

No. 1.

January, 1933.



M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

$\phi = 14^{\circ} 34' 42''$ N. $\lambda = 120^{\circ} 58' 41''$ E. $h = 2.40$ m. Alluvium.

GALITZIN-WILIP

WIECHERT. M=1000 Kg.
January 1, 1933

	T_0	D	T_1	λ	γ^2	K
N-S	12.43	100.5	12.59	11.52	0.017	97
E-W	11.80	100.5	11.91	11.40	-0.075	80
Z	11.60	100.5	9.00	14.82	1.250	200

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.4	194	2.4	0.029
E-W	4.8	208	2.6	0.029

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933				
January				
No. 2 1st	PNEZ	8 58 00	6080	After P from the Wiechert. Disturbed by microseisms. 15°S: 167° 30'E by Manila, Batavia, Hong Kong, Amboina, Zikawei, River-view.
	SNE	9 05 38		
	LNE	9 15 ca		
	F	9 51		
No. 3 2nd	PNE	14 42 58	125	From the Wiechert. Galitzin records Disturbed by strong microseisms.
	SNE	14 43 14		
	F	14 49		
No. 4 3rd	P?NEZ	13 14 05	1455?	Disturbed by strong microseisms.
	S?NE	13 16 36		
	F	13 34		
No. 5 3rd	PNEZ	15 34 45	2745	Disturbed by strong microseisms.
	SNE	15 39 00		
	LNE	15 41 30		
No. 6 4th	ePNEZ	1 30 04	2745	After P from the Wiechert. Disturbed by microseisms. 25°N: 144°E by Zikawei, Koti, Manila, Batavia, Riverview.
	SNE	1 34 19		
	1E	1 35 08		
	1N	1 35 10		
	1NE	1 37 42		
	F	2 38		
No. 10 5th	PNEZ	18 06 01	1300	Disturbed by microseisms.
	SNE	18 08 16		
	F	18 25		
No. 14 7th	PNEZ	4 13 16	3735	Northern Japan by Koti, Manila, Hong Kong.
	SNE	4 18 35		
	MNE	4 26 18		
	F	6 56		
No. 15 8th	eNEZ	6 35 26	4055?	Disturbed by microseisms.
	SNE	6 41 06		
	ME	6 49 ca		
	F	7 29		

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY
Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933				
January				
No. 16 9th	$\bar{1}$ PNEZ SNE SR ₁ E LNE MN ME F	2 10 17 2 17 03 2 20 34 2 24 13 2 30 05 2 32 24 3 45	5180	0=2:01:37 Compression from NW. In region of 31°N: 72° 30' E by Hong Kong, Manila, Batavia, Amboina. Disturbed by microseisms.
No. 19 13th	\bar{P} NEZ SNE	12 56 42 12 57 04	175	After P from the Wiechert. Galitzin records disturbed by microseisms.
No. 20 13th	\bar{P} NE SNE F	13 02 34 13 02 57 13 10	180	From the Wiechert.
No. 22 15th	\bar{P} NE SNE F	0 24 05 0 24 23 0 27	145	From the Wiechert. Disturbed by microseisms.
No. 35 19th	PNEZ SNEZ F	6 47 57 6 50 34 7 01	1510	Felt at Jolo, intensity II.
No. 42 20th	PNEZ SNE mN mE F	14 49 33 14 50 57 14 52 36 14 52 47 15 29	770	Compression. Felt at Butuan, Mindanao, Intensity IV.
No. 43 20th	\bar{P} NZ SNEZ F	22 19 11 22 19 32 22 24	165	
No. 45 21st	e \bar{P} NEZ SNEZ	3 06 56 3 07 16	160	
No. 46 21st	\bar{F} NE SNE F	3 08 58 3 09 18 3 37	160	From the Wiechert. Felt slightly in Manila and Ambulong.
No. 47 21st	P?NE S?N MNE F	16 38 55 16 41 57 16 49 ca 17 12	1775?	
No. 48 21st	$\bar{1}$ PNEZ iN PR ₁ NE SNE PSE LE MNE F	19 33 05 19 34 03 19 36 21 19 43 12 19 43 55 19 59 09 20 05 23 23 17	8780	0=19:21:11 Dilatation. After P from the Wiechert. 37°S: 59°E, 0=19:20:47 by U.S.C.G.S.



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
		h.	m.	s.		
1933						
January						
No. 49 21st	$\overline{\text{PNE}}$	23	55	48	90	From the Wiechert.
	$\overline{\text{SNE}}$	23	56	00		
	F	23	59			
No. 56 24th	PNEZ	10	40	53	1070	Felt at Basco, Batan Islands.
	SNEZ	10	42	46		
	mN	10	43	43		
	mE	10	45	49		
	F	10	58			
No. 60 25th	$\overline{\text{PNEZ}}$	2	15	09	150	Dilatation.
	$\overline{\text{SNE}}$	2	15	28		
	F	2	20			
No. 61 25th	$\overline{\text{iPZ}}$	2	35	01	150	Compression from SW. Felt slightly in Manila, 13° 55' N: 119° 45' E by Manila and and Baguio.
	$\overline{\text{ePNE}}$	2	35	01		
	$\overline{\text{SNE}}$	2	35	20		
	F	3	11			
No. 62 25th	$\overline{\text{PNEZ}}$	7	20	01	150	
	$\overline{\text{SNEZ}}$	7	20	20		
	F	7	24			
No. 63 25th	PNZ	16	58	13	470	Baguio 280 Km.
	SNE	16	59	11		
	$\overline{\text{SN}}$	16	59	19		
	F	17	19			
No. 65 27th	iPZ	22	48	08	8345	Dilatation, 0=22:36:29 Disturbed by microseisms. 74°N: 174°W, 0=22:36:42 by U.S.C.G.S.
	ePNE	22	48	08		
	SNE	22	57	54		
	LNE	23	12	27		
	F	0	38			
No. 67 29th	$\overline{\text{PNEZ}}$	18	07	31	2435	
	SNE	18	11	24		
	LNE	18	13	38		
	F	18	43			
No. 70 31st	$\overline{\text{PNEZ}}$	14	32	44	160	Dilatation.
	$\overline{\text{SNE}}$	14	33	04		
	F	14	41			
No. 71 31st	PNEZ	15	15	21	160	
	SNE	15	15	41		
	F	15	24			

Forty-two insignificant or undecipherable disturbances on the following days of January: 1st, 4th(2), 5th, 6th(3), 9th, 10th, 14th, 15th, 17th(5), 18th(6), 19th(5), 20th, 21st, 22nd, 23rd(5), 24th(3), 27th, 29th and 30th(2).

No. 3(b).

January, 1933.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

CORRECTION TO No. 671, NOVEMBER 3, 1932.

S at Manila 19:52:03, Distance 2665 Km.
Epicenter: 20°N : $145^{\circ} 30'\text{E}$ by Manila, Hong Kong,
Chiufeng.

ADDITION TO No. 709, NOVEMBER 27, 1932.

29°N : 147°E by Zikawei, Chiufeng, Manila.

CORRECTION TO No. 736, December 15, 1932

P=19:35.15
S=19:36:29 Distance 670 Km. $20^{\circ} 30'\text{N}$:
 120°E by Manila, Hong Kong, Zikawei.

CORRECTION TO No. 740, DECEMBER 20, 1932.

P=15:17:34
S=15:19:38 Distance 1200 Km. 5°N : 126°
E by Manila, Batavia, Amboina.

CORRECTION TO No. 742, DECEMBER 21, 1932.

P'NEZ=6:28:26
PSNE =6:37:31 Distance 11500 Km.

No. 747, DECEMBER 24, 1932.

6°S : 145°E , O=6:30:09 by Guam, Manila, Hong Kong, Zikawei, Chiufeng.

No. 749, DECEMBER 25, 1932.

39°N : 95°E , O=2:04:07 by Manila, Chiufeng, Hong Kong, Phu-Lien, Zikawei.

No. 761, DECEMBER 26, 1932.

Approx. $26^{\circ} 15'\text{N}$: $122^{\circ} 30'\text{E}$ by Zikawei, Manila, Chiufeng

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$\phi=14^{\circ} 34' 32''$ N.

$\lambda=120^{\circ} 58' 41''$ E.

$h=2.40$ m.

Alluvium.

GALITZIN-WILIP

WIECHERT, M=1000 Kg.

February 2nd, 1933.

	T_0	D	T_1	λ	μ^2	K
N-S	12.43	100.5	12.59	11.52	0.017	97
E-W	11.80	100.5	11.91	11.40	-0.075	80
Z	11.60	100.5	9.00	14.82	1.250	200

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.5	192	2.4	0.027
E-W	4.7	200	2.6	0.033

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933 February				
No. 72 1st	PNEZ SNE F	3 47 42 3 49 37 4 02	1090	Felt at Butuan, Mindanao, with intensity IV.
No. 73 1st	PNEZ SNE F	15 09 50 15 10 30 15 21	280	Felt at Naga with intensity III.
No. 78 2nd	iPZ ePNE SNE F	22 07 39 22 07 39 22 07 58 22 22	150	Compression.
No. 79 3rd	iPZ PR ₂ NE SNE SR ₃ NE LNE MNE F	22 19 29 22 22 26 22 26 42 22 32 32 22 34 08ca 22 38 ca 23 55	5490	O=22:10:39
No. 81 5th	PNE SNE F	18 20 26 18 21 17 18 26	415	Felt at Cape Bojeador, N Luzon, with intensity III-IV. From the Wiechert, Galitzin records defective.
No. 82 6th	PNEZ SNEZ F	5 15 53 5 16 09 5 21	125	
No. 83 9th	P?NEZ SNE F	4 02 26 4 05 49 4 31	2020?	
No. 84 9th	PEZ SNE LNE ME F	15 41 06 15 46 07 15 49 40ca 15 52 30ca 17 10	3445	

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
		h.	m.	s.		
1933 February						
No. 86 13th	PNEZ	2	57	00	4510	
	SNE	3	03	07		
	LNE	3	08	45		
	MNE	3	12	ca		
	F	4	20			
No. 88 14th	ePEZ	4	29	37	2865	Netherlands East Indies.
	SE	4	29	54		
	IZ	4	29	58		
	SNE	4	34	00		
	LN	4	34	06		
	ME	4	35	41		
	F	5	04			
No. 92 15th	PZ	9	03	51	2520	
	PNE	9	03	52		
	SNE	9	07	50		
	LNE	9	10	21		
	ME	9	12	12		
	F	9	58			
No. 94 16th	PEZ	4	57	05	1535	Manado, N Celebes, N.E. I.
	SNE	4	59	44		Butuan $\Delta=6.4^\circ$.
	F	5	37			
No. 95 16th	PNEZ	9	11	24	1680?	Celebes, N.E.I.
	SNE	9	14	17		Butuan $\Delta=8.6^\circ$.
	LNE	9	15	40		
	F	10	34			
No. 100 19th	PNE	4	28	35	1110	
	SNE	4	30	30		
	LNE	4	32	20		
No. 101 19th	PNE	4	36	01	195	14° 10' N; 122° 40' E by Manila and Baguio.
	SNE	4	36	26		Felt in southeastern Luzon. At Daet with intensity VIII. From the Wiechert.
No. 102 19th	P̄N	4	51	23	195	Aftershock of No. 101. From the Wiechert. E-W component off.
	S̄N	4	51	47		
No. 103 19th	P̄N	5	10	43	195	Aftershock of No. 101. From the Wiechert. E-W component off.
	S̄N	5	11	07		

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933 February				
No. 104 19th	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$ F	6 16 48 6 17 12 6 26	195	Aftershock of No. 101. Daet, intensity VI.
No. 105 19th	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$ F	6 47 35 6 47 59 6 53	195	Aftershock of No. 101.
No. 106 19th	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$ F	8 20 31 8 20 55 8 24	195	Aftershock of No. 101.
No. 107 19th	eNE S?NE LNE F	8 43 04 8 50 28 8 55 ca 9 44		
No. 108 19th	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$ F	9 51 13 9 51 38 9 54	195	Aftershock of No. 101.
No. 109 19th	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$	10 00 06 10 00 32	205	Aftershock of No. 101. 8 aftershocks until No. 118,
No. 118 19th	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$ F	18 03 42 18 04 08 18 22	205	Aftershock of No. 101. 5 aftershocks until No. 124.
No. 124 20th	$\overline{\text{PNEZ}}$ $\overline{\text{SNEZ}}$	8 03 11 8 03 37	200	Aftershock of No. 101.
No. 125 20th	$\overline{\text{PNEZ}}$ $\overline{\text{SNEZ}}$ F	8 07 20 8 07 44 8 14	190	Aftershock of No. 101.
No. 133 22nd	ePNEZ S?NE mE mN F	3 48 26 3 50 40 3 54 20 3 54 39 5 20	1020?	Butuan $\Delta = 3.7^\circ$.
No. 137 23rd	$\overline{\text{PNE}}$ $\overline{\text{SNE}}$ ME F	6 00 30 6 03 37 6 07 16 6 20	1835	

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
		h.	m.	s.		
1933						
February						
No. 138	ePNEZ	8	29	20		19°S; 68°W, 0=8:09:25 by U.S.C.G.S.
23rd	F	11	28			
No. 140	PNEZ	1	18	48	2555	Guam, $\Delta=180$ Km.
25th	SNE	1	22	51		
	L?NE	1	25	17		
	F	2	14			
No. 144	PNEZ	10	20	06	195	Aftershock of No. 101.
26th	SNEZ	10	20	31		
	F	10	31			
No. 145	P?NEZ	16	23	42	5735?	
27th	iN	16	26	29		
	SNE	16	31	00		
	LNE	16	39	ca		
	F	17	30			

Forty-six insignificant or undecipherable disturbances on the following days of February: 2nd(4), 4th, 10th, 13th, 14th(3), 16th(2), 18th(2), 19th(12), 20th(4), 21st(3), 22nd(5), 24th, 25th, 26th(2), 27th, and 28th(3).



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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

$\phi=14^{\circ} 34' 42''$ N.

$\lambda=120^{\circ} 58' 41''$ E.

$h=2.40$ m.

Alluvium.

GALITZIN-WILIP

WIECHERT. M=1000 Kg.

March 2, 1933

	T_0	D	T_1	l	μ^2	K
N-S	12.43	100.5	12.59	11.52	0.017	97
E-W	11.80	100.5	11.91	11.40	-0.075	80
Z	11.60	100.5	9.00	14.82	1.250	200

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.4	194	2.4	0.028
E-W	4.8	201	2.5	0.039

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks
1933 March				
No. 152 2nd	PNEZ SNE F	4 11 02 4 15 26 4 29	2880	
No. 153 2nd	PEZ SNE LE F	8 15 05 8 19 08 8 22 10ca 9 12	2580	Dilatation. Felt in Guam, $\Delta=145$ Km. Compression from NE. Phase after S from the Wiechert.
No. 154 2nd	ePNEZ SNE F	11 17 14 11 17 50 11 21	255	
No. 156 2nd	PNEZ SNE LNE MNE F	17 37 26 17 42 30 17 47 05 17 50 ca 22 30	3490	Dilatation. Japan. Phases after P from the Wiechert. 39.5° N; 143.5° E; $0=17:31:00$ by U.S.C. G.S. 40° N; 145° E Chiufeng.
No. 157 3rd	1PZ ePNE SNE F	2 20 00 2 20 00 2 20 15 3 24	120	Dilatation. Epicenter in Zambales Mtn. Felt in Manila with intensity IV. Also felt throughout western Luzon. S from the Omori. Compression at Baguio.
No. 159 3rd	PNEZ SNEZ LNE F	9 19 13 9 24 32 9 30 35 11 24	3730	In region of 39° N; 150° E by Manila, Zikawei, Hong Kong.
No. 161 3rd	P?NE S?NE LNE F	15 14 40 15 20 04 15 24 ca 16 57	3810?	
No. 164 3rd	eNE F	20 30 30 21 01		

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Dist. .Km.	Remarks.
		h.	m.	s.		
1933						
March						
No. 167 5th	ePNEZ	0	03	18	125	
	SNEZ	0	03	34		
	F	0	06			
No. 168 5th	iPNEZ	8	24	01	1935	Compression. N.E.I.
	SNE	8	27	17		
	MN	8	30	47ca		
	F	10	10			
No. 171 6th	iPNEZ	0	58	48	250	Compression.
	SNEZ	0	59	22		
	F	1	04			
No. 172 6th	iPZ	13	11	51	3700	Dilatation. In region of Himalayas by Hong- Kong, Manila, Chiufeng.
	ePNE	13	11	51		
	SNE	13	17	08		
	MNE	13	25	ca		
	F	13	46			
No. 177 11th	eNEZ	2	15	29	11770	Disturbed by microseisms. 33°40'N; 118°02'W; O=1:54:12 by U.S.C.G.S.
	S _c P _c SNE	2	19	16		
	LNE	2	44	00ca		
	MNE	2	52	00ca		
	F	4	06			
No. 180 11th	PNEZ	19	37	00	2070	Compression. In region of 24°N; 138°E by Manila, Guam, Butuan, Phu- Lien, Hong Kong, Batavia. Disturbed by microseisms. Phases after P from the Wiechert.
	SNE	19	40	26		
	F	20	50			
No. 190 15th	PNE	17	12	31	3610	Disturbed by microseisms.
	SNE	17	17	43		
	LNE	17	21	46		
	MN	17	24	42ca		
	F	18	10			
No. 195 17th	ePNEZ	0	10	37	2700	Disturbed by microseisms.
	iSE	0	14	18		
	eSN	0	14	48		
	F	0	36			
No. 196 17th	ePZ	16	04	28	5960	55°4N; 162°E; O=15:55.5 by U.S.C.G.S.
	ePNE	16	04	29		
	SNEZ	16	11	59		
	LNE	16	21	00ca		
	MNE	16	25	20ca		
	F	18	02			

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1935 March				
No. 197 17th	PNEZ SNE LNE MNE F	19 34 56 19 37 01 19 38 07 19 39 20ca 21 30	1200	Compression. In region of 6° 30' N; 128° E. Felt in eastern Mindanao. At Davao with intensity IV. Phases after P from the Wiechert.
No. 198 18th	P?NEZ S?N F	3 26 45 3 32 53 5 0.	4520?	Disturbed by microseisms.
No. 200 18th	PNEZ SNE LN F	15 57 14 16 01 48 16 04 48 16 36	3035	
No. 203 18th	eNE SNE F	18 56 04 19 02 42 19 45	3090?	
No. 204 18th	eNE F	23 29 02 23 46		
No. 205 19th	ePNEZ SNE mN mE F	1 16 09 1 19 26 1 21 06 1 21 36 2 25	1945	
No. 206 19th	PNEZ SNE mN F	3 50 20 3 51 29 3 52 42 4 10	610	
No. 212 20th	PNEZ SNE mN mN F	15 15 48 15 19 22 15 21 27 15 22 15 16 38	2165	
No. 214 20th	PE SNE F	19 42 53 19 47 32 20 12	3105	
No. 215 21st	PNEZ SNEZ F	19 10 54 19 11 20 19 26	200	Compression.
No. 216 21st	PNEZ SNE F	19 35 22 19 35 47 19 41	200	
No. 217 21st	PNEZ SNE F	21 14 36 21 14 56 21 19	160	



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933 March				
No. 219 22nd	PNEZ SNEZ F	11 30 32 11 30 57 11 38	200	
No. 220 22nd	PNEZ SNE mE mN F	11 42 12 11 42 54 11 43 33 11 43 43 11 54	290	Felt in Daet, southeast Luzon, with with intensity VI.
No. 223 23rd	P?NE SNE LNE MNE F	17 46 33 17 51 33 17 55 10ca 17 58 00ca 19 12	3435?	China. P is doubtful. Z component defective.
No. 226 25th	PNEZ SNE mN mE F	17 25 26 17 26 02 17 28 26 17 28 39 17 40	255	Felt in Vigan with intensity III. Compression.
No. 227 26th	ePNEZ SNE MNE F	9 26 50 9 29 27 9 32 18ca 9 50	1520	Disturbed by microseisms.
No. 230 27th	PNE SNE F	23 29 51 23 30 32 23 42	260	Z component defective.
No. 231 28th	ePNEZ SNE F	15 36 48 15 37 18 15 47	220	
No. 232 28th	PNEZ SNE F	22 11 24 22 11 49 22 17	190	
No. 233 31st	PNE SN LNE MNE F	22 11 59 22 15 40 22 17 36ca 22 19 37ca 22 46	2355	

Forty-six insignificant or undecipherable disturbances on the following days of March: 1st(2), 2nd, 3rd(4), 4th(2), 5th(2), 7th, 8th, 9th(2), 12th(4), 13th, 15th(5), 16th(3), 18th(3), 19th(3), 20th(3), 22nd, 23rd(2), 24th, 25th, and 26th(2).



MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

$\phi = 14^{\circ} 34' 42''$ N.

$\lambda = 120^{\circ} 58' 41''$ E.

$h = 2.40$ m.

Allivium.

GALITZIN-WILIP

WIECHERT. $M = 1000$ Km.
April 1st, 1933.

	T_0	D	T_1	λ	μ^2	K
N-S	12.43	100.5	12.59	11.52	0.017	97
E-W	11.80	100.5	11.91	11.40	-0.475	80
Z	11.60	100.5	9.00	14.82	1.250	200

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.4	194	2.4	0.021
E-W	4.8	203	2.6	0.027

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933 April				
No. 235 1st	PNEZ SNE MNE F	8 10 10 8 12 15 8 15 10ca 9 03	1200	Felt at Davao, SE Mindanao, with intensity II.
No. 236 1st	PNE SNE LNE MNE F	16 05 20 16 10 41 16 14 50ca 16 17 30ca 17 16	3760	
No. 244 9th	iPZ PNE SNEZ LNE MNE MN ME F	2 53 06 2 53 07 2 58 21 3 02 30ca 3 05 20ca 3 11 00 3 12 23 6 10	3665	Dilatation.
No. 245 9th	PNEZ SNE LNE ME F	10 36 54 10 41 59 10 46 ca 10 48 50ca 11 39	3570	
No. 247 9th	ePNEZ SNE F	17 11 36 17 12 13 17 18	260	Baguio, $\Delta = 60$ Km.
No. 249 10th	iPNEZ SNE F	15 25 23 15 25 40 16 11	135	Felt at Nasugbu, Batangas, and Manila with intensity IV-V and II respectively. Compression.
No. 253 12th	ePNEZ iZ iE SNE LNE MNE F	6 01 08 6 01 24 6 01 37 6 06 17 6 10 27 6 13 28 6 44	3580	



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks
1933 April				
No. 254 13th	PNEZ SN F	16 23 28 16 25 00 16 39	585	
No. 257 14th	PNE SNE F	7 57 10 7 58 05 8 25	365	From the Wiechert. Galitzin records defective. Baguio, $\Delta=175$ Km.
No. 263 16th	PNEZ SNE F	6 11 49 6 21 28 8 00	8210	
No. 264 16th	PNEZ SNE F	11 09 12 11 09 40 11 14	215	Baguio, $\Delta=75$ Km.
No. 267 16th	1PNEZ iE iN SNE LNE F	19 22 00 19 22 12 19 22 17 19 27 20 19 30 00ca 21 04	3745	Compression from SE.
No. 274 19th	PNZ SN MN F	3 02 04 3 07 08 3 13 48 3 45	3490	Galitzin E-W component defective.
No. 275 19th	PNEZ SNE LNE MNE F	6 47 00 6 52 08 6 56 ca 6 58 30ca 8 50	3560	Phases after P from the Wiechert.
No. 277 20th	PNEZ SNE F	9 30 25 9 31 34 9 39	610	
No. 278 20th	PNE SNE mNE F	20 53 16 20 54 48 20 56 24ca 21 08	850	
No. 279 20th	PNEZ SNE F	22 18 45 22 20 11 22 27	550	
No. 281 21st	PNEZ SNE mN mE F	16 39 49 16 40 28 16 41 44 16 42 03 16 53	290	

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933 April				
No. 283 22nd	$\bar{P}NE$ $\bar{S}NE$ F	16 02 26 16 02 46 16 08	160	
No. 284 22nd	$\bar{P}NEZ$ $\bar{S}NE$ F	19 05 20 19 05 36 19 09	125	
No. 285 23rd	iPZ ePNE iNE iS?NE L?NE MNE	6 10 03 6 10 08 6 10 10 6 22 07 6 42 10ca 6 49 40ca	11520?	37°N; 27°E; O=5:57.6 by U.S.C.G.S.
No. 288 25th	PNE SNE LN F	10 16 39 10 19 34 10 21 09 10 37	1695	Disturbed by microseisms specially in Z component.
No. 289 27th	iPNEZ SNE PSNE LNE F	2 48 03 2 57 42 2 58 13 3 12 23 5 40	8210	Anchorage, Alaska. Disturbed by microseisms. Phases after P from the Wiechert.
No. 296 30th	eNE MNE F	5 44 06 5 44 16ca 5 59		Felt at Jolo with intensity III. Disturbed by microseisms.

Thirty-eight insignificant or undecipherable disturbances on the following days of April: 1st(2), 2nd(3), 6th(2), 8th, 9th(2), 11th(3), 13th(2), 15th(5), 16th(2), 17th(5), 19th(2), 21st(2), 23rd(2), 27th(3), 29th and 30th.

M A Y , 1 9 3 3

We thankfully acknowledge the receipt of the following
bulletins and reports.

S T A T I O N S

B U L L E T I N S

Batavia-----	March 17 to 31, 1933.
Sydney-----	March 1 to 18, 1933.
Perth-----	Preliminary report of earthquake of Japan, March 2, 1933.
Adelaide-----	March, 1933.
Zikawei-----	No. 4; March 2 to 3, 1933.
Tananarive-----	September, 1932.
Chu-Lien-----	August, September, October, Novem- ber and December, 1932.
Batavia-----	April 1 to 19, 1933.
Chiufeng-----	March, 1933.
Georgetown-----	February, 1933.
Koti-----	February 2 to March 25, 1933.
STRASBOURG:	
L'Institut-----	February, 1933.
Bureau Central-----	February, 1933.
Union International-----	February, 1933.
Parc Saint Maur-----	February, 1933.
Hong Kong-----	March, 1933.
La Paz, Bolivia-----	April 22 to August 21, 1932.

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No. 15.



M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

$\phi=14^{\circ} 34' 42''$ N. $\lambda=120^{\circ} 38' 41''$ E. $h=2.40$ m. Alluvium.

GALITZIN-WILIP

WIECHERT. $M=1000$ Kg.
May 3, 1933.

	T_0	D	T_1	λ	μ^2	K
N-S	12.43	100.5	12.59	11.52	0.017	97
E-W	11.80	100.5	11.91	11.40	-0.075	80
Z	11.60	100.5	9.00	14.82	1.250	200

	T_0	V	ϵ	$\frac{F}{T_0^2}$
N-S	4.5	191	2.4	0.023
E-W	4.8	203	2.6	0.029

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks
1933 May				
No. 297 1st	iPZ ePNE iSNE mN mE F	5 41 44 5 41 46 5 42 45 5 43 45 5 44 00 6 03	400	Felt at Vigan with intensity II and I at Tuguegarao and Baguio.
No. 298 1st	PNEZ SNE MNE	18 37 41 18 44 22 18 55 10ca	5085	
No. 299 1st	PNEZ SNE LNE MNE F	19 58 33 20 05 20 20 12 05ca 20 15 45ca 21 46	5190	No. 298 still recording.
No. 300 1st	P?NEZ iZ S?NE iE iN F	23 21 28 23 21 59 23 27 03 23 28 25 23 38 02 24 10	3980?	
No. 301 2nd	PZ iZ SNE LNE F	6 39 13 6 40 32 6 42 06 6 43 32 7 08	1675	
No. 308 3rd	PNEZ SNE MNE F	23 33 02 23 35 54 23 38 50 24 26	1660	
No. 310 4th	iP'Z eP'NE LNE F	5 53 24 5 53 24 6 44 ca 8 00	16600	5° N; 84° W; $023; 33.3$ by U.S.G.C.S.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Dist. Km.	Remarks.
		h.	m.	s.		
1933 May						
No. 311 6th	ePNEZ	14	06	02	620?	
	SNEZ	14	07	40		
	mN	14	11	04		
	F	14	25			
No. 315 8th	iPZ	10	54	57	6310	
	iPN	10	55	01		
	ePE	10	55	01		
	SNE	11	02	48		
	IE	11	12	40ca		
	F	13	21			
No. 316 8th	PNEZ	16	47	45	840	Felt at Butuan with intensity II.
	SNEZ	16	49	16		
No. 317 8th	PNEZ	17	07	13	900	No. 316 still recording.
	SNEZ	17	08	50		Felt at Davao with intensity II.
	mN	17	11	58		
	mE	17	12	22		
	F	18	25			
No. 319 10th	ePNE	4	55	45	450	
	SNEZ	4	56	54		
	F	5	06			
No. 321 10th	PNEZ	14	13	28	290	
	SNEZ	14	14	07		
	F	14	18			
No. 324 11th	iPZ	19	22	29	9185	
	ePNE	19	22	33		
	iE	19	32	12		
	SNE	19	32	53		
	iN	19	33	03		
	iN	19	33	39		
	iE	19	36	19		
	MNE	19	56	20ca		
	F	20	47			
No. 325 12th	ePNEZ	16	16	03	2645	
	eSNEZ	16	20	16		
	LN	16	22	36		
	MNE	16	25	00		
	F	17	03			
No. 326 12th	ePNEZ	22	03	03	160	
	iSNE	22	03	23		
	F	22	05			
No. 327 13th	PNEZ	23	27	04	190	
	SNE	23	27	28		
	F	23	32			

No. 17.

May, 1955.

MANILA, I.



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time			Dist. Km.	Remarks
		h.	m.	s.		
1933 May						
No. 328 14th	PNE SE	1	23	07 59	350	
No. 329 14th	PNE SNE F	1	26	06 58 33	350	No. 328 still recording.
No. 330 14th	PNEZ SNE mN mE	4	54	49 48 34 08	390	
No. 331 14th	PNE SNE F	5	02	33 30 08	380	No. 330 still recording.
No. 332 16th	iPEZ ePN iSNE LNE MNE F	1	17	54 54 16 08 25 55	2855	
No. 333 16th	PNE SNE F	8	51	41 26 58	310	
No. 335 16th	iPZ ePN ePE SNE LNE F	16	45	14 14 23 32 24 43	1965	
No. 337 17th	ePEZ SNE F	5	50	50 38 13	390	
No. 338 17th	PNEZ SNE F	7	40	07 47 59	625	
No. 341 18th	PNEZ SNEZ F	13	00	46 57 03	85	
No. 343 19th	ePN iPEZ iSNE mN mE F	12	17	47 47 01 30 12 31	660	Felt at Surigao and Butuan with intensity III.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued,



No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1933 May				
No. 354 21st	PNEZ	11 56 20	2465	
	SNE	12 00 15		
	mN	12 01 24		
	mE	12 01 41		
	F	13 13		
No. 356 21st	iPNEZ	21 28 45	2520	
	SNEZ	21 32 44		
	iE	21 32 49		
	iN	21 32 53		
No. 358 22nd	\bar{P} NEZ	12 43 07	150	
	\bar{S} NE	12 43 26		
	F	12 48		
No. 359 23rd	\bar{P} NEZ	6 21 01	180	
	\bar{S} NE	6 21 24		
	F	6 24		
No. 371 27th	iPEZ	4 43 18	500	Felt at Borongan (E Samar) and Tacloban (NE Leyte) with intensity VI and V respectively.
	ePN	4 43 18		
	iSNE	4 44 17		
	mN	4 45 34		
	mE	4 45 43		
	F	5 57		
No. 372 27th	iPZ	13 59 10	415	Felt in northern Luzon with intensity III.
	ePNE	13 59 10		
	SNE	14 00 01		
	F	14 20		
No. 373 27th	i \bar{P} Z	16 40 10	160	
	e \bar{P} NE	16 40 11		
	\bar{S} NE	16 40 30		
	F	17 00		
No. 374 27th	i \bar{P} NEZ	22 41 43	160	
	\bar{S} N	22 42 03		
	F	23 40		
No. 378 30th	PNEZ	13 57 17	1720	Disturbed by microseisms.
	SNE	14 00 15		
	F	14 21		
No. 379 30th	PNEZ	15 45 01	740	Disturbed by microseisms.
	SNE	15 45 23		
	F	15 58		

Forty-seven insignificant or undecipherable disturbances on the following days of May: 2nd(2), 3rd(5), 5th, 6th, 7th(2), 10th(2), 11th(2), 13th, 16th(2), 17th, 18th(2), 19th(3), 20th(3), 21st(5), 22nd, 23rd(3), 24th(4), 25th(2), 26th(2), 28th and 29th(2).