

No. 1.

Year 1930.

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.

Instrument: Wiechert Inverted Pendulum (1000 Kg.)



	T	V	ϵ	$\frac{r}{T_0^2}$
N-S	7.87	144	4.386	0.021
E-W	8.11	145	4.226	0.020

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude		Dist. Km.	Remarks.
				N	E		
1930				μ	μ		
No. 1 Jan. 1st	iPNE iSNE F	4 07 24 4 07 39 4 13				117	
No. 2 Jan. 1st	iPNE iSNE F	15 45 05 15 45 21 15 51				125	
No. 3 Jan. 3rd	ePNE iSE F	10 41 45 10 42 28 10 51				297	
No. 4 Jan. 3rd	ePNE iSE F	18 07 39 18 10 06 18 27				1416	
No. 5 Jan. 4th	ePNE eSNE F	15 26 18 15 28 46 15 42				1422	
No. 6 Jan. 5th	iPNE PR ₁ NE PR ₃ N iSNE PSE iE mN mE F	1 27 51 1 29 31 1 30 17 1 34 12 1 34 17 1 34 49 1 37 38 1 37 50 2 14				4733	0=1:19:41 Wadati's Type B seismogram from deep focus. Hongkong, Manila, Batavia indicate epicenter near N. Saghalien. Also Zikawei.
No. 7 Jan. 5th	iPNE iSE F	19 00 ca 19 05 28 19 37				3878	0=18:52:51
No. 8 Jan. 14th	eNE SE F	22 13 ca 22 23 23 32					in minute gap.
No. 9 Jan. 15th	ePNE iSNE F	11 30 29 11 30 48 11 32				165	



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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude		Dist. Km.	Remarks.
				N	E		
				μ	μ		
No. 10 Jan. 17th	iPNE iSNE F	1 12 21 1 12 52 1 32				230	
No. 12 Jan. 18th	iPNE iNE iNE SE iN mE F	7 11 18 7 12 38 7 13 18 7 16 50 7 17 52 7 21 39 8 22	6.9		13	3940	O=7:04:04 About 5° S; 153° E, by Riverview, Batavia, Zikawei, Hong- kong, Manila.
No. 13 Jan. 19th	ePNE iSNE iSN F	12 56 32 12 57 23 12 57 36 13 07				420	
No. 14 Jan. 20th	iPNE iSNE F	7 19 27 7 20 44 8 17				690	O=7:17:54
No. 15 Jan. 20th	ePNE eSNE F	13 04 19 13 05 33 13 24				670	O=13:02:48 Felt at Bu- tuan, Mindanao.
No. 16 Jan. 21st	ePNE iSNE iSNE F	4 47 57 4 48 46 4 48 58 5 22				400	Felt in NW Luzon. Epi- center in China Sea.
No. 18 Jan. 23rd	iPNE iSNE F	17 24 00 17 24 17 17 28				130?	Begins in minute gap.
No. 20 Jan. 25th	iPNE iSNE MN MN ME F	1 40 25 1 41 46 1 42 37 1 43 53 1 43 55 3 27	6.4 7.5 6.8	34 50		730	O=1:38:47 Epicenter in SE Philippines.
No. 21 Jan. 26th	ePNE eSNE F	12 25 33 12 26 44 12 57				630	Disturbed by microseisms
No. 22 Jan. 27th	eNE F	6 17 6 39					Disturbed by microseisms Felt in Formosa.

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No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude		Dist. Km.	Remarks.
				N μ	E μ		
No. 23 Jan. 28th	ePN iPE SNE F	6 28 44 6 28 44 6 36 05 7 02				5800	O=6:19:25
No. 25 Jan. 29th	ePNE F	11 15 04 11 48					
No. 26 Jan. 29th	ePNE iSNE F	16 58 59 16 59 11 17 03				90	
No. 28 Jan. 30th	iPNE iSNE F	4 43 48 4 44 10 4 47				175	
No. 29 Jan. 30th	ePNE iSNE F	10 28 09 10 28 24 10 31				115	
No. 30 Jan. 30th	ePNE iSNE F	18 07 00 18 07 17 18 09				135	
No. 31 Jan. 31st	ePNE iSNE iSE F	12 10 31 12 11 41 12 12 09 12 22				620	Disturbed by microseisms
No. 32 Jan. 31st	ePN iSN F	22 11 47 22 12 33 22 26				360	Disturbed by microseisms

Five insignificant or undecipherable disturbances, on the following days of January: 17th, 21st, 24th, 29th and 30th.

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

Instrument: Wiechert Inverted Pendulum (1000 Kg.)

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	7.59	154	3.811	0.020
E-W	7.73	156	4.242	0.020

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude		Dist. Km.	Remarks.
				N μ	E μ		
1930 No. 33 Feb. 1st	iPNE iSNE F	5 44 48 5 45 28 5 58				295	
No. 34 Feb. 1st	ePNE iSNE F	11 08 35 11 09 51 11 21				683	O=11:05:47
No. 35 Feb. 1st	ePNE iSNE F	16 39 22 16 39 56 16 52				245	
No. 36 Feb. 2nd	iPN PR ₁ E iSNE PSNE mE F	15 06 01 15 08 33 15 14 14 15 14 34 15 17 15 16 24	7.3		10	6678	O=14:55:51. Aleutian Islands by Zikawei, Hong- kong, Batavia, Manila.
No. 37 Feb. 3rd	eNE F	2 50 48 3 24					
No. 38 Feb. 3rd	iPNE iSNE F	17 01 02 17 01 17 17 06	i	20	20	117	
No. 39 Feb. 5th	iPNE iSN F	16 48 08 16 48 41 17 04				240	
No. 40 Feb. 5th	eNE F	20 46 21 09					
No. 42 Feb. 7th	ePNE PR ₂ N? SNE? iLE F	16 40 15 16 41 44 16 45 44 16 50 00 17 43				3890?	O=16:33:05. West coast of Sumatra according to Batavia.
No. 43 Feb. 8th	eNE F	6 54 7 17					
No. 44 Feb. 11th	eNE F	9 40 00 9 51					Disturbed by micro- seisms.

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time			Per. s.	Amplitude		Dist. Km.	Remarks
		h.	m.	s.		N	E		
1930									
No. 45	iPNE	17	14	20				250	Northern Luzon. Disturbed by microseisms.
Feb. 11th	iSNE	17	14	55					
	F	17	37						
No. 46	PNE	4	21	00				320	Begins in minute gap. Disturbed by microseisms.
Feb. 12th	iSN	4	21	42					
	F	4	33						
No. 47	eNE	6	41	32					Disturbed by microseisms.
Feb. 12th	F	7	35						
No. 48	iPE	18	50	52				3067	O=18:44:49
Feb. 14th	eSN	18	55	28					
	F	19	22						
No. 49	PNE	20	52	30				8440	O=20:40:45. 30° S; 175° W by Batavia, Manila and Hongkong.
Feb. 14th	iSNE	21	02	12					
	PSN	21	02	41					
	F	22	05						
No. 51	ePNE	5	13	15					Disturbed by microseisms.
Feb. 17th	F	5	39						
No. 52	ePNE	22	56	50				345	Disturbed by microseisms.
Feb. 17th	iSNE	22	57	35					
	F	23	14						
No. 53	ePNE	0	34	56				117	
Feb. 18th	iSNE	0	35	11					
No. 54	ePNE	0	40	09				117	No. 53 still recording.
Feb. 18th	iSNE	0	40	24					
	F	0	52						
No. 57	ePNE	13	21	24				180	
Feb. 19th	iSNE	13	21	47					
	F	13	26						
No. 58	eNE	19	31	33				4567?	O=19:23:34?
Feb. 20th	S?NE	19	37	44					
	F	20	03						
No. 59	ePNE	6	06	44					
Feb. 21st	F	6	17						
No. 60	ePNE	18	50	27				120	
Feb. 22nd	iSNE	18	50	42					
	F	18	54						
No. 61	eNE	19	54						
Feb. 22nd	F	20	04						
No. 63	ePN	15	46	55				640	Epicenter in Mindanao Sea.
Feb. 23rd	eSN	15	48	07					
	F	16	11						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude		Dist. Km.	Remarks.
				N	E		
1930				μ	μ		
No. 64 Feb. 24th	iPNE	20 54 07				1330	O=20:51:14. 3° N; 118° E by Batavia, Amboi- na, Hongkong, Manila.
	mE	20 55 20	6.9		80		
	iSNE	20 56 25					
	SR ₁ N	20 56 40					
	mE	20 57 24	8.6		95		
	L	20 57 37					
	mN	20 58 01	7.2	95			
	mE	20 59 27	7.0		65		
	F	22 13					
No. 65 Feb. 25th	ePNE	5 17 53				1411	O=5:14:51
	iSN	5 20 19					
	F	5 54					
No. 69 Feb. 28th	ePNE	1 53 47				135	
	iSNE	1 54 04					
	F	2 01					
No. 71 Feb. 28th	ePNE	22 54 27				2420	O=22:49:28
	iSE	22 58 19					
	F	23 49					

Nine insignificant or undecipherable disturbances on the following days of February: 7th, 16th, 18th, 19th, 23rd, 25th, 27th (2) and 28th.

A D D I T I O N A L D A T A .

December 27th, 1929. Epicenter: 4° S; 125° E by
Batavia, Manila, Hongkong, Melbourne.

Manila, 2110 Km., O=13:32:03.

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

Wiechert. $M=1000$ Kg.

Galitzin-Wilip.

Wiechert. $M=1000$ Kg.					Galitzin-Wilip.	
	T_0	V	ϵ	$\frac{r}{T_0^2}$		T_0
N-S	7.76	154	3.822	0.019	N-S	12.3
E-W	8.01	144	3.879	0.017	E-W	11.8
					Z	12.0

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.
				N	E	Z	
1930				μ	μ	μ	
No. 74 March 2	iPNE iSNE iLNE F	15 29 08 15 31 06 15 32 14 16 03					1133 0=15:26:39
No. 75 Mar. 3rd	iPNE iSNE	10 28 44 10 29 03					150
No. 77 Mar. 4th	ePNE eSN iLN F	12 40 22 12 43 47 12 45 32 13 47					2030 0=12:36:06
No. 79 Mar. 6th	ePNE iSNE F	3 35 50 3 38 32 4 15					1556 0=3:32:30 25° 25' N; 132° 20' E by Zikawei, Manila.
No. 80 Mar. 6th	ePNE iSNE F	6 27 05 6 27 29 6 33					190
No. 81 Mar. 6th	ePNE iSNE F	6 35 54 6 36 22 6 41					215
No. 82 Mar. 6th	ePE PR ₂ N SE L?E F	15 46 51 15 51 51 15 56 25 16 11 59 17 08					8110 0=15:35:24 New Zealand.
No. 83 Mar. 6th	iPNE iSNE F	17 49 27 17 49 43 17 55					125
No. 84 Mar. 7th	ePNE iSNE F	2 53 53 2 54 09 3 09					125 From Galitzin. No time in Wiechert.
No. 85 Mar. 7th	ePE e?PN iSNE SR ₁ NE iLNE F	10 56 00 10 56 21? 10 59 09 10 59 26 11 00 43 11 57					1855 0=10:52:04. 28° 12' N; 130° 30' E by Manila and Zi- kawei. From Galitzin.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. S.	Amplitude			Dist. Km.	Remarks.
				N	E	Z		
1930				μ	μ	μ		
No. 86 Mar. 8th	eE F	4 06 4 46						From Galitzin. Panama.
No. 87 Mar. 8th	ePNE iSE eSN F	10 21 06 10 21 33 10 21 36 10 50					225	From Galitzin.
No. 89 Mar. 10th	iPNE PR ₁ E iSNE iN mE SR ₃ N iLNE F	16 34 31 16 35 40 16 40 01? 16 41 17 16 41 57 16 43 14 16 44 34 17 21	5.7 8.2	20 15	45 20		3900	O=16:27:20 44°N; 147°E approx. Ba- tavia, Manila, Zi- kawei. S in minute gap.
No. 91 Mar. 10th	ePN iSN F	22 57 48 22 58 10 23 00					175	
No. 92 Mar. 11th	ePNE iSNE F	4 36 47 4 37 32 4 48					320	Felt at Bangued, Luzon.
No. 93 Mar. 11th	iPZ iSN LN F	19 25 43 19 28 02 19 29 12 20 08					1345	
No. 94 Mar. 12th	ePNE iSNE F	3 04 59 3 05 51 3 25					415	Felt at Iloilo.
No. 95 Mar. 12th	ePNE iSE F	13 26 19 13 28 53 13 53					1490	
No. 96 Mar. 14th	ePNE iSNE F	4 36 08 4 36 24 4 42					125	
No. 99	ePNE iSNE iSN F	1 35 30 1 36 28 1 36 47 2 15					495	
No. 100 Mar. 15th	iPN iSN L M F	3 59 50 4 02 26 4 03 44 4 05 08 5 17					1510	O=3:56:35

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. S.	Amplitude			Dist. Km.	Remarks.
				N	E	Z		
1930				μ	μ .	μ		
No. 101 Mar. 15th	ePN iSN L M F	7 00 37 7 06 25 7 11 22 7 14 34 8 09					4190	0=6:53:05
No. 102 Mar. 16th	ePN iSN F	3 00 50 3 01 48 3 25					490	Felt at Aparri.
No. 103 Mar. 16th	ePN iSN F	5 00 46 5 01 46 6 10					510	Felt in N Luzon.
No. 104 Mar. 16th	iPN iSN F	20 47 49 20 48 08 20 55					150	
No. 106 Mar. 17th	ePN iSN F	12 53 14 12 53 31 13 02					135	
No. 110 Mar. 19th	ePNE iSNE F	3 04 04 3 04 30 3 11					200	
No. 111 Mar. 19th	eP iSN F	17 42 13 17 42 26 17 48					100	
No. 113 Mar. 21st	iPN iSN F	10 03 20 10 03 40 10 26					160	Compression from SW. Felt in Lubang Is- land, Mindoro Prov.
No. 114 Mar. 21st	ePNE iSN F	16 04 40 16 05 00 16 20					160	
No. 115 Mar. 22nd	ePNE eSNE F	8 55 53 9 01 44 9 38					4244	
No. 116 Mar. 24th	ePNE iSNE F	14 19 19 14 19 37 14 22					145	
No. 117 Mar. 25th	ePEZ iSEZ F	20 43 04 20 44 18 20 52					660	
No. 118 Mar. 26th	ePEZ iSEZ F	0 01 14 0 01 36 0 12					175	

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time			Per. s.	Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N	E	Z		
1930										
No. 119 Mar. 26th	iPNE	7	17	12					2665	O=7:11:48 Dilata- tion, 8° 30' S; 127° 30' E by Batavia, Ma- nila, Riverview, Hongkong, Zikawei.
	iN	7	17	21						
	PR ₁ E	7	17	44						
	PR ₃ N	7	17	54						
	iSNE	7	21	22						
	mN	7	21	42	14.1	900				
	L?N	7	24	14						
	mN	7	25	41	9.1	330				
F	9	35								
No. 120 Mar. 26th	iPNEZ	11	37	11					2665	O=11:31:47 Comp- ression.
	PR ₁ E	11	37	46						
	PR ₂ N	11	37	51						
	PR ₃ N	11	37	54						
	iSEZ	11	41	21						
	F	12	46							
No. 121 Mar. 26th	iPNZ	20	20	46					2665	O=20:15:22
	iPE	20	20	48						
	iSNEZ	20	24	59						
	F	21	35							
No. 123 Mar. 27th	ePNEZ	12	34	36					1490	
	SNE	12	37	10						
	LNE	12	38	28						
	F	12	58							
No. 125 Mar. 30th	PNEZ	0	31	00					2190?	Begins in minute gap.
	PR ₁ NEZ	0	31	18						
	iSNEZ	0	34	36						
	LNEZ	0	36	21						
	F	1	45							
No. 126 Mar. 30th	iPNEZ	8	45	30					2733	O=8:39:59
	iSNEZ	8	49	44						
	SR ₂ E	8	51	04						
	iLNZ	8	52	15						
	F	10	36							
No. 127 Mar. 30th	iPNEZ	15	24	32					2655	O=15:19:10 Dila- tation. Same epicenter as No. 119.
	PR ₁ E	15	25	00						
	PR ₁ Z	15	25	02						
	PR ₂ E	15	25	05						
	PR ₂ Z	15	25	06						
	iSN	15	28	42						
	iS?Z	15	28	42						
	F	17	50							
No. 128 Mar. 31st	ePNE	7	15	24						
	F	7	27							
No. 129 Mar. 31st	iN	12	48	21						
	eE	12	48	21						
	F	13	14							

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N	E	Z		
1930				μ	μ	μ		
No. 130 Mar. 31st	eNE F	13 25 13 46						
No. 131 Mar. 31st	iPNEZ iSNEZ F	22 36 11 22 36 32 22 52					165	Compression. Felt in Lubang Is- land, Mindoro Prov.
No. 132 Mar. 31st	iPEZ iSE F	23 50 16 23 53 04 24 34					1622	

Seventeen insignificant or undecipherable disturbances on the following days of March: 1st, 2nd, 3rd, 4th, 9th, 10th, 11th, 14th(2), 15th, 17th(2), 18th(2), 20th, 27th and 28th.

CORRECTION TO FEBRUARY REPORT.

Feb. 14th iPE 18:50:52
iSN 19:01:17 Dist. 9200 Km. 0=18:38:29

During the month of March the seismic equipment of the Observatory was augmented by the addition of a complete set of Galitzin-Wilip seismographs. The recording drums are located on the ground floor of the astronomical building. The vertical component is installed in an inner room of the same building where satisfactory constancy of temperature is obtained. The connecting circuit to the galvanometer is about 90 feet in length. The horizontal components are installed in the seismic room proper on the ground floor of the meteorological building. The circuits to the galvanometers are 430 feet in length and are protected from direct exposure to the sun. The above arrangement was necessitated chiefly by limitations of space but has proved very satisfactory. The seismographs were adjusted to aperiodicity according to the values furnished by the maker. The periods are approximately 12 seconds. The other constants have not yet been determined. The timing circuit is controlled by a Synchronome clock.

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

WIECHERT. $M = 1000$ Kg.

GALITZIN-WILIP.

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	7.59	158	3.748	0.021
E-W	7.72	161	5.200	0.018

	T_0
N-S	12.3
E-W	11.8
Z	12.0

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N	E	Z		
1930				μ	μ	μ		
No. 133 April 1st	eNE ePNE eSNE F	8 36 18 8 36 38 8 36 57 8 44					150	Felt in Lubang.
No. 134 April 1st	ePNE iSNE F	9 29 50 9 30 07 9 44					135	
No. 135 April 1st	eNE F	17 00 55 17 21						
No. 136 April 2nd	iPNEZ iSNEZ ME F	4 17 26 4 19 30 4 21 45 5 56					1200	O=4:14:50 8° N, 129 $^{\circ}$ 40' E by Manila and Zika- wei.
No. 137 April 2nd	eNE F	14 44 15 10						
No. 138 April 2nd	ePNEZ iNEZ iSNEZ F	19 57 38 19 57 50 19 59 48 21 35					1220	O=19:54:58 8° N, 130 $^{\circ}$ E by Manila, Hong-Kong, Zika- wei.
No. 139 April 4th	iNEZ iS?N F	2 22 25 2 31 31 2 53					7567?	O=2:11:27?
No. 141 April 4th	iPNEZ iSNEZ iLNE MN ME MN ME F	9 33 24 9 37 30 9 39 51 9 41 16 9 41 40 9 44 57 9 45 19 10 40				mm. mm.	2620	O=9:28:04 Compression.
No. 143 April 6th	iPNEZ iSNEZ F	10 50 37 10 50 55 11 04					145	Dilatation from SW
No. 145 April 8th	ePNEZ iSNE F	12 15 28 12 15 43 12 23					117	Felt in Lubang, al- so in the Observa- tory.



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per.	Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
1930								
No. 146	ePEZ	14 32 32					6455	O=14:22:34. Dilatation. N-S component out of order.
Apr. 10th	eSEZ	14 40 31						
	eLE	14 50 45						
	ME	14 54 52						
	M ₁ E F	14 55 18 15 37	12.8		11.2			
No. 147	ePNEZ	19 26 53						
Apr. 11th	F	19 50						
No. 148	ePNEZ	3 56 16					1090	O=3:52:53
Apr. 15th	eSNEZ	3 57 11						
	F	4 19						
No. 149	ePNEZ	10 36 37					1060	O=10:34:18
Apr. 15th	iSNE	10 38 29						
	F	11 52						
No. 150	ePNE	20 48 43						
Apr. 15th	F	20 52						
No. 151	ePNEZ	22 06 50						
Apr. 15th	F	22 50						
No. 152	eNE	14 47						
Apr. 16th	F	15 43						
No. 153	iPNE	12 37 56					100	
Apr. 17th	iSE	12 38 09						
	F	12 44						
No. 154	ePNE	15 47 51						
Apr. 17th	F	15 52						
No. 155	ePNE	16 47 52						
Apr. 17th	F	16 50						
No. 156	e?NE	20 19					10700?	
Apr. 17th	S?NE	20 30 25						
	F	21 37						
No. 157	ePNEZ	10 24 04					740	O=10:22:25. Felt in NE Mindanao.
Apr. 19th	iSNZ	10 25 26						
	iLNE	10 26 36						
	F	10 40						
No. 158	ePNEZ	20 54 16					1690	O=20:50:40
Apr. 19th	eSNE	20 57 10						
	F	21 26						
No. 159	eNEZ	1 54						
Apr. 20th	F	2 17						
No. 160	iPNEZ	16 31 36					2910	O=16:25:51 Compression.
Apr. 20th	iSNE	16 36 02						
	iLNE	16 39 04						
	ME	16 40 09	10		19			
	MN	16 40 25	10	18				
	MN	16 41 28						
	F	17 42						

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	
				N mm.	E mm.	Z mm ²		
1930								
No. 161	ePNEZ	23 35 23					150	
Apr. 20th	iSNEZ	23 35 42						
	F	23 42						
No. 162	ePNEZ	10 26 50					5922	0=10:17:24
Apr. 21st	PR ₁ NE	10 29 06						
	iSEZ?	10 34 19						
	PSNE	10 34 32						
	SR ₁ N	10 38 20						
	iLNE	10 43 18						
	MNE	10 47 39						
	F	11 42						
No. 163	ePNEZ	12 10 10						Continuous oscillation but no recognizable phases
Apr. 21st	iE	12 13 27						
	iN	12 13 50						
	F	15 08						
No. 165	eNEZ	22 05 17						
Apr. 21st	IE?	22 26 25						
	F	22 48						
No. 166.	ePNEZ	13 18 40					2222	0=13:14:03
Apr. 22nd	iSNE	13 22 19						
	F	13 56						
No. 167	ePNEZ	20 31 40					500	
Apr. 22nd	iSNE	20 32 39						
	F	20 44						
No. 168	ePNEZ	18 39 19?					7144?	
Apr. 23rd	SNE	18 48 00	in minute gap					
	LN	18 57 09						
	F	19 54						
No. 169	iPNEZ	21 56 30					6400	0=21:46:35
Apr. 23rd	iSNEZ	22 04 33						Compression.
	SR ₁ E	22 09 06						
	iLNEZ	22 13 44						
	MNE	22 19 41	18.2					
Apr. 24th	F	0 05						
No. 170	ePNE	0 31 12					5456	0=0:22:15 From Wiechert.
Apr. 24th	eSE	0 38 14						
	F	1 46						
No. 173	ePNEZ	11 47 55?					2010?	
Apr. 25th	eSNZ	11 51 17						
	F	12 44						
No. 174	ePNEZ	15 12 17					4390	
Apr. 25th	iE	15 12 53						
	iSN	15 18 17						
	eSE	15 18 17						
	LNE	15 24 35						
	F	16 31						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY. -- Continued.

No. and Date	Phase.	Green. Time			Per. s.	Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N	E	Z		
1930						mm.	mm.	mm.		
No. 176 Apr. 26th	iPNEZ	16	28	13					6465	Compression.
	iSNEZ	16	36	13						U.S.C.G.S.
	PSNEZ	16	36	30						O=16:18:13, 51°
	LNEZ?	16	44	30						N, 178° E.
	MNEZ?	16	49	30						
	M ₁ N	16	53	12	16.8	29.4				
	M ₂ E	16	57	03	17.0		20.0			
	F	18	51							
No. 177 Apr. 27th	ePNEZ	8	03	34					290	
	iSE	8	04	13						
	F	8	13							
No. 178 Apr. 27th	iPZ	10	02	12					3190	O=9:55:57
	iSNE	10	06	56						
	F	10	49							
No. 179 Apr. 27th	iPZ	14	38	13					8365	O=14:26:32
	iPE	14	38	15						Dilatation.
	iPN	14	38	19						
	iSNE	14	48	00						
	LE	15	01	21						
	LN	15	01	25						
	ME	15	07	54						
	MN	15	08	13						
	F	16	26							
No. 180 Apr. 27th	iPZ	21	42	35					2645	O=21:37:16.
	iPNE	21	42	37						Compression.
	iNE	21	43	13						
	iP _c PN?	21	46	11						
	iSNE	21	46	43						
	F	22	42							
No. 181 Apr. 28th	iPNEZ	13	17	11					2390	O=13:12:15.
	iSEZ	13	21	00						Dilatation.
	LNE	13	23	00						
	F	14	19							
No. 182 Apr. 28th	iPZ	18	39	52					2700	O=18:34:24. 26°
	iPNE	18	39	55						N, 98° W by Ma-
	iSNE	18	44	08						nila and Zikawei.
	iE	18	44	18						
	mE	18	44	43	12		65			
	iN	18	44	52						
	mN	18	45	00	12	60				
	iLNE	18	46	34						
	MNE	18	48	47						
	F	20	45							
No. 183 Apr. 28th	ePNE	23	32	14					1822	O=23:28:22
Apr. 29th	SNE	23	35	20						
	F	0	06							

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
1930								
No. 184	iPNEZ	7 17 14					160	Compression.
Apr. 29th	iSNEZ	7 17 34						
	F	7 26						
No. 185	iPNEZ	14 02 13					110	Dilatation.
Apr. 29th	iSNEZ	14 02 27						Felt in the Observ- atory.
	F	14 11						
No. 186	iPNZ	16 17 12					3922	O=16:10:02
Apr. 30th	iPE	16 17 13						Dilatation.
	PR ₁ NE	16 18 18						
	PR ₃ NE	16 18 51						
	iSNEZ	16 22 34						
	SR ₂ E	16 25 42						
	LNE	16 27 10						
	F	17 40						

Seven insignificant or undecipherable disturbances on the following days of April: 4th(2), 8th, 21st, 24th and 25th(2).

CORRECTION TO No. 79, March 6th:

iSNE 3:39:01 1890 Km., 25° 45' N,
134° 20' E, approx. by Koti,
Zikawei and Manila.

CORRECTION TO No. 115, March 22nd:

eSNE 9:00:06 2720 Km., off Sizuoka according to Koti.

No. 17.



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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.

WIECHERT. $M=1000$ Kg.

GALITZIN-WILIP.

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	7.7	154	4.1	0.018
E-W	7.8	155	4.4	0.017

	T_0	D	T_1	l	μ^2	K
N-S	12.43	100.5	12.3	11.52	.18	120
E-W	11.80	100.5	11.6	11.40		
Z	11.60	100.5	12.0	14.82		

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 187 May 1st	iPZ ePE iPN iSNE LNE MNE F	1 03 36 1 03 39 1 03 41 1 09 17 1 14 00 1 17 00 2 38					4080	
No. 189 May 1st	ePEZ ePN	9 59 28 9 59 29						Appears to be an aftershock of No. 185.
No. 190 May 1st	ePNEZ F	10 27 38 11 29						No. 189 still recording.
No. 193 May 2nd	iPZ ePE ePN iSNE LNE F	1 50 48 1 50 49 1 50 50 1 58 21 2 07 23 3 02					5980	$O=1:41:18$ Compression.
No. 194 May 2nd	iPNEZ iSNE iLNE F	6 11 15 6 19 00 6 28 13 7 36					6200	$O=6:01:32$ Compression.
No. 195 May 2nd	ePNEZ iSNE F	17 12 00 17 12 53 17 27					435	
No. 197 May 3rd	iPNEZ SNE? F	12 33 00 12 40 00 13 21					5422?	In minute gap.
No. 198 May 3rd	ePNEZ iL?NE F	15 32 28 15 40 12 16 28					3115?	

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 199 May 5th	iPZ iPE iPN iNE iSNE iLN F	13 51 08 13 51 09 13 51 10 13 51 32 13 55 13 13 57 28 17 58					2600	O=13:45:51 8° 30' N; 97° E By Hong Kong, Zikawei Batavia, Manila, Riverview. Compression.
No. 200 May 6th	iPZ ePNE iSNE	22 45 39 22 45 41 22 54 54					7715	O=22:34:32 North Persia. Dilatation.
May 7th	F	2 04						
No. 201 May 7th	PNEZ iSZ iSNE F	5 13 00 5 13 19 5 13 20 5 18					160	In minute gap.
No. 202 May 7th	iPZ iPNE iLNE F	14 28 41 14 28 44 14 37 00 14 54						Dilatation.
No. 207 May 8th	eNE F	9 46 10 29						
No. 208 May 8th	iPZ iPNE iN iE iSZ mE mZ	12 52 19 12 52 21 12 52 57 12 53 12 12 56 00 12 58 18 12 58 31					2330	O=12:47:36 Dilatation. 5° S; 116° E. By Batavia, Amboina, Manila.
No. 209 May 8th	iPZ iPNE iSNZ LNE F	13 45 23 13 45 24 13 53 46 14 07 00 15 08					6844	O=13:35:04 Dila- tation. No. 208 still re- cording.
No. 210 May 8th	iPZ ePNE iSNEZ LNEZ MNE	15 46 40 15 46 40 15 56 06 16 00 45 16 17 30					7922	O=15:35:24
No. 211 May 8th	ePNE iSE	16 57 36 16 57 47					85	Felt in Lubang (III). No. 210 still re- cording.
No. 212 May 8th	ePN ePE iSNE F	22 57 04 22 57 06 22 57 54 23 08					400	

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 213 May 9th	ePNEZ S?NE	7 19 32 7 29 30					8600?	
No. 214 May 9th	ePNE iSNE	7 50 13 7 50 29					125	No. 213 still recording.
No. 219 May 9th	iPZ ePN ePE PR ₁ N PR ₂ N iE iSNE SR ₃ N mE LE F	23 51 07 23 51 11 23 51 12 23 51 41 23 51 48 23 52 03 23 55 26 23 57 02 23 57 06 23 57 55 0 36					2744	O=23:45:39 Dilatation. Approx., 9° S; 120° E. By Batavia, Medan, Manila, Hong Kong.
			9.6		10.9			
May 10th								
No. 221 May 10th	iPNEZ iSNE F	8 05 15 8 05 53 8 31					280	
No. 222 May 10th	ePZ? ePNE? iL?NE F	12 24 14 12 24 16 12 30 04 12 55					2280?	
No. 223 May 10th	iPZ PR ₁ E iSNEZ F	17 21 37 17 22 25 17 26 21 18 14					3180	O=17:15:24 Compression from E. Felt in Guam.
No. 224 May 11th	ePNEZ iSNEZ F	7 29 34 7 33 54 7 45					2822	O=7:23:54
No. 225 May 11th	iPZ ePNE iSNEZ LNEZ F	10 20 45 10 20 45 10 23 26 10 24 43 11 07					1550	O=10:17:26
No. 226 May 11th	ePNE iSNE SZ iLN F	22 45 40 22 54 37 22 54 40 23 07 05 0 19					7400	O=22:34:52
May 12th								
No. 227 May 12th	iPZ ePNE iSNEZ F	0 31 35 0 31 36 0 33 41 0 54					1211	O=0:28:57 Compression.
No. 228 May 12th	iPZ ePNE iSN iSE F	2 47 18 2 47 18 2 55 20 2 55 21 3 22					6500	Compression.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 231 May 12th	iPNE iS?NE F	14 02 00 14 02 35 14 14					250	In minute gap.
No. 234 May 13th	iPZ iPNE F	5 26 29 5 26 30 6 20						
No. 235 May 13th	SNE LNE F	6 39 00 6 40 06 6 53						P lost in micro- seisms and local disturbances.
No. 237 May 13th	iPNEZ? iSNEZ LNEZ F	9 57 40 9 59 23 10 00 27 10 54					970?	Nos. 237, 238, 239 present similar appearance.
No. 238 May 13th	iPNEZ? iSNEZ LNE F	17 56 19 17 58 00 17 59 00 18 36					940?	
No. 239 May 13th	ePNEZ iSNEZ LNEZ F	20 05 12 20 07 00 20 08 16 21 18					1025	
No. 241 May 13th	PE iSNEZ F	22 54 47 22 57 15 23 18					1420	
No. 242 May 13th	ePNE iSNEZ iLNEZ MN ME F	23 37 28 23 39 27 23 40 33 23 41 23 23 41 28 0 52	13.8 11.1		17.1		1144	0=23:34:58 Pen swung downward to limit of 24 millimeters.
No. 243 May 14th	iPZ iPNE F	13 17 48 13 17 49 13 44						
No. 244 May 14th	iPN	19 42 38						
No. 245 May 14th	iPZ iPNE iSNEZ iLN MNE F	19 53 06 19 53 08 19 57 09 19 59 28 20 01 47 20 46					2580	0=19:47:51 No. 244 still re- cording.
No. 246 May 15th	PNE iSNE LNE F	4 19 00 4 23 00 4 25 28 4 40					2530	0=4:13:49



No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 247 May 15th	LNE F	17 44 14 18 03						
No. 248 May 16th	LNE	2 15 35						P and S lost in microseisms.
No. 249 May 16th	LNE	3 01 23						P and S lost in microseisms.
No. 250 May 16th	iPNE iSE F	8 26 36 8 27 06 8 33					240	
No. 251 May 16th	iNE iNE F	20 20 19 20 24 40 20 48 00						
No. 252 May 17th	iPE iSE iSE F	13 46 26 13 47 30 13 47 32 14 14					565	
No. 253 May 18th	iPNE iSNE iLNE F	0 10 17 0 15 29 0 19 39 1 00					3625	From the Wiechert. Change of paper on Galitzin. From Galitzin.
No. 254 May 19th	iPZ iPNE iSNE ME F	15 05 34 15 05 35 15 06 48 15 08 32 16 52	6.4		107		650	Dilatation. Felt in Northern Luzon. 20° 25' N; 120° 30' E. By Hong Kong and Manila.
No. 257 May 20th	iPZ iPNE iSNEZ iLNEZ MNEZ F	7 49 15 7 49 16 7 54 15 7 57 36 8 00 05 9 28					3420	0=7:42:41. Dilatation.
No. 258 May 20th	iPNEZ iSNEZ iNE iNEZ iNEZ iNEZ iLNE MN ₁ ME ₂ MN ₃ F	11 25 00 11 33 07 11 33 55 11 37 00 11 39 44 11 41 26 11 43 30 11 48 22 11 48 42 11 49 56 13 22	in minute gap				6578	0=11:14:56 Com- pression. 51° N; 180° W by U.S.C.G.S.
No. 259 May 20th	ePZ ePN iSN F	22 14 22 22 14 23 22 14 36 22 18					100	

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 260	ePNEZ	13 43 23					135	
May 21st	iSNE	13 43 40						
	F	13 50						
No. 261	iPZ	18 00 23					155	
May 21st	iPNE	18 00 24						
	iSE	18 00 43						
	F	18 10						
No. 263	eEZ	10 21 25						Masked by local disturbances due to storm.
May 22nd	F	11 20						
No. 267	ePNEZ	16 43 22					2656	0=16:37:59
May 23rd	PR ₁ E	16 43 52						
	PR ₂ E	16 44 01						
	iSNE	16 47 31						
	SR ₁ N	16 48 32						
	SR ₁ E	16 48 34						
	SR ₃ E	16 48 59						
	mN	16 49 16	9.0	20.6				
	mE	16 49 19	8.8		22.4			
	mZ	16 49 44	6.9			13.1		
	mNE	16 49 50						
	iLNZ	16 49 56						
	iLE	16 49 59						
	M ₁ E	16 50 26	10.2		24.2			
	M ₂ E	16 50 52	8.5		50.0			
	M ₃ Z	16 51 35	8.5			13.1		
	M ₄ N	16 51 56	8.5	33.5				
F	18 21							
No. 268	iPNEZ	2 25 ca					155	In minute gap.
May 24th	iSE	2 25 19						
	iSN	2 25 20						
	F	2 34						
No. 269	iPEZ	7 24 05						Disturbed by microseisms.
May 24th	F	8 37						
No. 270	iNE	23 40 27						Disturbed by microseisms.
May 25th	F	24 15						
No. 271	iE	15 50 ca						Disturbed by strong microseisms
May 26th	F	16 22						
No. 272	iPNEZ	12 28 56					480	Felt at Aparri, N Luzon.
May 27th	iSNE	12 29 53						
	iSNE	12 30 10						
	MZ	12 30 52	6.8			43.0		
	F	13 01						
No. 273	iPNEZ	13 54 00					150	Disturbed by microseisms.
May 27th	iSNEZ	13 54 19						
	F	14 05						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 274	iPNE	8 15 44					100	
May 28th	iSNE	8 15 57						
	F	8 18						
No. 275	iZ	3 05 52						Disturbed by mi-
May 29th	F	3 10						croseisms.
No. 276	iZ	4 20 55						Disturbed by mi-
May 29th	F	4 27						croseisms.
No. 277	iPZ	13 00 02					1522	0=12:56:46
May 30th	iPNE	13 00 03						Approx. 1° N; 123°
	PR ₁ NE	13 00 09						E. By Batavia,
	iSNEZ	13 02 40						Manila, Medan.
	iNE	13 02 47						
	mN	13 03 20	9.2	35.0				
	mN	13 03 40	7.6	25.6				
	mN	13 04 23	7.4	29.5				
	mE	13 05 07	8.0		18.5			
	ME	13 05 42	7.2		25.8			
	F	13 44						
No. 278	iPNZ	11 59 40					360	
May 31st	iSNE	12 00 26						
	F	12 03						
No. 279	iPNEZ	18 04 12						
May 31st	iN	18 04 52						
	F	19 24						

Twenty-five insignificant or undecipherable disturbances on the following days of May: 1st(3), 2nd, 7th(4), 9th(4), 10th, 12th (4), 13th(2), 20th(2), 21st, and 22nd(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.



WIECHERT. M=1000 Kg.

GALITZIN - WILIP.

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	7.9	149	4.1	0.019
E-W	7.8	165	4.3	0.021

	T_0	D	T_1	\int	μ^2	K
N-S	12.43	100.5	12.3	11.52	-.44	107
E-W	11.8	100.5	11.52	11.4	.068	101
Z	11.6	100.5	12	14.82	-1.81	78

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 280 June 1st	iPNZ F	4 06 27 4 21						
No. 281 June 1st	iPZ iPNE iSNEZ iE mE iLNEZ M ₁ N M ₂ E M ₃ E M ₄ N M ₅ E F	13 15 23 13 15 24 13 23 22 13 29 07 13 30 28 13 33 25 13 37 28 13 37 52 13 38 37 13 40 55 13 41 41 15 14					6444	0=13:05:26
No. 283	iPE iPN iSE iSN iLE iLN ME F	18 18 20 18 18 21 18 22 01 18 22 03 18 23 50 18 23 55 18 25 25 18 44					2256	0=18:13:39 Z component not operating.
No. 284 June 4th	iPNZ iPE iSNE F	9 54 55 9 54 56 9 57 18 11 37					1380	Compression. Koi Island, Molucas, according to Batavia.
No. 286 June 5th	ePN iPEZ iN PR ₁ E PR ₂ NZ mE mN iSNEZ mE mE mZ mE mN mE mN mE iLNE mN M ₁ N F	11 52 54 11 52 54 11 54 04 11 55 36 11 56 48 11 58 16 12 00 26 12 01 26 12 01 39 12 02 19 12 02 22 12 06 56 12 08 23 12 08 23 12 10 35 12 11 30 12 12 51 12 16 07 12 19 13 13 57					7000	0=11:42:26

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 287 June 5th	ePZ iPNE iZ iN iE iSNE iLE LNE F	16 32 13 16 32 14 16 32 27 16 32 46 16 32 47 16 36 45 16 39 40 16 42 00 17 27					3000	0=16:26:16
No. 289 June 7th	ePNE iE iSN iSZ F	6 39 26 6 39 39 6 39 48 6 39 51 6 48					140?	
No. 290 June 7th	iPZ iPE iPN iSNE F	16 28 56 16 28 55 16 28 57 16 29 19 16 49					185	Dilatation. Slightly felt in Ambulong, Batangas
No. 293 June 8th	ePE ePN iPZ iSNE LNE F	17 52 54 17 52 35 17 52 35 17 53 50 18 04 42 18 43					4660	0=17:44:29 Compression.
No. 296 June 10th	ePE ePN SE? F	15 29 14 15 29 15 15 32 21 16 03					1833?	
No. 297 June 11th	iPNEZ iSZ? F	0 56 26 1 01 52 3 28					3833?	0=0:49:20 Phases not well defined.
No. 298 June 11th	ePNE iSNE F	6 17 19 6 17 36 6 22					135	Z component not operating.
No. 299 June 11th	iPN iPE iSNE F	8 13 10 8 13 11 8 15 07 9 34					1122	Z component not operating. Felt at Butuan, Mindanao.
No. 300 June 11th	iPNE iSE F	10 26 12 10 28 14 11 56					1178	Z component not operating.
No. 301 June 11th	iPNE iSNE F	13 47 05 13 49 31 14 38					1411	Z component not operating.



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 303 June 12th	ePEZ	20 01 26					60	
	iPN	20 01 26						
	iSNZ	20 01 33						
	iSE	20 01 35						
	F	20 05						
No. 304 June 13th	iPEZ	1 04 41					7211	0=0:54:02
	ePN	1 04 43						52° N; 172° W by
	iSNE	1 13 26						U.S.C.G.S.
	iE	1 14 39	i					
	mE	1 15 47	8.8		6.0			
	mE	1 16 13	7.8		5.1			
	F	2 37						
No. 305 June 13th	ePNEZ	10 42 32					1190	0=10:39:56
	iSNE	10 44 35						
	iLN	10 45 36						
	F	11 19						
No. 308 June 14th	ePNEZ	13 54 00					155	In minute gap.
	iSNE	13 54 20						
	F	13 57						
No. 310 June 15th	eN	21 28 37						No distinct phases
	iE	21 28 37						
	F	22 30						
No. 311 June 16th	ePNEZ	9 21 45					1390	0=9:18:45
	iN	9 23 23	i					
	iN	9 23 53	i					
	iSNE	9 24 00						
	iE	9 24 25	i					
	iLNE	9 25 22						
	MN	9 27 11	7.3	7.3				
	ME	9 28 31	8.6		10.4			
	F	9 49						
No. 313 June 17th	iPNZ	17 06 06						
	ePE	17 06 07						
	iEZ	17 06 26						
	mN	17 07 47	7.0	4.6				
	F	17 41						
No. 314 June 17th	iE	20 21 49						
	iN	20 21 51						
	F	20 56						
No. 315 June 17th	iPZ	23 24 11					220	Compression.
	iPN	23 24 12						
	ePE	23 24 12						
	iSE	23 24 40						
	iSN	23 24 42						
	F	23 32						
No. 316 June 18th	iPN	13 41 17					238	
	ePEZ	13 41 20						
	iSNE	13 41 49						
	F	13 44						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 317 June 18th	iPZ	13 56 28					970	
	iPN	13 56 29						
	iSNE	13 58 12						
	LNE	13 59 12						
	ME	14 01 20	9.6		6.3			
	MN	14 02 36	8.9	5.3				
	F	14 18						
No. 318 June 18th	iPNEZ	20 59 04					1506	0=20:56:50
	iSNE	21 01 39						
	iLN	21 02 57						
	iLE	21 02 58						
	F	21 46						
No. 319 June 19th	iPNEZ	3 58 24					245	Compression.
	iSNEZ	3 58 58						
	MZ	3 59 14	4.0			30.0		
	F	4 12						
No. 320 June 19th	iPZ	13 12 53					2910	0=13:07:05
	ePN	13 12 54						Dilatation.
	iPE	13 12 56						Sunda Strait, ac-
	iSNE	13 17 19						ording to Bata-
	mE	13 18 59	12.1		47.4			via.
No. 321 June 19th	iZ	13 32 45						No. 320 still re-
	iPEZ?	13 32 53						ording.
	iPN?	13 32 54					3122	0=13:26:45
	PR ₁ E	13 33 35						
	PR ₁ N	13 33 36						
	iSNEZ	13 37 33						
	mN	13 38 37	9.2	17.1				
	mN	13 39 12	11.2	16.6				
	mE	13 39 28	14.3		32.8			
	iLN	13 40 42						
	F	15 22						
No. 322 June 19th	iPZ	19 44 12					505	
	ePN	19 44 12						
	ePE	19 44 13						
	iSNE	19 45 12						
	iSNE	19 45 31						
	F	20 01						
No. 325 June 20th	PNE	14 02 24						
	F	14 30						
No. 328 June 21st	ePNEZ	9 55 54					690	
	iSNZ	9 57 11						
	F	10 07						
No. 329 June 21st	iE	12 10 00						
	F	12 31						
No. 331 June 23rd	ePZ	1 08 40					455	Felt at Aparri,
	iPE	1 08 41						Luzon.
	iN	1 09 18						
	iSE	1 09 35						
	F	1 27						

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 332 June 23rd	iPNEZ	19 41 17					3610	0=1934:28 Compression.
	PR ₃ NE	19 42 41						
	iSNE	19 46 29						
	iLE	19 50 19						
	iLN	19 50 22						
	ME	19 54 20	10.3		9.8			
	F	21 33						
No. 334 June 25th	iNEZ	10 3 8 09						16° N; 78° W, ac- cording to U.S.C. G.S.
	mN	10 49 46	8.6	5.6				
	mE	11 23 36	13.2		9.5			
	F	12 ca						
No. 337 June 25th	iZ	21 41 47					16010	Compression? 16° N; 78° W, ac- cording to U.S.C. G.S.
	iE	21 41 50						
	S _c P _c PN	21 45 03						
	S _c P _c SNE	21 48 27						
	mN	21 49 10	9.2	5.6				
	mN	21 52 42	8.6	4.6				
	mE	21 53 24	12.0		14.6			
	PPSNEZ	21 57 20						
	mN	21 57 34	9.2	7.2				
	mE	21 59 41	12.4		15.1			
	SR ₁ NE	22 03 19						
	mE	22 09 09	13.2		11.8			
	mN	22 10 21	11.6	7.4				
	L?NE	22 33 16						
	ME	23 17 20	18.1		8.9			
	ME	23 18 11	20.2		11.4			
	F	23 49						

Twenty insignificant or undecipherable disturbances on the following days of June: 2nd, 4th, 7th, 8th(3), 10th, 12th, 13th(2), 15th, 16th, 20th(4), 22nd, 24th, and 25th(2).

CORRECTION TO THE REPORT FOR MAY, 1930.

A misprint was made in writing the epicenter of the earthquake of May 5th, 13:51:08.

It should have been 18° 30' N, instead of 8° 30' N.



MANILA. P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

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

WIECHERT. M=1000 Kg.

GALITZIN-WILIP.

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	7.8	165	3.6	0.021
E-W	7.7	166	3.6	0.025

	T_0	D	T_1	l	μ^2	K
				cm.		
N-S	12.43	100.5	12.3	11.52	-.44	107
E-W	11.8	100.5	11.52	11.4	.068	101
Z	11.6	100.5	12	14.82	-1.81	78

No. and Date	Phase	Green. Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
1930								
No. 338 July 2nd	iPN	21 09 46					3680	Wiechert. Galitzin records obscured by heavy microseisms. ASSAM INDIA.
	PE	21 09 47						
	mN	21 12 48	6.3	11.0				
	mE	21 13 15	7.5		6.4			
	iSN	21 15 02						
	iSE	21 15 07						
	mE	21 15 34	6.8		9.6			
	mE	21 20 15	7.4		13.2			
	M ₁ N	21 22 39	14.5	21.0				
	M ₂ E	21 24 27	14.1		21.1			
	M ₃ N	21 24 58	13.7	23.8				
	M ₄ E	21 25 20	11.8		17.7			
	M ₅ N	21 28 24	10.4	16.8				
	F	22 45						
No. 340 July 3rd	iPZ	8 53 13					175	
	iSZ	8 53 35						
	F	9 01						
No. 342 July 4th	iPNE	0 50 26					215	Strong microseisms Wiechert.
	iSNE	0 50 55						
	F	0 58						
No. 344 July 4th	iPNE	16 53 21					120	Wiechert.
	iSNE	16 53 36						
	F	16 59						
No. 345 July 5th	iPZ	18 03 43					940	Strong microseisms
	iSZ	18 05 23						
	F	18 49						
No. 346 July 6th	iPNE	0 11 40					160?	Felt slightly at Ambulong.
	iSNE	0 12 00?	in minute gap.					Disturbed by strong micro- seisms.
	F	0 27						
No. 347 July 6th	iPZ	10 53 01					1020	Disturbed by mi- croseisms.
	iSZ	10 54 49						
	F	11 17						
No. 348 July 6th	iPNEZ	23 03 18					180	Disturbed by mi- croseisms.
	iSNEZ	23 03 41						
	F	23 08						

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
1930 No. 350 July 13th	iPNE iSNE iLNE M ₁ E M ₂ E M ₃ E F ca	19	38	11 19 34 52 51 39 47					1840	O=19:34:18 Disturbed by strong microseisms
No. 352 July 16th	iPNE iSNE F	0	04	31 41 ca					75	Disturbed by local storm and strong microseisms.
No. 353 July 18th	iPNZ iSNZ F	9	23	46 04 26					140	
No. 354 July 19th	iPE iPNZ iSNZ LE F	15	25	50 52 09 44 54					2810	O=15:20:11
No. 356 July 20th	eEZ? mE ME F	10	29	27 25 16 06	9.6 9.0	2.8 2.6				Felt at Karenko coast of Taiwan.
No. 357 July 21st	iPEZ PR ₃ E? iSEZ iLEZ mE mZ ME ₁ ME ₂ ME ₃ F	14	08	37 41 40 50 20 49 56 41 30 06	6.6 4.8 7.1 8.4	19.9	15.2		1190	O=14:06:01 Compression. N-S component not operating.
No. 359 July 22nd	iPNE F	9	01	50 13						Wiechert. Records in the Galitzin masked by strong microseisms. Felt at Butuan.
No. 360 July 22nd	iPNE iSNE F	19	33	29 36 26					3540	Wiechert. Records in the Galitzin masked by strong microseisms. U.S.C.G.S. O=19:26:05, 47°N; 152° E.
No. 361 July 23rd	iPE iSE F	13	14	13 29 18					125	N-S component not operating. Disturbed by microseisms.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
1930								
No. 363	ePZ	4 17 40					160	
July 26th	iNE	4 17 45						
	iSNE	4 18 00						
	iZ	4 18 07						
	F	4 21						
No. 364	iPNEZ	2 11 17					395	Felt in N Luzon.
July 30th	iSNE	2 12 06						
	F	2 24						
No. 366	PNE	23 10 05					590	
July 30th	SNE	23 11 12						
	F	23 20						

Nine insignificant or undecipherable disturbances on the following days of July: 3rd(2), 4th, 10th, 14th, 20th, 21st, 23rd and 30th.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

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

WIECHERT. $M = 1000$ Kg.

GALITZIN-WILIP.

	T_0	V	ϵ	$\frac{r}{T_0^2}$		T_0	D	T_1	λ	μ^2	K
N-S	7.2	193	4.0	0.023		12.43	100.5	12.3	11.52	-.44	107
E-W	7.0	203	4.2	0.034		11.8	100.5	11.52	11.4	.068	101
						11.6	100.5	12.0	14.82	-1.81	78

No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
No. 367 Aug. 2nd	i PEZ	16 24 26					4265	O=16:16:49
	FR ₁ Z	16 25 50						
	PR ₃ E	16 26 26						
	i SEZ	16 30 20						
	i LE	16 35 32						
	e LZ	16 35 32						
	ME	16 38 17	4.8	2.3				
MZ	16 38 39	5.3		2.2				
F	17 48							
No. 368 Aug. 4th	i PEZ	5 23 32					3510	O=5:16:50 Dilatation. Phases not well defined. N-S component not operating.
	mE	5 26 15	5.7	4.6				
	i SEZ	5 28 36						
	i E	5 30 01						
	i LEZ	5 32 20						
	mZ	5 32 47	6.5		5.0			
	ME	5 35 47	6.5					
F	6 13							
No. 369 Aug. 5th	e PE	20 03 05					175	N-S component not operating.
	e PZ	20 03 07						
	i SE	20 03 29						
	F	20 06						
No. 370 Aug. 6th	e PE	7 32 11						Do.
	F	7 59						
No. 371 Aug. 7th	e PEZ	0 03 26					895	Do. Felt at Karenko, Taiwan.
	i SEZ	0 05 02						
	F	0 19						
No. 372 Aug. 7th	i PEZ	6 00 33					75	Felt strongly at Los Baños. N-S component not operating.
	i SNE	6 00 43						
	F	6 04						
No. 373 Aug. 7th	i PZ	23 49 44					935	
	PNE	23 49 47						
	i SN	23 51 23						
	i SEZ	23 51 25						
	mE	23 53 34	8.8	11.5				
	mZ	23 53 45	4.8		4.8			
	mZ	23 56 22	5.9		4.7			
Aug. 8th	F	0 22						



M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 386 Aug. 20th	i PNEZ	20	56	29					1810	0=20:52:38 <i>cf. p.36</i> Pen went to limit of its swing, 50.5 mm. Pen went to limit of its swing, 40.3 mm.
	mN	20	58	46	6.6	10.5				
	i SN	20	59	34						
	LNE	21	01	05						
	mN	21	02	34	10.8	27.9				
	M ₁ E	21	03	15	10.9					
	M ₂ N	21	03	28	10.4	28.4				
	M ₃ N	21	04	20	11.4	31.3				
	M ₄ E	21	05	13	11.7		38.8			
	M ₅ N	21	07	53	9.3					
	M ₆ N	21	08	24	10.1	42.0				
	M ₇ E	21	10	29	9.4		45.1			
F	23	29								
No. 387 Aug. 21st	i \bar{P} NEZ	8	04	55					195	
	i \bar{S} NEZ	8	05	20						
	F	8	09							
No. 388 Aug. 22nd	i \bar{P} N	0	16	27					260	
	e \bar{P} E	0	16	27						
	i \bar{S} N	0	17	00						
	F	0	27							
No. 390 Aug. 22nd	i \bar{P} NEZ	18	05	17					145	
	i \bar{S} NEZ	18	05	35						
	F	18	09							
No. 391 Aug. 23rd	i PNEZ	11	03	39					6945	0=10:53:14
	PR ₁ E	11	06	18						
	PR ₂ Z	11	07	30						
	PR ₃ N	11	08	23						
	mE	11	09	24	7.6		7.0			
	i SNE	11	12	08						
	PSE	11	12	27						
	mN	11	13	21	10.5	29.2				
	mE	11	14	18	8.5		9.3			
	mN	11	15	16	9.8	25.4				
	SR ₁ E	11	16	50						
	i LN	11	23	23						
	M ₁ N	11	31	48	14.1	21.1				
	M ₂ E	11	36	49	14.4		8.2			
	M ₃ N	11	37	17	14.8	22.6				
	M ₄ E	11	39	50	14.4		8.6			
	M ₅ E	11	41	23	13.2		8.0			
	M ₆ N	11	41	38	13.6	26.9				
F	13	48								
No. 392 Aug. 23rd	i NE	15	40	00						
	F	16	07							
No. 393 Aug. 24th	i PNEZ	1	23	55					580	
	i SNEZ	1	25	01						
	F	1	38							

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.---Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N	E	Z		
						mm.	mm.	mm.		
No. 395 Aug. 24th	e PZ	9	16	34					1390	0=9:13:34
	i PNE	9	16	35						
	i SNE	9	18	58						
	i LNE	9	20	16						
	M ₁ N	9	23	07	9.2	21.4				
	M ₂ E	9	25	15	9.6		9.0			
	M ₃ Z	9	25	28	6.9			5.4		
	M ₄ N	9	26	15	9.0	26.4				
	M ₅ N	9	27	51	10.8	32.1				
	M ₆ E	9	30	38	14.4		8.8			
F	10	44								
No. 396 Aug. 24th	e PNZ	10	56	40					2490	
	i SNE	11	00	37						
	LNE	11	02	49						
	MNE	11	04	52						
	M ₁ N	11	05	51	13.2	18.5				
	M ₂ E	11	05	54	14.4		11.0			
	M ₃ N	11	07	18	11.3	37.8				
	M ₄ N	11	07	29	10.3	31.3				
	M ₅ E	11	09	02	11.6		9.5			
	M ₆ N	11	09	18	13.2	22.2				
M ₇ E	11	09	43	10.4		10.9				
F	11	53								
No. 400 Aug. 24th	i PNEZ	19	12	04					945	
	i SNE	19	13	45						
	F	19	28							
No. 402 Aug. 25th	i PEZ	1	31	10					130	Compression. N-S component not operating.
	i SE	1	31	26						
	i SZ	1	31	27						
	F	1	37							
No. 404 Aug. 27th	i PNE	14	56	37					2665?	
	i S?E	15	00	47						
	mN	15	07	50	9.5	3.9				
	F	15	46							
No. 405 Aug. 27th	i PE	21	25	22					355	Legaspi, intensi- ty III.
	e PNZ	21	25	22						
	i SNE	21	26	14						
	mZ	21	27	48	5.2		3.4			
	F	21	35							
No. 406 Aug. 28th	e PEZ	4	56	21					200	
	i SNE	4	56	46						
	mN	4	59	08	9.1	13.2				
	mN	4	59	27	6.6	12.2				
	F	5	06							
No. 407 Aug. 29th	i PN	8	47	19						8° N; 83° W by U.S.C.G.S. 0=8:27:18
	e PZ	8	47	19						
	e PE	8	47	21						
	i NE	8	51	41						
	F	9	26							

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h	m.	s.		N mm.	E mm.	Z mm.		
No. 408 Aug. 29th	i PE	11	25	54				505		
	i PNZ	11	25	55						
	SNE	11	26	51						
	i SNE	11	27	14						
	mN	11	28	18	8.4	11.8				
	mE	11	28	39	9.7		7.1			
	F	11	45							
No. 409 Aug. 29th	i PNE	20	09	27				505		
	i SE	20	10	46						
No. 410 Aug. 29th	i PNE	20	14	27				300	No. 409 still recording.	
	i SNE	20	15	08						
	F	20	28							
No. 411 Aug. 30th	i NE	10	18	11						
	i E	10	21	53						
	i N	10	21	54						
	F	11	12							
No. 412 Aug. 31st	i PN	1	14	50				200	Compression. Felt at Baguio.	
	i PEZ	1	14	51						
	i SNE	1	15	16						
	F	1	47							
No. 413 Aug. 31st	i NE	3	46	30						
	F	4	12							

Nine insignificant or undiscipherable disturbances on the following days of August: 8th, 22nd, 24th(5), 26th and 31st.

CORRECTION TO THE NO. 386, AUGUST 20th.

Felt in north Taiwan, according to Taihoku. Epicenter approximately: $24^{\circ} 20' N$; $122^{\circ} 30' E$ by Taihoku, Zikawei, Hong Kong and Manila. Same as December 18th, 1929.

SNE 20:58:26 Distance 1120 Km.
LNE 20:59:19

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY/

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

WIECHERT. $M=1000$ Kg.

GALITZIN-WILHE

	T_c	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.4	189	2.6	0.021
E-W	4.8	214	2.7	0.030

	T_0	D	T_1	l	η^2	K
				cm.		
N-S	12.43	100.5	12.3	11.52	-.44	107
E-W	11.8	100.5	11.52	11.4	-.60	101
Z	11.6	100.5	12.0	14.82	-1.81	78

No. and Date	Phase	Green. Time		Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.		s.	N	E		
					mm.	mm.	mm.		
No. 415 Sept. 1	iPNEZ	5	23	14				2900	O=5:17:26
	iN	5	23	37					
	iSN	5	27	39					
	iSE	5	27	40					
	iLNE	5	30	35					
	M ₁ N	5	35	18	10.3	8.3			
	M ₂ E	5	37	31	11.3	4.4			
	M ₃ N	5	37	50	9.8	10.1			
	M ₄ N	5	39	38	10.5	11.0			
	M ₅ N	5	42	11	10.4	12.8			
M ₆ E	5	42	15	9.9	4.8				
F	6	12							
No. 416 Sept. 1	iPNE	14	17	00				175	In minute gap. Z component not operating.
	iSNE	14	17	22					
	F	14	25						
No. 417 Sept. 1	iPNE	16	59	39				1555	O=16:56:19 Z component not operating.
	iSNE	17	02	21					
	F	17	32						
No. 418 Sept. 1	PNE	17	51	00				5455	In minute gap. O=17:42:03 Z component not operating.
	iN	17	53	26					
	iN	17	57	12					
	mN	17	57	22	9.6	6.7			
	iSNE	17	58	02					
	mN	18	00	53	10.3	10.2			
	mN	18	01	17	11.4	10.9			
	iL?E	18	06	07					
	iL?N	18	06	09					
	mN	18	09	42	14.6	12.7			
	M ₁ E	18	10	40	14.0	9.5			
	M ₂ N	18	12	09	8.4	16.1			
	M ₃ E	18	13	44	12.1	4.4			
F	18	54							
No. 419 Sept. 2	ePNE	12	37	35				660	
	iSN	12	38	49					
	F	12	44						
No. 420 Sept. 2	ePNE	19	09	42				7110?	Z component not operating.
	iS?N	19	18	21					
	iS?E	19	18	22					
	F	19	57						

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
No. 422 Sept. 5	PNZ	17 05 00					120	In minute gap. Felt in Lubang Is- land and slight- ly at Ambulong. Light spot went to limit of its swing, 60.5 mm. Light spot went to limit of its swing, 57.5 mm.
	iPE	17 05 01						
	iSNEZ	17 05 15						
	mE	17 05 49						
	mN	17 06 34						
	mN	17 07 11	8.9	45.2				
	mE	17 07 30	6.4		42.8			
	mN	17 07 46	7.3	30.1				
F	17 26							
No. 423 Sept. 5	iPZ	20 22 24					225	
	ePNE	20 22 24						
	iSNEZ	20 22 55						
	F	20 29						
No. 425 Sept. 6	iPNE	17 20 39					3265	O=17:15:18
	iSNE	17 25 30						
	iLN	17 28 37						
	iLE	17 28 38						
	F	17 50						
No. 426 Sept. 7	iPZ	2 02 24					115	
	iPE	2 02 26						
	iSE	2 02 40						
	F	2 05						
No. 427 Sept. 8	iPNZ	14 11 18					110	
	ePE	14 11 19						
	iSNEZ	14 11 32						
	F	14 15						
No. 429 Sept. 9	iPN	10 44 32					990	Z component not operating.
	iSNE	10 46 18						
	LNE	10 47 18						
	M ₁ E	10 51 35	13.6		5.0			
	M ₂ N	10 53 17	13.4	9.2				
	M ₃ N	10 56 57	10.5	20.5				
	M ₄ N	11 06 52	10.3	8.8				
	F	11 42						
No. 430 Sept. 9	iPNE	19 07 23					1190	Z component not operating.
	iSNE	19 09 27						
No. 431 Sept. 9	iPN	19 47 14					1040	No. 430 still re- cording. Z component not operating.
	ePE	19 47 14						
	iSNE	19 49 04						
	F	20 03						
No. 432	iNE	4 42 11						
	iN	4 44 43						
	iN	4 46 32						
	mN	4 49 13	12.3	5.3				
	F	5 03						

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 433 Sept. 10	iPNEZ	7	18	46					240	Felt slightly at San Jose, Mindoro.
	iSNE	7	19	19						
	mN	7	20	19	6.4	61.6				
	mE	7	21	04	6.8		35.9			
No. 436 Sept. 10	ePN	22	31	50						
	F	22	58							
No. 437 Sept. 11	PNE	3	57	38					3080	O=3:51:34
	iSN	4	02	15						
	iLE	4	05	17						
	iLN	4	05	18						
	MN	4	16	35	10.4	7.2				
	F	4	32							
No. 438 Sept. 11	PNE	11	08	43					1820	
	iSN	11	11	49						
	mE	11	12	30	12.4		3.5			
	mN	11	13	11	12.4	7.1				
	MN	11	15	22	9.9	6.9				
	F	11	40							
No. 439 Sept. 11	iPNE	12	49	04					1200?	
	iS?N	12	51	09						
	F	14	06							
No. 440 Sept. 11	iLN	18	35	03						
	F	19	33							
No. 443 Sept. 13	iPE	18	04	19					2865	O=17:58:35
	iSNE	18	08	42						
	iLN	18	11	25						
	M ₁ N	18	13	48						
	M ₂ N	18	15	51	9.6	6.2				
	M ₃ N	18	19	11	9.8	5.2				
	M ₄ N	18	23	20	10.4	5.6				
	F	18	34							
No. 444 Sept. 13	iPNE	22	59	55					165	
	iSE	23	00	16						
	F	23	04							
No. 445 Sept. 13	iPN	23	27	46					3030	O=23:21:46
	ePE	23	27	46						
	iSNE	23	32	20						
	mN	23	34	28	8.9	4.2				
	iLE	23	35	16						
	iLN	23	35	19						
	M ₁ N	23	36	20	9.7	4.7				
	M ₂ E	23	36	23	12.2		3.7			
	M ₃ N	23	44	15	9.7	6.8				
	M ₄ N	23	46	41	10.9	6.5				
	F	0	38							

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N	E	Z		
				mm	mm.	mm.		
No. 446 Sept. 14	iPNE	3 13 02					8445	O=3:01:17
	iN	3 14 30						
	iE	3 14 53						
	iE	3 20 44						
	iSNE	3 22 53						
	mE	3 25 22	9.5		5.8			
	mE	3 30 37	9.7		5.9			
	mN	3 34 10	9.3	5.4				
	MN	3 48 41	9.6	5.9				
F	4 31							
No. 447 Sept. 14	iN	4 58 32						
	iN	5 01 36						
	iN	5 06 24						
	F	5 53						
No. 448 Sept. 14	iPNE	17 22 26					5535	O=17:13:24
	PR ₁ E	17 24 32						
	PR ₃ E	17 25 40						
	iE	17 26 46						
	mN	17 27 11	9.1	9.4				
	iSNE	17 29 33						
	mE	17 30 17	6.7		13.8			
	mN	17 30 21	8.8	24.8				
	mN	17 35 32	10.1	14.2				
	mN	17 39 30	10.5	9.1				
F	18 27							
No. 449 Sept. 14	iPN	19 27 34					270	
	ePE	19 27 34						
	iSNE	19 28 12						
	F	19 36						
No. 452 Sept. 16	iPE	11 06 53					2490?	
	S?E	11 10 50						
	F	11 30						
No. 454 Sept. 17	eE	16 30 20						
	iE	16 30 40						
	iE	16 42 55						
	F	17 13						
No. 455 Sept. 17	iPEZ	21 56 32					135	Dilatation.
	iSE	21 56 49						
	F	22 05						
No. 456 Sept. 19	iE	2 10 00						
	iE	2 11 40						
	iE	2 15 32						
	iE	2 21 37						
	F	2 42						
No. 457 Sept. 20	iPE	2 00 24					215	
	ePZ	2 00 25						
	iSE	2 00 52						
	F	2 04						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
No. 458 Sept. 20	iE iE F	13 05 48 13 06 40 13 22						
No. 459 Sept. 21	\bar{e} PNEZ iSNEZ F	8 02 35 8 02 48 8 05					100	Horizontal data from Wiechert.
No. 460 Sept. 21	iPEZ iSN iLN M ₁ N M ₂ N M ₃ E M ₄ N M ₅ E M ₆ E M ₇ N M ₈ E M ₉ N M ₁₀ E F	23 09 31 23 13 37 23 16 12 23 18 08 23 20 08 23 20 27 23 22 21 23 22 26 23 23 33 23 23 36 23 25 30 23 25 37 23 26 34 0 24		11.7 10.0 11.0 10.8 11.1 10.7 12.6 12.0 10.2 10.1	14.6 9.3 15.2 8.9 16.1 12.3 9.5 14.1 11.1 16.2		2620	0=23:04:11 26° N; 98° 30' E by Phu-Lien, Ma- nila, Zikawei, Batavia, Medan, Hong Kong. Maxima data from Wiechert.
Sept. 22								
No. 461 Sept. 22	\bar{e} NE mE F	1 43 16 1 53 16 2 34	6.3		2.6			
No. 463 Sept. 22	iPNEZ iSNE F	14 25 18 14 30 16 15 01					3400	Horizontal data from Wiechert. Approx. 26° N; 92° E by Phu- Lien, Hong Kong, Manila.
No. 464 Sept. 23	iZ iE iE iZ iE F	12 11 30 12 11 50 12 13 05 12 13 25 12 14 13 12 38						
No. 465 Sept. 24	iPNE iSNE L?NE F	7 40 10 7 41 40 7 42 08 8 38					830	From the Wiechert Felt at Butuan.
No. 466 Sept. 24	\bar{e} PNE iSNE F	10 54 00 10 54 20 10 57					160	In minute gap. From the Wiechert

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued

No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km,	Remarks.
				N mm.	E mm.	Z mm.		
No. 467 Sept. 24	oPNE	12 05 46					870 From the Wiechart Felt at Butuan and Surigao, Min- danao.	
	iSNE	12 07 20						
	oSE	12 08 48						
	iE	12 09 29						
	iN	12 10 22						
	iE	12 10 29						
	mE	12 12 26	7.1		9.6			
	mN	12 12 34	11.4	12.4				
F	13 34							
No. 468 Sept. 24	oPNE	15 49 19				900		
	iSN	15 50 56						
	oSE	15 50 56						
	F	16 19						
No. 469 Sept. 25	oPZ	12 53 25				560		
	iPE	12 53 25						
	oPN	12 53 26						
	iSNE	12 54 30						
	F	13 42						
No. 470 Sept. 25	oPEZ	16 51 38						
	F	17 26						
No. 471 Sept. 25	oPZ	18 18 07				1025		
	iPE	18 18 07						
	iSE	18 19 55						
	iE	18 21 22						
	mE	18 28 14	6.9		7.9			
No. 472 Sept. 25	iPZ	18 39 22?				2510? No. 471 still re- cording.		
	iPE	18 39 23						
	iSE	18 43 20						
	mE	18 43 46	6.8		13.1			
	mZ	18 44 29	5.9		2.5			
	mZ	18 45 38	5.7		2.9			
	mE	18 48 33	14.6		19.6			
	mE	18 50 02	11.2		30.8			
	mE	18 52 21	13.8		35.6			
	F	19 34						
No. 473 Sept. 26	oPZ	4 43 27				670 Felt at Surigao Mindanao.		
	iSZ	4 44 42						
	iZ	4 46 40						
	F	4 49						
No. 474 Sept. 27	iE	17 53 35						
	iE	17 54 53						
	mE	18 00 51	8.2		2.1			
	F	18 10						
No. 475 Sept. 28	iPE	1 15 10				510		
	iSE	1 16 10						
	F	1 32						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time		Per. s.	Trace Amplitude			Dist. Km.	Remarks.	
		h.	m.		s.	N mm.	E mm.			Z mm.
No. 476 Sept. 28	iPN	6	00	41				2245		
	ePE	6	00	41						
	iZ	6	01	07						
	iZ	6	02	17						
	iSE	6	04	21						
	iLE	6	06	14						
	ME	6	10	14	11.2	4.1				
	F	6	44							
No. 477 Sept. 28	PNEZ	19	34	44				1490		
	iSE	19	37	19						
	mE	19	39	12	10.8	15.4				
	mE	19	40	17	10.1	17.4				
	F	20	34							
No. 478 Sept. 29	iPEZ	4	56	16				530		
	iSE	4	57	18						
	F	5	06							
No. 480 Sept. 29	iE	13	57	42						
	iE	14	01	15						
	F	14	23							
No. 481 Sept. 30	iPEZ	21	27	07				3530	Compression. Approx. 2°5 S; 148° E by Manila, Hong Kong, Koti.	
	iSEZ	21	32	14						
	mZ	21	32	20	8.8		19.4			
	mZ	21	34	44	9.0		26.3			
	mZ	21	35	29	9.0		27.7			
	iLZ	21	35	54						
	mZ	21	37	16	7.5		23.8			
	M ₁ Z	21	39	18	9.3		30.8			
	M ₂ Z	21	40	14	9.4		27.8			
	M ₃ Z	21	42	15	8.8		32.5			
	M ₄ Z	21	47	25	9.9		29.8			
	M ₅ Z	21	50	39	10.4		19.6			
	F	22	48							

Twelve insignificant or undecipherable disturbances on the following days of September: 2nd, 6th, 8th, 10th(2), 12th, 13th, 15th(2), 17th, 22nd and 29th.

No. 44.

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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.

WIECHERT. $M=1000$ K σ .

GALITZIN-WILIP/

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.4	193	2.5	0.018
E-W	4.6	227	2.7	0.027

	T_0	D	T_1	l	β^2	K
N-S	12.43	100.5	12.3	11.52	-.44	107
E-W	11.8	100.5	11.52	11.4	.068	101
Z	11.6	100.5	12.0	14.82	-1.81	78

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 482 Oct. 1st	iPNEZ	2	54	07					100? Compression. From the Wiechert Felt at Ambulong	
	iS?N	2	54	21						
	F	3	36							
No. 483 Oct. 2nd	iPZ	0	45	16					2480 Felt in Guam.	
	iPNE	0	45	17						
	iSNE	0	49	12						
	iLZ	0	51	24						
	mZ	0	47	46	9.2		10.9			
	mZ	0	51	36	12.1		7.5			
No. 484 Oct. 3rd	iPZ	18	13	33					2300 O=18:08:47 Compression.	
	ePE	18	13	35						
	iSEZ	18	17	17						
	F	18	37							
No. 485 Oct. 4th	iZ	4	34	36						
	iE	4	35	15						
	F	5	12							
No. 487 Oct. 5th	iE	2	33	59						
	iE	2	35	52						
	iE	2	39	23						
	F	2	56							
No. 488 Oct. 5th	iN	18	46	46						
	iE	18	46	56						
	F	19	18							
No. 491 Oct. 6th	iPNEZ	14	31	48					1870 O=14:27:51	
	iSNE	14	34	58						
	mN	14	36	10	11.2	15.1				
	iLN	14	36	36						
	MN	14	38	25	8.2	8.0				
	F	15	36							

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 492 Oct. 6th	iPN	15	45	50					1700	O=15:42:13
	ePEZ	15	45	51						
	iSNE	15	48	46						
	iLE	15	50	05						
	iLN	15	50	07						
	mN	15	50	14	11.9	20.2				
	mE	15	50	26	12.1		8.8			
	F	16	42							
No. 493 Oct. 6th	iPNEZ	18	23	36					118	Dilatation.
	eSN	18	23	51						
	iSE	18	23	51						
	F	18	28							
No. 495 Oct. 7th	iPNEZ	2	32	32					3000	
	iSEZ	2	37	04						
	mE	2	46	11	11.2		2.4			
	F	3	08							
No. 496 Oct. 7th	iPNEZ	7	50	38					160	Compression.
	iSE	7	50	58						
	F	8	06							
No. 497 Oct. 8th	iPNZ	10	28	51					6270	Compression. J.S.A. O=10:09:05 16°S; 169°E. Manila, Honolulu, Koti, Amboina confirm this epi- center.
	ePE	10	28	52						
	mZ	10	31	30	7.5		17.2			
	mZ	10	32	38	8.5		13.5			
	mZ	10	33	33	6.9		15.8			
	iSNE	10	36	46						
	mZ	10	37	38	9.0		15.6			
	mZ	10	38	57	7.3		19.8			
	mZ	10	39	26	7.1		23.6			
	mE	10	40	12	9.2		25.2			
	mE	10	41	22	10.9		39.6			
	mE	10	43	11	10.0		34.4			
	mE	10	44	22	13.3		35.6			
	iLE	10	46	47						
	iLZ	10	46	49						
	M ₁ E	10	51	12	14.5		39.2			
	M ₂ E	10	51	57	8.1		31.2			
M ₃ E	10	54	41	14.0		47.5				
M ₄ E	10	56	36	13.6		29.5				
M ₅ E	10	57	14	11.9		36.0				
M ₆ E	10	58	03	10.1		24.0				
F	12	48								
No. 498 Oct. 8th	iE	19	16	31						
	eN	19	16	31						
	iN	19	16	42						
	iN	19	21	32						
	F	20	06							

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
No. 499 Oct. 10th	iPEZ mE iZ iE iZ iE iSE mE LEZ M ₁ E M ₂ E M ₃ E M ₄ E M ₅ E F	0 42 29 0 43 05 0 43 49 0 44 45 0 45 22 0 45 59 0 46 36 0 47 24 0 49 ca 0 54 29 0 56 12 0 58 22 1 01 34 1 02 09 1 44	4.2 10.6 10.7 11.1 10.8 9.4 8.9		9.6 9.4 10.4 10.6 14.4 12.2 12.1	2630	25° 30' N; 98° E by Hong Kong, Medan, Batavia, Manila. As on Sept. 21, 1930. N-S component un- dergoing adjust- ment.	
No. 500 Oct. 10th	iPZ iPNE iSEZ iSN F	3 01 15 3 01 16 3 02 51 3 02 52 3 36				895		
No. 501 Oct. 10th	iPNEZ iSNE iSZ F	13 01 13 13 01 31 13 01 33 13 08				150	Dilatation.	
No. 502 Oct. 10th	ePNEZ iSNE F	20 55 36 20 55 56 21 01				160		
No. 503 Oct. 11th	L?NE F	3 59 34 5 08						
No. 504 Oct. 11th	iPZ ePE S?NE F	16 08 23 16 08 23 16 13 09 16 29				3210?		
No. 505 Oct. 11th	PNE iSNE LNE MN ME F	17 08 24 17 11 53 17 13 40 17 15 27 17 15 29 17 34	11.4 7.1	9.2	2.6	2100		
No. 507 Oct. 13th	iPZ PNE iSNE F	17 15 37 17 15 40 17 15 51 17 18				110		
No. 508 Oct. 13th	iN eE iN mN F	19 23 31 19 23 31 19 24 06 19 39 48 19 53	8.9	5.1				

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 509 Oct. 14th	iN	7	21	25						
	iE	7	21	26						
	eZ	7	21	26						
	iN	7	22	59						
	mN	7	25	53	13.2	4.6				
	mN	7	31	34	8.8	4.4				
	F	7	44							
No. 510 Oct. 15th	iPNEZ	3	17	12					385	
	iSNE	3	18	00						
	mN	3	19	43	7.7	16.2				
	F	3	35							
No. 511 Oct. 15th	P?NEZ	9	14	20					5520?	
	iNEZ	9	15	49						
	iNE	9	15	54						
	iS?NE	9	21	26						
	mN	9	21	57	10.8	8.8				
	mN	9	22	35	10.1	10.4				
	mE	9	24	24	10.1		5.6			
	mE	9	26	27	10.8	8.0				
	iLNE	9	29	33						
	mE	9	30	52	8.9		2.6			
	mE	9	32	26	8.8		2.6			
	M ₁ N	9	33	56	9.4	9.8				
	M ₂ E	9	34	44	8.9		4.8			
	M ₃ N	9	35	23	9.2	13.0				
	M ₄ E	9	38	40	9.8		4.4			
M ₅ N	9	38	41	10.7	9.2					
F	10	29								
No. 512 Oct. 15th	eN	11	14	24						
	iE	11	14	25						
	iN	11	15	50						
	mN	11	23	15	10.7	3.8				
	mN	11	29	24	9.0	3.4				
	mN	11	34	00	10.2	4.8				
	mE	11	34	14	9.1		2.0			
F	11	50								
No. 513 Oct. 15th	ePNEZ	15	19	22					490	
	iSN	15	20	12						
	iSEZ	15	20	20						
	mN	15	20	45	6.6	12.2				
	mE	15	24	15	5.5		4.5			
	F	15	36							
No. 515 Oct. 16th	PNEZ	1	57	00					390?	In minutes gap.
	iSNE	1	57	48						
	mN	1	59	42	8.8	8.2				
	mE	2	01	37	7.6		6.8			
	mN	2	02	37	7.8	5.6				
	F	2	13							

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 517 Oct. 16th	iNZ	20	55	28						
	oE	20	55	28						
	mE	21	05	27	6.9		4.0			
	mN	21	06	50	8.2	6.4				
	mE	21	07	10	8.1		3.6			
	mN	21	07	39	7.4	5.2				
	F	21	26							
No. 518 Oct. 16th	oPEZ	21	41	13				2990	O=21:35:17	
	iPN	21	41	14						
	mZ	21	43	46	6.6		3.0			
	iSNE	21	45	44						
	mZ	21	46	16	6.0		2.2			
	mE	21	48	33	6.9		5.4			
	LNE	21	48	34						
	mN	21	49	15	9.3	9.0				
	mN	21	50	34	9.1	9.6				
	M ₁ E	21	51	16	8.1		3.8			
	M ₂ N	21	51	44	9.4	8.3				
	M ₃ N	21	52	25	8.0	8.3				
	M ₄ E	21	54	30	10.5		5.6			
	M ₅ N	22	01	25	11.0	6.7				
	F	22	54							
No. 519 Oct. 17th	iP'Z	9	06	37				17570	O=8:46:22	
	oP'N	9	06	37						
	iZ	9	07	10					U.S.C.G.S. O=8:	
	iN	9	07	18					46:32; 33°S; 72°	
	iZ	9	07	38					W.	
	iN	9	08	11					E-W component	
	mN	9	08	32	8.0	8.1			stopped at 6:59.	
	iPR ₁ NZ	9	10	56						
	iNZ	9	11	06						
	iNZ	9	11	19						
	mZ	9	11	28	8.8		8.6			
	iN	9	12	19						
	iN	9	13	49						
	PR ₂ N	9	14	20						
	iN	9	15	05						
	iN	9	15	39						
	mN	9	15	56	8.1	12.2				
	S _o P _c P _c S	9	17	28						
	mN	9	17	45	9.1	14.6				
	mN	9	18	30	11.6	10.8				
	iNZ	9	19	31						
	mZ	9	19	43	5.3		3.4			
	mN	9	19	45	8.1	13.8				
mN	9	21	32	7.7	12.0					
iN	9	24	46							
mN	9	24	55	11.0	15.8					
F	10	36								

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No. and Date	Phase	Greenwich Time			Par. S.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 520 Oct. 18th	iPNEZ	2	59	06					Felt in Guam, Manila record not clear.	
	mN	3	00	39	7.3	3.2				
	mE	3	00	50	7.2		2.4			
	mN	3	09	50	7.1	3.6				
	F	3	35							
No. 522 Oct. 19th	iNE	11	15	32						
	iZ	11	15	33						
	mN	11	24	45	7.8	2.4				
	F	11	36							
No. 523 Oct. 20th	iPNEZ	19	23	28				3510		
	SNE	19	33	34						
	F	19	55							
No. 530 Oct. 20th	iPEZ	22	56	26				1560	N-S trace lost by overlapping lines.	
	iSE	22	59	09						
	iLE	23	00	30						
	F	23	22							
No. 537 Oct. 22nd	iPNEZ	18	13	08				3530?	Compression. 4° S; 147° E by Batavia, Hong Kong, Manila.	
	iZ	18	14	34						
	mN	18	15	31	5.3	6.2				
	mE	18	15	48	6.9		7.1			
	iN	18	16	05						
	mE	18	17	26	6.7		6.4			
	SNE	18	18	08						
	mZ	18	18	26	6.2			2.6		
	LNE	18	21	50						
	mE	18	22	13	8.9		5.8			
	ME	18	25	59	9.1		6.4			
F	19	03								
No. 538 Oct. 23rd	iPNEZ	9	06	46				3825	U=8:59:41	
	iE	9	08	26						
	iN	9	08	55						
	iN	9	09	48						
	iE	9	09	57						
	iZ	9	10	00						
	mZ	9	10	07	6.6			4.0		
	iN	9	10	29						
	iN	9	11	26						
	iN	9	11	49						
	iSNEZ	9	12	10						
	iNE	9	14	05						
	iZ	9	16	17						
	LNEZ	9	16	34						
	mZ	9	17	22	7.8			4.2		
	mE	9	17	57	7.1		6.2			
	mN	9	19	19	6.2	5.8				
	M ₁ E	9	19	45	8.4		6.3			
	M ₂ Z	9	20	17	7.4			3.6		
	M ₃ N	9	20	41	6.8	5.8				
	M ₄ E	9	20	53	7.0		6.2			
	M ₅ Z	9	22	11	7.1			4.0		
	M ₆ E	9	22	51	8.9		6.9			
M ₇ N	9	23	44	7.1	5.4					
M ₈ N	9	32	20	8.6	4.8					
F	10	29								



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Par. S.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
No. 539 Oct. 24th	iPNZ	7 56 39					165	
	iPE	7 56 39						
	iSNE	7 57 00						
	F	8 03						
No. 540 Oct. 24th	iN	10 58 46						
	iE	10 58 46						
	F	11 52						
No. 541 Oct. 24th	iPNEZ	20 20 35					3220	Compression. Manila, Hong Kong, Phu-Lien, Batavia, indicate epicen- ter about 22°N; 153°E. U.S.C.G.S. 24°N; 146°E. Horizontal data from the Wiechart, Galitzin records lost by overlap- ping lines. Pan want to li- mit of its swing 44 mm. Galitzin.
	mE	20 21 23	4.0		22.1			
	mN	20 22 34	4.7	26.4				
	mE	20 22 51	5.1		24.6			
	mE	20 23 20	4.9		29.1			
	iSNE	20 25 21						
	mN	20 26 19	7.9	36.2				
	mE	20 26 44	7.6		31.5			
	mE	20 27 18	5.3		34.5			
	iLNE	20 28 46						
	mN	20 31 18	8.2	28.6				
	M ₁ E	20 31 30	9.9					
	M ₂ E	20 32 16	8.7		35.3			
M ₃ N	20 32 29	10.3	23.1					
Oct. 25th	F	0 25						
No. 542 Oct. 24th	iPZ	22 44 42				175	N-S and E-W un- decipherable in overlapping os- cillations of No. 541.	
	iSZ	22 45 04						
	F	22 51						
No. 543 Oct. 25th	iPZ	4 37 46				135		
	iPNE	4 37 46						
	iSNEZ	4 38 03						
	F	4 45						
No. 544 Oct. 25th	iNEZ	5 23 19						
	iN	5 28 08						
	F	6 02						
No. 545 Oct. 25th	iPN	12 14 47				8440	0=12:03:02 U.S.C.G.S. 0= 12:03:01; 60° N; 154° W.	
	iPEZ	12 14 48						
	iNZ	12 14 56						
	iZ	12 15 50						
	mN	12 16 19	7.2	8.8				
	iZ	12 16 23						
	mN	12 17 38	7.3	7.8				
	mE	12 17 44	8.5		4.8			
	iN	12 17 50						
	iN	12 20 08						
	iSNE	12 24 38						
	iN	12 24 51						
	PSE	12 25 14						
	mN	12 28 24	11.8	5.6				

Over



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Per. S.	Trace Amplitude			Dist. Km.	Remarks.
				N mm.	E mm.	Z mm.		
Continuation of No. 545.								
	mN	12 29 23	10.2	6.1				
	mZ	12 32 31	7.0			1.3		
	mN	12 36 26	10.9	6.2				
	iLNE	12 39 38						
	mN	12 43 28	12.1	4.4				
	ME	12 57 32	12.2		4.2			
	MN	13 07 33	12.3	5.4				
	F	13 50						
No. 549 Oct. 26th	iPZ	11 50 13					140	Rarefaction.
	iPNE	11 50 14						
	iSNEZ	11 50 31						
	F	11 54						
No. 551 Oct. 26th	ONE	22 16 52						
	iE	22 17 32						
	iN	22 20 36						
	mN	22 36 12	8.8	3.6				
	F	23 02						
No. 552 Oct. 27th	iPNEZ	9 37 50					940	
	iSNE	9 39 30						
	mN	9 40 34	8.9	4.0				
	F	9 53						
No. 553 Oct. 27th	PNEZ?	12 39 07					2600?	
	iSNE	12 43 11						
	iLN	12 45 28						
	iLE	12 45 29						
	MN	12 47 40	11.1	6.8				
	ME	12 47 52	9.2		4.6			
	F	14 03						
No. 554 Oct. 27th	iPNEZ	21 43 09						
	iN	21 43 17						
	F	22 26						
No. 555 Oct. 28th	iPNEZ	21 15 45					3120	0:21:09:37 15°N; 150° E by Manila, Zikawai, Phu-Lian.
	iZ	21 15 49						
	iNE	21 15 50						
	iN	21 15 57						
	iSNZ	21 20 25						
	iLZ	21 23 05						
	mZ	21 24 41	17.2			41.4		
	mZ	21 26 17	15.1			27.5		
	F	23 28						
No. 557 Oct. 29th	PNE?	6 10 08					2310?	
	iSNE	6 13 52						
	mE	6 14 39	7.7		3.2			
	mN	6 14 42	6.1	5.2				
	F	6 31						

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N mm.	E mm.	Z mm.		
No. 559 Oct. 29th	iPNEZ	12	35	15					2090?	
	iSNE	12	38	45?						
	iLNE	12	40	24						
	MN	12	42	34	11.3	11.0				
	MN	12	48	39	9.2	7.9				
	F	13	43							
No. 560 Oct. 30th	PNEZ	4	43	12					3580	Compression.
	SNE?	4	48	25						
	iN	4	49	26						
	F	5	11							
No. 561 Oct. 30th	PNE	7	27							
	iNE	7	33	04						
	iNE	7	36	52						
	F	8	59							
No. 562 Oct. 30th	PZ	22	12	42					2310	
	iNEZ	22	13	27						
	iSN	22	16	27						
	iLNE	22	18	14						
	F	22	42							
No. 563 Oct. 31st	iPNEZ	10	32	43					4160	O=10:25:12
	iZ	10	32	58						
	PR2N	10	34	24						
	iN	10	36	53						
	iSNE	10	38	28						
	mN	10	38	41	9.7	20.2				
	mZ	10	38	51	6.6		3.9			
	mZ	10	40	51	6.8		3.4			
	iE	10	41	37						
	mZ	10	41	53	7.3		4.3			
	iLN	10	43	19						
	iLE	10	43	21						
	mN	10	43	45	13.4	49.1				
	mN	10	44	46	11.9	37.4				
	mE	10	44	57	14.9		23.8			
	M1N	10	47	16	14.5	33.5				
	M2N	10	47	45	14.3	32.2				
	M3N	10	51	39	14.9	38.4				
	M4E	10	55	25	15.9		13.8			
	M5N	10	58	13	15.2	31.4				
F	12	13								
No. 564 Oct. 31st	iPEZ	16	10	27						
	iN	16	17	34						
	iE	16	21	05						
	F	17	07							
No. 565 Oct. 31st	iPEZ	18	38	40					1480?	
	iPN	18	38	54						
	iE	18	38	54						
	iN	18	40	08						
	iS?NE	18	41	13						
	iE	18	41	54						
	mN	18	49	32	11.0	8.9				
	mE	18	50	43	13.4		4.8			
	F	19	36							

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks
		h.	m.	s.		N	E	Z		
						mm.	mm.	mm.		
No. 566	aPZ	20	26	39					920	
Oct. 31st	iPE	20	26	40						
	iPN	20	26	41						
	iSNE	20	28	17						
	LNE	20	29	12						
	mN	20	29	50	13.8	56.8				
	mN	20	31	13	11.1	57.6				
	mZ	20	31	32	5.9			6.8		
	mE	20	31	43	9.2		20.1			
	mZ	20	32	22	6.3			4.1		
	mN	20	33	06	12.4	30.8				
	F	21	42							

Twenty six insignificant or undecipherable disturbances on the following days of October: 4th, 5th(2), 6th, 12th, 15th, 16th, 19th, 20th(6), 21st(6), 25th(2), 26th(2), and 29th(2).

No. 58.

1930

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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.

WIECHERT. M=1000 Kg.

GALITZIN-WILIP.

	T_0	V	δ	$\frac{r}{T_0^2}$
N-S	4.4	193	2.5	0.020
E-W	4.9	202	2.8	0.023

	T_0	D	T_1	λ	μ^2	K
N-S	12.43	100.5	12.3	11.52	-.44	107
E-W	11.8	100.5	11.3	11.4	-.64	130
Z	11.6	100.5	12.0	14.82	-1.81	78

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N	E	Z		
1930						mm.	mm.	mm.		
No. 606 Dec. 1st	iPNEZ iSE mN F	2	07	29	6.8	10.8			280	Disturbed by microseisms.
		2	08	07						
		2	08	47						
		2	14							
No. 607 Dec. 1st	iPNEZ S?NE mN mN iN F	10	52	35	10.2	8.6			4655?	Do.
		10	58	51						
		11	00	35						
		11	07	52						
		11	09	52						
		11	57							
No. 608 Dec 1st	ePNEZ iSNE F	18	55	32					150	Rarefaction.
		18	55	51						
		18	59							
No. 609 Dec. 2nd	iPNEZ iSNEZ mE iLNEZ F	7	06	40	6.9	18.4			2930	O=7:00:59 27° N; 97° E by Hong Kong, Manila, Batavia. Disturbed by microseisms.
		7	11	08						
		7	11	55						
		7	14	05						
		9	35							
No. 611 Dec. 3rd	iPNEZ mN iSNE mN mE iLNE mN mE F	18	57	00	5.5	6.2			2890	O=18:51:14. U.S.C.G.S. 19°N; 96° E, O=18:51:50. Disturbed by microseisms. Horizontal data from the Wiechert.
		18	58	50						
		19	01	25						
		19	02	27						
		19	02	46						
		19	04	13						
		19	05	47						
		19	06	36						
		20	53							
No. 612 Dec. 4th	ePN iPEZ iSNE F	16	32	22					130	Disturbed by microseisms.
		16	32	23						
		16	32	39						
		16	34							
No. 613 Dec. 8th	ePZ iE iZ iSEZ mZ mE F	6	22	09	6.9	8.8			970	Formosa. N-S failed to record. Defective. Disturbed by microseisms. Paper.
		6	22	37						
		6	23	29						
		6	23	52						
		6	25	57						
		6	26	35						
		7	31							

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N	E	Z		

1930										
No. 614 Dec. 8th	iPEZ	8	03	08					970	Formosa. Disturbed by microseisms.
	iZ	8	03	30						
	iE	8	03	43						
	iZ	8	03	56						
	iE	8	04	25						
	iSEZ	8	04	51						
	F	9	48							
No. 615 Dec. 8th	iPEZ	17	33	14					2990	O=17:27:18
	iE	17	33	52						
	iE	17	35	32						
	iSEZ	17	37	45						
	mE	17	39	17	8.9		4.5			
	iLEZ	17	40	43						
	ME	17	43	45	11.8		9.6			
F	18	56								
No. 617 Dec. 10th	ePNZ	1	55	04					220	E-W component not operating. Disturbed by microseisms.
	iSNZ	1	55	33						
	mN	1	56	49	9.9	9.2				
	mZ	1	57	24	7.4		4.6			
	F	2	04							
No. 618 Dec. 10th	ePN	2	51	46					255	Disturbed by microseisms.
	iPZ	2	51	46						
	iSNZ	2	52	21						
	F	2	55							
No. 619 Dec. 10th	iP?N	10	47	36						Disturbed by microseisms.
	eP?Z	10	47	36						
	iN	10	49	07						
	iN	10	50	19						
	iN	10	52	49						
	mN	11	22	58	14.9	14.0				
F	11	58								
No. 620 Dec. 11th	ePNEZ	21	26	02					300	
	iSNEZ	21	26	27						
	F	21	28							
No. 621 Dec. 12th	iPNZ	2	39	21					260	Rarefaction.
	ePE	2	39	21						
	iN	2	39	40						
	iSNEZ	2	39	58						
	mZ	2	42	10	4.9		6.4			
	mN	2	43	43	7.5	15.3				
	F	2	53							
No. 622 Dec. 12th	iPNE	2	58	36					3050?	
	ePZ	2	58	36						
	iS?NE	3	05	11						
	mN	3	07	03	12.6	7.2				
	mN	3	09	27	10.9	12.9				
	F	4	10							

No. 61.

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M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY/--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Per. s.	Trace Amplitude			Dist. Km.	Remarks.
				N. mm.	E. mm.	Z. mm.		
1930								
No. 633 Dec. 22nd	iPZ	0 10 35					1005	23° 35' N; 120° 10' E by Hong Kong, Zikawei, Manila. No. 632 still recording.
	iSZ	0 12 21						
	?LZ	0 13						
	F	2 01						
No. 634 Dec. 22nd	ePN	4 21 49					890	22° 30' N; 120° E by Hong Kong, Manila, Zikawei.
	iPEZ	4 21 49						
	SNEZ	4 23 24						
	LZ?	4 24 30						
	F	5 50						
No. 635 Dec. 22nd	eN	8 48 09					2010?	
	iEZ	8 48 10						
	iS?NE	8 51 31						
	F	9 27						
No. 636 Dec. 23rd	iPNEZ	5 24 29					2010?	Disturbed by microseisms.
	iZ	5 24 45						
	iN	5 24 47						
	mN	5 28 39	11.9					
	mE	5 29 48	12.3					
	F	6 02						
No. 637 Dec. 23rd	iPNEZ	7 37 30					3065?	Do.
	iE	7 38 22						
	iN	7 38 35						
	iS?NE	7 42 06						
	LN?	7 44 40						
	F	8 05						
No. 638 Dec. 23rd	iPNE	21 41 17					2780?	Do. Identification of phases uncertain.
	ePZ	21 41 17						
	iS?NE	21 45 34						
	MN	21 50 26	11.0					
	ME	21 50 30	10.2					
	F	23 24						
No. 639 Dec. 24th	iPNEZ	20 09 24					340	
	iSNE	20 10 15						
	F	20 17						
No. 640 Dec. 27th	iPNZ	16 36 31					1300?	Do.
	iZ	16 37 05						
	iN	16 37 19						
	iS?N	16 38 46						
	iL?N	16 40 07						
	F	17 17						

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time			Per. s.	Trace Amplitude			Dist. Km.	Remarks.
		h.	m.	s.		N. mm.	E. mm.	Z. mm.		
1930										
No. 641	iPNEZ	10	55	20					175	Dilatation. E-W galvanometer not operating freely.
Dec. 28th	iSNE	10	55	42						
	mZ	10	58	23	5.5			40.5		
	mN	10	59	28	6.4	58.2				
	F	11	45							
No. 642	eNE	8	54	08						
Dec. 30th	iNE	9	02	52						
	F	9	23							
No. 644	PNE?	20	21	04					3220?	
Dec. 31st	iSNE	20	25	50						
	LNE	20	29	00						
	F	21	41							

Three insignificant or undecipherable disturbances on the following days of December: 3rd, 9th and 30th.

A D D I T I O N A L D A T A T O D E C E M B E R 8:

23° 10' North; 119° 40' East by Manila, Hong Kong, Zikawei, Phu-Lien.

O=8:01:00

Approximately same epicenter on December 15, by Hong Kong, Zikawei, Manila. O=15:59:40.

Correction to No. 541, October 24th, 1930. Epicenter 19° 20' N, and 146° 30' E. Determination based on data from the following observatories: Manila, Hong Kong, Taihoku, Zikawei, Osaka, Phu-Lien, Batavia, Honolulu, Riverview, Wellington and Tucson.