

MANILA OBSERVATORY



MAY, 1940

We thankfully acknowledge the receipt of the following
Bulletins and Reports.

STATIONS

BULLETINS

Adelaide-----	December, 1939, January and February, 1940.
Apia-----	January, February and March, 1940.
Bucarest-----	March, 1940.
Harvard-----	Years 1937, 1938, and 1939.
Hong Kong-----	February and March, 1940.
India-----	January and March, 1939.
J.S.A.-----	Preliminary Bulletin of earthquakes January 17th and February 12th, 1940.
Kew-----	March, 1940.
Ksara-----	March, 1940.
La Paz-----	March 16 to August 18, 1938.
Little Rock-----	January 1st to May 17th, 1939.
Melbourne-----	January, February and March, 1940.
Osaka-----	July 1st to December 31st, 1939.
Paris-----	January and February, 1940.
Perth-----	March, 1940.
Queensland-----	March and April, 1940.
Riverview-----	February and March, 1940.
Roma-----	Microseismics of 1934 and Macroseismics of 1936.
Saint Louis-----	July 1st to September 28th, 1939.
Strasbourg:	
L'Institut-----	January and February, 1940.
Bureau Central-----	January and February, 1940.
Union International-----	January and February, 1940.
Sydney-----	November and December, 1939.
Trieste-----	January and February, 1940.
Toledo-----	July, August and September, 1939.
Uccle-----	September 1st to December 31st, 1939.
U.S.C.G.S.-----	November and December, 1937, and January 1938.

MIGUEL SELGA, S.J.,
Director, Weather Bureau,
Manila, Philippine Islands.

WILLIAM C. REPETTI, S.J.,
Seismologist.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

$\phi=14^{\circ} 34' 42''$ N. $\lambda=120^{\circ} 58' 41''$ E. $h=3$ m. Alluvium.

CONSTANTS OF THE
GALITZIN-WILIP

	T_1	T
N-S	12.6	12.9
E-W	11.8	11.9
Z	11.6	9.0

CONSTANTS OF THE WIECHERT
INVERTED PENDULUM. $M=955$ Kg.

May 2, 1940

	T_0	V	ϵ	$\frac{-I}{T_0^2}$
N-S	4.3	205	2.6	0.085
E-W	4.2	252	2.7	0.108

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks
			h.	m.	s.		
	May 1940						
240	1st	iPZ oPNE SNEZ F	6	01	56 56 12 27	125	Slightly felt at Lobo, Batangas. Baguio, 325 Km.
241	1st	ePNEZ ePE LSN LNE MN F	7	57	16 19 40 20ca 20ca 20	2,030	
243	2nd	iPZ ePNE SNE F	5	49	59 59 24 40	4,645	
244	2nd	ePNEZ SNE F	8	33	19 05 10	6,090	
245	3rd	eP?NEZ SNE F	4	00	29 56 45	2,020?	
246	3rd	ePNEZ SNE F	5	13	54 35 37	1,550	
249	4th	iPZ oPNE LSNE LNE F	7	33	47 47 46 05ca 47	6,430	Dilatation. 53° N: 173° E by USGS.
251	4th	ePNEZ SNE LNE MNE F	21	12	02 31 20ca 30ca 25	6,940	Compression.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
252	May 1940 5th	P ₁ Z PPZ F	2 23 45 28 00 4 40		Long distance.
253	6th	ePNEZ SNE F	10 46 02 16 52	110	
255	7th	iPZ ePNE SN F	22 35 04 06 44 20 23 58	7,700	
257	8th	ePNZ SNE F	8 41 08 45 23 9 11	2,740	
260	9th	ePNZ SNEZ F	0 36 32 40 11 1 32	2,220	
262	10th	iPZ ePNE iSNE F	6 45 15 15 31 52	125	
263	10th	iPZ ePNE SNE LE F	19 05 20 20 10 05 12 55ca 20 20	3,190	
264	11th	ePNEZ eSNEZ F	7 47 42 53 55 8 25	4,600	
265	11th	iPZ ePNE iSNE MNE F	14 04 18 18 12 11 26 40ca 16 57	6,340	Compression. 53.2°N: 172°E by USCGS.
266	11th	ePNEZ SN F	21 06 03 12 59 22 20	5,390	
269	13th	ePNEZ SNE LN F	22 43 18 45 27 46 45ca 23 17	1,245	
271	14th	ePNEZ SE F	16 07 17 11 01 55	2,300	

No. 17.

M A N I L A , P . I .

May, 1940.



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
	May 1940						
275	16th	ePNEZ SNE F	15 16	45 50 10	21 18	3,390	
277	17th	iZ iE F	2	19 23 49	34 10	16,435	7.9°N: 81.8°W by USCGS.
278	17th	ePNEZ SEZ F	8	02 04 12	47 03	680	
279	17th	ePNEZ SNEZ F	13	52 59	02 24	175	
280	18th	ePNEZ SNE F	5 6	08 14 20	21 15	4,290	
281	19th	ePNEZ PPZ SKSNE S PSN L F	4 5 5 6 8	51 55 01 03 04 27 35	11 38 47 20 47 0a	12,015	Near 32.8°N: 115.6°W by USCGS. 0=4:36:46.
282	19th	iPZ ePNE SNE iNE F	15	25 30 34 17	04 04 31 00	4,560	Dilatation. Near 50°N: 156°E; h about 600 Km. by USCGS.
283	19th	iPZ SE F	18	29 39 21	52 28	8,140	
284	20th	ePNEZ SN F	11	28 30 55	20 34	1,290	
287	21st	ePNEZ SNE F	7	27 30 52	11 15	1,755	
289	21st	iPEZ PN iZ LNE F	18 19 20	59 01 08 20	32 35 32 31		Dilatation. Region 23°S: 178°W; h about 400 Km. by USCGS.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
292	May 1940 23rd	ePZ	6	11	40	4,300	
		ePNE			41		
		SNE		17	35		
		LE		22	10ca		
		MNE		26	15ca		
		F		7	37		
293	23rd	ePNEZ	12	18	42	145	
		SNEZ		19	00		
		F		28			
295	23rd	ePNEZ	20	36	50	230	Felt in southeastern part of Luzon and in Marinduque.
		SNEZ		37	21		
		F		21	00		
296	24th	1P ₁ 'EZ	16	53	57	17,990	Compression. Near 11.9°S; 77.4°W; O=16:33:40 by USCGS. Destructive in Peru. Phases after P ₁ ' from Wiechert.
		eP ₁ 'N		54	00		
		SSS	17	25	10ca		
		L		51	00ca		
		M	18	03	00ca		
		F		22	08		
297	24th	1P ₁ 'Z	22	17	49	17,990	Aftershock of #296. O=21:57:40 by USCGS.
	25th	F		0	50		
298	26th	ePNEZ	4	12	20	580	
		SNE		13	52		
		F		27			
299	26th	ePNEZ	6	51	50	210	
		ENE		52	19		
		F		59			
300	27th	ePEZ	4	19	08	6,310	Deep focus.
		1SNE		26	59		
		F		56			
303	28th	1PZ	9	46	04	3,000	Dilatation. Provisional 2°S; 136° E by USCGS. L from the Wiechert.
		PNE			06		
		1SE		50	35		
		1NE		53	30		
304	28th	ePNEZ	13	06	22	2,980	No. 303 still recording.
		SN		10	52		
		F		14	22		
305	28th	1PZ	14	28	41	3,020	
		1SN		33	14		
		F		15	02		

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks
			h.	m.	s.		
	May 1940						
307	28th	oPNEZ SN F	21 22	33 38 25	40 06	2,910	
308	29th	iPZ oPNE SN LE MNE	1	03 08 13 17	33 33 56 10ca 30ca	3,790	Compression. Deep focus?
309	29th	oPZ SNE LNE MN F	2 4	10 20 35 43 40	14 29 50ca 20ca	8,950	No. 308 still recording. 68°N: 138° W by USCGS.
310	29th	oPNEZ SN F	8	03 06 32	29 06	3,080	
311	29th	oPNEZ SNEZ F	19	15 31	22 40	145	
313	31st	oPNEZ SNE F	0 1	52 02 54	30 06	8,140	
315	31st	PZ SNEZ F	22 23	35 37 27	57 07	630	Felt at Dumaguete, Cebu and Maasin.

Twenty-seven insignificant or undecipherable disturbances on the following days of May: 1st, 3rd(2), 4th, 6th, 8th(2), 9th(2), 12th(2), 14th, 15th, 16th(2), 17th, 20th(2), 21st(2), 22nd, 23rd, 27th(2), 28th, 30th, and 31st.

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MANILA OBSERVATORY

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

JUNE, 1940.

2nd	1PZ 1SNE	12 13 41 17 50	Dilatation.
2nd	PZ 1SNE	19 30 09 37 08	
3rd	P'Z 1NE	18 25 12 59 00	Long distance. Provisional, 25°N: 110°W; 02:18:05:22 by USCGS.
5th	ePZ SN	11 13 35 23 56	68°N: 138°W by USCGS.
5th	1PNZ SNE	14 48 51 49 55	Compression. Felt at Vigan.
7th	1PZ 1SNE	7 24 42 30 41	Compression.
8th	1PZ SNE	4 11 23 21 26	Dilatation?
11th	1PZ 1SNE	8 47 19 51 36	Compression (?)
12th	ePZ SNE	11 59 46 12 08 48	
12th	ePNEZ SNE	14 06 09 11 25	
12th	1PZ 1SN	18 42 25 48 03	Compression?
17th	ePEZ SNE	10 38 55 49 18	
18th	1PEZ 1SNE	13 54 46 56 33	Compression from SE. Deeper than normal.
18th	ePZ SNE	18 48 40 56 33	
22nd	ePNEZ SNE	23 17 17 20 12	Dilatation from SE.
26th	1PZ 1SNE	8 05 45 10 35	Compression.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

$\phi = 14^{\circ} 34' 42''$ N. $\lambda = 120^{\circ} 58' 41''$ E. h=3 m. Alluvium

CONSTANTS OF THE
GALITZIN-WILIP

	T_1	T
N-S	12.6	12.9
E-W	11.8	11.9
Z	11.6	9.0

CONSTANTS OF THE WIECHERT
INVERTED PENDULUM. M=955 Kg.

June 1, 1940.

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-E	4.4	195	2.6	0.079
E-W	4.2	257	2.8	0.105

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
317	June 1940 2nd	iPZ iPNE iNEZ iSNE F	12 13 41 43 17 14 50 13 58	2,630	Dilatation.
318	2nd	PZ iSNE F	19 30 09 37 08 20 20	5,255	
319	3rd	P'Z LNE F	18 25 12 59 00 20 30	13,000	Provisional, 25° N: 110° W. O 18:05 - 22 by USCGS.
320	4th	iPZ ePNE SNE	0 06 05 07 09 45	2,240	
321	4th	ePN SNE F	0 11 33 13 20 32	1,010	No. 320 still recording.
323	4th	ePNEZ iSNE F	17 55 28 45 18 05	135	
324	5th	ePZ SN IN MN F	11 13 35 27 56 40 50ca 47 10ca 13 55	9,110	68° N: 38° W by USCGS.
325	5th	iPNZ SNE F	14 48 51 49 55 16 15	550	Compression. Felt in northern Luzon.
326	6th	ePZ ePNE SNE? F	11 05 41 42 08 57 51	1,930?	

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks
			h.	m.	s.		
	June 1940						
327	7th	iPZ ePNE iSNE LNE F	7	24	42 43 30 41 36 20ca 8 55	4,390	Compression.
328	8th	iPZ ePNE SNE F	4	11	23 29 21 26 5 25	8,680	Dilatation?
331	10th	ePNEZ SNEZ F	11	41	56 42 15 46	150	
332	11th	iPZ iPN ePE iSNE MNEZ F	8	47	19 21 21 51 36 56 30ca 10 15	2,780	Compression(?)
333	12th	ePNEZ SNE F	5	45	36 52 00 6 35	4,790	
334	12th	ePZ SNE F	11	59	46 12 08 48 13 20	7,400	
335	12th	ePNEZ SNE LNE F	14	06	09 11 25 15 30ca 17 00	3,680	
336	12th	iPZ ePNE iSN LN F	18	42	25 25 48 03 51 15ca 19 50	4,000	Compression?
339	15th	ePNEZ SNE F	6	17	15 47 25	230	
342	17th	ePEZ SNE LNE ME F	10	38	55 49 18 11 05 30ca 12 30ca 13 04	9,150	
343	17th	iPZ ePNE iSN MN F	14	40	06 06 42 29 45 54ca 15 42	1,370	Compression?



No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks
			h.	m.	s.		
	June 1940						
344	17th	ePNZ iS?N F	20 21	23 05	39 01	1,360?	
346	18th	iPEZ ePN iSNE F	13 16	54 00	46 33	1,010	Compression from SE. Deeper than normal. In region of 5° 30'N: 122° E by Manila and Butuan.
347	18th	ePZ ePNE SNE MN F	18 19 20	48 00 15	40 41 33 30ca	6,200	
351	19th	ePNEZ SNEZ F	23	12 13 26	56 38	320	
355	22nd	iPNEZ SNE F	11 14	40 22	04 00	1,700	Dilatation from SE. In region of 11°N: 136°E by Manila and Butuan. S from the Wiechert and Horizontals.
356	22nd	ePNEZ SNE F	23	17 20 41	17 12	1,690	Dilatation from SE.
360	24th	ePNEZ SNE F	2 3	39 30	19 07	4,190	
361	25th	ePNEZ S?E LN F	2 3	24 30 34 25	18 09 18ca	4,240?	
363	26th	iPZ ePNE iSNE INE MNE F	8 9	05 30	45 45 35 20ca 35ca	3,090	Compression.
364	27th	ePNEZ S?N F	6 7	56 00 19	44 37	2,430?	

Twenty insignificant or undecipherable disturbances on the following days of June: 2nd, 4th, 9th, 10th, 13th, 14th, 15th(2), 17th, 18th, 19th(2), 21st(3), 23rd(3), 26th, and 27th.

11 NOV. 1940



MANILA OBSERVATORY

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

JULY, 1940

NO further data for July
P23-25 missing

10th	iPNZ iSNEZ	5 55 31 6 00 05	Dilatation
13th	P/EZ SSN	17 07 20 30 00	Long distance.
14th	iPNEZ iSNE	6 02 47 10 52	Dilatation from NE (?).
15th	iPZ iSN	8 49 51 54 55	Compression(?).
15th	ePNEZ SNE	16 35 28 39 28	Deep focus.
16th	iPZ iSN	4 51 02 56 03	
16th	ePNEZ SNE	19 19 19 24 28	
16th	ePNEZ SNE	23 20 28 28 23	
19th	iPZ SNE	4 57 13 5 05 06	
20th	PNEZ SN	2 05 21 13 17	Disturbed by microseisms.
21st	ePNEZ S?E	5 25 41 32 41	
21st	iPNEZ iSNEZ	15 41 26 43 58	Dilatation from S by E. Felt at Jolo and at Zamboanga.
23rd	ePNEZ SNEZ	2 47 51 51 35	
27th	eP'NEZ	18 51 11?	Long distance. Disturbed by microseisms.
31st	iPZ eSNE	11 46 28 52 06	Dilatation(?).

MANILA OBSERVATORY



JULY, 1940.

We thankfully acknowledge the receipt of the following
Bulletins and Reports.

STATIONS

BULLETINS

Adelaide-----	May, 1940.
Hamburg-----	July 1 to December 31, 1939.
Helgoland-----	July, August, and September, 1939.
Hong Kong-----	May, 1940.
India-----	April - June, 1939.
J.S.A.-----	Preliminary Bulletin of earthquakes of November, 1939.
J.S.A.-----	Preliminary Bulletin of earthquakes of February 7, March 27, and April 16, 1940.
Kew-----	April, 1940.
Ksara-----	April, 1940.
L'URSS-----	July, 1937 - April, 1939.
Mizusawa-----	April - December, 1939.
Perth-----	May, 1940.
Queensland-----	May, 1940.
USCGS-----	May, 1938.
Wellington-----	May, 1940.
Zikawei-----	October 16 to December 31, 1939, and Preliminary Report of principal earthquakes of January, 1940.

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WILLIAM C. REPETTI, S.J.,
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MANILA OBSERVATORY



AUGUST, 1940

We thakfully 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

Adelaide-----	June, 1940.
Apia-----	April, May, and June, 1940.
Cluj-----	February, March, and April, 1940.
Hukuoka-----	July - December, 1939.
India-----	July - September, 1939.
Kew-----	May 1940.
Ksara-----	May, 1940.
Osaka-----	December 31, 1939 to March 31, 1940.
Ottawa-----	April, 1940.
Paris-----	April, 1940.
Perth-----	June, 1940.
Queensland-----	June, 1940.
Riverview-----	April, May, and June, 1940.
San Fernando-----	November, 1939 to April, 1940.
Strasbourg:	
L'Institut-----	April, 1940.
Bureau Central-----	April, 1940.
Union International----	April, 1940.
Sydney-----	March and April, 1940.
Wellington-----	June, 1940

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Aug - Nov '40
Ref 2869

MANILA OBSERVATORY
SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES



AUGUST, 1940

1st	iFEZ SE	12 48 59 53 53	Dilatation.
1st	iPZ SE	15 15 03 20 30	Compression. 44.5° N: 140° E by USCGS. S from the Wiechert.
1st	eFEZ SE	19 58 24 20 02 07	
2nd	ePNEZ SNE	3 47 33 50 25(?)	
2nd	ePNEZ iSE	5 42 49 45 06	
5th	ePNEZ SNE	8 30 32 38 14	
5th	iPZ iSN	10 00 40 05 24	
5th	iPZ iSNE	21 31 36 35 21	
11th	ePNEZ SNE	16 58 05 17 07 32	
13th	iPZ iSE	15 41 55 46 26	Compression. S from the Wiechert,
15th	iPZ iSNE	21 28 35 33 17	Compression.
22nd	iPNEZ iSNE	3 38 23 47 29	Dilatation from NE. Near 43° N: 165° W by USCGS.
24th	iPZ iSE	13 42 29 48 00	

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY



International
Seismological
Centre

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

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

h=3 m.

Alluvium

CONSTANTS OF THE
GALITZIN-WILIP

CONSTANTS OF THE WIECHERT
INVERTED PENDULUM. M=955 Kg.

August 1, 1940

	T_1	T
N-S	12.6	12.9
E-W	11.8	11.9
Z	11.6	9.0

	T_0	V	E	$\frac{I}{T_0^2}$
N-S	4.3	197	2.5	0.082
E-W	4.2	259	2.1	0.104

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks
	Aug. 1940				
418	1st	iPEZ SE F	12 49 59 59 13 14 20	7,280	Dilatation. Near 23° S: 179° E by Riverview and Manila. h=500 Km. according to Riverview.
419	1st	iPZ ePE SE F	15 15 03 03 20 30 19 20	3,680	Compression. 44.5° N: 140° E by USCGS S from the Wiechert.
420	1st	ePEZ SE F	19 58 24 20 02 07 40	2,290	
421	2nd	ePNEZ SNE F	3 47 33 50 25(?) 4 30	1,625	
422	3rd	ePNEZ iSE F	5 42 49 45 06 6 45	1,320	
423	2nd	eFNEZ SNE F	7 08 52 11 15 35	1,380	
425	3rd	ePNEZ iSNEZ F	8 01 30 03 06 9 10	900	
429	5th	ePNEZ SNE LNEZ F	8 30 32 38 14 46 20ca 9 47	6,140	
430	5th	iPZ ePE iSN MNE F	10 00 40 41 05 24 11 10ca 11 15	3,170	
432	5th	iPZ iFN ePE iSNE LNE F	21 31 36 38 38 35 21 37 15ca 23 10	2,310	

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY. --Continued



No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks
	Aug. 1940				
435	6th	ePNEZ SNE F	20 56 30 58 43 21 13	1,270	
437	7th	ePNEZ SN LNE F	15 45 37 47 47 49 08ca 16 16	1,250	
438	7th	ePNEZ SNE F	20 17 29 20 21 52	1,660	
441	8th	PZ SNE LNE F	14 20 10 29 48 40 40ca 15 26	8,255	Riverview, 24.1 In region of New Zealand(?) by Riverview and Manila.
443	9th	ePNEZ SE F	14 35 41 40 29 15 13	3,240	
445	10th	ePNE SNE F	12 56 08 16 58	60	Very small.
448	11th	ePNE SNE LE MN F	5 15 13 21 38 26 20ca 32 15ca 6 37	4,800?	
450	11th	ePNEZ SNE LE F	16 58 05 17 07 32 20 40ca 18 33	8,020	
453	12th	ePNEZ SN F	5 30 51 34 48 52	2,490	
455	12th	ePNZ SNE F	12 48 45 51 32 13 07	1,600	
457	13th	eP?NEZ SNE F	4 00 44 02 36 27	1,050?	Slightly felt at Butuan,
459	13th	iPZ ePNE iSE ME F	15 41 55 55 46 26 52 05 18 25	2,990	Compression. S from the Wiechert.
460	13th	ePZ SNEZ F	20 49 35 54 08 21 32	3,020	Deep focus?

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
	Aug. 1940						
463	14th	ePNEZ SNE F	8	46	23 23 58	1,150	
467	15th	ePNEZ SNEZ F	10	22	26 58 44	230	
468	15th	ePNEZ SNE F	15	54	52 16 16	1,390	
469	15th	iPZ ePNE iSNE F	21	28	35 35 17 43	2,980	Compression.
470	20th	ePNEZ S?NE L?E F	17	36	30 26 ca 45	4,200?	
474	22nd	iPNEZ iSNE LNE MNE F	3	38	23 29 ca 30ca 35	7,600	Dilatation from NE. 51.9° N: 164.9° W by USCGS.
477	24th	eNE F	8	56	06 18		Trace.
478	24th	iPZ ePE iSE LNE	13	42	29 30 00 35ca	3,920	
479	24th	ePNEZ iSNEZ F	4	00	08 27 55	150	No. 478 still recording.

Forty-three insignificant or undecipherable disturbances on the following days of August: 1st, 2nd, 4th(3), 5th, 6th(2), 7th, 8th(3), 10th(2), 11th(2), 12th(4), 13th, 14th(5), 21st(3), 22nd, 23rd, 24th, 26th(6), 27th(2), 29th, 30th, and 31st.



MANILA OBSERVATORY

SEPTEMBER, 1940

We thankfully acknowledge the receipt of the following
Bulletins and Reports.

STATIONS

BULLETINS

Adelaide -----	July, 1940
Batavia -----	October-December, 1939.
Hong Kong-----	June and July, 1940
Hukuoka -----	January to June, 1940
J. S. A. -----	Preliminary Bulletin of Earth- quakes of April, May, and June, 1940.
Ottawa -----	May, 1940.
Palau -----	September 16, 1939 to July 30, 1940.
Pasadena -----	May and June, 1940.
Perth -----	July, 1940.
Queensland-----	July and August, 1940.
Riverview -----	July 2 to August 2, 1940.
Toledo -----	January-March, 1940.
U.S.C.G.S.-----	June to October, 1940.
Wellington-----	July, 1940.

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*à faire p
dans 2e semestre
Septembre*



MANILA OBSERVATORY

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

SEPTEMBER, 1940

X	1st	iPNEZ SNEZ	8 15 42 17 10	Epicenter in Philippine Deep, near 9° 45' N: 126° 35' E. Felt in NE Mindanao and E Leyte. Dilatation at Butuan.
X	3rd	iPZ SE	1 38 11 46 37	
X	3rd	iPEZ SNE	14 47 01 52 06	
X	4th	ePNEZ SNE	19 24 37 30 01	
X	7th	iPNZ SNZ	19 25 31 27 06	Compression(?). Butuan, 110 Km., Dilatation. Felt in E Mindanao, near 9° N: 126° 50' E,
X	12th	iPNZ iSNEZ	0 24 51 27 39	Compression from SSE?
X	12th	iPZ iSE	13 24 19 29 19	Dilatation.
X	19th	iPZ iSNE	18 30 00 38 33	Dilatation.
X	20th	iPNEZ SNE	0 06 03 11 03	Compression.
X	21st	iP ₁ Z SKSEZ	13 57 31 14 04 26	Compression. Long distance.
	21st	ePNEZ SNE	18 59 33 19 01 46	
X	22nd	iPEZ SN	3 44 09 48 50	
X	22nd	iPNEZ iSNE	22 53 55 55 34	Dilatation from SE. Deeper than normal. S from the Wiechert.) 500k
X	24th	iPEZ PP?	0 53 31 58 14	Compression. au large E de Formose
X	26th	iPEZ iSNE	4 05 30 12 48	Compression. A été fermée Coulm...



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

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

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

$h = 3$ m.

Alluvium.

CONSTANTS OF THE GALITZIN-MILIF

	T_1	T
N-S	12.6	12.9
E-W	11.8	11.9
Z	11.6	9.0

CONSTANTS OF THE WIECHERT INVERTED PENDULUM. $M = 955$ Kg.

September 1, 1940

	T_a	V	ϵ	$\frac{I}{T_0^2}$
N-S	4.3	196	2.5	0.084
E-W	4.2	260	2.1	0.032

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks
			h.	m.	s.		
	Sep. 1940						
492	1st	iPNEZ SNEZ F	8	15	42 17 10 9 10	810	Epicenter in Philippine Deep, near $9^{\circ} 45' N$: $126^{\circ} 35' E$. Felt in NE Mindanao and E Leyte. Dilatation at Butuan.
494	3rd	iPZ ePE SE F	1	38	11 11 46 37 2 10	6,850	
495	3rd	iPEZ SNE LNE MN	14	47	01 52 06 55 30ca 58 45ca	3,510	
496	3rd	F?NEZ SN F	15	33	15 37 41 16 45	2,910	#495 still recording. Disturbed by microseisms
501	4th	ePNEZ SNE LE MNE F	19	24	37 30 01 32 25ca 35 00ca 20 00	3,620	
503	6th	ePNEZ SNE F	6	18	18 20 30 52	1,260	Disturbed by microseisms.
505	7th	iFNZ iPE SNZ F	19	25	31 32 27 06 20 40	890	Compression(?). Felt in E Mindanao near $9^{\circ} N$: $126^{\circ} 50' E$. Butuan, 110 Km., Dilatation.
506	7th	ePNEZ SN	21	39	00 40 36	890	Aftershock of #505. Butuan, 110 Km.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

International
Seismological
Centre

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
510	Sep. 1940 9th	iPNZ	20	25	02	970?	Felt in eastern Mindanao.
		ePE			02		
		iS?NE		26	45		
		MN		30	30ca		
		F	22	15			
512	10th	ePNEZ	9	43	23	110	Felt at Batangas.
		SNEZ			37		
		F		47			
513	12th	iPNZ	0	24	51	1,590	Compression from SSE?
		iPE			53		
		iSNEZ		27	39		
		F	1	17			
514	12th	iPZ	13	24	19	3,440	Dilatation. Felt very strongly at Rabaul, New Britain, according to Riverview, relaying a government report.
		ePNE			19		
		iSE		29	30		
		iLNE		32	53		
		iMNE		35	12		
		F	15	25			
516	14th	ePNEZ	4	29	21	1,540	
		iSE		32	02		
		F		55			
517	14th	ePEZ	7	04	38	540	Felt at Catbalogan, Borongan, Tacloban, Cebu, and Iloilo.
		iSNEZ		05	41		
		SNE		06	04		
		F	8	12			
518	14th	ePNEZ	18	12	47	4,010	
		SNE		18	24		
		F	19	02			
521	16th	ePNEZ	14	36	24	200	
		iSNEZ			50		
		F		44			
524	19th	iPZ	1	31	26	1,900	
		ePNE			26		
		iSN		34	39		
		F		53			
525	19th	ePNE	11	15	39	1,190	From the Wiechert.
		SNE		17	42		
		F		38			
526	19th	iPZ	18	30	00	7,020	Dilatation. New Hebrides by Riverview and Manila.
		iPNE			02		
		iSNE		38	33		
		LNE		50	ca		
		MNE		55	15ca		
		F	21	38			

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks
			h.	m.	s.		
527	Sep. 1940 20th	iPNEZ SNE iLE iME F	0	06	03 11 03 14 38 17 50 1 55	3,420	Compression.
529	21st	iP ₁ Z P ₂ NEZ SKSEZ F	13	57	31 58 48 14 04 2e 15 20		Compression. Long distance.
530	21st	ePNEZ SNE F	18	59	33 19 01 46 45	1,280	Slightly felt at Zamboanga.
531	22nd	iPEZ SN MNE F	3	44	09 48 50 54 ca 4 45	3,130	
536	22nd	ePEZ SN F	12	29	43 32 02 50	1,340	
537	22nd	ePNEZ SNE F	17	44	36 46 11 18 10	890	
538	22nd 23rd	iPNEZ iSNE F	22	53	55 55 34 1 20	930	Dilatation from SE. Deep focus. Slight felt at Butuan and Hinatuan. S from the Wiechert.
540	23rd	ePNEZ S?NE F	10	42	30 46 44 11 30	2,730?	
541	24th	iPEZ ePN PP? F	0	53	31 31 58 14 2 30		Compression.
543	25th	iPZ ePN ePE SE F	14	34	25 28 29 40 32 15 22	4,500	
544	25th	PZ SN MN F	19	42	07 50 43 20 08 30ca 21 20	7,050	

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
	Sep. 1940				
545	26th	iPEZ	4 05 30	5,700	Compression. Deeper than normal. In region of Santa Cruz Island, Solomon Islands, by Riverview and Manila
		iPN	33		
		iSNE	12 48		
		LN	20 23ca		
		F	5 40		

Twenty-five insignificant or undecipherable disturbances on the following days of September: 2nd, 3rd(2), 4th(3), 6th, 7th, 8th, 9th, 10th, 13th, 15th(2), 17th, 18th, 20th, 22nd(4), 23rd, 24th, 28th, and 30th.

MANILA OBSERVATORY



SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

OCTOBER, 1940

2nd	ePNEZ	0 57 24	
	SNE	1 04 43	
4th	iPNZ	4 42 24	Dilatation?
	SNE	48 15	
4th	iPNEZ	8 15 08	Dilatation. Epicenter, region 15°S:
	PPNZ	20 20	67°W by USCGS. H=7:54:35.
	SKKS	26 46	
	SS	41 34	
5th	iPZ	14 58 25	Compression. Epicenter, region 9°N;
	LNE	15 46 ca	85°W by USCGS. H=14:38:40.
6th	iPZ	15 58 41	Compression.
	SKKS	16 10 15	
7th	iPZ	6 45 34	Dilatation from SE. Felt SE Mindanao.
	iSNEZ	47 36	
10th	PZ	21 35 21	
	iSN	37 54	
22nd	iPNE	6 49 15	Rumania.
	SNE	59 30	
24th	iPZ	20 26 38	Compression. Chile.
	iZ	27 11	
27th	iPZ	5 55 15	Compression from NE.
	iZ	58 38	
30th	iPZ	11 58 39	Deep focus?
	SNE	12 06 57	
31st	iPEZ	5 32 18	Dilatation. Deep focus?
	SNE	40 48	
31st	iPZ	10 52 39	Compression?
	SNE	59 56	

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

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

$\lambda = 120^{\circ} 38' 41''$ E.

h=3 m.

Alluvium.



CONSTANTS OF THE GALITZIN-WILIP

	τ_1	T
N-S	12.6	12.9
E-W	11.8	11.9
Z	11.6	9.0

CONSTANTS OF THE WIECHERT INVERTED PENDULUM. M 955 Kg.

October 1, 1940.

	T	V	E	$\frac{T}{T_0^2}$
N-S	4.4	126	2.5	0.081
E-W	4.2	260	2.4	0.102

No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
	Oct. 1940						
549	1st	ePNEZ SNE F	21	50	53	5,700	
				58	09		
			22	55			
551	2nd	ePNEZ SNE F	0	57	24	5,740	
			1	04	43		
				49			
553	3rd	iPNZ iPE iSNEZ F	1	04	38	510	Felt in northern Luzon.
					39		
				05	38		
			2	03			
554	4th	iPNZ ePE SNE LNE MNE F	4	42	24	4,240	Dilatation?
					24		
				48	15		
				54	35ca		
				58	ca		
			5	50			
555	4th	iPNEZ SKP? PPNZ SEKS iNE PSKS SS LNE F	8	15	08	19,000	Dilatation. Epicenter, region, 19° S: 67° W by USCGS. H=7:54:35.
				18	24		
				20	20		
				26	46		
				27	03		
				30	46		
				41	34		
				9	14 ca		
			11	45			
556	4th	iPZ ePN SE F	14	21	33	910	Compression.
					33		
				23	11		
			15	10			
557	4th	ePNEZ iSNEZ F	19	31	11	930	
				32	51		
			20	27			
560	5th	ePNEZ iSNEZ f	8	04	59	215	
				05	28		
				30			

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
561	Oct. 1940 5th	iPZ	14	58	25	16,120	Compression. Epicenter, region, 9°N: 84°W by USCGS. H=14:38:40.
		ePE			25		
		iNE		59	54		
		LNE	15	46	ca		
		F	17	06			
564	6th	iPZ	15	58	41		Compression.
		ePNE			41		
		PP	16	03	32		
		SKKS		10	15		
		LNE		58	ca		
		F	18	10			
566	7th	iPZ	6	45	34	1,170	Dilatation from SE. Felt in SE Min- danao.
		iPNE			36		
		iSNEZ		47	36		
		F	8	45			
567	7th	ePNZ	16	16	58	1,820	Deep focus.
		iSNE		20	04		
		F		46			
570	10th	ePNEZ	5	25	37	3,880?	
		S?NE		31	06		
		F	6	20			
571	10th	PNEZ	19	45	05	930	
		iSNE		46	44		
		F		57			
574	10th	PZ	21	35	21	1,470	
		iSN		37	54		
		F	22	15			
576	11th	iPZ	19	01	04	16,355	Dilatation. 45°S: 73°W by USCGS.
		LNE		53	ca		
		F	21	17			
577	12th	ePNEZ	14	39	30	640	
		SNE		40	43		
		F	15	08			
582	15th	ePNEZ	9	09	18	110	
		SNE			32		
		F		18			
584	16th	ePE	22	38	31	780	Felt at Surigao and Butuan. About 9° 50'N: 126° 20'E by Butuan and Manila.
		SNE		39	57		
		iNEZ		41	40		
		F	23	15			

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks
585	Oct. 1940 17th	iPZ ePNE SNE F	8 22 08 08 43 34	250	
587	19th	ePNEZ SNE F	4 48 34 49 36 5 02	520	
590	20th	iPNEZ SNE F	10 56 28 54 11 35	200	Dilatation from E. Felt in S Luzon, 14° 35' N: 122° 50' E by Manila and Baguio. h=40 Km? S from the Wiechert and Horizontals.
592	21st	ePNEZ SNE F	2 36 40 37 16 41	260	
594	22nd	iPNE iN SNE F	6 49 15 59 21 59 30 8 01	9,090	Rumania.
596	24th	ePEZ SNE F	0 35 53 36 30 41	260	Felt at Vigan.
597	24th	iPZ ePE iZ F	20 26 38 38 27 11 22 50		Compression. Chile.
599	27th	iPZ ePNE iE SKPZ LNE F	5 55 15 15 56 43 58 38 6 45 ca 8 50	16,120	Compression from NE. 10° N: 84° W by USCGS.
601	28th	iPZ ePNE SNE F	23 18 43 43 19 02 27	150	
602	29th	ePNEZ SNEZ F	0 20 11 46 35	250	
603	29th	ePNEZ SNE F	10 18 21 21 58 35	2,200	



MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
	Oct. 1940				
606	30th	iPZ ePNE SNE F	11 58 39 39 12 06 57 37	6,740	Deep Focus?
607	31st	ePNEZ SNE F	2 00 31 07 46 50	5,670	
608	31st	iPEZ ePN SNE LN ME F	5 32 18 19 40 48 52 26 57 05 6 40	6,960	Dilatation. Deep focus?.
609	31st	iPZ iPE SNE NE F	10 52 39 41 59 56 11 13 ca 12 10	5,710	Compression?
612	31st	iPZ ePNE iPNEZ F	23 12 57 57 13 15 17	140	

Thirty insignificant or undecipherable disturbances on the following days of October: 1st, 2nd(2), 5th(2), 6th(3), 8th, 9th, 10th(2), 11th, 12th, 13th, 14th, 15th(2), 17th, 19th, 20th(2), 21st, 22nd, 26th, 27th, 29th, 30th, and 31st(2).



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.

$h=3$ m.

Alluvium.

CONSTANTS OF THE GALITZIN-WILIP

	T_1	T
N-S	12.6	12.9
E-W	11.8	11.9
Z	11.6	9.0

CONSTANTS OF THE WIECHERT INVERTED PENDULUM. $M=955$ Kg.

November 1, 1940.

	T_0	V	ϵ	$\frac{r}{T_0^2}$
N-S	4.6	177	2.6	0.076
E-W	5.0	329	2.2	0.106

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
	Nov. 1940				
613	3rd	iPZ ePNE SNE F	1 35 48 48 36 09 42	165	
614	3rd	ePNEZ SNE F	4 59 13 30 5 09	135	
615	5th	ePNE iSNE F	1 06 47 08 26 37	930	No record of Z component.
617	7th	iPZ iPE iPN iSN F	14 02 14 15 18 04 45 50	1,460	Dilatation. Microseisms.
620	10th	iPZ ePNE iSN MNE F	1 51 20 21 2 01 34 24 ca 4 20	9,160	Rumania. 45° N: 26.2° E by USCGS.
623	13th	ePNEZ SNE LNE MNE F	11 42 40 47 16 50 35ca 53 ca 12 25	3,060	
626	14th	iPZ ePNE S?NE F	10 40 36 36 46 18 11 25	4,090?	
629	16th	ePNEZ S?E LNE F	2 35 44 40 30 44 35ca 3 36	3,210?	Disturbed by microseisms.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.



No.	Date	Phase.	Greenwich Time			Dist. Km.	Remarks.
			h.	m.	s.		
	Nov. 1940						
633	17th	ePNEZ iSNE F	6	08	42 17 40 7 15	7,430	Disturbed by microseisms.
634	17th	ePNEZ SN ME F	12	05	17 08 06 11 45ca 13 05	1,620	Disturbed by microseisms.
635	17th	iPZ ePNE SN LNE F	19	49	25 26 54 51 58 27ca 20 45	3,830	Disturbed by microseisms.
636	18th	ePNE SN F	4	48	29 50 14 5 15	980	
637	18th	iPZ iPNE iSNEZ F	12	52	28 30 56 40 13 45	2,720	Dilatation. Japan.
638	19th	ePNEZ iSNE MNE F	15	07	51 12 57 23 30ca 17 17	3,520	Compression from NE(?).
642	22nd	iPZ ePE ePN SNE F	9	07	23 24 25 13 17 10 15	4,290	Compression.
644	23rd	iPZ ePNE F	4	08	36 38 45		Compression. Long distance.
649	25th	ePNEZ SNEZ F	1	22	41 23 56 40	670	Felt at Surigao.
650	25th	iPZ ePNE SNEZ F	6	43	00 00 55 7 40	455	Compression from north. Felt in northern Luzon.
653	27th	iPZ ePNE SNE iMN F	14	48	19 20 53 49 15 01 24 16 10	3,900	Compression.

No. 39.

November, 1940.



MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
654	Nov. 1940 28th	iPZ ePNE iSNE F	11 23 05 05 23 25	145	

Twenty-seven insignificant or undecipherable disturbances on the following days of November: 6th, 8th, 9th, 11th, 12th, 13th(2), 15th(2), 16th(2), 17th, 20th, 21st(2), 22nd, 23rd(2), 24th(2), 26th, 27th, 29th(3), and 30th(2).

MANILA OBSERVATORY

NOVEMBER, 1940



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

Adelaide-----	September, 1940.
Hamburg-----	January to June, 1940.
Helgoland-----	October, 1939 to June, 1940.
Ksara-----	August, 1940.
Osaka-----	April to June, 1940.
Ottawa-----	July, 1940.
Pasadena-----	September, 1940.
Berth-----	September, 1940.
Queensland-----	September, 1940.
Riverview-----	July to September, 1940.
Sydney-----	July and August, 1940.
U.S.C.G.S.-----	November, 1938.
Wellington-----	September, 1940.

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