				
F	19	30						Probably two distinct shocks at interval of 5 minutes.				

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3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$ (1)	206	7.7s	6.6	0.04
(3)	82.3	7.0	1.6	0.04
$A_E$ (1)	198	7.7	9.3	0.03
(3)	73	6.4	2.9	0.05
$A_Z$ (2)	70	3.5	2.5	0.07

No.	Date.	Char.	Phase	Time. (Greenwich).			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
12	Feb. 3	I	e	17	15.4	5						
			eL		19.5	12						
			MN		21 50	11	$1\frac{3}{4}$					
			ME		22 57	9		$1\frac{1}{2}$				
13	" 6	I	F	17	42							
			e	12	22.5							
			eL		24.6	16						
			MN		25 47	12	$3\frac{1}{4}$					
14	" 7	$I_u$	ME		29 46	?						
			F	12	40							
			iP	3	11 6	3	-4	-		5240		
			iS		18 1	4	$2\frac{1}{4}$	-3				
15	" 8	I	eL		22.9	20						
			ME		24 41	20		59				
			MN <sub>1</sub>		25 04	18	15					
			MN <sub>2</sub>		34 32	14	14					
16	" 11	I	MZ		34 43	14				22		
			F	5	10							
			e(L?)	18	25.4	12						
			MN		26 24	12	2					
17	" 12	I	ME		30 20	12		$1\frac{1}{4}$				
			F	18	33							
			e(L?)	23	59.3	?						
			MN		0 01 33	14	3					
18	" 14	$I_r$	ME		2 11	14		3				
			F	0	18							
			e	17	22.0							
			eL		29.2	16						
19	" 15	$I_r$	MN		30 16	12	$3\frac{1}{4}$					
			ME		30 36	12		$2\frac{1}{2}$				
			F	17	50							
			iP	18	57 32	4	$-3\frac{1}{2}$	-		2400		
19	" 15	$I_r$	S	19	01 32	7	$\frac{1}{2}$	2				
			i		2 33	7	$+5\frac{1}{2}$	$+6\frac{1}{4}$				
			eL		4.0	20						
			MN <sub>1</sub> )		5 46	16	$7\frac{1}{2}$		29			
19	" 15	$I_r$	ME <sub>1</sub>		6 28	14		$6\frac{1}{4}$				
			MN <sub>2</sub>		9 34	10	3					
			ME <sub>2</sub>		10 29	9		3				
			F	19	58							
19	" 15	$I_r$	iP	19	08 05	3	$+1\frac{1}{2}$	$+1\frac{1}{2}$		2450 (cf.No. 22)		
					8 44	4	$2\frac{1}{2}$	$2\frac{1}{2}$				
			iS		12 07	7	-7	$-5\frac{1}{4}$				
			PS		12 19	7	11	$5\frac{1}{4}$				
19	" 15	$I_r$			13 39	7	6	10				
			ME		15 58	12		5				
			MN		16 15	12	$5\frac{1}{4}$					
			F	20	24							

No. 2 (continued)

February 1 to 28

1913

# Riverview College Observatory,

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**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>o</sub>	ε : 1	$\frac{r}{T_o^2}$
A <sub>N</sub>				
A <sub>E</sub>	(see last sheet)			
A <sub>Z</sub>				

No.	Date.	Char.	Phase	Time. (Greenwich).			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
20	Feb. 20	I <sub>u</sub>	eP ?	9	11.0						8000 ?	
			i(S?)		20 22	5	-1½	-2				
			eL		37.1	25						
			MN		41 31	18	10					
			ME		41 37	18		8				
21	" 22	I <sub>r</sub>	F	10	45						2100	Felt in South Island (N.Z.) especially at Westport, Grey-mouth, &c.
			iP	1	12 37	4	+1½	-3½				
			iS		16 17	4	-	+2				
			eL		17.0	14						
			ME		17 31	12		3½				
22	" 25	I <sub>r</sub>	MN		19 03	10	1½				2500	(cf. No. 19)
			F	3	50							
			iP	14	23 23	3	+1½	+1½				
			iPR <sub>1</sub>		24 11	4	-10	-8½	+1½			
			iS		27 29	7	-3½	-4½				
					28 35	7	12	8				
			eL		29.0	12						
23	" 27	I	MN		30 33	8	2½					
			ME		30 42	8		3				
			F	16	10							
			e	21	27.4	?						
			e		29.3	5						
			i		30 05	6	5	8				
					30 32	7	-	5				
		32 29	10	-	6							
		F	22	0								

No. 3

March 1 to 31

19 13

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**INSTRUMENTS:**

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3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$ (1)	194	7.8s.	6.9	0.03
3	83	7.0	1.7	0.04
$A_E$ (1)	186	7.8	7.7	0.03
3	74	6.4	3.0	0.05
$A_Z$ (2)	72	3.5	2.2	0.04

No.	Date.	Char.	Phase	Time. (Greenwich).			Per. s.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
24	Mar. 1	$I_v$	e	15	09	.2				?	Short wave-lengths: origin probably less than 500 km. distant.	
			MN		13	.0	5	2				
			ME		13	13	5		$1\frac{1}{2}$			
25	" 4	$I_r$	F	15	32							
			e	7	10	.3						
			eL		22	.4	15					
26	" 6	I	MN		26	28	12	2				
			ME		28	05	14		3			
			F	7	53							
27	" 10	I	e	9	03	.6						
			ME		8	40	12		2			
			MN		10	27	12	2				
28	" 14	$III_u$	F	9	38							
			e	14	03	.4						
			MN <sub>1</sub>		8	21	10	$2\frac{1}{4}$				
			ME		10	20	13		7			
			MN <sub>2</sub>		14	52	10	$1\frac{1}{2}$				
29	" 23	$I_u$	F	14	54							
			iP	8	53	21	3	$+7\frac{1}{2}$	$-5\frac{1}{2}$	$5\frac{3}{4}$	5100 Destructive earthquake in Sangir islands, S. of Mindanao, (Philippines)	
			i		53	41	4	$+23$	$-32$			
			PR <sub>1</sub>		55	42	6	48	35			
			PR <sub>2</sub>		56	58	6	50	46			
			iS	9	0	10	8	$-235$	$-121$	82		
			SR <sub>1</sub>		3	41	10	511	481	?		
			eL		4	.8	30					
			MN <sub>1</sub>		7	07	9	290				
			ME <sub>1</sub>		10	10	16		1040			
			MN <sub>2</sub>		10	40	11	332				
			MZ		12	34	12			462		
			ME <sub>2</sub>		14	35	11		373			
			MN <sub>3</sub>		15	32	11	465				
G		28	36	10	34	45						
29	" 23	$I_u$	F	14	10					5000		
			eP	20	57	.4	3					
			S	21	04	09	8	$4\frac{1}{2}$	-			
			iPS		5	34	8		-6			
			eL		11	.3	24					
			ME		16	57	14		11			
			MN		17	36	14	6				

No. 3 (continued)

March 1 to 31

1913

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	V	T <sub>o</sub>	ε : 1	r T <sub>o</sub> <sup>2</sup>
A <sub>N</sub>				
A <sub>E</sub>	(see last sheet)			
A <sub>Z</sub>				

No.	Date.	Char.	Phase	Time. (Greenwich).			Per. s.	Amplitude.			Δ km.	Remarks.
				h.	m.	s.		A <sub>N</sub> μ	A <sub>E</sub> μ	A <sub>Z</sub> μ		
30	Mar. 24	I <sub>r</sub>	e	19	27.0							
			e(S?)		29.2	?						
			eL		31.9	18						
			ME		33 47	12			4½			
			MN		34.0	12	4½					
31	" 26	I	F	20	07							
			e(S?)	21	53.1	7?						
			eL		59.7	22						
			MN	22	04 44	16	8					
			ME		5 16	16			10			
32	" 30	I	F	22	40							
			e	8	41.6	?						
			eL		47.1	14						
			MN		51 58	12	4½					
			ME		52 15	12			4½			
33	" 31	I <sub>u</sub>	F	10	05							
			eP	3	54.0	3					9500	
			eS	4	04.6	?						
			PS		5 16	7	4	-				
			eL		21.5	35?						
			MN <sub>1</sub>		23 26	22	19					
			ME <sub>1</sub>		33 35	18			8			
			MN <sub>2</sub>		34 20	18	10					
			ME <sub>2</sub>		42 26	15			9			
			F		7 10							
34	" "	I <sub>r</sub>	eP	16	56.6						4000	
			eS	17	02.4	8?						
			eL		5.3	12						
			MN		7 05	10	22					
			ME		7 22	10			4			
35	" "	I <sub>r</sub>	F	18	20							
			eP	21	48.5	4					4000	Probably 2nd shock of No.34
			S?		54.3	6						
			eL		58.1	14						
			ME		59 30	12			6			
			MN		59 44	12	10					
F	23	06										

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2. Wiechert Vertical Seismometer (80 kilo.)
3. Manka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_1 \left. \begin{matrix} 1 \\ 3 \end{matrix} \right\}$	194	7.8	6.9	0.03
$A_2 \left. \begin{matrix} 1 \\ 3 \end{matrix} \right\}$	83	7.0	1.7	0.04
$A_3 \left. \begin{matrix} 1 \\ 3 \end{matrix} \right\}$	186	7.8	7.7	0.03
$A_4 \left. \begin{matrix} 1 \\ 3 \end{matrix} \right\}$	74	6.4	3.0	0.05
$A_5 \left. \begin{matrix} 1 \\ 2 \end{matrix} \right\}$	72	3.5	2.2	0.04

No.	Date.	Char.	Phase	Time. (Greenwich).			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
	March 14	III.	iP	8	53	21	3	+ 7 $\frac{1}{2}$	- 5 $\frac{1}{2}$	5 $\frac{1}{2}$	5120	
			i		53	41	4	+ 23	- 32			
			PR <sub>1</sub>		55	42	6	48	35			
			PR <sub>2</sub>		56	58	6	50	46			
			iS	9	00	10	8	235	-121	82		
			SR <sub>1</sub>		3	41	10	511	481	?		
			eL		4.	8	30					
			MN <sub>1</sub>		7	07	9	290				
			ME <sub>1</sub>		10	10	16		1040			
			MN <sub>2</sub>		10	40	11	332				
			MZ		12	34	12			462		
			ME <sub>2</sub>		14	35	11		373			
			MN <sub>3</sub>		15	32	11	465				
			C		28	36	10	34	45			
			F	14	10							

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	V	T <sub>0</sub>	$\epsilon : 1$	$\frac{r}{T_0^2}$
A <sub>N</sub> (1)	204	7.6	7.1	0.02
A <sub>N</sub> (3)	87	7.0	1.7	0.05
A <sub>E</sub> (1)	195	7.6	4.6	0.02
A <sub>E</sub> (3)	67	6.2	2.5	0.05
A <sub>Z</sub> (2)	73	3.5	2.5	0.08

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
79	June 4	II <sub>r</sub>	iP	10	03	51	5	$+2\frac{1}{2}$	$\mu$	$\mu$	3500	
			eS		9	0	?					
			eL		11	0	30					
			ME <sub>1</sub>		15	33	19		232		3200	
			ME <sub>2</sub>		19	14	12		130			
			M(N, Z)		20	1	11	115		51		
			F	12	20							
80	" 13		ME	3	42	5	18		$5\frac{1}{4}$			From 3h 33 <sup>m</sup> . to
			MN		45	4	16	6				3h 50 <sup>m</sup> . a few
81	" 14	I	eL	10	47	1	18					long waves.
			MN		52	17	16	2				
			ME		54	17	16		4			
			F	11	26							
82	" 17	I <sub>r</sub>	eP	9	07	8	8				3500	
			S		13	03	8	1	1			
			eL		17	1	12					
			MN		17	54	10	$1\frac{1}{2}$				
			ME		18	44	9		1			
			F	10	30							
83	" 22	I <sub>r</sub>	e(P?)	14	13	6	8				4500?	
					14	04	8	5	6			
			e(S?)		19	8	14					
			e(L?)		26	5	20					
			MZ		34	43	18		18			
			MN		35	39	20	22				
			ME		37	29	18		10			
			F	15	52							
84	" "	I	e	16	08	8						
			ME		16	52	16		1			
			MN		18	20	16	2				
			F	16	30							
85	" 25	I	e	18	39	0						
			MN		40	37	?					
			ME		42	15	10		$\frac{3}{4}$			
			F	18	50							
86	" 26	III <sub>r</sub>	iP	5	03	58	5	-	$-6\frac{1}{4}$	+4	3550	Felt on islands
			i		4	07	5	$+4\frac{1}{2}$	+15	-12		of Tongatabu,
			PR <sub>1</sub>		5	31	6	8	29	19		Haapai and Va-
			iS		9	18	9	+45	+23			vau (Tonga or
			PS		9	45	9	94	116			Friendly group
			eL		11	7	?	?				
					12	04	16	460	150			IV Sieberg ?
			MN <sub>1</sub>		13	22	15	504				
			ME <sub>1</sub> )		15	08	20		2130	1440		Azimuth compu-
			MZ		17	03	11	287				ted, N 73 E.
			MN <sub>2</sub>		24	13	14		290			
			ME <sub>2</sub>		34	1	12	95	86	31		
			C		9	20						
			F		9	20						

(See Special Bulletin June 30, 1913)



No. Special Bulletin

June 30, 1913.

19

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
A <sub>1</sub> (1)	204	7.6	7.1	0.02
(3)	87	7.0	1.7	0.05
A <sub>2</sub> (1)	195	7.6	4.6	0.02
(3)	67	6.2	2.5	0.05
A <sub>3</sub> (2)	73	3.5	2.5	0.08

No.	Date.	Char.	Phase	Time. (Greenwich).			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$	$A_E$	$A_Z$		
	June 26	III <sub>r</sub>	iP	5	03	58	5	$\mu$	$\mu$	$\mu$		
			i		4	07	5	-	$-6\frac{1}{2}$	+4	3550	Probably near island of Tongatabu, - Tonga group
			PR <sub>1</sub>		5	31	6	$+4\frac{1}{2}$	+15	-12		
			iS		9	18	9	8	29	19		
			PS		9	45	9	$+45$	$+23$			
			eL		11.7	?	?	94	116			Azimuth calculated, N 73 E.
			MN <sub>1</sub>		12	04	16	460	150			
			ME <sub>1</sub> )		13	22	15	504				
			MZ <sub>1</sub> )		15	08	20		2130	1440		
			MN <sub>2</sub>		17	03	11	287				
			ME <sub>2</sub>		24	13	14		290			
			C		34.1		12	95	86	31		
			F		9	20						

No. 7

July 1 to 31

1913

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^\circ 49' 49''$  S.     $\lambda = 151^\circ 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N(1)$	206	7.6	4.7	0.02
$A_N(3)$	163	7.0	1.7	0.04
$A_E(1)$	193	7.6	4.4	0.02
$A_E(3)$	123	6.2	2.5	0.07
$A_Z(2)$	74	3.5	2.4	0.05

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
87	July 1	I	eP ?	3	59	.2						
			e(S?)	4	04	.9						
			PS	5	11		7	4	$3\frac{3}{4}$			
			eL	9	.8		16					
			ME	13	00		10		$6\frac{1}{4}$			
			MN	13	13		10	$4\frac{3}{4}$				
			F	4	45							
88	" 6	II <sub>r</sub>	eP	16	20	.2					4300	
			PR <sub>1</sub> ?	22	21							
			eS	26	.2							
			PS	26	29		8	4	5			
			SR <sub>1</sub>	29	21		8	$2\frac{3}{4}$	$4\frac{1}{2}$			
			eL <sub>1</sub>	32	.0		18					
			ME	37	24		16		42			
			MZ	38	40		15			24		
			MN	39	41		14	21				
			F	17	50							
89	" 7	I <sub>r</sub>	eP	9	28	.0					3000	
			S	32	40		6	$\frac{3}{4}$	$1\frac{1}{2}$			
			eL	35	.7		15					
			MN	39	40		12	3				
			ME	41	00		10		6			
90	" "	II <sub>r</sub>	F	10	35						3500	
			iP	17	42	38	4	-7	-			
			iS	47	49		8	9	+13			
			PS	48	22		8	19	10			
			SR <sub>1</sub>	50	18		10	21	28			
			eL <sub>1</sub>	50	30		24					
			ME	54	10		10		53			
			MN	54	39		11	59				
			MZ	56	25		12			30		
			C	18	04	.4	8	21	18			
91	" 8	II <sub>r</sub>	F	19	20					3300		
			eP	22	14	.0						
			iS	18	47		6	$-3\frac{3}{4}$	+15			
			iPS	19	06		6	$3\frac{3}{4}$	-12			
			eL	20	.8		20					
92	" 12	I <sub>r</sub>	M	22	.7		16	47	100	4900		
			F	23	50							
			iP	10	42	23	5	$-1\frac{1}{4}$	$+7\frac{1}{4}$			
			S	49	.0		9	-	1			
			eL	52	.0		20					
			MN	11	00	35	16	11				
ME	6	30		14		$7\frac{1}{2}$						
F	11	40										

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS :**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Manka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>o</sub>	ε : 1	$\frac{r}{T_o^2}$
A <sub>N</sub>				
A <sub>E</sub>	(See last sheet)			
A <sub>Z</sub>				

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			Δ km.	Remarks.
				h.	m.	s.		A <sub>N</sub> μ	A <sub>E</sub> μ	A <sub>Z</sub> μ		
93	July 21	I	e ?	18	17.9							
			MN		21	5	11	2½				
			ME		21	24	14		3			
94	" 22	II	F	18	30							
			e(S?)	6	40.4							
			eL		45	05	22					
			ME <sub>1</sub>		48	38	22		64			
			MZ		50	37	20			31		
			MN		50	52	20	57				
95	" 23	I	ME <sub>2</sub>		51	25	15		59			
			F	8	05							
			eP?	18	30.5	5	¼	1¼				
			S?		34.1	8	1	-				
			eL		36.7	12						
			MN		38	25	12	4				
96	" 24	I <sub>r</sub>	ME		41	34	14		3			
			F	19	05							
			iP	10	50	10	4	+3¼	+5¼	-2	2400	
					50	11	4	-6¼	-8	+18		
			PR <sub>1</sub>		51.5	5	5	2¼	4¼			
			iS		54	06	6	-4	-3½			
			PS		54.2	6	6	8	8			
					54.8	6	6					
			ME		57.9	12	12					
			MN		59.7	11	11					
97	" 25	I	F	11	40							
			eL	8	05.5	14						
			ME		9	28	9		2½			
			MN		10	32	10	1½				
98	" 28	I	F	8	40							
			e(L?)	6	55.3	20?						
			MN		37	42	16	2				
			ME		45	56	14		1½			
99	" "	II <sub>r</sub>	F	7	35							
			eP	12	04.3	6	¾	½		2400		
			eS		08.2	8	½	½				
			eL		09.6	15						
			ME <sub>1</sub>		10	08	14		37			
			MN)		12.4	12	19			15		
			MZ									
			ME <sub>2</sub>		12	41	12		33			
			F	13	35							

No.7 (continued)

July 1 to 31

1913

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^\circ 49' 49''$  S.     $\lambda = 151^\circ 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS :**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_o$	$\epsilon : 1$	$\frac{r}{T_o^2}$
$A_N$				
$A_E$	(See last sheet)			
$A_Z$				

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
100	July 29	II	e(S?)	15	6.9							
			eL		11.3	14						
			ME <sub>1</sub>		12 58	10		7				
			MN <sub>1</sub>		13 07	9	8½					
			MZ <sub>1</sub>		14 24	11			9			
			ME <sub>2</sub>		16 30	14		15				
			MN <sub>2</sub>		16 44	14	8					
			F		16 15							
			e?		18 49.0							
			e?		57.1							
101	" "	I	i(SR <sub>1</sub> ?)	19	0 31	12	-	-21				
			eL		0.8	15?						
			M		2.1	12	11	17				
			F		19 30							
102	" "	I	e(S?)	22	24.3							
			eL		30.5	?						
			ME		31 55	12		1				
			MN		32 19	12	1					
			F		23 0							

N.B.

In the preceding Bulletins of this year (Nos. 1 to 6), the Magnification (V) of the Mainka seismometer (No. 3) was inadvertently given at ½ its real value. Please correct this error.

E.F. Pigot, S.J.

No. 2

August 1 to 31

1913

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS :**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	$\epsilon : 1$	$\frac{r}{T_0^2}$
A <sub>1</sub> (1)	199	7.7	5.2	0.025
A <sub>1</sub> (3)	163	7.0	1.7	0.04
A <sub>2</sub> (1)	189	7.6	5.0	0.02
A <sub>2</sub> (3)	123	6.2	2.5	0.07
A <sub>2</sub> (2)	73	3.5	2.7	0.05

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		A <sub>N</sub> $\mu$	A <sub>E</sub> $\mu$	A <sub>Z</sub> $\mu$		
103	Aug. 1	I <sub>u</sub>	eP	17	23.4						8600	Probably East of Kurile Islands.
			eS		33.3							
			PS		34.3	12	4	-				
			e(SR <sub>1</sub> ?)		38.7	15	1 $\frac{3}{4}$	-				
			eL		48.7	30						
			MN <sub>1</sub>		53 26	20	12					
			ME <sub>1</sub> )		57.4	16		6 $\frac{1}{4}$				
			MN <sub>2</sub> )			18	7 $\frac{1}{2}$					
			ME <sub>2</sub> )	18	09 21	18		5 $\frac{1}{2}$				
			F	19	25							
104	" 4	II <sub>r</sub>	eP	21	20.3	2				3600	Banda Sea	
			eS		25.5							
			iS		25 37	5	-4 $\frac{1}{4}$	-4 $\frac{1}{4}$				
			PS		26 19	5	4 $\frac{1}{4}$	-				
			SR <sub>1</sub>		27 35	7	5	3 $\frac{1}{2}$				
			eL		28.2	?						
			MN		31.9	7	47	40				
			ME									
			MZ		32 37	5			5 $\frac{1}{2}$			
			F	22	30							
105	" 6	I <sub>r</sub>	eP	12	10.6	5				2700		
					10 54	5	$\frac{1}{2}$	2				
			S		14 56	8	1	2 $\frac{1}{2}$				
			eL		17.4	24						
			ME		19 21	18		13				
			MN		19 37	13	7 $\frac{1}{2}$					
106	" 6	I	e	13	05					2700	T. very short F lost in 107	
				22	23.3							
107	" 6	II <sub>u</sub>	eP	22	31.0	6			3 $\frac{3}{4}$	13000	Destructive E.Q. Quicacha (Peru)	
			iS		43 50	15	-32	+43				
			SR <sub>1</sub>		49 55	20	96	66				
					50 47	20	114	92				
			SR <sub>2</sub>		54 23	21	17	54				
			eL <sup>2</sup>	23	01.4	40						
			ME <sub>1</sub>		03 42	34		73				
			MN <sub>1</sub>		04 03	32	94					
			MN <sub>1</sub>		08 20	23	63					
			ME <sub>2</sub>		08 51	23		70				
			MZ		10 31	18			72			
			ME <sub>3</sub> )		10.6	18	62	65				
			MN <sub>3</sub> )									
			F	2	17							

No. E (Continued)

August 1 to 31

1913

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS :**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	ε : 1	$\frac{r}{T_0^2}$
A <sub>N</sub>				
A <sub>E</sub>	( See last sheet )			
A <sub>Z</sub>				

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
108	Aug. 6	II <sub>r</sub>	P	23	22	50	s?	μ	μ	μ	3100	Superposed on No. 107
			S		27	39	8	11	5			
			PS		26	07	8	23	12			
			eL		31.5		25					
			F		?							
109	" 7	II	e?	14	46.6							
			S		51	20	8	2	2			
			eL		53.1		12					
			LE									
			MN <sup>7</sup>		55.3		9	62	47			
110	" 11	I	LZ		58	38	10			20		
			F	16	05							
			e	6	45.2	6	1½	2				
			e		52.2	9	-	2				
			eL		56.1	12						
			MN <sub>1</sub>		56	35	12	5				
			ME <sub>1</sub>		57	00	12		4½			
			MZ	7	00	00	12			11		
			MN <sub>2</sub>		0	13	12	4				
			ME <sub>2</sub>		0	28	12		2½			
111	" 13	II <sub>u</sub>	F	7	20	00						
			iP	4	54	36	5	½	3½		5500	Sunda Straits
			iS		41	42	7	-14	+14			
			eL		47.8		35					
			MN <sub>1</sub>		52	12	22	83				
			ME <sub>1</sub>		55.0		22		96			
			MZ				24			64		
			LE <sub>2</sub>		56	32	18	50				
F	6	30	00									
112	" 15	I	eP	19	21.6							
			e(L?)		30.8	25?						
			MN		40	26	14	3				
			LE		40	37	14		3			
113	" 18	I	F	20	05	00						
			e?	1	19.4							
			e(L?)		30.4	?						
			MN		33	15	10	2				
			ME		33	23	10		1½			
F	1	50	00									

No.8 ( Continued )

August 1 to 31

1913

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation : Triassic sandstone.

**INSTRUMENTS :**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	ε : 1	r T <sub>0</sub> <sup>2</sup>
A <sub>N</sub>				
A <sub>E</sub>	( See last sheet )			
A <sub>Z</sub>				

No.	Date.	Char.	Phase.	Time. (Greenwich.)			Per.	Amplitude.			Δ km.	Remarks.
				h.	m.	s.		A <sub>N</sub> μ	A <sub>E</sub> μ	A <sub>Z</sub> μ		
114	Aug. 25	I	e(P?)	5	19	7						
			S?		24	7	8	3	2½			
			eL		26	8	12					
			ME		29	24	10		6½			
			MN		30	41	10	5				
115	" 31	II <sub>r</sub>	F	6	05	00					2500	
			eP	6	09	46						
			iP		9	55	4	4½				
			PR <sub>1</sub>		10	55	5	5½				
			iS <sub>1</sub>		13	51	8	-14	4			
			i		14	00	8	-	+25			
					14	07	8	21	50			
			eL		15	1	30?					
			ME <sub>1</sub>		16	58	14		54			
			MN <sub>1</sub>		17	26	14	159				
			MZ		19	36	11			12		
			MN <sub>2</sub> ) ME <sub>2</sub> ) F <sub>2</sub>		19	45	11	70	17			
116	" 31	II	eP?	17	21	7						
			eL		27	3	28					
			ME		30	18	15		27			
			MN <sub>1</sub>		30	34	15	30				
			ME <sub>2</sub>		32	09	12		44			
			MN <sub>2</sub>		32	47	12	33				
			MZ		33	19	12			15		
			F	18	40	00						

No. 9

September 1 to 30 19 13

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^\circ 49' 49''$  S.     $\lambda = 151^\circ 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	$\epsilon : 1$	$\frac{r}{T_0^2}$
A <sub>N</sub> (1)	206	7.7	4.8	0.027
A <sub>N</sub> (3)	140	10.5	4.8	0.018
A <sub>E</sub> (1)	195	7.7	4.6	0.02
A <sub>E</sub> (3)	127	11.2	7.4	0.018
A <sub>Z</sub> (2)	80	5.1	4.7	0.03

No.	Date.	Char.	Phase.	Time. (Greenwich.)	Per.	Amplitude.			$\Delta$	Remarks.
						A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
117	Sept 1	I	eP	20 59.8	5	$\mu \frac{1}{2}$	$\mu \frac{1}{2}$	$\mu$	km.	
			ME	21 11 39	16		5			
			MN	12 06	16	2				
			F	21 50						
118	" 2	I <sub>r</sub>	eP	19 08.2					2500	
			S	13 07						
			PS	13 25	10	3	$\frac{1}{2}$			
			eL	17.0						
			ME	18 35	17		24			
			MN	19 07	18	24				
			MZ	21 48	14			8		
			F	20 30 00						
119	" 3	II <sub>r</sub>	eP	20 57.3					3100	
			iP	57 26	7	+6				
			iS	21 02 07	9	-33	4			
			PS	02 38	10	55	26			
			eL	04.1	28					
			MN <sub>1</sub>	06 19	22	360				
			MZ <sub>1</sub>	06 31	24			109		
			ME	07 22	15		195			
			MN <sub>2</sub>	09 28	12	88				
			C	20 00	10	20	19			
			F	23 15						
120	" 7	I <sub>r</sub>	eP	21 26.4	4	-	1		2400	
			S	30 26	6	-	$2\frac{1}{2}$			
			eL	33.4	14					
			ME	37.7	10	1	$\frac{1}{2}$			
			F	21 50						
121	" 8	I	e	2 09.5						
			eL	18.8	18					
			MN	20 21	14	3				
			ME	23 46	10		$\frac{1}{2}$			
			F	2 35 00						
122	" 13	II <sub>r</sub>	eP	2 13.2	?				1400	
			S	15 44	7	1	1			
			eL	17.0	18					
			M	20.1	10	56	50			
			MZ	23 26	7			2		
			F	3 25 00						
123	" 26	I	e(S?)	21 50.0	?					
			eL	54.6	20					
			M	56 12	16	3	5			
			F	22 35 00						
124	" 29	I <sub>r</sub>	e(P)	19 52.9						
			iS	54 52	4	2	3			
			eL	55.5	12					
			ME	56 23	10		4			
			MN	57 20	10	$2\frac{1}{2}$				
			F	20 15 00						



No 10

October 1 to 31

19 13

# Riverview College Observatory, SYDNEY, N.S.W.

## Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.       $\lambda = 151^{\circ} 9' 30''$  E.       $h = 41.9$  m.      Foundation : Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$ (1)	205	7.8	5.7	0.03
$A_N$ (3)	136	10.6	4.1	0.02
$A_E$ (1)	193	7.8	5.2	0.02
$A_E$ (3)	121	11.3	9.4	0.01
$A_Z$ (2)	80	5.2	4.8	0.03

No.	Date.	Char.	Phase.	Time (Greenwich)		Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m. s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
125	Oct. 2	I	eS	4	54.5	12	2	3			
			eL	5	23.3	25					
			ME <sub>1</sub>		25.8	18		7			
			MN <sub>1</sub>		30.2	16	4				
			ME <sub>2</sub>		42.0	14		3			
			F	6	55						
126	" 9 10	I <sub>r</sub>	1P	22	41.00	5	8	2½	1	2600	
			eS		45.2	8					
			iS		45.23	8	-11	-5			
			eL		47.8	16					
			MN <sub>1</sub>		48.58	12	10				
			ME <sub>1</sub>		49.25	12		9			
			MN <sub>2</sub>		52.43	10	7				
			MZ		53.16	12			6		
			ME <sub>2</sub>		55.06	10		11			
			F	0	10						
127	" 10	I	e	22	42.2						
			ME		48.49	10		3			
			MN		50.55	10	2				
128	" 11	II <sub>r</sub>	F	23	20	½				2800	P, very short waves (½s.) superposed on others of unusually large wave-length..
			eP	1	40.1	10/13)					
			eS		44.6	11					
			iS		44.46	11	18	9			
			iPS		45.02	11	-48	+14	-35		
			eL		47.4	25					
			ME <sub>1</sub>		51.00	14		134			
			MZ <sub>1</sub>		51.33	14			67		
			MN <sub>1</sub>		52.25	14	126				
			MZ <sub>2</sub>		53.51	14			92		
			ME <sub>2</sub>		54.03	11		149			
			MN <sub>2</sub>		55.43	10	66				
			C	2	1.2	10	18	23	12		
			F	3	35						
129	" 11	I <sub>r</sub>	eP	3	53.2					3100	
			eS		58.0	10	2	-			
			eL	4	01.3	20					
			ME		4.00	15		17			
			MN		6.00	14	7				
			MZ		10.54	10			4		

 F. lost in N<sup>o</sup>130

(Continued on next sheet)

# Riverview College Observatory, SYDNEY, N.S.W.

## Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation : Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Manka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	ε : 1	r T <sub>0</sub> <sup>2</sup>
A <sub>N</sub>				
A <sub>E</sub>	(See last sheet)			
A <sub>Z</sub>				

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
130	Oct. 11	II <sub>r</sub>	iP	4	12	02	3	-5 $\frac{3}{4}$	-1	+3	2870	Azim. N.9° E. Lat. 9° S. Long. 155° E.
			iS		16	36	10	-7	+21			
			iPS <sub>N</sub>		16	54	10	-91				
			iPS <sub>E</sub>		16	59	10		+36			
			eL <sub>E</sub>		19.	3	25					
			ME		22	15	15		195			
			MN <sub>1</sub>		24	56	16	140				
			MZ <sub>1</sub>		25	00	16			90		
			MN <sub>1</sub>		30	55	10	94				
			MZ <sub>2</sub>		31	00	12			61		
			C		37	13	9	21	11			
F		6	10									
131	" 11	I	eL	7	15.	0	24					
			ME		20	09	18		5			
			MN		25	09	12	6				
132	" 11	I	F	7	50							
			eL	8	07.	8	?					
			ME		15	43	12		3			
133	" 11	I	MN		17	15	12	3				
			F	8	32							
			eL	9	31.	0	20					
134	" 13	I	ME		50	07	15		5			
			MN		54	00	16	4				
			F	10	45							
135	" 13	I	eP	3	59.	9						
			e(S?)	4	02.	2	8	1	2			
					3	27	10		-	3		
			eL		5.	0	18					
			ME		5	23	13			4		
			MN		7	09	13	2				
			F	4	22							
136	" 14	III <sub>r</sub>	e?	8	42.	1	27					
			eL		44.	2						
			ME <sub>1</sub>		46	14	18		10			
			MN <sub>1</sub>		47	10	18	5				
			MN <sub>2</sub>		51	10	11	4				
			ME <sub>2</sub>		52	43	11			4		
			F	9	15							
136	" 14	III <sub>r</sub>	iP	8	13	28	5	+34	+51	-53	2330	Azimuth (computed from iP): N. 56° 10' E. Lat. 21° S. Long. 170° E.
			PR <sub>1</sub>		14	33	5	63	43			
			iS <sub>1</sub>		17	19	8	-176	-80			
			iPS		17	28	8	-440	256			
					17	45	8	460	290			
			eL		19.	0	30?					
			M <sub>1</sub>		20	00	18	468	465	720		
			M <sub>2</sub>		21	32	15	402	360			
			C		30	10	12	50	90			
			e		37.	1						
F	13	45										

(Continued on next sheet)

No 10 (Continued)

October 1 to 31

19 13

# Riverview College Observatory, SYDNEY, N.S.W.

## Seismological Bulletin.

 $\phi = 33^{\circ} 49' 49'' \text{ S.}$ 
 $\lambda = 151^{\circ} 9' 30'' \text{ E.}$ 
 $h = 41.9 \text{ m.}$ 

Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	ε : 1	$\frac{r}{T_0^2}$
A <sub>N</sub>				
A <sub>E</sub>				
A <sub>Z</sub>				

(See last sheet)

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
137	Oct. 14	I <sub>r</sub>	eP?	21	19.5						2400?	
			S	23	32	9	-	2				
			eL	26	7	30						
			ME	28	30	18		15				
			MN	29	45	13	12					
138	" 16	I	F	22	00							Strong micro-seismic-movement.
			e?	2	09.2							
			eL	18	4	18						
			ME	19	57	18		7				
			MN	22	12	13	5					
138 <sub>a</sub>	" 19	I	F	2	50							
			e?	17	57.8							
			eL	18	11.3	21						
			ME	12	22	16		2				
			MN	14	40	13	1 $\frac{1}{4}$					
139	" 22	I <sub>r</sub>	F	18	45						2260	
			iP	6	50 54	4 $\frac{1}{2}$	-	+5				
			iS	54	39	8	-9	+4				
			PS	54	57	8	7	$\frac{1}{2}$				
			eL	58	.1	17						
			ME	59	18	14		7				
			MN	59	55	12	6					
140	" 22	I	F	7	30							
			e	8	01.1							
			ME	1	49	15		2				
			MN	3	07	11	2					
141	" 28	I	F	8	08							
			e(P?)	15	45.2							
			eL	47	.1	17						
			ME	50	42	13		4				
			MN	51	06	12	4					
142	" 29	I <sub>r</sub>	F	16	10						3700	
			iP	4	50 34	5	-	-3				
			iS	56	05	?						
			eL	5	05.2	28						
			M	11	.1	17	11	11				
144 <sup>3</sup>	" 30	I	F	5	40							
			e	12	34.1							
			MN	41	14	13	2					
			ME	45	15	13		1				
F	13	00										

*E. F. Pigot 57*

No 11

November 1 to 30 1913

# Riverview College Observatory, SYDNEY, N.S.W.

## Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation : Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$ (1)	208	7.8	5.5	0.03
$A_N$ (3)	132	10.5	4.8	0.02
$A_E$ (1)	186	7.8	5.8	0.02
$A_E$ (3)	121	11.3	13.1	0.02
$A_Z$ (2)	80	5.1	5.0	0.03

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$	$A_E$	$A_Z$		
144	Nov. 6	$I_r$	eP	10	31	08	6	$\mu \frac{1}{2}$	$\mu \frac{1}{2}$	$\mu \frac{1}{2}$	2600	See No.145.
			PR <sub>1</sub>	32	36		4	$\frac{1}{2}$	2	2		
			iS	35	21		8	-3	+9			
			iPS	36	00		8	-10	-5			
			eL	39	25		14					
			MN	40	12		14	6				
145	" 6	$I_r$	iP	10	38	34	5	+5	-4	-	4200	Superposed on No.144.
			iPR <sub>1</sub>	40	27		6	-10	+14			
			eS	44	35		9	$\frac{1}{2}$	2			
				44	53		9	6	6			
146	" 9	I	F	11	10							
			e	19	12.4							
			ME	17	23		15		4			
147	" 10 11	$II_r$	F	19	45							
			iP	21	17	28	4	+8	+10			-8
			iS	21	54		5	20	32	17		
				21	37		9	-64	-77	+66		
				21	41		9	142	119			
				22	00		9	91	144			
				23	30		29					
				24	34		17		264			
				26	21		15			136		
				26	32		14	171				
				26	56		13		91			
				28	45		12	72				
				35	16		10	17	14	8		
148	" 11	I	F	0	10						2400	
			eP	12	39.6		4					
			eS	42.6			8	1	$\frac{1}{2}$			
			PS	42	54		8	3	3			
			eL	44.4			18					
			ME	46	28		13		1			
148 <sub>a</sub>	" 13	I	MN	46	54		13	5				
			F	13	15							
			e	19	40.1		?					
			MN	55	11		20	3				
			ME	20	01.0		20		3 $\frac{1}{2}$			
			F	20	25							
149	" 14	I	eL	21	24.4		17					
			MN	27	22		11	1				
			ME	31	06		15		2			
			F	22	00							

(Continued on next sheet)

No 11 (Continued)

November 1 to 30

1913

# Riverview College Observatory, SYDNEY, N.S.W.

## Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.     $\lambda = 151^{\circ} 9' 30''$  E.     $h = 41.9$  m.    Foundation : Triassic sandstone.

**INSTRUMENTS :**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	T <sub>0</sub>	ε : 1	r T <sub>0</sub> <sup>2</sup>
A <sub>N</sub>				
A <sub>E</sub>				
A <sub>Z</sub>				

(See last sheet)

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
150	Nov. 15	II <sub>r</sub>	eP	5	31.4		8 <sup>2</sup> )				2320	Azim. N. 57 $\frac{1}{2}$ ° E. Lat. 21.1° S. Long. 170° E.
			iP		31	42	8 $\frac{1}{2}$	-12	-20	+30		
			iPR <sub>1</sub>		32	53	8	-19	-14	-		
			iS		35	14	9	-29	-31	-		
					35	21	9	51	106	-		
			PS		35	31	9	47	81	26		
			eL		37.6	22						
			MN		37	15	15	48				
			ME		38.5	16			42	12		
			MZ									
151	" 17	I <sub>r</sub>	F	7	05		2				2360	
			iP	21	04.1	5 $\frac{1}{2}$ )	1	1	1			
					4	15	6	8	7	3		
			PR <sub>1</sub>		5	23	6	-	5	-		
			iS		8	00	9	-3	-6	3		
					8	14	9	8	13	10		
			eL		9.6	22						
			ME <sub>1</sub>		11	26	15		32			
			MN <sub>1</sub>		11	37	12	17				
			MN <sub>2</sub>		13	38	11	18				
152	" 17	I	MZ	13	56	12			6	18	F lost in No. 152.	
			ME <sub>2</sub>	14	00	12						
			eP?	21	32.2	?						
			eS?		36.1	?						
			eL		37.3	20						
			MN		39	34	13	6				
			ME		43	20	13		4			
153	" 18	I	F	22	50							
			eP?	5	46.3							
			eL		50.0	17						
			ME		51	42	11		3			
154	" 18	I <sub>r</sub>	MN	52	17	11	1			1760		
			F	6	05							
			eP	12	18.2	4						
			S		21	13	9	1	-			-
			eL		23.5	18						
			ME		24	46			3			
			MN		25	15	13	7				
			F		12	50						

(Continued on next sheet)

# Riverview College Observatory, SYDNEY, N.S.W.

## Seismological Bulletin.

 $\phi = 33^{\circ} 49' 49'' \text{ S.}$ 
 $\lambda = 151^{\circ} 9' 30'' \text{ E.}$ 
 $h = 41.9 \text{ m.}$ 

Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$				
$A_E$				
$A_Z$				

(See last sheet)

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			$\Delta$	Remarks.		
								$A_N$	$A_E$	$A_Z$				
				h.	m.	s.	sec <sup>2</sup>	$\mu$	$\mu$	$\mu$	km.			
155	Nov. 19	II	eP	3	28.1		4					4440	Felt in north-east Celebes.	
			iP					28	09	4	-2			-6
			PR <sub>1</sub>					29	43	5	2½			4
			iS					34	17	10	-13			-4
			SR <sub>1</sub>					37	21	10	3			8
								38	04	10	15			12
			eL					40	.8	26				
			ME <sub>1</sub>					42	39	19				174
			MN <sub>1</sub>					42	51	19	182			
			ME <sub>2</sub>					46	19	12				53
MN <sub>2</sub>					49	33	14	74						
F				5	35									
156	" 21	I	eP?	16	47.1									
			S					49	25	10	1¼			¾
			eL					53	.4	14				
			ME					54	53	12				15
			MN					55	31	12	9			
F				17	42									
157	" 23	I	e	22	03.4		23					A few long waves.		
			F	22	20									
158	" 29	I	e(P?)	1	31.5						8500?			
			eS					41	.3	10				
							41	43	10	3			4	
			eL				50	.7	27					
			MZ				54	51	16				12	
			MN				55	12	17	10				
			ME				55	32	18				24	
F				3	25									
159	" 30	I	e(P?)	18	04.5		5	½						
			e(S?)					14	.8	?				
			eL					18	.2	27				
			ME					22	40	13				4
			MN					23	57	13			3½	
F				18	50									
160	" 30	I	e	22	06.5									
			ME					9	40	18				3
			MN					10	06	17			2	
			F	22	30									

*P. F. Pigot S.*

No 12

December 1 to 31

19 13

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^\circ 49' 49''$  S.     $\lambda = 151^\circ 9' 30''$  E.     $h = 41.9$  m.    Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Manka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$ (1)	202	7.8	5.2	0.03
$A_E$ (3)	123	10.5	4.0	0.02
$A_N$ (1)	188	7.8	5.5	0.02
$A_Z$ (3)	125	11.3	7.3	0.02
$A_Z$ (2)	77	5.4	5.5	0.03

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			$\Delta$	Remarks.	
				h.	m.	s.		$A_N$	$A_E$	$A_Z$			
							s.	$\mu$	$\mu$	$\mu$	km.		
161	Dec. 1	I	eS	21	17.0		?						
			e(SR <sub>1</sub> ?)		19.3		9	1	-				
			eL		21.3		17						
			ME <sub>1</sub>		22 47		15		17				
			MN <sub>1</sub>		24 30		13	13					
			MZ <sub>1</sub>		24 35		13				7		
			MN <sub>2</sub>		29 08		11	14					
			ME <sub>2</sub>		29 28		10			13			
		F		22 15									
161 <sub>a</sub>	"	3	I	e	7	59.8		10	-	$\frac{3}{4}$			
				e?		8 18.2		?					
				e(L?)		38.6		21					
		F		9 00									
162	"	6	I <sub>r</sub>	eP	14	19.5		6	-	1		2300	
				S		23 18		?					
				eL		28.2		18					
				MN		32 54		11	5				
				ME									
				MZ)		33.5		16		12	11		
		F		15 15									
163	"	9	II <sub>r</sub>	eP	4	39.8		5				2760	Due North.
				iP		39 49		5	-8	-	+10		
				iS		40 26		5	4	5			
				PS		44 13		7	+8	-13			
				eL		44 36		7	8	7			
				eL		45.6		24					
				ME <sub>1</sub>		48 40		15		99			
				MZ <sub>1</sub>		49 12		15				27	
				MN		50 42		10	26				
				ME <sub>2</sub>		53 15		10		38			
		F		7 15		1							
164	"	10	II <sub>r</sub>	eP	6	13.7		8				2390	Azim. N.68.3 E.
				i		14 11		8	-10	-26	+12		
				PR <sub>1</sub>		15 13		9	4	10			
				iS		17 38		9	-3 $\frac{1}{2}$	-6	+15		
				i		17 45		9	-9	+18			
				PS		18 09		9	11	20			
				eL		19.5		21					
				ME		21 45		13		39			
				MZ		21 56		12				30	
				MN		23 39		10	77				
				F		8 20							

(Continued on next sheet)

# Riverview College Observatory,

## SYDNEY, N.S.W.

### Seismological Bulletin.

$\phi = 33^{\circ} 49' 49''$  S.       $\lambda = 151^{\circ} 9' 30''$  E.       $h = 41.9$  m.      Foundation: Triassic sandstone.

**INSTRUMENTS:**

1. Wiechert Astatic Pendulum Seismometer (1000 kilo.)
2. Wiechert Vertical Seismometer (80 kilo.)
3. Mainka Conical Pendulum Seismometer (450 kilo.)

	V	$T_0$	$\epsilon : 1$	$\frac{r}{T_0^2}$
$A_N$				
$A_E$	(See last sheet)			
$A_Z$				

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			$\Delta$ km.	Remarks.
				h.	m.	s.		$A_N$ $\mu$	$A_E$ $\mu$	$A_Z$ $\mu$		
165	Dec. 11	I	e	7	04.9		?					
			eL		13.2		15					
			MN		15 11		16	6				
			ME		16 19		13		4			
166	" 14	I	F	8	00							
			e?	6	35.5							
			eL		52.4		23					
			ME		54 03		17		7			
168 <sub>a</sub>	" 15	I	MN		55 12		17	4				
			F	7	40							
			e	18	19.5		18	2½				
					22.0		17		2½			
167	" 16	I	eL	6	37.1		18				A few long waves.	
			MN		40 24		13	1				
			ME		41 14		13		1½			
			F	7	10							
168	" 16	I	eL	11	39.7		18					
			MN		42 47		10	2				
			ME		43 08		14		5			
			F	12	25							
169	" 18	I <sub>r</sub>	eP	13	57.1		1			1490	Felt at Ravenswood, Townsville and Charters Towers. (Queensland) (111-1V F.M.)	
			i		57 44		3	+5	-8			
					58 03		3	6	6	1½		
			S		59 42		5½	2½	4½			
			M	14	01.1		7	2½	3			
			F	14	04							
170	" 20, 21	I <sub>r</sub>	iP	23	41 05		4	-3	½	+1	2760	
			eS		45.5		6	¾	-			
					45 43		6	1½				
			iPS		46 04		6	+5	+6			
			eL		48.7		24					
			ME		50 14		13		12			
			MN		50 53		13	3½				
			F	0	35							
171	" 21	I	e	10	27.1		6	-	¾			
			eL		33.7		22					
			MZ		36 29		16			8		
			MN		36 43		15	3				
			ME		36 48		15		5			
			F	11	10							

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## Seismological Bulletin.

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**INSTRUMENTS:**

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	V	T <sub>o</sub>	ε : 1	r T <sub>o</sub> <sup>2</sup>
A <sub>N</sub>				
A <sub>K</sub>	(See last sheet)			
A <sub>Z</sub>				

No.	Date.	Char.	Phase.	Time (Greenwich)			Per.	Amplitude.			Δ	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
172	Dec. 21	I	e?	15	43.6						km.	
			e		49.9	?						
			eL	16	14.1	30						
			MN <sub>1</sub>		23 36	18	14					
			ME <sub>1</sub>		26 49	19		15				
			MN <sub>2</sub>		28 39	18	14					
173	" 23	I	F	17	45							
			e	2	42.0	?						
			e		49.9	10	$\frac{3}{4}$					
			eL		54.5	19						
			ME		59 33	12		5				
			MN		59 41	12	5					
174	" 25	I	MZ	3	02 02	10				4	5000?	Large micro-seisms (4-8 μ) from 14h. to 23h.
			F	3	50							
			iP	0	41 04	7	-4	1				
			SR <sub>1</sub> ?		51 04	8	2	1				
			eL		53.5	17						
			MN		56 06	10	2					
175	" 30	I <sub>r</sub>	ME		58 27	10			3		1400	
			F	1	35							
			eP	11	12.9							
			eS		15.4	9		5				
			PS		15.8	9	$\frac{1}{2}$	3				
			eL		17.5	23						
			ME		19 13	13			5			
			MN		22 39	15	3					
			F	11	45							

*E. F. Pigot*