International Seismological Centre

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND COMMERCE

WEATHER BUREAU

MANILA CENTRAL OBSERVATORY

SEISMOLOGICAL BULLETIN FOR 1932
JANUARY–JUNE

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INTRODUCTION

SEISMIC STATIONS

The following is the list of official seismic stations. Moreover, all the meteorological stations, official and coöperative, have instructions to report all perceptible earthquakes.

Name	Province	North latitude	East longitude	Elevation	Equipment
		° ′	° ′	*m.*	
Manila	Manila	14 35	120 59	2.5	Galitzin-Wilip seismographs, 3 components. Wiechert inverted pendulum, mass 1,000 kg. Two horizontal pendulums, mass 20 kg. each.
Baguio	Mountain	16 25	120 35	1,512.0	Vicentini seismograph, 3 components. Wiechert inverted pendulum, mass 200 kg.
Ambulong	Batangas	14 05	121 03	10.5	Vicentini seismograph, 3 components.
Butuan	Agusan	8 56	125 32	2.0	Wiechert inverted pendulum, mass 200 kg.
Agaña	Guam	13 24	144 38	5.0	Do.

NOTE.—The subsoil of Manila is alluvium.

The time of occurrence is that indicated by the seismographs at the Central Observatory, Manila, whenever the disturbance has been recorded by them. This fact is denoted by an asterisk(*). Otherwise the time is that noted by the meteorological observers who report them. All time indications are in Greenwich Mean Time (midnight=0^h), insular time being added in brackets for the convenience of Philippine readers.

The intensity of macroseisms is given according to the Rossi–Forel scale.

The instrumental record is that obtained from the seismographs in the Manila Observatory. It is that of the Galitzin-Wilip instruments except where noted otherwise.

ROSSI–FOREL SCALE OF EARTHQUAKE INTENSITIES

I. *Microseismic shock:* recorded by a single seismograph or by seismographs of the same model but not by several seismographs of different kinds; the shock felt by an experienced observer.

II. *Extremely feeble shock:* recorded by several seismographs of different kinds; felt by small number of persons at rest.

III. *Very feeble shock:* felt by several persons at rest; strong enough for the direction or duration to be appreciable.

IV. *Feeble shock:* felt by persons in motion; disturbances of movable objects, doors, windows; creaking of ceilings.

V. *Shock of moderate intensity:* felt generally by everyone; disturbance of furnitures, beds, etc., ringing of swinging bells.

VI. *Fairly strong shock:* general awakening of those asleep; general ringing of house bells; oscillation of chandeliers; stopping of pendulum clocks; visible agitation of trees and shrubs; some startled persons leave their dwellings.

VII. *Strong shock:* overthrow of movable objects; fall of plaster; ringing of church bells; general panic, without damage to buildings.

VIII. *Very strong shock:* fall of chimneys, cracks in walls of buildings.

IX. *Extremely strong shock:* partial or total destruction of some buildings.

X. *Shock of extreme intensity:* great disaster, buildings ruined, disturbance of the strata, fissures in the ground, rock-fall from mountains.

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SYMBOLS AND ABBREVIATIONS

P	Normal first preliminary tremors; longitudinal waves which have passed below the continental layer.
$\overline{P}$	Upper first preliminary tremors whose path lies wholly in the continental layer.
P′	Longitudinal waves that have traversed the earth's core.
PRn	Longitudinal waves reflected "n" times at the earth's surface.
PcP	Longitudinal waves reflected from the outer surface of the earth's core.
S	Normal second preliminary tremors; transverse waves that have passed below the continental layer.
$\overline{S}$	Second preliminary tremors whose path lies entirely in the continental layer.
PS	Waves transformed from longitudinal to transverse oscillations or vice versa through one reflection at the earth's crust.
SRn	Normal transverse waves reflected "n" times at the earth's surface.
ScS	Normal transverse waves reflected from the outer surface of the earth's core.
$\overline{ScPcP}$	Waves which start with transverse vibrations but on refraction into the core are changed to longitudinal, or starting as longitudinal are refracted out as transverse.
L	Long waves of irregular form at the beginning of the surface or main phase.
M	Shorter and more regular waves of large amplitude in the surface group which travel more slowly than the L waves.
Mn	Individual waves of relatively large amplitude in the surface phase and usually in the M group.
F	Finis. End of discernible movement.
i	Impetus. Impulsive and sharply defined beginning of a phase.
e	Emersio. Poorly defined emergency of a phase.
m	Maximum wave in any phase.
A	Amplitude of earth motion measured in microns from position of equilibrium. One micron equals .001 mm.
μ	Micron.
A_E	E–W component of A.
A_N	N–S component of A.
A_Z	Vertical component of A.
T	Period of waves.
O	Time of earthquake at the epicenter.
Δ	Arcual distance from station to epicenter.
T_O	Free or undamped period of the seismograph.
V	Static magnification.
ϵ	Ratio of successive damped amplitudes.
r	Friction constant.
J. S. A.	Jesuit Seismological Association. Central Office at St. Louis University, St. Louis, Missouri, U. S. A.
U. S. C. G. S.	United States Coast and Geodetic Survey, Washington, D. C., U. S. A.

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CONSTANTS OF THE WIECHERT INVERTED PENDULUM

Date	N-S component.				E-W component			
	T_o	V	ϵ	$\frac{r}{T_o^2}$	T_o	V	ϵ	$\frac{r}{T_o^2}$
1932								
January	4.4	189	2.4	0.026	4.6	202	2.7	0.029
February	4.3	196	2.4	0.029	4.7	202	2.6	0.028
March	4.4	190	2.3	0.029	4.6	197	2.5	0.033
April	4.4	201	2.3	0.029	4.6	200	2.6	0.026
May	4.4	201	2.3	0.026	4.6	200	2.3	0.026
June	4.4	193	2.4	0.023	4.7	200	2.6	0.025

CONSTANTS OF THE GALITZIN-WILIP INSTRUMENTS

	N-S	E-W	Z
PERMANENT CONSTANTS			
Galvanometer periods	12.3s	11.8s	11.0s
Galvanometers to drums	100.5 cm.	100.5 cm.	100.5 cm.
Telescope to seismographs	500 cm.	492 cm.	450 cm.
Reduced pendulum lengths	11.52 cm.	11.40 cm.	14.82 cm.
TEMPORARY CONSTANTS			
Seismograph period, T_1 ..... April	12.57	11.83	9.0
Coefficient of damping ..... April	.017	—.075	1.25
Transmission factor, k ..... April	97	80	200

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SEISMOLOGICAL BULLETIN FOR 1932

JANUARY, 1932

MACROSEISMIC RECORD

——— [1, 5h 53m] **Butuan, NE Mindanao.** Light earthquake of five seconds duration. December 31 by Greenwich Time.

1, 12h 10m [1, 20h 10m] **E Mindanao.** Slight earthquake felt at Hinatuan on the coast and at Veruela and Talacogon in the Agusan Valley.

4, 5h 30m [4, 13h 30m] **E Mindanao.** Earthquake felt with intensity IV–V in Butuan. Duration fifteen seconds and direction apparently from the east. Reported also from Cantilan and Hinatuan on the coast and from Veruela and Talacogon in the Agusan Valley. Felt slightly in these places.

5, 11h 27m 44s* [5, 21h 27m 44s] **Guam.** Slight earthquake felt at Sumay.

6, 10h 55m [6, 18h 55m] **Hinatuan, E Mindanao.** Slight earthquake.

7, 17h 30m [8, 1h 30m] **Pasuquin, NW Luzon.** Light earthquake.

8, 19h 45m [9, 3h 45m] **Cape Bojeador, NW Luzon.** Feeble earthquake.

13, 23h 30m [14, 7h 30m] **Calbayog, Samar.** Earthquake of intensity III and of short duration.

16, 4h 19m 03s* [16, 12h 19m 03s] **Manila.** Light earthquake of intensity II and about six seconds duration.

17, 17h 17m 19s* [18, 1h 17m 19s] **Guiuan, Samar.** Earthquake of intensity V. Epicenter in the Philippine Deep at 10° 30′ N; 125° 26′ E.

18, 20h 27m 33s* [19, 4h 27m 33s] **N Luzon.** Earthquake felt at Basco, Aparri and Cape Bojeador. Strong and of thirty-four seconds duration at Aparri. Epicenter probably at 19° 45′ N; 124° 30′ E.

21, 13h 30m [21, 21h 30m] **Masbate.** Earthquake of intensity III.

22, 5h 15m [22, 13h 15m] **NW Luzon.** Light earthquake felt at Cape Bojeador and Laoag.

23, 8h 00m [23, 16h 00m] **Cape Bojeador, NW Luzon.** Feeble earthquake.

25, 13h 55m [25, 21h 55m] **Masbate.** Earthquake of intensity II.

30, ——— **Cagutongan, Pilar, Abra.** Light earthquake, about midnight.

31, 23h 22m 26s* [February 1, 7h 22m 26s] **Aparri, N Luzon.** Earthquake of intensity IV and duration twenty-five seconds. Motion apparently E–W.

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INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
1	1	PNE	8 41 47	530	Disturbed by microseisms. Z record light-struck.
		SNE	42 49		
		F	59		
2	3	PNEZ	8 00 12	2,310	Disturbed by microseisms.
		SNE	03 57		
		MNE	08 ca		
		F	30		
4	5	PNEZ	0 38 48	1,905?	Disturbed by microseisms. N. E. I. earthquake.
		SNE?	42 01		
		LNE?	43 39		
		MNE	45 24		
		F	1 16		
6	5	PNEZ	11 27 44	2,578	Epicenter, 13° N and 144° E by Manila, Kobe, Guam. Felt in Guam.
		iSNE	31 47		
		MNE	36 ca		
		F	46		
7	6	PNEZ	5 22 27	760	
		SNE	23 50		
		F	33		
8	6	PNEZ	14 31 18	7,160	Near Fiji Islands.
		SNE	40 00		
		F	15 06		
9	6	PNEZ	17 02 40	3,165	
		SNE	07 23		
		LNE	10 30		
		F	43		
11	9	PNEZ	10 23 40	3,925	11° S and 170° E by J. S. A. New Hebrides according to Strasbourg. Baguio, dilatation. S–P=4,010 km. Horizontal data from the Wiechert.
		SNE	34 11		
		LN	38 45		
		F	11 35		
12	10	PNEZ	9 53 45	215	S and F from the Wiechert. Baguio, 150 km.
		SNE	54 13		
		F	58		
13	11	PNEZ	18 05 36	440	S from the Wiechert.
		SNE	06 30		
		F	12		
19	16	PNEZ	4 13 12	140	
		SNE	13 30		
		F	15		
20	16	PNEZ	4 19 03	110	Felt in Manila by a few persons. Compression.
		SNE	19 17		
		F	28		
22	17	PNEZ	7 54 04	5,355?	Tentative epicenter, 10° S and 160° E by Apia.
		SNE?	8 01 00		
		F	52		
23	17	PNE	17 17 19	740	10° 30′ N and 126° 25′ E by Manila and Butuan. Felt at Guiuan, Samar. Data from the Wiechert.
		SNE	18 41		
		F	49		
24	18	PNE	20 27 33	680	Compression. Felt at Basco, Batanes Islands, Aparri and Cape Bojeador, N. Luzon. Epicenter, 19° 45′ N and 124° 30′ E.
		SNE	28 49		
		F	50		
26	20	PNEZ	15 12 17	2,545	Disturbed by microseisms.
		SN	16 18		
		MN	20 48		
		F	33		
29	24	ePNEZ	3 54 04	6,000	Dilatation. 17° S and 169° E according to Wellington.
		SNE	4 01 37		
		LNE	10 30		
		F	5 32		
31	25	PNEZ	2 02 33	6,910	Probable epicenter, 15° S and 164° E according to Wellington.
		SNE	11 00		
		LNE?	16 29		
		ME	20 49		
		F	3 12		
32	25	PZ	4 55 32	195	
		SNZ	55 57		
		F	58		
34	26	PNE	5 04 03	5,370?	
		SNE?	11 00		
		F	37		
35	27	PNEZ	12 23 04	220	
		SNEZ	23 33		
		F	29		

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
36	29	PNEZ	13 48 44	4,490	O=13:40:00. Compression. Horizontal data from the Wiechert. Epicenter, 7° 30′ S and 155° E by Manila, Phu Lien, Zikawei, Batavia, Hong Kong, Riverview, Apia, Amboina, Wellington, Adelaide.
		PR1N	50 14		
		SNE	54 50		
		LNE	14 00 30		
		F	15 43		
37	29	PNE	15 46 43	4,420	Same epicenter as No. 36 by Manila, Hong Kong, Batavia, Amboina, Medan. Data from the Wiechert.
		SNE	52 44		
		F	16 53		
38	29	PNEZ	19 07 27	4,200?	
		SE?	13 15		
		F	35		
40	30	PNEZ	2 25 30	330	Baguio, S-P=200 km.
		SNEZ	26 13		
		F	35		
41	30	PNEZ	3 12 26	4,560	Epicenter probably related to that of No. 36. Other phases difficult of determination because of overlapping with preceding quake.
		SNEZ	18 37		
		F	5 20		
42	30	PNZ	7 19 11	5,505?	Epicenter probably related to that of No. 36.
		SNE?	26 16		
		MNE	38 30		
		F	8 34		
43	30	PNZ	12 48 22	2,655	
		SNE	52 31		
		F	13 12		
44	30	PNEZ	21 26 52	3,560	
		SNE	32 00		
		M	22 11		
45	31	PNEZ	1 25 02	4,390	Do.
		SNE	31 02		
		LNE	36 39		
		MN	39 32		
		F	2 23		
46	31	PNEZ	4 42 33	4,400	Do.
		SNE	48 34		
		LNE	54 23		
		ME	57 58		
		F	5 44		
47	31	PNEZ	16 08 43	4,490	Do.
		SNE	14 49		
		LE?	20 18		
		ME	24 11		
		F	17 32		
48	31	PNEZ	21 42 15	2,745?	Atjeh, Sumatra, according to Batavia.
		SNE?	46 30		
		F	22 12		
49	31	ePNEZ	23 22 26	400	Felt in Aparri, northern Luzon.
		SNE	23 16		
		F	38		

In addition to the above there were fifteen insignificant or undecipherable disturbances on the following days of January: 4th, 5th, 8th, 12th(2), 13th(3), 16th, 20th(3), 24th, 25th, and 29th.

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FEBRUARY, 1932

MACROSEISMIC RECORD

5, 21^h 10^m [6, 5^h 10^m] **Mindoro.** Strong earthquake felt at the Halcon Rubber Station, Baco.

8, 11^h 55^m [8, 19^h 55^m] **Hinatuan, E Mindanao.** Light earthquake.

13, 9^h 10^m [13, 17^h 10^m] **Butuan, NE Mindanao.** Light oscillatory earthquake of 25 seconds duration.

15, 12^h 15^m [15, 20^h 15^m] **Davao, SE Mindanao.** Earthquake of intensity IV.

15, 18^h 23^m 34^s* [16, 2^h 23^m 34^s] **Ambulong, S Luzon.** Feeble earthquake.

16, 14^h 30^m [16, 22^h 30^m] **Masbate.** Earthquake of intensity III.

20, 11^h 25^m [20, 19^h 25^m] **Talacogon, E Mindanao.** Slight earthquake.

21, 2^h 35^m [21, 12^h 35^m] **Guam.** Slight earthquake felt at Sumay.

21, 7^h 33^m 17^s* [21, 15^h 33^m 17^s] **N Luzon.** Moderate earthquake felt at Aparri for ten seconds. Felt lightly at Cape Bojeador and Pasuquin.

22, 14^h 03^m 24^s* [22, 22^h 03^m 24^s] **SE Luzon.** Earthquake of intensity IV felt at Naga. Preceded by a noise. Felt also at Tinambac.

23, 12^h 45^m [23, 20^h 45^m] **E Mindanao.** Light earthquake felt at Hinatuan and Talacogon.

24, 4^h 40^m [24, 12^h 40^m] **Cape Bojeador, NW Luzon.** Feeble shock.

24, 18^h 17^m [25, 2^h 17^m] **Basco, Batan Islands.** Earthquake of intensity II and short duration.

27, 11^h 30^m [27, 19^h 30^m] **Lais, SE Mindanao.** Light shock.

28, 3^h 17^m [28, 11^h 17^m] **Basco, Batan Islands.** Earthquake of intensity IV and four seconds duration.

29, 7^h 30^m [29, 15^h 30^m] **E Mindanao.** Slight earthquake of 25 seconds duration felt at Butuan. Direction apparently NNE–SSW. Felt also at Hinatuan.

29, 11^h 45^m [29, 19^h 45^m] **Mambusao, Capiz, Panay.** Slight earthquake.

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INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
52	1	PNEZ	14 24 53	540	
		SNE	25 56	----------	
		F	37	----------	
56	3	PNEZ	6 35 31	15,855	19.2° N and 76° W by J. S. A. 19.3° N and 76° W by U. S. C. G. S.
		iNE	38 28	----------	20.5° N and 74.5° W by Strasbourg.
		iNEZ	39 30	----------	
		LNE	7 31 ca	----------	
57	3	PNE	7 38 57	1,550?	No. 56 still recording. Northwest of Bonin Islands according to Kobe.
		SNE?	41 38	----------	
		F	8 40	----------	
58	3	PEZ	14 39 07	4,690	N–S cylinder stopped at 12:13.
		SE	45 25	----------	
		F	15 10	----------	
59	4	PNEZ	7 22 20	4,645	
		iSNE	28 35	----------	
		LNE	34 29	----------	
		F	8 20	----------	
61	5	PNEZ	13 49 00	3,080	
		SNE	53 37	----------	
		LNE	56 30	----------	
		F	14 44	----------	
63	6	PNZ	17 50 30	4,820	
		SNE	56 56	----------	
		LNE	18 03 22	----------	
		F	16	----------	
65	8	PNZ	19 41 11	1,850	E–W cylinder stopped at 7:04.
		SN	44 20	----------	
		MN	48 00	----------	
		F	20 12	----------	
66	8	PNZ	21 21 54	820	
		SN	23 23	----------	
		mN	26 32	----------	
		F	33	----------	
67	9	PNE	17 07 46	4,235	
		SE	13 36	----------	
		F	46	----------	
68	9	PNEZ	20 34 12	2,545	
		SNE	38 13	----------	
		F	54	----------	
71	12	PNEZ	1 08 31	7,390	
		SNE	17 26	----------	
		LNE	27 ca	----------	
		MNE	34 43	----------	
72	12	PNEZ	2 07 13	1,410	No. 71 still recording.
		SNE	09 39	----------	
		LNE	10 51	----------	
		F	38	----------	
73	13	PNEZ	19 17 42	2,655	Recorded at Guam, 180 km. ±
		SNE	21 51	----------	
		LNE	24 ca	----------	
		MNE	26 30	----------	
		F	20 30	----------	
77	14	PNEZ	12 00 45	5,880	In region of New Hebrides by Riverview, Wellington, Manila.
		SNE	08 11	----------	
		LNE	17 ca	----------	
		MNE	21 ca	----------	
		F	54	----------	
78	14	PNEZ	23 24 16	6,735	Dilatation.
		SNE	32 33	----------	
		PSNE	32 49	----------	
		SR1E	37 10	----------	
		LNE	43 20	----------	
		ME	48 13	----------	
		F	24 37	----------	
79	15	PNEZ	0 46 20	2,635	
		SNE	50 27	----------	
		F	1 19	----------	
81	15	$\overline{P}$NZ	18 23 34	145	Compression. Felt very slightly at Ambulong.
		$\overline{P}$E	23 36	----------	
		$\overline{S}$NE	23 52	----------	
		F	31	----------	

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
82	16	iPEZ	13 59 43	7,270	Dilatation. 13° S; 180° W by J. S. A. 14° S; 179° W by U. S. C. G. S. 14° S; 176° W by Apia, tentatively.
		ePN	59 43		
		PR1EZ	14 02 30		
		PR2N	03 50		
		SNE	08 31		
		LNE	20 16		
		F	15 56		
83	16	$\overline{P}$NEZ	19 42 25	195	
		$\overline{S}$NE	42 50		
		F	45		
84	17	$\overline{P}$NEZ	15 51 22	145	
		$\overline{S}$NE	51 40		
		F	57		
85	19	ePNEZ	13 30 03	4,120	Southeast of Hatidyo Island, according to Kobe.
		SNE	35 47		
		F	50		
86	21	PNEZ	1 38 41	2,810	Felt in Guam.
		SNE	43 00		
		LNE	45 30		
		ME	48 36		
		F	2 22		
87	21	PNEZ	4 23 13	265	
		$\overline{S}$NEZ	23 50		
		F	30		
88	21	PNEZ	7 33 17	495	Felt in northern Luzon.
		SNE	34 15		
		F	44		
92	21	$\overline{P}$NE	20 59 40	160	S in the minute gap.
		$\overline{S}$NE	21 00 00		
		F	05		
95	22	PNEZ	0 18 40	1,280	
		SNE	20 53		
		LNE	22 06		
		MNE	23 46		
96	22	PNE	0 38 24	1,625	No. 95 still recording
		SNE	41 13		
		LNE	42 37		
		MNE	44 12		
		F	1 25		
98	22	$\overline{P}$NEZ	14 03 24	280	Felt at Naga, southeast Luzon.
		$\overline{S}$NE	04 04		
		F	06		
99	23	PNEZ	0 33 40		55.8° S; 29.7° W by J. S. A.
		F	2 50		
100	23	PNEZ	20 19 56	5,100	Compression. Solomon Islands by Riverview, Manila, Pasadena.
		SNE	26 38		
		LNE	33 30		
		F	21 45		
104	26	PNEZ	11 33 27		
		iNE	35 21		
		F	12 04		
105	27	$\overline{P}$NEZ	10 05 27	110	
		$\overline{S}$NE	05 41		
		F	08		

In addition to the above there were twenty two insignificant or undecipherable disturbances on the following days of February; 1st(3), 2nd(2), 4th, 6th, 7th, 10th, 11th, 13th, 14th(2), 15th, 21st(5), 22nd, 24th, 25th, and 26th.

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MARCH, 1932

MACROSEISMIC RECORD

2, 2h 53m [2, 10h 53m] **Sorsogon, SE Luzon.** Earthquake of three seconds duration.

3, 22h 50m 48s* [4, 6h 50m 48s] **Samar and Leyte.** Earthquake felt with intensity IV at Catbalogan and Tacloban, and with intensity III at Calbayog.

4, 4h 45m [4, 12h 45m] **Hinatuan, E Mindanao.** Slight earthquake.

7, 1h 06m 40s* [7, 9h 06m 40s] **Ambulong, S Luzon.** Slight shock.

8, 6h 46m [8, 14h 46m] **Butuan, NE Mindanao.** Slight earthquake of five seconds duration.

9, 6h 15m [9, 14h 15m] **Cape Bojeador, NW Luzon.** Earthquake of intensity II and two seconds duration. Light aftershock at 16h 54m standard time.

9, 19h 58m [10, 3h 58m] **Romblon.** Strong earthquake.

10, 0h 10m [10, 8h 10m] **Masbate.** Earthquake of intensity II. A second shock 6 hours later.

10, 15h 50m [10, 23h 50m] **Cape Bojeador, NW Luzon.** Very light earthquake of two seconds duration.

12, 13h 21m 59s* [12, 21h 21m 59s] **NW Luzon.** Light earthquake felt at Cape Bojeador and Pasuquin. Noise heard at Bojeador.

14, 13h 02m [14, 21h 02m] **Vigan, NW Luzon.** Light earthquake.

15, 20h 20m [16, 4h 20m] **Masbate.** Earthquake of intensity II. Another on the 19th at 14h 10m standard time.

26, 9h 54m [26, 17h 54m] **Ambulong, S Luzon.** Feeble earthquake.

28, 14h 00m [28, 22h 00m] **Glan, SE Mindanao.** Feeble earthquake.

30, 21h 13m [31, 5h 13m] **Butuan, NE Mindanao.** Light oscillatory earthquake.

31, ——— **Dumaguete, SE Negros.** Earthquake of intensity III. Time not reported.

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INSTRUMENTAL RECORD

No.	Date	Phase	Time			△	Remarks
			h.	*m.*	*s.*	*Km.*	
107	3	iPNEZ	22	50	47	455	Dilatation. Felt at Calbayog and Catbalogan in Samar and at Tacloban in Leyte.
		SEZ		51	42		
		SN		51	40		
		F	23	16			
108	4	PNEZ	23	28	33	5,050	
		SNE		35	12		
		LNE?		42	31		
		MNE		45	56		
	5	F	0	09			
109	6	PNE	0	29	01	6,540?	
		SNE?		37	06		
		F	1	00			
110	6	PNEZ	21	49	40	2,470	
		SNE		53	35		
		LNE?		55	40		
		iMNE		57	47		
		F	22	42			
111	7	$\overline{P}$NE	1	06	40	190	Felt slightly at Ambulong, Batangas. Z record defective.
		$\overline{S}$NE		07	04		
		F		31			
112	8	PNEZ	3	18	35	5,270	L and M not apparent.
		SNE		25	27		
		F	4	30			
113	8	PNEZ	4	39	43	6,670	Compression. Probable epicenter, 51° N; 176° W according to Pasadena.
		SNE		47	55		
		LNE		56	40		
		ME	5	01	ca		
		F		38			
114	8	ePNE	18	12	03	7,890	In Tonga Deep by Manila, Riverview, Melbourne. Felt in Fiji Islands according to Wellington.
		iPZ		12	03		
		SNE		21	26		
		PSNE		21	52		
		LNE		34	51		
		MNE		40	28		
		F	19	40			
116	12	PNEZ	6	36	11	530	Dilatation.
		SNE		37	13		
		F		42			
117	12	PNEZ	8	55	59	1,465	
		SN		58	31		
		LNE		59	37		
		F	9	17			
118	12	$\overline{P}$NEZ	12	31	17	135	
		$\overline{S}$NE		31	34		
		F		34			
119	12	PNEZ	13	21	59	640	Felt at Pasuquin and Cape Bojeador in northwestern Luzon.
		SNE		23	11		
		mNE		25	24		
		F	14	02			
121	14	PNEZ	10	06	36	220	
		$\overline{S}$NEZ		07	05		
		F		24			
123	14	P'NEZ	23	02	46	17,090	9.7° N; 72° W by J. S. A. Felt at Cucuta, Columbia. Continuous oscillations with no definite phases.
	15	F	1	02			
124	15	iPZ	4	37	24	2,810	Dilatation. O=4:31:45. Felt in Guam. 215 km. Epicenter, approximately 12 .6° N; 146 .3° E as on July 17th, 1931 and November 3rd, 1931. Southeast slope of Nero Deep.
		ePNE		37	24		
		SN		41	43		
		S_{R1}NE		42	31		
		LNE		44	39		
		F	6	50			
126	18	PNEZ?	5	28	34	5,170?	Disturbed by microseisms. 20° S; 52° E according to Wurttemburg.
		SNE		35	19		
		LNE		42	30ca		
		F	6	25			
127	19	PNEZ	11	05	11	3,120	Compression. Felt in Guam. Epicenter, approximately 16.5° N; 149° E by Manila, Hong Kong, Batavia, Riverview, Zikawei.
		P_{R2}N		06	06		
		SNE		09	51		
		S_{R1}N		11	21		
		S_{R2}N		11	45		
		LNE		13	00		
		F	13	18			

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time			Δ	Remarks
			h.	*m.*	*s.*	*Km.*	
128	19	Pz	23	17	00	3,650?	Disturbed by microseisms.
		PNE		17	03	----------	
		SNE?		22	17	----------	
		MNE		25	00	----------	
	20	F	0	40		----------	
130	22	PNEZ	14	04	16	3,745	
		SNE		09	3	----------	
		F		41	9	----------	
132	24	PNEZ	16	15	45	3,495?	
		SNE?		20	49	----------	
		F		50		----------	
136	26	PNEZ	0	10	24	8,270	61° N; 151° W by J. S. A. 63° N; 155° W by U. S. C. G. S. Preceded at 0:06:38 by a slight disturbance from another earthquake.
		SNEZ		20	06	----------	
		LNE		34	40	----------	
		MNE		40	ca	----------	
		F	3	02		----------	
137	26	PNE	9	56	59	2,390	Data from the Wiechert. In the Banda Sea, Netherlands East Indies.
		SNE	10	00	49	----------	
		LNE		02	50	----------	
		MNE		05	00	----------	
		F	12	26		----------	
138	27	PNEZ?	8	51	31	3,020?	Disturbed by microseisms.
		SNE		56	04	----------	
		LN		59	07	----------	
		F	9	34		----------	
139	27	PNEZ	9	59	01	2,165	Do.
		SNE	10	02	35	----------	
		F		38		----------	
140	27	PNEZ	13	34	31	970	
		SNE		36	04	----------	
		LE		37	19	----------	
		F		53		----------	
141	28	PEZ	0	42	04	4,590	Compression. Netherlands East Indies.
		PN		42	08	----------	
		SNE		48	16	----------	
		LE		57	40	----------	
		F	2	18		----------	
144	30	PNEZ	15	09	05	4,390	Compression.
		SNE		15	05	----------	
		LE		20	24	----------	
		F		52		----------	
147	31	PNEZ?	16	12	27	1,480?	Disturbed by microseisms.
		SNE		15	00	----------	
		F		32		----------	

In addition to the above there were sixteen insignificant or undecipherable disturbances on the following days of March; 2nd, 10th, 13th, 14th, 16th, 20th, 23rd, 25th(2), 26th, 29th, 30th(2), and 31st(2).

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APRIL, 1932

MACROSEISMIC RECORD

6, 14h 12m [6, 22h 12m] **Masbate.** Earthquake of intensity II. Similar shocks at 14h 07m and 20h 08m on the 7th, and at 16h 48m on the 8th.

9, 22h 19m 50s* [10, 6h 19m 50s] **Benguet, Luzon.** Earthquake of intensity III at Bokod. Felt slightly at Atok. Repetition of intensity III at Bokod at 0h 30m on the 10th.

10, 3h 55m [10, 11h 55m] **Ganassi, Lanao, Mindanao.** Light earthquake of eleven seconds duration.

10, 8h 06m 50s* [10, 16h 06m 50s] **Bokod, N Luzon.** Earthquake of intensiy III. Repetitions at 8h 20m and at 5h 00m on the 11th.

10, 11h 15m [10, 21h 15m] **Guam.** Earthquake recorded and felt.

12, 12h 25m [12, 20h 25m] **Cape Bojeador, NW Luzon.** Earthquake of intensity I and three seconds duration.

13, 15h 10m [13, 23h 10m] **Bato, Camarines Sur, SE Luzon.** Slight earthquake.

15, 3h 23m 08s* [5, 11h 23m 08s] **SE Luzon.** Light earthquake of short duration felt at Naga and Bacacay. A slight shock felt at Pandan, Catanduanes at about the same time may have been due to another earthquake.

17, 1h 03m 42s* [17, 9h 03m 42s] **SE Mindanao.** Moderate earthquake felt in the Province of Davao. Reported from Malita, Lais, Cateel, and Compostela.

25, 21h 02m 50s* [26, 5h 02m 50s] **NW Luzon.** Earthquake felt with intensity V in Laoag. Forty-five seconds duration. Also felt in Sinait and Cape Bojeador.

29, 17h 32m 56s* [30, 1h 32m 56s] **E Mindanao.** Earthquake felt throughout Eastern Mindanao. Very strong at Hinatuan and Veruela. Felt as far west as Mambajao. The center was in the Philippine Deep, probably at 8° 20′ N and 126° 53′ E as on June 13, 1929.

29, 21h 09m 01s* [30, 5h 09m 01s] **N Luzon.** Earthquake felt at Aparri, Cape Bojeador and Pasuquin. At Cape Bojeador some walls, which had been cracked in previous earthquakes, were shaken down. Epicenter probably north of the northwest end of Luzon.

International Seismological Centre

INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
150	1	PNEZ	8 35 20	2,020	
		SEZ	38 43		
151	1	PNEZ?	8 56 22	2,545?	No. 150 still recording.
		SNE	9 00 23		
152	1	PNE?	9 20 23	2,535	No. 151 still recording.
		SNE	24 23		
		F	49		
156	3	PNEZ	20 50 34	8,430	Compression. 33° S: 177° W according to Strasbourg.
		SNE	21 00 24		
		PSNE	01 00		
		LNE	15 30ca		
		F	22 04		
158	4	iPNEZ	19 21 06	2,000?	Dilatation from NE.
		SNE?	24 27?		
		F	21 00		
159	5	PNEZ	5 09 52	2,920	
		SNE	14 19		
		F	37		
160	6	PNEZ	0 49 37	1,000	
		SNE	51 23		
		F	1 07		
161	6	ePNEZ	1 47 07	200	Disturbed by microseisms.
		$\overline{S}$EZ	47 33		
		F	50		
162	6	PNEZ	8 22 37	245	Do.
		$\overline{S}$NE	23 11		
		F	28		
163	6	PNEZ	9 15 25	2,165	Dilatation. S in minute gap. 31° N: 116° E by Zikawei, Hong Kong, Manila. Felt in Nanking and Hankow, China, according to Associated Press.
		SNE	19 00		
		LNE	20 49		
		MNE	22 42		
		F	10 16		
165	7	PNEZ	21 37 14	1,630	
		SNE	40 04		
		F	22 02		
166	8	PNEZ	12 03 36	3,535?	
		SNE?	08 43		
		F	13 04		
167	9	$\overline{P}$EZ	14 31 42	160	
		$\overline{S}$NEZ	32 02		
		F	37		
171	11	PNEZ	1 04 00	220	Compression.
		$\overline{S}$NEZ	04 29		
		F	11		
172	12	PNEZ	12 31 02	260	Probably east of Luzon by Manila and Baguio.
		$\overline{S}$NEZ	31 39		
		F	40		
173	12	iPz	23 59 40	3,970	Compression. 5° S: 152° E by Manila, Amboina, Wellington, Christchurch, Batavia. 4° S: 162° E by Strasbourg.
		ePNE	59 41		
	13	SNE	0 05 19		
		LN	0 10 ca		
		F	1 25		
174	13	iPz	4 03 40	2,265	Dilatation. Felt in Amboina according to Batavia.
		PNE	03 40		
		SNE	07 22		
		LN	09 19		
		F	5 06		
175	14	PNEZ	11 36 36	1,800	
		SNE	39 40		
		LNE	41 20		
		MNE	42 44		
		F	12 06		
176	14	iPz	17 03 20	2,300	Compression. 2° S: 134° E by Manila and Pelew.
		ePNE	03 20		
		SNEZ	07 04		
		LNE	09 02		
		MNE	11 07		
		F	45		
177	15	ePNEZ	3 23 08	230	Compression. Felt slightly at Naga, SE Luzon.
		i$\overline{S}$NEZ	23 39		
		F	31		
178	15	ePNEZ	4 31 24	235	
		i$\overline{S}$NEZ	31 56		
		F	38		

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
180	17	PNEZ	1 03 42	1,120	Dilatation. Felt in the Province of Davao, Mindanao.
		SNEZ	05 39		
		LNE	06 47		
		ME	07 48		
		F	46		
181	18	PNEZ	4 54 42	2,365	Compression from SE. Felt in Amboina according to Batavia. Approximately 4° 30′ S: 130° E by Batavia, Manila, Amboina.
		SNEZ	58 31		
		F	5 45		
182	18	PNEZ	11 32 54	6,165	Frontier of Persia and Beluchistan (?) according to Strasbourg.
		SNE	40 37		
		LN	50 00		
		MNE	54 30		
		F	12 27		
183	19	P̄EZ	15 28 20	110	Dilatation. N-S component not recording, 8:15 to 24:00
		S̄EZ	28 34		
		F	34		
184	21	PNEZ	13 58 08	440	
		SNEZ	59 02		
		F	14 06		
185	22	PNEZ	5 03 40	3,320	West Java according to Batavia.
		SNE	08 33		
		LNE?	11 00		
		F	6 10		
186	22	PNEZ	7 26 31	215	
		S̄NE	26 59		
		F	30		
188	23	eP̄EZ	4 22 24	5	
		iS̄NE	22 27		
		F	24		
192	25	ePNEZ	21 02 50	400	Felt in Northern Luzon.
		iSNE	03 41		
		F	11		
193	26	PNEZ	8 15 04	10,555	25° S: 70° W according to Florissant.
		SNE	26 23		
		F	9 07		
194	26	P̄NEZ	10 59 18	90	
		S̄NE	59 30		
		F	11 01		
196	26	PNE	12 45 07	5,455	Disturbed by microseisms.
		SNE	52 09		
		F	13 02		
197	26	PNE	13 43 19	1,300	Do.
		SNE	45 34		
		F	14 07		
200	27	PNE	14 37 41	970	Do.
		SNE	39 24		
		F	50		
203	27	PNEZ	17 24 17	1,925	Do.
		SNE	27 33		
		F	39		
217	29	PNEZ	17 32 56	950	Compression at Manila and Butuan. Felt in eastern Mindanao. Epicenter in Philippine Deep, probably at 8° 20′ N: 126° 53′ E. As on June 13th, 1929.
		SNE	34 38		
		F	19 56		
218	29	PNEZ	21 09 01	470	Felt in Northern Luzon. Dilatation.
		SNE	09 57		
		F	27		

In addition to the above there were thirty three insignificant or undecipherable disturbances on the following days of April; 1st(3), 4th, 6th, 9th(2), 10th, 16th, 22nd, 25th(3), 26th, 27th(4), 28th(11), 29th(2), and 30th(2).

International Seismological Centre

MAY, 1932

MACROSEISMIC RECORD

11, 6h 00m 22s* [11, 14h 00m 22s] **Ambulong, S Luzon.** Feeble earthquake felt at Ambulong.

11, 10h 04m [11, 18h 04m] **Talacogon, Agusan, Mindanao.** Slight earthquake felt. Repetition at 5h 36m on 12th.

11, 14h 00m [11, 22h 00m] **Cateel, Davao, Mindanao.** Light earthquake.

14, 12h 51m [14, 20h 51m] **Baguio, N Luzon.** Earthquake felt with intensity II.

14, 13h 14m 41s* [14, 21h 14m 41s] **Mindanao.** Although felt in Southern and Eastern Mindanao this is not considered as a Philippine earthquake. Its center was in the Netherlands, East Indies. It was destructive in Ternate and Northeastern Celebes. Felt over all of Celebes and in the Lesser Sunda Islands.

15, 12h 30m [15, 20h 30m] **Cotabato, Mindanao.** Earthquake of intensity II.

16, 5h 02m [16, 13h 02m] **Vigan, Ilocos Sur, Luzon.** Earthquake of intensity III and four seconds duration.

16, 20h 00m [17, 4h 00m] **Pandan, Catanduanes Island.** Slight earthquake felt.

17, 19h 13m 12s* [18, 3h 13m 12s] **SE Luzon.** Earthquake of short duration and intensity III felt at Daet and Naga.

19, 3h 45m [19, 11h 45m] **Masbate.** Earthquake of intensity I.

19, 10h 45m [19, 18h 45m] **Cape Bojeador, NW Luzon.** Earthquake of five seconds duration and intensity II.

23, 20h 14m [24, 4h 14m] **Talacogon, E Mindanao.** Slight earthquake.

24, 11h 14m 24s* [24, 19h 14m 24s] **Calbayog, Samar.** Earthquake of short duration and intensity II.

27, 1h 05m [27, 9h 05m] **Mindoro.** Slight earthquake at Halcon Rubber Station, Baco.

27, 11h 00m [27, 19h 00m] **Davao, SE Mindanao.** Light earthquake at Camp Mactan, Penal Colony.

27, 12h 46m 17s* [27, 20h 46m 17s] **NE Mindanao.** Moderately strong earthquake felt in the Province of Surigao, Agusan and Northern Davao. The center seems to have been in the Pacific near Cantilan.

27, 18h 00m [28, 2h 00m] **Veruela, E Mindanao.** Slight earthquake at Veruela in the Agusan valley.

27, 20h 33m [28, 4h 33m] **Talacogon, E Mindanao.** Slight earthquake.

28, 6h 46m [28, 14h 46m] **Masbate.** Earthquake of intensity II.

INSTRUMENTAL RECORD

No.	Date	Phase	Time			△	Remarks
			h.	*m.*	*s.*	*Km.*	
225	1	ePNEZ?	15	53	27	2,020?	No. 224 still recording.
		SNE		56	50	----------	
		F	16	18		----------	
226	2	$\overline{P}$NEZ	8	30	21	180	
		$\overline{S}$NE		30	44	----------	
		F		34		----------	
227	2	PNEZ	23	33	39	2,480	In the region of 30° N: 135° E by Osaka, Zikawei, Hong Kong, Manila.
		SNE		37	34	----------	
		LN?		40	37	----------	
		MNE		43	ca	----------	
	3	F	0	21		----------	
228	4	iPNEZ	5	08	26	1,675	Dilatation from the SE. Boeol, N. Celebes, according to Batavia.
		SNE		11	19	----------	
		F		44		----------	

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
229	5	iPEZ	4 15 46	2,340	Dilatation. In region of 30° N: 136° E by Osaka, Zikawei, Hong Kong, Manila.
		ePN	15 46	----------	
		SNEZ	19 33	----------	
		LNEZ	21 36	----------	
		F	53	----------	
230	5	PNE	8 35 56	7,930	Felt at Napier, Hastings, New Zealand according to Associated Press. 39° 30′ S: 177° 30′ E by Wellington.
		SNE	45 21	----------	
		LNE	59 ca	----------	
		MNE	9 04 ca	----------	
		F	27	----------	
231	6	iPZ	5 38 35	1,735	N. Celebes according to Batavia.
		ePNE	38 35	----------	
		SNEZ	41 34	----------	
		LNEZ	43 13	----------	
		F	6 08	----------	
232	9	iPZ	0 08 41	2,430	Dilatation. Disturbed by microseisms. Guam, △=125 km.
		ePNE	08 41	----------	
		SNEZ	12 34	----------	
		F	19	----------	
234	10	iPZ	14 27 55	2,480	Dilatation.
		ePNE	27 55	----------	
		SNEZ	31 51	----------	
		iNE	32 48	----------	
		F	15 23	----------	
235	11	$\overline{\text{iP}}$Z	6 00 22	125	Dilatation. Felt very slightly at Ambulong.
		$\overline{\text{eP}}$NE	00 22	----------	
		$\overline{\text{S}}$NE	00 38	----------	
		F	12	----------	
236	11	PNEZ	6 59 48	3,780	
		SE	7 05 20	----------	
		LNE	09 ca	----------	
		F	8 20	----------	
237	11	ePNEZ	9 40 52	880	
		SNE	42 26	----------	
		F	10 05	----------	
238	12	iPNEZ	6 11 23	1,840	Dilatation from the SE. Felt in Ternate and N. Celebes according to Batavia.
		SNEZ	14 31	----------	
		LNE	16 15ca	----------	
		F	7 31	----------	
240	14	iPNEZ	13 14 41	1,720?	Felt in southern and eastern Mindanao. Destructive in Ternate and Minahasa, according to Batavia. Epicenter near 1° N: 126° E. 1° N: 124° E according to J. S. A. 3° N: 129° E according to U. S. C. G. S. 0.5° N: 126° E according to Batavia.
		Sz?	17 38	----------	
		F	18 08	----------	
241	15	PNEZ	8 52 23	1,535	Disturbed by microseisms.
		SNE	55 02	----------	
		F	9 13	----------	
243	16	PNEZ	22 13 08	235	
		$\overline{\text{S}}$NE	13 40	----------	
		F	17	----------	
244	17	iPZ	13 01 39	3,690	Compression. Felt in E. Java, Lombok, Bali, according to Batavia. 18° S: 117° E by Manila, Batavia, Osaka.
		ePNE	01 42	----------	
		SNE	06 56	----------	
		LE	11 00	----------	
		F	32	----------	
245	17	PNEZ	17 34 11	2,230?	N. Celebes according to Batavia.
		SNE?	37 50	----------	
		LNE	39 30ca	----------	
		F	18 16	----------	
246	17	ePNEZ	19 13 12	235	Dilatation. Felt at Daet and Naga, SE Luzon.
		$\overline{\text{S}}$NEZ	13 44	----------	
		F	26	----------	
248	17	PNE	22 26 06	1,710?	N. Celebes according to Batavia.
		SNE?	29 03	----------	
		LN?	30 31	----------	
		F	53	----------	
251	18	PNEZ	18 56 17	6,940	
		SNE	19 04 46	----------	
		LNE	19 15 ca	----------	
		F	20 32	----------	
252	19	PNEZ	2 12 24	1,935	
		SNE	15 40	----------	
		LNE	17 23	----------	
		F	34	----------	
253	20	PNEZ	7 19 01	1,390	
		SNE	21 25	----------	
		MN	24 10	----------	

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
254	20	PNEZ	7 56 20	510	No. 253 still recording.
		SNE	57 20		
		SNE	57 39		
		F	8 13		
256	21	PNEZ	10 29 29	15,580	San Salvador, Central America. 13° N: 88° W, according to U. S. C. G. S. 13° 48′ N: 88° 30′ W, according to J. S. A. 16° N: 87° W, according to Strasbourg.
		P′NE?	32 19		
		LNE	11 16 ca		
		MNE	26 ca		
		F	12 47		
257	21	PNEZ	21 45 12	3,420	W. Java and S. Sumatra according to Batavia.
		SNE	50 12		
		F	22 20		
258	22	PNEZ	11 40 46	8,045	Compression. Region of Fiji according to Pasadena. Probably, 18° S: 168° W by Wellington. Approximately 20° S: 174° W by Manila, Pasadena, Batavia.
		SNE	50 17		
		LNE	12 04 25		
		MNE	10 ca		
		F	13 36		
259	24	PNEZ	11 14 24	490	Felt at Calbayog, NW Samar.
		SNEZ	15 22		
		F	26		
260	24	PNE	17 27 08	565	
		SNE	28 13		
		F	43		
262	26	PNEZ	5 20 12	1,820?	Disturbed by microseisms.
		SNE?	23 18		
		LNE?	24 52		
		F	6 12		
263	26	PNEZ	9 12 00	505	
		SNEZ	13 19		
		F	27		
264	26	iPNEZ	16 19 48	6,980	Dilatation. S from the Wiechert. In region of 25° S: 175° E. Apparently deep focus. 23° S: 180° according to J. S. A. 16° S: 173° E according to U. S. C. G. S.
		SNE	28 13		
		F	19 40		
265	26	iPNEZ	20 33 54	2,340	N. Celebes according to Batavia.
		iSNE	37 41		
		LNE?	39 44		
		F	21 10		
266	26	PNEZ	22 32 02	6,855	In region of New Hebrides by Manila, Apia, Osaka.
		SNE	40 26		
		F	23 15		
267	27	PNEZ	1 39 55	7,555	Dilatation. Approximately 25° S: 178° E by Riverview, Manila, Apia.
		SNE	49 00		
		F	2 10		
268	27	PNEZ	12 46 17	820	Dilatation. Felt throughout NE Mindanao. Probable epicenter, 9° N: 126° 40′ E.
		SNE	47 46		
		F	13 29		
269	28	PNEZ	2 25 14	2,035?	Dilatation.
		SNE?	28 36		
		LNE?	30 18		
		F	4 34		
270	28	PNEZ	5 06 45	1,865	
		SNEZ	09 55		
		LNE	11 31		
		MN	13 13		
		F	6 18		
271	28	PNEZ	10 17 06	1,320	
		SNEZ	19 23		
		LNE	20 40		
		MNE	22 00		
		F	55		
273	31	iPNEZ	4 37 32	40	
		SNE	37 38		
		F	38		
275	31	ePNEZ	13 57 37	2,720	Felt in Guam.
		iSNE	14 01 50		
		LNE?	04 48		
		F	48		

In addition to the above there were fourteen insignificant or undecipherable disturbances on the following days of May: 1st(4), 9th, 14th, 15th, 17th, 18th(2), 20th, 25th, 30th, and 31st.

International Seismological Centre

JUNE, 1932

MACROSEISMIC RECORD

1, 10h 38m [1, 18h 38m] **Cape Bojeador, NW Luzon.** Earthquake of two seconds duration and intensity II.

2, 11h 14m 48s* [2, 19h 14m 48s] **Butuan, NE Mindanao.** Earthquake of intensity IV.

3, 22h 43m 47s* [4, 6h 43m 47s] **NW Luzon.** Felt in the Provinces of Abra, Ilocos Sur, La Union, and western part of Mountain. Intensity III in Vigan and Bangued. Center at 17° 14′ N; 119° 50′ E in the China Sea.

7, 20h 25m [8, 4h 25m] **Talacogon, E Mindanao.** Strong earthquake felt.

8, 14h 56m 29s* [8, 22h 56m 29s] **N Mindanao.** Strong earthquake in Provinces of Oriental Misamis, Bukidnon, Agusan, and Surigao. The center seems to have been in the mountains of Eastern Bukidnon. Intensity V in Cagayan, Oriental Misamis.

8, 18h 00m [9, 2h 00m] **Lais, Davao, Mindanao.** Slight earthquake.

8, 21h 50m [9, 5h 50m] **Talacogon, Agusan, Mindanao.** Slight earthquake.

9, 4h 05m [9, 12h 05m] **Lubuagan, Mountain Province, Luzon.** Light earthquake.

10, 20h 23m 59s* [11, 4h 23m 59s] **Butuan, Agusan, Mindanao.** Slight earthquake of long duration. The center was in the Pacific about 500 kilometers southeast of Butuan.

11, 17h 05m 05s* [12, 3h 05m 05s] **Guam.** Earthquake felt in Guam with intensity VI. Center to the east of Guam in the Nero Deep.

13, 20h 58m 37s* [14, 4h 58m 37s] **NW Luzon.** Earthquake of moderate intensity at Vigan. Felt lightly in Provinces of Ilocos Norte, La Union, and Mountain. Epicenter in the China Sea.

14, 6h 00m 40s* [14, 14h 00m 40s] **NW Luzon.** Earthquake felt throughout Northern Luzon. Intensity VII at Cape Bojeador, where some walls were cracked and one lens in the Lighthouse was broken. Some buildings slightly damaged in Laoag. The epicenter of the earthquake was in the China Sea about thirty miles from the coast. Previous earthquakes originated here on June 18, 1927 and March 19, 1931.

15, 6h 00m 56s* [15, 14h 00m 56s] **Butuan, Agusan, Mindanao.** Very light earthquake felt by few persons.

22, 4h 14m 05s* [22, 12h 14m 05s] **NW Luzon.** Earthquake felt with intensity III at Vigan and with intensity II along the coast of Ilocos Norte.

22, 21h 35m [23, 5h 35m] **Marinduque.** Earthquake of moderate intensity felt throughout the island. Considerable damage done to cocoanut trees bearing ripe fruit.

27, 7h 25m [27, 15h 25m] **Cauayan, Occidental Negros.** Slight earthquake.

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INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
276	1	PNEZ	0 20 10	255	
		$\overline{S}$NE	20 36		
		F	31		
279	2	PNEZ	18 35 32	2,520	
		SNE	39 31		
		F	19 08		
280	2	PNE	19 59 13	2,380	Felt slightly in Osaka, Japan.
		SNE	20 03 03		
		LNE	05 06		
		MNE	07 ca		
		F	22		
282	3	PNEZ	5 08 25	350	Dilatation.
		SNEZ	09 17		
		F	25		
283	3	ePNEZ	10 52 30	14,135	L from the Wiechert. 16° N: 104° W, by J. S. A. 17° N: 104° W, by U. S. C. G. S.
		P'NEZ	56 15		
		LNE	11 35 ca		
284	3	iPNEZ	14 26 47	200	Compression. $\overline{S}$ from the Wiechert. No. 283 still recording.
		$\overline{S}$NE	27 13		
		F	16 15		
286	3	PNEZ	22 43 47	320	Compression. Felt in NW Luzon. 17° 14′ N: 119° 50′ E by Manila and Baguio.
		SNE	44 29		
		F	23 13		
290	5	iPZ	13 04 32	3,020	Dilatation.
		ePNE	04 33		
		SNE	09 05		
		LN	12 20		
		MNE	14 40		
		F	14 17		
291	6	ePNEZ	6 33 16	1,590?	
		SNEZ?	36 02		
		F	50		
292	6	ePNEZ	8 58 32	10,490?	California. 41° 12′ N: 124° W, by J. S. A. 42° N: 123° W, by U. S. C. G. S.
		PS?NE	9 10 54		
		LNE	30 ca		
		F	11 13		
295	8	PNEZ	8 04 28	1,420	
		SNE	06 56		
		F	29		
296	8	PNEZ	10 58 21	2,535	Approximately 23° N: 136° 30′ E by Manila, Zikawei, Chiufeng.
		SNE	11 02 21		
		F	25		
297	8	PNEZ	14 56 29	835	Compression. Felt in northern Mindanao. Epicenter near 8° 20′ N: 125° 15′ E.
		iNE	56 34		
		SNE	57 59		
		F	16 24		
300	10	iPNEZ	20 23 59	1,255	Compression from the SE. Felt slightly in Butuan, Mindanao. In region of 5° 30′ N: 129° E.
		SNE	26 10		
		LNE	27 22		
		F	22 06		
302	11	PNEZ	17 05 05	2,810	Felt in Guam with intensity VI. Epicenter, 13° 30′ N: 147° E, in the Nero Deep.
		SNE	09 24		
		LNE	12 00		
		F	18 10		
303	13	iPNEZ	20 58 37	380	Compression. S from the Wiechert. Felt in NW Luzon. Epicenter, 18° N: 119° 20′ E.
		SNE	59 23		
		F	22 47		
304	14	iPNEZ	6 00 40	425	S from the Wiechert. Felt in NW Luzon. Intensity VI at Laoag and Cape Bojeador. Epicenter, 18° 20′ N: 120° 10′ E, as on June 18th, 1927 and March 19th, 1931.
		SNE	01 32		
		F	7 40		
305	14	PNEZ	11 19 43	895	Disturbed by microseisms.
		SNE	21 19		
306	14	PNEZ	12 41 43	400	Epicenter, approximately 18° 05′ N: 120° E by Manila and Baguio. No. 305 still recording. Disturbed by microseisms.
		SNE	42 33		
		F	57		
309	16	PNEZ	1 24 11	2,540?	Compression. N. Sumatra according to Batavia. In region of 1° N; 98° E by Medan, Hong Kong, Manila, Zikawei.
		SNE?	28 12		
		LNE	30 20		
		MN	32 ca		
		F	2 49		
312	16	PNEZ	15 16 53	1,420	
		SNE	19 21		
		ME	22 11		
		F	16 02		

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time			Δ	Remarks
			h.	*m.*	*s.*	*Km.*	
316	18	PNEZ	10	28	09	13,820	Mexico. Data after 10:33:10 taken from the Wiechert. 18° 48′ N; 105° 30′ W, by J. S. A. 19° N: 104° W, by U. S. C. G. S.
		P′NEZ		31	31		
		PR$_1$NEZ		33	10		
		iNE		43	10		
		iNE		45	10		
		LZ?	11	19	ca		
		F	15	30			
317	18	PNE	17	45	25	2,690?	N. Atjeh, Sumatra.
		SNE?		49	35		
		F	18	29			
322	20	PNEZ	3	59	20	1,800	
		SNE	4	02	24		
		F		35			
326	20	PNEZ	14	20	08	5,270?	An abnormal record. No L or M phase.
		SNE?		27	00		
		F	15	37			
327	20	iPE	19	14	19	2,830	
		iPZ		14	21		
		iN		14	22		
		SNE		18	38		
		F	20	35			
328	21	ePNEZ	23	01	24	975	W. Formosa by Manila and Hong Kong.
		SNE		03	08		
		F		50			
329	22	PNEZ	0	42	33	3,795	
		SNE		47	56		
		F	1	27			
330	22	PNEZ	4	14	05	390	Dilatation. Felt at Vigan and Cape Bojeador, N. Luzon.
		SNEZ		14	52		
		F		32			
331	22	eNE	13	17	08		Z record insignificant and undecipherable. 17° 18′ N: 103° 30′ W, by J. S. A. 19° 30′ N: 104° W, by U. S. C. G. S.
		iNE		19	31		
		iNE		21	09		
		LNE		58	30ca		
		F	16	00			
332	23	ePNEZ	2	19	15	4,900	Solomon Islands?
		SNE		25	45		
		LNE		32	30		
		MNE		36	ca		
		F	3	12			
333	23	PNEZ	10	03	42	2,345	3° 45′ S: 131° 30′ E by Amboina, Manila, Batavia.
		SNE		07	28		
		F		35			
335	26	$\overline{\text{P}}$NEZ	18	16	26	175	
		$\overline{\text{S}}$NEZ		16	48		
		F		25			
336	26	PNEZ	19	26	59	4,490	Kurile Islands by Osaka, Manila, and DeBilt.
		iN		30	17		
		SNE		33	05		
		LN		38	48		
		F	21	03			
338	27	PNEZ	6	13	46	585	
		$\overline{\text{S}}$NEZ		15	18		
		F		25			
340	29	PNEZ	18	22	17	3,735?	Disturbed by microseisms.
		SNE		27	31		
		LNE		31	30		
		F	19	32			

In addition to the above there were thirty insignificant or undecipherable disturbances on the following days of June: 1st, 2nd, 3rd,(2), 4th, 5th(2), 7th, 8th, 9th, 10th, 11th, 14th, 15th, 16th(3), 17th, 18th(4), 19th, 20th(3), 26th, 27th, 28th, and 30th.

International Seismological Centre

ENERO, 1932

——— [1, 5h 53m] **Butúan, NE de Mindanao.** Ligero temblor de cinco segundos de duración. Este temblor corresponde al 31 de diciembre en hora de Greenwich.

1, 12h 10m [1, 20h 10m] **E de Mindanao.** Ligero temblor sentido en Hinatuan, costa oriental y en Veruela y Talacogon, Valle del Agusan.

4, 5h 30m [4, 13h 30m] **E de Mindanao.** Temblor sentido en Butúan con intensidad IV–V, dirección aparentemente del E y duración 15 segundos. También fué sentido ligeramente en Cantilan y Hinatuan, costa oriental y en Veruela y Talacogon, Valle del Agusan.

5, 11h 27m 44s* [5, 21h 27m 44s] **Guam.** Ligero temblor sentido en Sumay.

6, 10h 55m [6, 18h 55m] **Hinatúan, E de Mindanao.** Ligero temblor

7, 17h 30m [8, 1h 30m] **Pasuquin, NW de Luzón.** Ligero temblor.

8, 19h 45m [9, 3h 45m] **Cabo Bojeador, NW de Luzón.** Ligero temblor.

13, 23h 30m [14, 7h 30m] **Calbayog, Sámar.** Temblor de intensidad III y de corta duración.

16, 4h 19m 03s* [16, 12h 19m 03s] **Manila.** Temblor de intensidad II y de unos 6 segundos de duración.

17, 17h 17m 19s* [18, 1h 17m 19s] **Guiuan, Sámar.** Temblor de intensidad V. Su epicentro se hallaba en el Abismo de Filipinas hacia los 10° 30′ N y 125° 26′ E.

18, 20h 27m 33s* [19, 4h 27m 33s] **N de Luzón.** Temblor sentido en Basco, Aparri y Cabo Bojeador. En Aparri fué fuerte y de 34 segundos de duración. El epicentro se hallaba probablemente hacia los 19° 45′ N y 124° 30′ E.

21, 13h 30m [21, 21h 30m] **Masbate.** Temblor de intensidad III.

22, 5h 15m [22, 13h 15m] **NW de Luzón.** Ligero temblor sentido en Cabo Bojeador y Laoag.

23, 8h 00m [23, 16h 00m] **Cabo Bojeador, NW de Luzón.** Ligero temblor.

25, 13h 55m [25, 21h 55m] **Masbate.** Temblor de intensidad II.

30, ——— **Cagutongan, Pilar, Abra.** Ligero temblor hacia medianoche.

31, 23h 22m 26s* [Febrero 1, 7h 22m 26s] **Aparri, N de Luzón.** Temblor de intensidad IV, duración 25 segundos. Su oscilación aparentemente era del E al W.

International Seismological Centre

5, 21h 10m [6, 5h 10m] **Mindoro.** Temblor fuerte sentido en "Halcon Rubber Station," Baco.

8, 11h 55m [8, 19h 55m] **Hinatuan, E de Mindanao.** Ligero temblor.

13, 9h 10m [13, 17h 10m] **Butúan, NE de Mindanao.** Ligero temblor oscilatorio de 25 segundos de duración.

15, 12h 15m [15, 20h 15m] **Dávao, SE de Mindanao.** Temblor de intensidad IV.

15, 18h 23m 34s* [16, 2h 23m 34s] **Ambulong, S de Luzón.** Ligero temblor.

16, 14h 30m [16, 22h 30m] **Masbate.** Temblor de intensidad III.

20, 11h 25m [20, 19h 25m] **Talacogon, E de Mindanao.** Ligero temblor.

21, 2h 35m [21, 12h 35m] **Guam.** Ligero temblor sentido en Sumay.

21, 7h 33m 17s* [21, 15h 33m 17s] **N de Luzón.** Temblor de moderada intensidad sentido en Aparri, duración 10 segundos. Sintióse ligeramente en Cabo Bojeador y Pasuquin.

22, 14h 03m 24s* [22, 22h 03m 24s] **SE de Luzón.** Temblor de intensidad IV sentido en Naga y precedido de un ruido. Sintióse también en Tinambac.

23, 12h 45m [23, 20h 45m] **E de Mindanao.** Ligero temblor sentido en Hinatuan y Talacogon.

24, 4h 40m [24, 12h 40m] **Cabo Bojeador, NW de Luzón.** Ligera sacudida.

24, 18h 17m [25, 2h 17m] **Basco, Islas Batanes.** Temblor de intensidad II y de corta duración.

27, 11h 30m [27, 19h 30m] **Lais, SE de Mindanao.** Ligera sacudida.

28, 3h 17m [28, 11h 17m] **Basco, Islas Batanes.** Temblor de intensidad IV, duración 4 segundos.

29, 7h 30m [29, 15h 30m] **E de Mindanao.** Ligero temblor de 25 segundos de duración sentido en Butúan, su dirección aparentemente era de NNE a SSW. También se sintió en Hinatuan.

29, 11h 45m [29, 19h 45m] **Mambusao, Cápiz, Panay.** Ligero temblor.

International Seismological Centre

MARZO, 1932

2, 2h 53m [2, 10h 53m] **Sorsogón, SE de Luzón.** Temblor de 3 segundos de duración.

3, 22h 50m 48s* [4, 6h 50m 48s] **Sámar y Leyte.** Temblor de intensidad IV sentido en Catbalogan y Tacloban y con intensidad III en Calbayog.

4, 4h 45m [4, 12h 45m] **Hinatúan, E de Mindanao.** Ligero temblor.

7. 1h 06m 40s* [7, 9h 06m 40s] **Ambulong, S de Luzón.** Ligera sacudida.

8, 6h 46m [8, 14h 46m] **Butúan, NE de Mindanao.** Ligero temblor de 5 segundos de duración.

9, 6h 15m [9, 14h 15m] **Cabo Bojeador, NW de Luzón.** Temblor de intensidad II y de 2 segundos de duración. Repitió ligeramente a 16h 54m hora insular.

9, 19h 58m [10, 3h 58m] **Romblón.** Fuerte temblor.

10, 0h 10m [10, 8h 10m] **Masbate.** Temblor de intensidad II. Una segunda sacudida se sintió 6 horas más tarde.

10, 15h 50m [10, 23h 50m] **Cabo Bojeador, NW de Luzón.** Ligerísimo temblor, que duró 2 segundos.

12, 13h 21m 59s* [12, 21h 21m 59s] **NW de Luzón.** Ligero temblor sentido en Cabo Bojeador y Pasuquin. En Cabo Bojeador se oyó un ruido.

14, 13h 02m [14, 21h 02m] **Vigan, NW de Luzón.** Ligero temblor.

15, 20h 20m [16, 4h 20m] **Masbate.** Temblor de intensidad II. Repitió el día 19 a las 14h 10m hora insular.

26, 9h 54m [26, 17h 54m] **Ambulong, S de Luzón.** Ligero temblor.

28, 14h 00m [28, 22h 00m] **Glan, SE de Mindanao.** Ligero temblor.

30, 21h 13m [31, 5h 13m] **Butúan, NE de Mindanao.** Ligero temblor oscilatorio.

31, ——— **Dumaguete, SE de Negros.** Temblor de intensidad III. No mencionan la hora.

International Seismological Centre

ABRIL, 1932

6, 14h 12m [6, 22h 12m] **Masbate.** Temblor de intensidad II. Repitió con la misma intensidad el día 7 a las 14h 07m y a las 20h 08m, y el día 8 a las 16h 48m.

9, 22h 19m 50s* [10, 6h 19m 50s] **Benguet, Luzón.** Temblor de intensidad III sentido en Bokod, también se sintió ligeramente en Atok. Repitió con la misma intensidad en Bokod el día 10 a las 0h 30m.

10, 3h 55m [10, 11h 55m] **Ganassi, Lánao, Mindanao.** Ligero temblor que duró 11 segundos.

10, 8h 06m 50s* [10, 16h 06m 50s] **Bokod, N de Luzón.** Temblor de intensidad III. Repitió a las 8h 20m y el día 11 a las 5h 00m.

10, 11h 15m [10, 21h 15m] **Guam.** Temblor registrado y sentido.

12, 12h 25m [12, 20h 25m] **Cabo Bojeador, NW de Luzón.** Temblor de intensidad I y 3 segundos de duración.

13, 15h 10m [13, 23h 10m] **Bato, Camarines Sur, SE de Luzón.** Ligero temblor.

15, 3h 23m 08s* [15, 11h 23m 08s] **SE de Luzón.** Ligero temblor y de corta duración sentido en Naga y Bacacay. En Pandan, Catanduanes, se sintió una ligera sacudida hacia la misma hora, pero puede haber sido de otro origen.

17, 1h 03m 42s* [17, 9h 03m 42s] **SE de Mindanao.** Temblor de moderada intensidad sentido en la Provincia de Dávao. Dieron cuenta de él Malita, Lais, Cateel y Compostela.

25, 21h 02m 50s* [26, 5h 02m 50s] **NW de Luzón.** Temblor sentido en Laoag con intensidad V, duración 45 segundos. También se sintió en Sinait y en Cabo Bojeador.

29, 17h 32m 56s* [30, 1h 32m 56s] **E de Mindanao.** Extenso temblor sentido en la parte oriental de Mindanao. Su mayor intensidad V–VI se experimentó en Hinatúan y Veruela. También se sintió en Mambajao, que está algo al oeste. Su origen se hallaba en el Abismo de Filipinas, probablemente hacia los 8° 20′ N y 126° 53′ E como el ocurrido el día 13 de junio de 1929.

29, 21h 09m 01s* [30, 5h 09m 01s] **N de Luzón.** Temblor sentido en Aparri, Cabo Bojeador y Pasuquin. Algunas paredes rajadas por los temblores anteriores, en Cabo Bojeador, se cayeron. Su epicentro se hallaba probablemente al extremo norte o noroeste de Luzón.

International Seismological Centre

MAYO, 1932

11, 6h 00m 22s* [11, 14h 00m 22s] **Ambulong, S de Luzón.** Ligero temblor sentido en Ambulong.

11, 10h 04m [11, 18h 04m] **Talacogon, Agusan, Mindanao.** Ligero temblor sentido. Repitió el día 12 a las 5h 36m.

11, 14h 00m [11, 22h 00m] **Cateel, Dávao, Mindanao.** Ligero temblor.

14, 12h 51m [14, 20h 51m] **Baguio, N de Luzón.** Temblor sentido con intensidad II.

14, 13h 14m 41s* [14, 21h 14m 41s] **Mindanao.** Aunque se sintió al Sur y Este de Mindanao, éste no se considera como temblor filipino. Su centro estaba entre las islas de Molucas y Célebes; fué destructor en Ternate y NE de Célebes.

15, 12h 30m [15, 20h 30m] **Cotabato, Mindanao.** Temblor de intensidad II.

16, 5h 02m [16, 13h 02m] **Vigan, Ilocos Sur, Luzón.** Temblor de intensidad III y de 4 segundos de duración.

16, 20h 00m [17, 4h 00m] **Pandan, Isla de Catanduanes.** Ligero temblor sentido.

17, 19h 13m 12s* [18, 3h 13m 12s] **SE de Luzón.** Temblor de intensidad III y de corta duración sentido en Daet y Naga.

19, 3h 45m [19, 11h 45m] **Masbate.** Temblor de intensidad I.

19, 10h 45m [19, 18h 45m] **Cabo Bojeador, NW de Luzón.** Temblor de intensidad II, duración 5 segundos.

23, 20h 14m [24, 4h 14m] **Talacogon, E de Mindanao.** Ligero temblor.

24, 11h 14m 24s* [24, 19h 14m 24s] **Calbayog, Sámar.** Temblor de corta duración y de intensidad II.

27, 1h 05m [27, 9h 05m] **Mindoro.** Ligero temblor sentido en "Halcon Rubber Station," Baco.

27, 11h 00m [27, 19h 00m] **Dávao, SE de Mindanao.** Ligero temblor sentido en la Colonia del Campamento Penal de Mactán.

27, 12h 46m 17s* [27, 20h 46m 17s] **NE de Mindanao.** Temblor algo fuerte sentido en las Provincias de Surigao, Agusan y N de Dávao. Su origen parece hallarse en el Pacífico cerca de Cantilan.

27, 18h 00m [28, 2h 00m] **Veruela, E de Mindanao.** Ligero temblor sentido en Veruela, Valle del Agusan.

27, 20h 33m [28, 4h 33m] **Talacogon, E de Mindanao.** Ligero temblor.

28, 6h 46m [28, 14h 46m] **Masbate.** Temblor de intensidad II.

International Seismological Centre

JUNIO, 1932

1, 10h 38m [1, 18h 38m] **Cabo Bojeador, NW de Luzón.** Temblor de 2 segundos de duración y de intensidad II.

2, 11h 14m 48s* [2, 19h 14m 48s] **Butúan, NE de Mindanao.** Temblor de intensidad IV.

3, 22h 43m 47s* [4, 6h 43m 47s] **NW de Luzón.** Temblor sentido en las Provincias de Abra, Ilocos Sur, La Unión y parte W de la Montañosa. Vigan y Bangued tuvieron intensidad III. Origen en el Mar de la China hacia los 17° 14′ N y 119° 50′ E.

7, 20h 25m [8, 4h 25m] **Talacogon, E de Mindanao.** Fuerte temblor.

8, 14h 56m 29s* [8, 22h 56m 29s] **N de Mindanao.** Fuerte temblor en las Provincias de Misamis Oriental, Bukidnon, Agusan y Surigao. El centro parece se hallaba en las montañas orientales de Bukidnon. Cagayán, Misamis Oriental, tuvo intensidad V.

8, 18h 00m [9, 2h 00m] **Lais, Dávao, Mindanao.** Temblor de ligera intensidad.

8, 21h 50m [9, 5h 50m] **Talacogon, Agusan, Mindanao.** Ligero temblor.

9, 4h 05m [9, 12h 05m] **Lubuagan, Provincia Montañosa, Luzón.** Ligero temblor.

10, 20h 23m 59s* [11, 4h 23m 59s] **Butúan, Agusan, Mindanao.** Ligero temblor de larga duración. Su centro se hallaba en el Pacífico a unos 500 kilómetros al SE de Butúan.

11, 17h 05m 05s* [12, 3h 05m 05s] **Guam.** Temblor sentido en Guam con intensidad VI. El centro se hallaba al E de Guam en el Abismo "Nero Deep."

13, 20h 58m 37s* [14, 4h 58m 37s] **NW de Luzón.** Temblor de moderada intensidad sentido en Vigan. Se sintió ligeramente en las Provincias de Ilocos Norte, La Unión y Montañosa. El epicentro se hallaba en el Mar de la China.

14, 6h 00m 40s* [14, 14h 00m 40s] **NW de Luzón.** Temblor sentido al norte de Luzón. Cabo Bojeador tuvo intensidad VII, donde algunas paredes fueron rajadas y una de las lentes del Faro se rompió. En Laoag algunos edificios fueron ligeramente dañados. El epicentro se hallaba en el Mar de la China a unas 30 millas de la costa. Temblores anteriores originados en dicho lugar fueron: el ocurrido el 18 de junio de 1927 y el de 19 de marzo de 1931.

15, 6h 00m 56s* [15, 14h 00m 56s] **Butúan, Agusan, Mindanao.** Ligerísimo temblor sentido por algunas personas.

22, 4h 14m 05s* [22, 12h 14m 05s] **NW de Luzón.** Temblor sentido en Vigan con intensidad III y con intensidad II a lo largo de la costa de Ilocos Norte.

22, 21h 35m [23, 5h 35m] **Marindque.** Temblor de moderada intensidad sentido en toda la isla. Considerables daños causó a los cocales que tenían el fruto ya maduros.

27, 7h 25m [27, 15h 25m] **Cauayan, Negros Occidental.** Ligero temblor.

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SEISMOLOGICAL BULLETIN FOR 1932
JULY–DECEMBER

DOMINION OBSERVATORY
RECEIVED
14 NOV. 1933
WELLINGTON, N.Z.

International Seismological Centre

INTRODUCTION

SEISMIC STATIONS

The following is the list of official seismic stations. Moreover, all the meteorological stations, official and coöperative, have instructions to report all perceptible earthquakes.

Name	Province	North latitude	East longitude	Elevation	Equipment
		° ′	° ′	*m.*	
Manila	Manila	14 35	120 59	2.5	Galitzin-Wilip seismographs, 3 components. Wiechert inverted pendulum, mass 1,000 kg. Two horizontal pendulums, mass 118 kg. each.
Baguio	Mountain	16 25	120 35	1,512.0	Vicentini seismograph, 3 components. Wiechert inverted pendulum, mass 200 kg.
Ambulong	Batangas	14 05	121 03	10.5	Vicentini seismograph, 3 components.
Butuan	Agusan	8 56	125 32	2.0	Wiechert inverted pendulum, mass 200 kg.
Agaña	Guam	13 24	144 38	5.0	Do.

NOTE.—The subsoil of Manila is alluvium.

The time of occurrence is that indicated by the seismographs at the Central Observatory, Manila, whenever the disturbance has been recorded by them. This fact is denoted by an asterisk(*). Otherwise the time is that noted by the meteorological observers who report them. All time indications are in Greenwich Mean Time (midnight=0^h), insular time being added in brackets for the convenience of Philippine readers.

The intensity of macroseisms is given according to the Rossi–Forel scale.

The instrumental record is that obtained from the seismographs in the Manila Observatory. It is that of the Galitzin-Wilip instruments except where noted otherwise.

INSTRUMENTAL CHANGES

During the period covered by this report a radical improvement has been made in the Horizontal pendulums of the Manila Observatory. Masses of 118 kg. have been substituted for the old ones of 20 kg. and a timing device has been added. A better grade of paper has been adopted for these instruments. A slight amount of damping has been introduced by means of vanes in oil. The static magnification is about 20 and the period about 8 seconds. Decidedly better results have been obtained by these improvements.

ROSSI-FOREL SCALE OF EARTHQUAKE INTENSITIES

I. *Microseismic shock:* recorded by a single seismograph or by seismographs of the same model but not by several seismographs of different kinds; the shock felt by an experienced observer.

II. *Extremely feeble shock:* recorded by several seismographs of different kinds; felt by small number of persons at rest.

III. *Very feeble shock:* felt by several persons at rest; strong enough for the direction or duration to be appreciable.

IV. *Feeble shock:* felt by persons in motion; disturbances of movable objects, doors, windows; creaking of ceilings.

V. *Shock of moderate intensity:* felt generally by everyone; disturbance of furnitures, beds, etc., ringing of swinging bells.

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VI. *Fairly strong shock:* general awakening of those asleep; general ringing of house bells; oscillation of chandeliers; stopping of pendulum clocks; visible agitation of trees and shrubs; some startled persons leave their dwellings.

VII. *Strong shock:* overthrow of movable objects; fall of plaster; ringing of church bells; general panic, without damage to buildings.

VIII. *Very strong shock:* fall of chimneys, cracks in walls of buildings.

IX. *Extremely strong shock:* partial or total destruction of some buildings.

X. *Shock of extreme intensity:* great disaster, buildings ruined, disturbance of the strata, fissures in the ground, rock-fall from mountains.

SYMBOLS AND ABBREVIATIONS

P	Normal first preliminary tremors; longitudinal waves which have passed below the continental layer.
$\overline{P}$	Upper first preliminary tremors whose path lies wholly in the continental layer.
P′	Longitudinal waves that have traversed the earth's core.
PRn	Longitudinal waves reflected "n" times at the earth's surface.
PcP	Longitudinal waves reflected from the outer surface of the earth's core.
S	Normal second preliminary tremors; transverse waves that have passed below the continental layer.
$\overline{S}$	Second preliminary tremors whose path lies entirely in the continental layer.
PS	Waves transformed from longitudinal to transverse oscillations or vice versa through one reflection at the earth's crust.
SRn	Normal transverse waves reflected "n" times at the earth's surface.
ScS	Normal transverse waves reflected from the outer surface of the earth's core.
$\overline{ScPcP}$	Waves which start with transverse vibrations but on refraction into the core are changed to longitudinal, or starting as longitudinal are refracted out as transverse.
L	Long waves of irregular form at the beginning of the surface or main phase.
M	Shorter and more regular waves of large amplitude in the surface group which travel more slowly than the L waves.
Mn	Individual waves of relatively large amplitude in the surface phase and usually in the M group.
F	Finis. End of discernible movement.
i	Impetus. Impulsive and sharply defined beginning of a phase.
e	Emersio. Poorly defined emergency of a phase.
m	Maximum wave in any phase.
A	Amplitude of earth motion measured in microns from position of equilibrium. One micron equals .001 mm.
μ	Micron.
A_E	E–W component of A.
A_N	N–S component of A.
A_Z	Vertical component of A.
T	Period of waves.
O	Time of earthquake at the epicenter.
Δ	Arcual distance from station to epicenter.
T_O	Free or undamped period of the seismograph.
V	Static magnification.
ϵ	Ratio of successive damped amplitudes.
r	Friction constant.
J. S. A.	Jesuit Seismological Association. Central Office at St. Louis University, St. Louis, Missouri, U. S. A.
U. S. C. G. S.	United States Coast and Geodetic Survey, Washington, D. C., U. S. A.

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CONSTANTS OF THE WIECHERT INVERTED PENDULUM

Date	N–S component.				E–W component.			
	T_o	V	ϵ	$\frac{r}{T_o^2}$	T_o	V	ϵ	$\frac{r}{T_o^2}$
1932								
July	4.2	200	2.3	0.029	4.4	229	2.6	0.033
August	4.4	193	2.4	0.026	4.8	206	2.6	0.027
September	4.4	190	2.5	0.023	4.8	211	2.8	0.029
October	4.4	190	2.4	0.021	4.8	199	2.7	0.024
November	4.4	191	2.5	0.025	4.8	205	2.7	0.028
December	4.4	193	2.4	0.026	4.8	209	2.5	0.034

CONSTANTS OF THE GALITZIN-WILIP INSTRUMENTS

	N–S	E–W	Z
PERMANENT CONSTANTS			
Galvanometer periods	12.3s	11.8s	11.0s.
Galvanometers to drums	100.5 cm	100.5 cm	100.5 cm.
Telescope to seismographs	500 cm	492 cm	450 cm.
Reduced pendulum lengths	11.52 cm	11.40 cm	14.82 cm.
TEMPORARY CONSTANTS			
Seismograph period, T^1	12.57	11.83	9.0
Coefficient of damping			
Transmission factor, k			

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MACROSEISMIC RECORD

9, 20h 26m 24s* [10, 4h 26m 24s] **SE Mindanao.** Earthquake felt with intensity III at Davao, and as far north as Hinatuan and Talacogon. Center between Mindanao and Netherlands, East Indies.

11, 8h 22m 45s* [11, 16h 22m 45s] **Samar and SE Luzon.** Earthquake felt throughout Northern Samar and as far as Legaspi in Luzon. Center in Philippine Deep, east of Northern Samar.

13, 14h 39m [13, 22h 39m] **Catanduanes.** Light oscillatory earthquake felt at Virac.

18, 5h 02m 26s* [18, 13h 02m 26s] **W Luzon.** The center of the earthquake was in the China Sea, 130 kilometers west of Manila. Intensities of IV and V were experienced in Manila. It was felt as far as Boac, Marinduque to the SE, along the north-shore of Mindoro and in the Province of Tarlac. Two persons were injured in Balanga, Bataan. Considerable fright was aroused in Manila by the shock.

26, 16h 40m 08s* [27, 0h 40m 08s] **SE Luzon.** Earthquake of light intensity and short duration felt at Daet.

29, 5h 35m [29, 13h 35m] **Masbate.** Earthquake of intensity II.

31, 4h 11m [31, 12h 11m] **NW Luzon.** Light earthquake felt at Bojeador and Pasuquin.

31, 14h 30m [30, 22h 30m] **Hinatuan, Surigao.** Very slight earthquake felt here.

INSTRUMENTAL RECORD

No.	Date	Phase	Time			△	Remarks
			h.	*m.*	*s.*	*Km.*	
343	1	PNEZ	10	13	56	2,645	7° S; 131° E, by Batavia and Manila. 3° 30′ S; 124° 24′ E according to Batavia.
		SNEZ		18	04	----------	
		LNE		20	29	----------	
		F		44		----------	
345	2	PNEZ	2	15	55	2,310	Dilatation. Region of western New Guinea by Manila, Riverview and Amboina. 4° 12′ S: 130° 48′ E according to Batavia.
		SNE		19	40	----------	
		LN		21	42	----------	
		MN		23	44	----------	
		F	3	20		----------	
346	2	PZ	10	18	50	1,650	Disturbed by microseisms.
		SNE		21	41	----------	
		F		41		----------	
348	3	$\overline{P}$NEZ	6	51	55	160	
		$\overline{S}$NE		52	15	----------	
		F		58		----------	
350	4	PNEZ	1	43	53	1,365	
		SNE		46	15	----------	
		F	2	04		----------	
351	4	PEZ	6	02	46	1,000	
		SEZ		04	32	----------	
		F		11		----------	
352	5	PNEZ	10	57	53	3,320	6° 6′ S: 103° 48′ E according to Batavia.
		SNE	11	02	28	----------	
		LNE		07	ca	----------	
		MNE		11	07	----------	
		F	12	24		----------	
357	7	P′NE	16	35	08	13,920	27.4° N:113° W; 0=16:15:57. U. S. C. G. S. 28° N:113.5° W; 0=16:15:44. J. S. A.
		L?NE	17	07	42	----------	
		F	19	12		----------	
365	9	PNEZ	13	05	26	6,015	Compression. 15° S:167° E, by Riverview, Manila, Amboina, Osaka, Melbourne.
		SNE		13	01	----------	
		LNE	22	06		----------	
		F	14	32		----------	
366	9	iPNEZ	20	26	24	1,190	Dilatation from the southeast. Felt at Davao, Mindanao. 4° 24′ N: 125° 12′ E according to Batavia.
		iSNEZ		28	28	----------	
		F	21	42		----------	

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
367	10	PNEZ	0 58 00	3,135	In region of Andaman Islands by Hong Kong, Manila, Nanking.
		SNE	1 02 41		
		LE	05 47		
		F	50		
368	10	PNEZ	7 52 14	3,480	East of Japan.
		SNE	57 17		
		LNE	8 01 ca		
		ME	04 00		
		F	9 45		
369	11	iPEZ	8 22 45	555	Compression. Felt in Samar and southeast Luzon. 12° 38′ N:125° 40′ E by Manila, Osaka, Hong Kong, Nanking, Baguio. Epicenter of July 19 1922. S and $\bar{S}$ from the Wiechert.
		ePN	22 45		
		SNE	23 50		
		$\bar{S}$NE	24 12		
		F	10 15		
370	12	P?NEZ	19 44 10		25° N: 110° W:0=19:24:06; U. S. C. G. S. 25.6° N:110.5° W:0=19:24:13: J. S. A.
		iNE	53 40		
		LNE	20 17 51		
		F	22 06		
372	14	PNEZ	9 00 30	3,035	Compression. In the region of 5° N: 148° E by Amboina, Manila, Hong Kong. Disturbed by microseisms.
		SNE	05 04		
		F	44		
375	16	PNEZ	21 12 48	5,865	
		SNE	20 13		
		F	22 15		
377	17	PNEZ	11 33 25	1,625	
		SNE	36 14		
		F	48		
378	17	PNEZ	16 53 38	1,145	Butuan, △=300 km.
		SNE	55 37		
		F	17 40		
379	17	$\bar{P}$NEZ	19 17 17	135	
		$\bar{S}$NE	17 34		
		F	21		
380	17	PNEZ	21 34 08	2,545	
		SNE	38 09		
		F	52		
382	18	iPNEZ	5 02 26	130	Felt in western and southwestern Luzon. In Manila with intensity V. 14° 33′ N: 119° 54′ E by Manila and Baguio. Wiechert pens disjointed.
		F	52		
384	20	PNEZ	20 17 42	7,320	In region of 30° S: 173° E by Manila, Riverview, Wellington.
		SNE	26 33		
		F	21 15		
386	21	iPEZ	12 45 08	2,735	Compression from East. 2° S: 140° E, by Riverview, Manila, Hong Kong, Koti, Phu-Lien. L from the Wiechert.
		ePN	45 08		
		SNE	49 22		
		L?NE	51 ca		
		F	14 12		
388	24	PNEZ	8 54 01	1,040	
		SNE	55 51		
		L?NE	56 45		
		F	9 38		
391	25	PNEZ	8 29 30	2,880	Wakasa Bay, Japan, according to Nagasaki. h=300 km according to Kobe.
		SNE	33 34		
		LNE	35 23		
		ME	42 22		
392	25	P?NEZ	9 33 27		Other phases not distinguishable. No. 391 still recording. 18.5° N: 103.5° W: 0=9:12:40: U. S. C. G. S. 17.2° N: 104° W: J. S. A.
		F	11 57		
395	27	PNEZ	21 24 37	2,560	Banda Sea, Netherlands East Indies. Felt at Darwin, Australia, according to Adelaide. Horizontal data from the Wiechert. Baguio, △=23.8°. Butuan, △=17°.
		SNE	28 39		
		LNE	31 ca		
		F	22 15		
397	29	PNE	1 29 29	480	Baguio, 325 km.
		SNE	30 26		
		F	49		
399	29	PNEZ	21 01 59	1,780	1° S: 123° 30′ E by Manila and Riverview. S from the Wiechert.
		SNE	05 01		
		F	42		
400	30	PNEZ	7 07 04	575	
		$\bar{S}$NEZ	07 35		
		F	30		
401	30	PNEZ	12 17 23	1,835	Dilatation. Felt in Menado according to Batavia.
		SNE	20 31		
		F	13 01		

In addition to the above there were twenty-nine insignificant or undecipherable disturbances on the following days of July; 1st(2), 2nd, 4th, 5th, 6th(2), 7th, 8th(4), 9th(3), 14th, 15th(2), 17th(2), 20th, 21st, 23rd, 24th(2), 26th(2), 28th, and 29th.

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AUGUST, 1932

MACROSEISMIC RECORD

2, 13h 18m [2, 21h 18m] **Mindanao.** Very light earthquake felt at Butuan and Talacogon in the Agusan Valley and at Hinatuan on the Pacific coast.

5, 0h 34m 37s* [5, 8h 34m 37s] **Mindanao.** Light earthquake felt at Bual and Lebak, Province of Cotabato.

5, 0h 48m 16s* [5, 8h 48m 16s] **Batan Islands.** Light earthquake felt at Basco. Duration eight seconds.

6, 11h 35m 13s* [6, 19h 35m 13s] **SW Luzon.** Light earthquake reported from Ambulong and Balayan in the Province of Batangas.

7, 13h 47m [7, 21h 47m] **Guinobatan, Albay.** Slight earthquake.

16, 10h 46m 42s* [16, 18h 46m 42s] **Baguio, N Luzon.** Earthquake of intensity IV.

16, 17h 28m [17, 3h 28m] **Guam, Mariana Islands.** Light earthquake recorded and felt.

17, 0h 53m [17, 8h 53m] **NW Luzon.** Light earthquake of very short duration felt at Cape Bojeador and Pasuquin.

17, 3h 44m 48s* [17, 11h 44m 48s] **N Central Luzon.** Earthquake of intensity V felt in Baguio and with less intensity in the surrounding districts of Benguet and in the neighboring portions of La Union Province.

17, 4h 04m [17, 12h 04m] **Talacogon, Agusan.** Slight earthquake.

17, 6h 00m [17, 14h 00m] **Ganassi, Lanao.** Light earthquake.

18, 12h 01m [18, 22h 01m] **Guam, Mariana Islands.** Perceptible earthquake.

18, ... **Cotabato, Mindanao.** Earthquake during the night. Time not reported.

18, 18h 04m 41s* [19, 2h 04m 41s] **Ormoc, W Leyte.** Earthquake of intensity III and duration forty seconds.

19, 8h 52m 32s* [19, 16h 52m 32s] **Central Luzon.** Earthquake felt in Benguet, La Union, Pangasinan and Nueva Vizcaya provinces. Intensity IV at Baguio. The epicenter was probably in the mountains south of Baguio.

20, 9h 25m 01s* [20, 17h 25m 01s] **Central Luzon.** Earthquake of same intensity and same extension as that on the 19th. The earthquakes on the 17th, 19th and 20th are probably fore-runners of the severe earthquake of the 24th.

20, 20h 30m [21, 4h 30m] **Naguilian, La Union.** Earthquake.

21, 4h 40m 05s* [21, 12h 40m 05s] **NE Mindanao.** Very light earthquake felt at Butuan and Cantilan. Repetition at Cantilan three hours later.

21, 14h 51m [21, 22h 51m] **N Central Luzon.** Earthquake of intensity II at Baguio and Bokod.

21, 16h 16m 17s* [22, 0h 16m 17s] **SE Luzon.** Earthquake felt throughout southeastern Luzon. Intensity IV at Sorsogon and III at Legaspi.

24, 12h 11m 07s* [24, 20h 11m 07s] **Central Luzon.** Earthquake felt in Luzon from Aparri in the extreme north to Calatagan, Batangas. The epicenter was in the mountains about 10 kilometers west of Baguio. A special account of this earthquake is given elsewhere in this bulletin.

24, 13h 48m [24, 21h 48m] **Talacogon, Agusan.** Light earthquake felt.

24, 16h 40m [25, 0h 40m] **Aringay, La Union.** Earthquake. Three hours later there was another shock which registered in Manila.

24, 21h 31m [25, 7h 31m] **Guam, Mariana Islands.** Earthquake registered and perceived.

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24, 21h 50m [25, 5h 50m] **Benguet.** Earthquake felt at Bokod and Kapangan.

25, 5h 00m [25, 13h 00m] **Benguet.** Aftershock felt at Kapangan and Itogon. Several shocks at Tubao, La Union.

25, 17h 30m [26, 1h 30m] **Sagada, Bontoc.** Light earthquake. Another shock on the 26th at 20h 00m [27, 4h 00m].

25, 21h 30m [26, 5h 30m] **Bokod, Benguet.** Earthquake. Probably an aftershock of the Baguio earthquake of the 24th.

26, 14h 16m [26, 22h 16m] **Butuan, Agusan.** Very light earthquake of short duration.

27, 1h 00m [27, 9h 00m] **Benguet.** Another aftershock of the Baguio earthquake felt at Kapangan, Bokod and Itogon, and at Tubao, La Union.

27, 13h 55m [27, 21h 55m] **Romblon.** Light earthquake.

28, 3h 07m [28, 11h 07m] **Benguet.** Another aftershock felt in Baguio, Bokod, Aringay, Naguilian and Tubao.

29, 5h 20m [29, 13h 20m] **Sagada, Bontoc.** Light earthquake.

29, 13h 30m [29, 21h 30m] **Hinatuan, Surigao.** Slight earthquake.

29, 15h 36m 40s [29, 23h 36m 40s] **Baguio.** Light shock felt by a few persons.

30, 16h 46m 02s* [31, 0h 46m 02s] **NW Luzon.** Earthquake of intensity V felt at Vigan and with less intensity at Laoag, Pasuquin and Lubuagan. Epicenter probably in the China Sea.

31, 1h 35m [31, 9h 35m] **Cape Bojeador.** Light earthquake of short duration.

31, 21h 00m [Sept. 1, 5h 00m] **Zamboanga.** Light earthquake of four seconds duration.

31, 22h 40m [Sept. 1, 6h 40m] **Benguet.** Light earthquake at Bokod and Kapangan.

INSTRUMENTAL CHANGES

No.	Date	Phase	Time			△	Remarks
			h.	*m.*	*s.*	*Km.*	
402	2	PNE	4	28	59	1,675	1° N: 127° 30′ E by Batavia, Manila, Adelaide, Pelew. Data from the Wiechert. Galitzin disturbed by microseisms.
		SNE		31	50		
		F	5	00			
403	3	PNEZ	9	37	17	2,450	
		SNE		41	11		
		F	10	00			
404	4	PNEZ	5	14	30	2,300	Recorded at Guam, 250 km.
		SNE		18	14		
		F	6	03			
407	5	PNEZ	0	48	16	740	21° 10′ N: 120° 30′ E by Manila and Hong Kong. Baguio, 530 km.
		SNEZ		49	37		
		F	1	28			
408	5	$\overline{P}$NEZ	19	37	06	145	Compression.
		$\overline{S}$NE		37	24		
		F		47			
409	6	i$\overline{P}$NEZ	11	35	13	120	Dilatation. 14° 33′ N: 119° 54′ E, as on July 18th. Felt slightly at Ambulong, Batangas.
		$\overline{S}$NE		35	28		
		F		54			
414	11	PNEZ	11	53	54	2,200	Netherlands East Indies. 4° 42′ S: 111° 30′ E according to Batavia.
		SNEZ		57	31		
		F	12	11			
415	12	PNE	3	34	52	7,480	Z record defective. 53° N: 169° W, 0=3:23:57, by U. S. C. G. S. 52° N: 167° W, 0=3:24:09, by J. S. A.
		P_{R_2}		39	09		
		SNE		43	53		
		PSNE		44	15		
		S_{R_1}N		48	47		
		S_{R_2}E		51	39		
		LNE		56	36		
		F	5	55			
416	12	$\overline{P}$NEZ	22	01	27	125	
		$\overline{S}$NE		01	43		
		F		06			
417	13	i$\overline{P}$Z	14	41	36	150	Baguio, 130 km
		$\overline{P}$NE		41	36		
		$\overline{S}$NE		41	55		
		F	15	16			

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INSTRUMENTAL CHANGES—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
418	13	PNEZ	21 07 52	8,270	Felt in Stewart Island, south New Zealand.
		SNE	17 34		
		LNE	31 36		
		F	22 48		
419	14	PNEZ	0 49 04	2,790	Northern New Guinea by Amboina and Manila. 4° 12′ S: 138° 18′ E according to Batavia.
		SNEZ	53 22		
		LNE	56 05		
		F	1 31		
420	14	PNEZ	4 45 02	3.410	Data after P from the Wiechert. 27° N: 103° E: 0=4:39:30, by U. S. C. G. S. 27.5° N: 95° E, by Strasbourg.
		SNE	50 00		
		LNE	53 37		
423	16	$\overline{P}$NEZ	10 46 42	125	Dilatation. Felt at Baguio.
		$\overline{S}$NEZ	46 57		
		F	11 18		
424	17	PEZ	3 44 48	200?	Felt in Baguio with intensity V. Epicenter very near Baguio. Seismograph levers at Baguio disjoined by first impulse.
		iNEZ	45 46		
		F	57		
426	19	$\overline{P}$NEZ	8 52 32	200	Compression from the north. $\overline{S}$ from the Wiechert. Felt in Baguio with intensity IV. Seismograph levers at Baguio disjoined by first impulse.
		$\overline{S}$NEZ	52 58		
		F	9 45		
429	20	PZ	2 14 17	1,435	
		SNE	16 46		
		LNE	18 00		
		F	3 15		
430	20	PNE	8 11 48	255	
		SNF	12 24		
		F	20		
431	20	PZ	9 25 01	215	Dilatation. Epicenter less than 20 km. from Baguio.
		SNEZ	25 28		
		F	45		
432	21	iPZ	4 17 53	1,010	Dilatation. 23° 30′ N: 122° 30′ E by Manila, Zikawei, Hong Kong, Koti, Osaka, Riverview, Christchurch. Felt in east Formosa.
		iPNE	17 54		
		SNE	19 40		
		F	7 50		
433	21	PNEZ	9 07 07	325	
		SNE	07 50		
		F	30		
434	21	PNEZ	12 40 05	1,480	
		SNEZ	42 38		
		F	14 00		
436	21	PZ	16 16 17	435	Felt in Legaspi, SE Luzon, with intensity III.
		SNEZ	17 10		
		F	38		
438	22	iPZ	11 17 34	2,535	Compression. Felt in Weiheiwei and Tsingtao according to Nanking 35° 18′ N: 121° 18′ E according to Kobe.
		ePNE	17 34		
		SNE	21 34		
		LNE	23 45ca		
		F	13 00		
440	24	iPNEZ	12 11 07	205	Dilatation. $\overline{S}$ from the Wiechert. Seismograph in Baguio damaged. Felt throughout central and northern Luzon. Intensity VIII in Baguio. Epicenter about 15 km. to the west or northwest of Baguio.
		$\overline{S}$NE	11 32		
		F	14 00 ca		
441	24	PNE	16 39 58	440	
		SNE	40 52		
		F	51 ca		
450	29	PNEZ	8 05 25	226	Compression. S from the Wiechert.
		SNE	05 53		
		F	45		
452	29	ePZ	10 27 28	2,810	10° 42′ S: 117° 12′ E according to Batavia.
		SNE	31 47		
		F	11 08		
453	29	ePZ	12 46 30	205	
		SNE	46 56		
		F	53		
461	30	PEZ	16 46 02	340	Felt on northwest coast of Luzon.
		SE	46 46		
		$\overline{S}$N	46 52		
		F	17 07		
462	31	$\overline{P}$NEZ	8 14 08	135	
		$\overline{S}$NE	14 25		
		F	18		

In addition to the above there were thirty insignificant or undecipherable disturbances on the following days of August; 4th, 5th, 6th, 7th(2), 10th, 14th(2), 18th, 19th(2), 21st(2), 23rd, 24th(2), 25th(2), 26th(2), 27th, 29th(7), and 30th(2).

International Seismological Centre

SEPTEMBER, 1932

MACROSEISMIC RECORD

1, 2^h 26^m [1, 10^h 26^m] **Baguio.** Light earthquake felt by a few persons.

5, 16^h 28^m 27^s* [6, 0^h 28^m 27^s] **Benguet and La Union.** Light earthquake felt at Baguio, Tubao and Aringay.

6, 2^h 29^m [6, 10^h 29^m] **Vigan, Ilocos Sur.** Earthquake of intensity III and duration of six seconds.

6, 23^h 14^m 09^s* [7, 7^h 14^m 09^s] **Ambulong, Batangas.** Feeble earthquake perceived.

9, ... **Davao.** Slight earthquake felt at Lais and Malita in the morning. Exact time not given.

12, 0^h 11^m [12, 8^h 11^m] **Baguio.** Light earthquake felt at Mirador Observatory, Baguio.

15, 5^h 28^m 14^s [15, 15^h 28^m 14^s] **Guam, Mariana Islands.** Earthquake recorded and felt at Agaña, Guam.

15, 11^h 15^m 38^s* [15, 19^h 15^m 38^s] **SW Mindanao and Sulu.** Strong earthquake having its center in the Celebes Sea was felt with intensity V–VI in Jolo. Also felt in Zamboanga and Basilan. In Jolo, people were thrown off their feet, movable objects were thrown down and the glass of the light house was broken. An aftershock occurred two minutes later. Still another was felt in Jolo at 11^h 25^m [19^h 25^m]. Another strong shock occurred at 11^h 57^m 07^s* [19^h 57^m 07^s] having intensity IV in Jolo. Also felt in Cotabato to the northeast and in Siasi Island to the south of Jolo.

Light aftershock at Zamboanga at 12^h 12^m G. M. T. Aftershocks were felt at Jolo on the 15th at 12^h 54^m; 13^h 24^m; 14^h 17^m; 20^h 40^m G. M. T. and at 3^h 07^m G. M. T. on the 16th. Still another shock was felt at 18^h 00^m G. M. T. on the 21st.

17, 3^h 07^m [17, 11^h 07^m] **Baguio.** Light shock felt at Mirador Observatory. Probably an aftershock of the earthquake of August 24th.

19, 3^h 28^m [19, 11^h 28^m] **Benguet.** Light shock felt at Baguio and Kapangan.

22, 10^h 55^m [22, 18^h 55^m] **Negros.** Very light earthquake of one second duration felt at Bacolod and Murcia.

26, 5^h 20^m 09^s* [26, 13^h 20^m 09^s] **E Mindanao.** Earthquake felt throughout the whole eastern Mindanao. The greatest intensity seems to have been V or VI in the upper Agusan Valley. It caused some alarm in Butuan.

27, 1^h 38^m [27, 9^h 38^m] **Catanduanes.** Light earthquake at Baras.

29, 1^h 45^m [29, 9^h 45^m] **Cateel Davao.** Light shock felt.

30, 3^h 45^m [30, 11^h 45^m] **E Mindanao.** Light shock felt at Hinatuan and Talacogon. Probably an aftershock of the earthquake of the 26th.

30, 17^h 45^m [October 1, 1^h 45^m] **Jolo.** Earthquake of intensity II and duration of three seconds. Another shock at 20^h 20^m [October 1, 4^h 20^m].

International Seismological Centre

INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
463	1	PNEZ	1 58 35	2,745	Compression.
		SNE	2 02 50		
		F	32		
465	2	PNEZ	13 01 15	2,920	Compression. 21° N; 148° E by Manila and Osaka. Felt in the Bonins according to Kobe.
		SNEZ	05 42		
		F	48		
468	3	PNEZ	12 05 26	3,695	In region of 39° N: 147° E by Koti, Nagasaki, Osaka, Zikawei, Chiufeng, Manila, Hong Kong, Pasadena. ESE of Siriyazaki according to Nagasaki. 41° 06′ N: 142° 48′ E according to Tokyo.
		SNE	10 43		
		LNE	14 51		
		F	14 04		
478	6	$\overline{P}$NEZ	23 14 09	165	Compression. Felt at Ambulong, Batangas.
		$\overline{S}$NE	14 30		
		F	25		
479	7	$\overline{P}$NEZ	0 54 56	345	
		$\overline{S}$NE	55 47		
		F	1 07		
487	9	PNEZ	6 50 32	2,090	Laboeha, Batjan, Moluccas, according to Batavia.
		SNE	54 00		
		LNE	55 38		
		MNE	57 40ca		
		F	8 18		
489	9	PNEZ	13 43 35	2,165	Compression. Data after P from the Wiechert. 3.57° S: 128.35° E, according to Batavia.
		SNE	47 09		
		LNE	49 ca		
		MNE	51 ca		
		F	15 38		
490	9	PN	22 34 41	1,480	
		SNE	37 14		
		F	52		
491	9	PNEZ	23 04 54	2,365	
		SNE	08 43		
		LNE	10 50		
		F	46		
493	10	PNEZ	22 52 54	1,255?	Felt in southern and south Taiwan, according to Taihoku
		S?NE	55 04		
		L?E	56 14		
		F	23 21		
495	11	PNEZ	4 19 36	1,415	Do.
		SNE	22 03		
		LNE	23 21		
		MNE	24 46		
		F	52		
497	11	PNEZ	14 21 16	4,820	Turkestan.
		SNEZ	27 42		
		LN	34 ?		
		MNE	37 30ca		
		F	15 13		
507	15	PNE	11 15 38	960	Felt in SW Mindanao and Sulu Archipelago. Intensity VI in Zamboanga and Jolo. In region of 5° 20′ N and 122° E. Data from the Wiechert. Disturbed by microseisms.
		SNE	17 20		
		F	12 17		
508	15	P?NE	11 57 07		Aftershock. Felt at Zamboanga, Jolo, Cotabato and Siasi Island. From the Wiechert. No. 507 still recording.
513	18	$\overline{P}$NEZ	11 58 20	75	Disturbed by microseisms.
		$\overline{S}$EZ	58 30		
515	19	$\overline{P}$NE	1 13 51	95	From the Wiechert.
		$\overline{S}$NE	14 03		
		F	16		
516	19	PNEZ	2 47 42	950?	
		S?N	48 23		
		F	3 07		
520	20	PNEZ	15 49 44	4,465?	Disturbed by microseisms.
		SNE?	55 48		
		LNE?	16 00 ca		
		F	45		
525	23	PZ	14 28 27	3,520	In region of 41° N: 141° E. Data after P from the Wiechert. 45° N: 134° E, by U. S. C. & G. S.
		PNE	28 29		
		iSNE	33 34		
		LNE	37 22		
		MNE	40 ca		
		F	17 09		

International Seismological Centre

INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	Δ	Remarks
			h. *m.* *s.*	*Km.*	
533	25	PNEZ	9 00 52	8,175?	
		S?NE	10 29		
		F	10 07		
537	25	PNEZ	22 04 34	2,065	Dilatation. Felt in Pelew Island.
		SNE	08 00		
		LNE	09 42		
		F	23 54		
538	25	$\overline{P}$NEZ	22 41 54	140	No. 537 still recording.
		$\overline{S}$NE	42 12		
539	26	PNEZ	5 20 09	1,030	Felt in eastern Mindanao.
		SNE	21 58		
		mN	23 40		
		mE	23 42		
		F	6 30		
541	26	PNEZ	19 33 26	9,425	Greece. 40.5° N: 24° E by Strasbourg.
		SNE	44 00		
		LNE	20 01 20		
		MNE	07 56		
		F	23 05		
550	28	PNEZ	11 06 20	250	Compression.
		$\overline{S}$NEZ	06 55		
		F	19		
556	28	$\overline{P}$EZ	22 22 46	235	
		$\overline{S}$NE	23 18		
		F	32		
557	29	iPZ	0 31 00	2,310	Dilatation. Netherlands East Indies.
		ePNE	31 00		
		SNEZ	34 45		
		LE	36 51		
559	29	PEZ	4 10 04	9,055	Greece. Aftershock of No. 541. L and M not definite.
		PN	10 06		
		SNE	20 23		
		F	5 48		
565	29	PNEZ	17 54 22	4,435	No. 564 still recording. 47° N: 154° E by J. S. A. 46° N: 152° E by U. S. C. G. S.
		SNE	18 00 25		
		LNE	05 50		
		F	20 23		

In addition to the above there were eighty insignificant or undecipherable disturbances on the following days of September: 1st, 3rd(2), 4th(4), 5th(5), 7th(3), 8th(4), 9th, 10th, 11th(6), 13th(3), 14th(2), 15th, 17th(3), 18th, 19th, 20th(2), 21st, 22nd, 23rd(2), 24th(4), 25th(6), 26th(3), 27th(5), 28th(6), 29th(6), and 30th(6).

International Seismological Centre

OCTOBER, 1932

MACROSEISMIC RECORD

1, $3^h\ 45^m$ [1, $11^h\ 45^m$] **Hinatuan, Surigao.** Light shock.

1, $6^h\ 19^m$ [1, $14^h\ 19^m$] **Cape Bojeador.** Earthquake of intensity II, duration five seconds.

3, $8^h\ 53^{m*}$ [3, $16^h\ 53^m$] **Jolo.** Earthquake of intensity III, duration three seconds. Another shock of the same nature at $19^h\ 02^m\ 01^{s*}$ [4, $3^h\ 02^m\ 01^s$].

5, $1^h\ 54^m\ 45^{s*}$ [5, $9^h\ 54^m\ 45^s$] **Basco, Batan Islands.** Earthquake of intensity II, duration six seconds.

5, $13^h\ 00^m$ [5, $21^h\ 00^m$] **Jolo.** Feeble earthquake. Another feeble shock at $10^h\ 58^m$ [$18^h\ 58^m$].

6, $20^h\ 23^m$ [7, $4^h\ 23^m$] **Talacogon, Agusan.** Slight shock.

10, $11^h\ 10^m$ [10, $19^h\ 10^m$] **Lamitan, Basilan.** Slight shock.

12, $7^h\ 04^m$ [12, $15^h\ 04^m$] **Virac, Catanduanes.** Moderate shock.

12, $10^h\ 21^m\ 07^{s*}$ [12, $18^h\ 21^m\ 07^s$] **Mindanao and Sulu.** Very light earthquake felt in Zamboanga and Jolo. Another shock of intensity IV felt in same place at $11^h\ 09^m\ 04^{s*}$ [$19^h\ 09^m\ 04^s$].

13, $23^h\ 48^m$ [14, $7^h\ 48^m$] **Jolo.** Very feeble earthquake.

18, $10^h\ 47^m$ [18, $18^h\ 47^m$] **Tacloban, Leyte.** Earthquake of intensity III and duration three seconds.

22, $16^h\ 19^m\ 15^{s*}$ [23 $0^h\ 19^m\ 15^s$] **Baguio.** Very light shock.

29, $3^h\ 54^m$ [29, $11^h\ 54^m$] **Cape Bojeador.** Earthquake of intensity III and duration five seconds.

International Seismological Centre

INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
575	1	PEZ	15 12 31		Felt in the Bonins according to Kobe.
		SNE?	15 44		
		F	46		
578	2	P'Z	3 18 40	14,065?	12° N: 86° W by U. S. C. G. S. 10.9° N: 86.5° W by J. S. A. Disturbed by microseisms.
		P'NE	18 43		
		SPSE?	40 34		
		iNE	4 00 11		
		LNE	07 ca		
		MNE	18 ca		
		F	5 44 ca		
582	3	PEZ	4 57 22	400	
		$\overline{S}$NE	58 23		
		F	5 07		
583	3	PZ	5 14 11	200	
		PNE	14 13		
		$\overline{S}$NEZ	14 37		
		F	20		
593	9	PNEZ	12 52 00	1,085	24.2° N: 122.5° E according to Taihoku. Confirmed by Manila, Hong Kong, Chiufeng.
		SNE	53 54		
		LNE	54 49		
		ME	57 47		
		F	14 10		
601	12	PEZ	16 18 10	2,560	Disturbed by microseisms.
		SNE	22 12		
		F	37		
602	12	PNEZ	19 48 08	3,160?	Do.
		S?NE	52 51		
		F	20 24		
616	15	e$\overline{P}$NE	23 12 44	125	Dilatation.
		i$\overline{P}$Z	12 44		
		$\overline{S}$NE	13 00		
		F	23		
617	16	iPZ	12 19 29	7,890	Compression 54° N: 158° W by U. S. C. G. S. 55° N: 155° W by J. S. A.
		ePNE	19 29		
		SNE	28 52		
		PSNE	29 18		
		PPPSE	29 34		
		LNE	42 ca		
		MNE	47 30ca		
		F	14 44		
621	17	PNEZ	13 33 10	4,880	In region of New Britain by Manila and Riverview.
		SNE	39 39		
		LNE	46 00ca		
		F	15 25		
624	18	PNEZ	4 13 13	1,635	Compression from SE. Data after P from the Wiechert. Netherlands East Indies. 0°: 124° 30' E according to Batavia.
		SNE	16 03		
		F	55		
651	21	PNEZ	18 27 30	1,700	
		SNE	30 26		
		LNE	31 50ca		
		F	20 10		
653	23	P?NEZ	0 15 35		Strong in Ceram, N. E. I.
		F	1 25		
654	23	$\overline{P}$NE	9 57 02	95?	From the Wiechert. Disturbed by strong microseisms.
		$\overline{S}$?NE	57 14		
		F	10 00		
662	30	PZ	20 58 22	8,235	Compression. 54° N; 156° W by U. S. C. G. S. 54° N: 155° W by J. S. A.
		PNE	58 23		
		SNE	21 08 02		
		LNE	22 34		
		F	23 10		
664	31	PNEZ	8 20 49	270	Disturbed by microseisms.
		$\overline{S}$NEZ	21 27		
		F	24		

In addition to the above there were seventy-seven insignificant or undecipherable disturbances on the following days of October: 1st(4), 2nd(2), 3rd(5), 4th, 5th, 7th(2), 9th(3), 10th(3), 12th(3), 13th, 14th(7), 15th(5), 16th, 17th(3), 18th(3), 19th(11), 20th(7), 21st(6), 22nd, 23rd, 24th(3), 25th, 29th(2), and 31st.

International Seismological Centre

NOVEMBER, 1932

MACROSEISMIC RECORD

1, $8^h\ 31^m\ 09^s$* [1, $16^h\ 31^m\ 09^s$] **Calbayog, Samar.** Earthquake of intensity III and duration nine seconds. Epicenter in the Samar Sea.

11, $2^h\ 20^m$ [11, $10^h\ 20^m$] **Baguio.** Earthquake felt by few persons.

13, $4^h\ 36^m$ [13, $12^h\ 36^m$] **Tacloban, Leyte.** Very feeble shock. Stronger in towns south of Tacloban.

14, $1^h\ 12^m\ 40^s$* [14, $9^h\ 12^m\ 40^s$] **Leyte and Samar.** Very strong shock in Tacloban. Intensity VI accompanied by loud noise. Duration about fifty seconds. In Palo the intensity was greater than in Tacloban. Epicenter in Philippine Deep.

17, $9^h\ 55^m\ 12^s$ [17, $19^h\ 55^m\ 12^s$] **Guam, Mariana Islands.** Earthquake recorded and felt.

20, $14^h\ 36^m$ [20, $22^h\ 36^m$] **Surigao, Mindanao.** Earthquake of intensity II and duration of eight seconds.

21, $22^h\ 28^m\ 59^s$* [22, $6^h\ 28^m\ 59^s$] **Basco, Batan Islands.** Earthquake of intensity II and duration of eight seconds.

22, $13^h\ 26^m$ [22, $23^h\ 26^m$] **Guam, Mariana Islands.** Light earthquake felt at Agaña and Sumay.

25, $5^h\ 45^m$ [25, $13^h\ 45^m$] **Talacogon, Agusan.** Slight earthquake.

25, $13^h\ 20^m$ [25, $21^h\ 20^m$] **Cotabato, Mindanao.** Earthquake of intensity II felt at Cotabato and Bual.

27, $12^h\ 29^m$ [27, $20^h\ 29^m$] **Odiongan, Tablas.** Earthquake of intensity II.

28, $7^h\ 57^m$ [28, $15^h\ 57^m$] **Cape Bojeador.** Earthquake of intensity II and duration of four seconds.

International Seismological Centre

INSTRUMENTAL RECORD

No.	Date	Phase	Time			Δ	Remarks
			h.	*m.*		*Km.*	
665	1	ePNEZ	8	31	09	470	Felt in Calbayog, Samar. Epicenter near 11° 50′ N; 124° 10′ E by Manila and Butuan.
		SNE		32	05		
		F		45			
669	2	ePNEZ	11	22	40	13,870?	Disturbed by microseisms. P′ in minute gap. 23° S: 111° W by U. S. C. G. S. and J. S. A.
		iP′NE		26	00		
		$\overline{S_cP_cP_cS}$		34	31		
		LNE	12	06	ca		
		MNE		16	06		
		F	13	30			
671	3	PZ	19	47	53	2,665	Dilatation. 17° 30′ N: 145° 30′ E by Manila, Hong Kong, Chiufeng, Koti.
		PNE		47	56		
		PRIN		48	33		
		iE		48	46		
		SNEZ		52	03		
		LNE		56	30		
		F	21	09			
672	4	ePNEZ	8	15	37	295	
		SNE		16	17		
		mN		18	06		
		F		27			
679	6	$e\overline{P}$NEZ	21	51	13	135	
		$i\overline{S}$NE		51	30		
		F	22	20			
682	8	$\overline{P}$NEZ	1	18	40	180	From November 8th to 16th the Galitzin records were illegible because of large microseisms set up by a typhoon in the Pacific, east of Luzon.
		$\overline{S}$NEZ		19	03		
692	13	PNE	4	53	02	3,245	From the Wiechert. Disturbed by microseisms. 41° N; 135° E, deep focus, by J. S. A. 43° 30′ N: 137° 18′ E by Kobe. 45° N: 137° E, by U. S. C. G. S.
		SNE		57	50		
		LNE	5	01	14		
		iE		02	55		
		F		30	ca		
693	14	ePNE	1	12	40	630	From the Wiechert. Felt in Samar and eastern Leyte. Epicenter probably in the Gulf of Leyte.
		SNE		13	51		
		$\overline{S}$NE		14	21		
		mN		15	01		
		F		22			
695	18	$\overline{P}$NE	2	49	55	130	From the Wiechert.
		$\overline{S}$NE		50	12		
		F		55			
696	18	iPNEZ	13	50	13		Compression from the SE. Phases after P from the Wiechert. S unrecognizable. Felt in Ternate and Minahasa, N. E. I. 1° 12′ N: 125° 42′ E by Batavia. Probably deep focus.
		mE		52	50		
		mN		52	56		
		F	14	46			
702	21	PNEZ	22	28	59	650	Felt at Basco, Batan Islands.
		SNE		30	12		
		$\overline{S}$NE		30	42		
		mE		31	56		
		F		46			
704	22	iPZ	14	56	14	2,585	Compression. 7° 30′ S; 128° E by Batavia.
		ePNE		56	14		
		SNE	15	00	17		
		F	16	00			
708	26	iPZ	4	30	36	3,610	Dilatation. 42° 24′ N: 142° 18′ E by Taihoku.
		ePNE		30	36		
		SNE		35	48		
		LNE		39	45		
		F	6	10			
709	27	PNEZ	3	42	47	3,145	29° N: 147° E by Manila, Zikawei, Chiufeng.
		SNE		47	29		
		LNE		50	41		
		MN		54	ca		
		F	4	46			
712	27	$\overline{P}$NEZ	7	52	09	125	
		$\overline{S}$NE		52	25		
		F		56			
714	29	$\overline{P}$NE	9	51	10	150	From the Wiechert. Baguio, △=165 km.
		$\overline{S}$NE		51	29		
		F		54			

In addition to the above there were thirty-six insignificant or undecipherable disturbances on the following days of November: 1st(3), 3rd, 4th(2), 5th(2), 6th(2), 8th(9), 10th, 12th, 16th, 18th, 19th(3), 21st, 22nd, 25th(3), 27th(3), 29th, and 30th.

International Seismological Centre

DECEMBER, 1932

MACROSEISMIC RECORD

2, 2h 05m [2, 10h 05m] **Lubuagan, Mountain Province.** Slight shock.

2, 11h 43m 08s* [2, 19h 43m 08s] **Benguet and La Union.** Earthquake of intensity IV in Baguio. Also felt at Kapangan, Tubao and Aringay.

2, 23h 30m [3, 7h 30m] **Lubuagan, Mountain Province.** Slight shock.

3, 6h 30m [3, 14h 30m] **Pandan, Catanduanes.** Slight shock.

4, 8h 14m 13s* [4, 16h 14m 13s] **Mindanao and Sulu.** Earthquake of intensity IV at Zamboanga. Felt over the same area of Mindanao and Sulu Archipelago as the earthquake of September 15th. Aftershock at 10h 35m 56s* [18h 35m 56s].

6, 20h 20m [7, 4h 20m] **Kapangan, Benguet.** Light shock.

6, 23h 45m 18s* [7, 7h 45m 18s] **Benguet.** Very light shock felt at Bokod, Baguio and Itogon. Another shock on the 12th over the same area at 16h 54m 55s* [13, 0h 54m 55s].

16, 7h 16m 49s* [16, 15h 16m 49s] **Mindanao.** Moderate earthquake felt throughout eastern Mindanao from Butuan, Agusan, to Malita in Davao. Epicenter in the southern part of the Philippine Deep.

21, 0h 04m [21, 8h 04m] **Talacogon, Agusan.** Slight shock.

22, 13h 53m [22, 23h 53m] **Guam, Mariana Islands.** Light shock recorded and felt at Agaña. Another light shock felt at Agaña and Sumay at 18h 16m [23, 4h 16m]. Still another shock at Agaña at 12h 35m [22h 35m].

25, 2h 10m [25, 10h 10m] **Baguio.** Shock of intensity I.

27, 8h 45m 36s* [27, 16h 45m 36s] **Kagotungan, Pilar, Abra.** Slight earthquake.

28, 11h 39m 57s* [28, 19h 39m 57s] **Iba, Zambales.** Earthquake of intensity III and duration of four seconds.

28, 18h 18m 13s* [29, 2h 18m 13s] **Basco, Batan Islands.** Earthquake of intensity III and duration of six seconds.

29, 5h 58m [29, 13h 58m] **Baguio.** Earthquake of intensity I.

29, 11h 30m [29, 19h 30m] **Mangatarem, Pangasinan.** Light earthquake of ten seconds duration.

29, 20h 34m [30, 4h 34m] **Talacogon, Agusan.** Slight earthquake.

30, 20h 31m 52s* [31, 4h 31m 52s] **Tacloban, Leyte.** Earthquake of intensity VI and duration thirty-eight seconds. Sleepers awakened.

INSTRUMENTAL RECORD

No.	Date	Phase	Time	△	Remarks
			h. m. s.	*Km.*	
717	2	PNE	2 34 31	930	
		SE	36 10	----------	
		F	42	----------	
718	2	PNEZ	11 43 08	270	Felt at Baguio with intensity IV.
		$\overline{S}$NEZ	43 46	----------	
		F	49	----------	
720	3	ePNEZ	6 31 12	----------	Felt in Apia, Samoa.
		S?E	41 43	----------	
		iN	45 51	----------	
		F	7 15	----------	
723	4	PNEZ	8 14 13	1,410	Dilatation. Phases after P from the Wiechert. Felt at Zamboanga and Jolo, P. I. with intensity IV. Felt at Minahasa and in east Borneo, N. E. I. 2° 6′ N: 121° 54′ E by Batavia.
		P_{R1}	14 20	----------	
		SNE	16 40	----------	
		LNE	18 10	----------	
		F	10 00	----------	

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INSTRUMENTAL RECORD—Continued

No.	Date	Phase	Time	△	Remarks
			h. *m.* *s.*	*Km.*	
724	4	PNEZ	10 35 56	1,545	Felt at Jolo, P. I., with intensity III. Felt at Menado and east Borneo, N. E. I. 2° 54′ N: 121° 48′ E by Batavia.
		SNE	38 36		
		F	11 40		
					December 5th to 8th, inc. Galitzin records illegible because of large microseisms set up by typhoon and monsoon.
734	11	PNEZ	8 56 43	550	Disturbed by microseisms.
		$\overline{S}$NE	58 09		
		F	9 08		
736	15	PNEZ	19 35 15	670	Phases after P from the Wiechert. Felt at Taito, Formosa. 20° 30′ N; 120° E by Manila, Hong Kong and Zikawei.
		SNE	36 29		
		mN	37 01		
		mE	38 08		
		F	20 10		
737	16	PNE	7 16 49	1,230	Felt at Davao, intensity III, and at Butuan, intensity I. 5° 30′ N: 127° 40′ E by Manila and Batavia.
		SNE	18 58		
		F	30		
738	20	PNEZ	7 16 54	580	
		SNE	18 00		
		F	25		
740	20	iPZ	15 17 34	1,200	Dilatation. 5° N: 126° E by Manila, Batavia, Amboina, Pelew.
		ePNE	17 34		
		SNE	19 38		
		LNE	20 14		
		F	16 10		
742	21	P′NEZ	6 28 26	11,500	Galitzin horizontal records undecipherable after PS because of overlapping swings. Conspicuous group of waves of 26 seconds period on Z component from 6:58 to 7:03. Epicenter in Nevada, U. S. 38° 6′ N: 118° 30′ W by J. S. A.
		PSNE	37 31		
		F	9 38		
747	24	PNEZ	6 36 50	3,510	Dilatation. After P from the Wiechert. 6° S: 145° E by Guam, Manila, Zikawei, Hong Kong, Chiufeng, Koti.
		SNE	41 55		
		LNE	45 30ca		
		F	7 57		
749	25	iPNEZ	2 11 04	3,670	Compression from NW. Phases after P from the Wiechert. 38° 30′ N: 95° 30′ E by 17 stations giving residuals of 10 seconds or less.
		SNE	16 19		
		LNE	20 19		
		MNE	23 30ca		
		F	4 43		
757	26	PNEZ	16 10 10		East of Taito according to Taihoku.
		S?NE	12 24		
		LNE	13 50ca		
		F	26		
761	26	PNEZ	21 17 36	1,480	Compression from the north. 25° 12′ N: 126° 18′ E by Taihoku.
		SNE	20 09		
		F	22 00		
762	26	PNEZ	22 35 45	1,745	Southeast of Titi, Bonins, by Zinsen.
		SNE	38 40		
		LNE	40 10		
		MNE	42 00		
		F	23 28		
763	27	PNEZ	8 45 36	390	
		SNE	46 24		
		F	9 02		
764	27	PNEZ	10 20 13	220	
		$\overline{S}$NE	20 42		
		F	25		
766	28	$\overline{P}$NEZ	11 39 57	135	Compression. Felt at Iba, west coast of Luzon.
		$\overline{S}$NE	40 14		
		F	54		
768	28	PNEZ	18 18 13	710	Felt at Basco, Batan Islands.
		SNE	19 32		
		ME	23 40		
		F	40		
774	30	iPNEZ	20 31 52	595	Compression from SE. Felt at Tacloban with intensity VI.
		SNE	33 00		
		F	56		

In addition to the above there were thirty-seven insignificant or undecipherable disturbances on the following days of December: 2nd, 3rd, 4th, 6th, 7th, 8th, 9th(2), 10th(3), 11th, 12th, 20th(2), 23rd(2), 24th(3), 25th(7), 26th(3), 28th(2), 30th(4), and 31st.

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THE BENGUET EARTHQUAKE OF AUGUST 24TH, 1932

By W. C. Repetti, S. J.
Chief, Seismic Division, Manila Observatory

Northern Luzon was shaken by an earthquake about 8.10 p. m. on the night of Wednesday, August 24th. Telegraphic reports made it evident that the center of the disturbance was in the vicinity of Baguio. Some shocks had been felt there during the preceding week.

FORESHOCKS

August 16th	6.46 p. m.	Felt with intensity IV.
August 17th	11.45 a. m.	Felt with intensity V.
August 19th	4.52 p. m.	Felt with intensity IV.
August 20th	1.15 a. m.	Felt with intensity IV.
August 20th	1.21 a. m.	Felt with intensity IV.
August 20th	5.24 p. m.	Felt with intensity IV.
August 21st	10.51 p. m.	Felt with intensity IV.

PRINCIPAL SHOCK

The principal shock was recorded at Manila at 12:11:07, G.M.T. (8:11:07 p. m., Standard Time). The time at the epicenter was very closely 12:10:35, G.M.T. The pens of the Wiechert and Omori seismographs were disjointed or dislocated by the transverse waves. The Galitzin trace became too faint to follow after the first few vibrations. The Wiechert seismograph at Baguio had both pens dislocated, one thrust arm hinge broken, one damper connecting wire broken, and the component parts of the mass jolted out of position. The horizontal component pendulum of the Vicentini had its support bent by the vertical component of the earth movement to such an extent that the pendulum came down on the arresting platform and broke the rod in the bottom of the pendulum. The vertical component pendulum remained in operation.

MACROSEISMIC AREA

The main shock was felt with intensity VII in Baguio and the immediate vicinity. Over an area of about 50 km. radius around Baguio the intensity was V–VI. The limit of the macroseismic area was about 250 km. from Baguio, from Aparri on the north to about Ambulong on the south.

EPICENTER

The macroseismic evidence points to a location between west and northwest of Baguio. Many objects in Baguio fell to the east or southeast and the meteorological observer in San Fernando noted that the first motion was in a north-northwest-south-southeast direction. These indications are in agreement with the first motion of the seismographs of Manila and Baguio which indicated a dilatation. The dilatation at Baguio was in a northwest direction. Moreover, at Bayombong, Infanta, Dagupan, and Bangued where the shock was oscillatory (transverse waves) the directions noted were at right angles to lines drawn to the location mentioned above.

The seismic records of the foreshocks and aftershocks at Baguio showed a phase interval of about 2.5 seconds, indicating an epicentral distance less than 20 kilometers.

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The phase interval of the Manila records indicated a distance of about 215 kilometers.

The coördinates of the epicenter were fixed as 16° 25′ N and 120° 30′ E.

Time at epicenter, $12^h\ 10^m\ 35^s$, G. M. T.

The following microseismic data were obtained.

Observatory	Distance	P Observed	Observed–Calculated
Manila	213 km.	12:11:07	0s
Hong kong	8° 24′	12:12:36	—3s
Phu-Lien	13° 51′	12:13:55	+1s
Pelew	16° 24′	12:14:32	+5s
Nagasaki	18° 24′	12:14:50	—2s
Koti	20° 46′	12:15:16	—6s
Kobe	22° 30′	12:15:37	—5s
Medan	25° 00′	12:16:08	—2s
Batavia	26° 20′	12:16:22	—2s
Vienna	86° 52′	12:23:16	—5s
Hamburg	88° 26′	12:34:00 ($\overline{S_c P_c S}$)	+1s
Stuttgart	91° 00′	12:23:42	—1s

DAMAGE

Mirador Observatory.—A retaining wall corner about seven feet in height slumped down. A few slight cracks in plaster. Two small patches of plaster dislodged. Some movable objects overturned.

Zig Zag Hotel.—Retaining wall bulged. Some very small cracks in wall of building just above ground level. Some very small cracks in cement pavement.

Steward Building.—A new structure of concrete. Small crack appeared in one column.

Camp John Hay.—About ₱1,000 worth of medicines were destroyed in the hospital. The Post Exchange and Commissary suffered losses of a few hundred pesos. Dishes and bric-a-brac in officers' quarters broken.

Stores in the city suffered several thousands pesos loss in broken stock.

Camp One (Klondyke's).—A corner of the swimming pool cracked. This wall is of concrete about three feet thick and six to seven feet deep. The belt of the dynamo was thrown off.

Baguio Hydro-Electric Plant.—Eight kilometers west of Baguio. Flume section broken by falling boulders. Damage not serious.

Bauang.—The storage batteries in the railroad station, used for telegraphy and yard lighting, were overturned.

The facade of the church was cracked from the top of the door to the peak of the roof. Some plaster was dislodged from a side wall. The rectory was very badly damaged but this can not be taken as a criterion of the severity of the earthquake. The roof and porch beams had been honeycombed by anay and the wonder is that they had not fallen long ago. The walls were of rubble masonry and many buttresses were of thin brick laid in thick layers of mortar. The second floor of the buildings was rendered uninhabitable and dangerous by the falling of the walls in several places and the sagging of the roof.

San Fernando.—A lumber shed filled with lumber was overturned. It is said to have been in poor condition and the loose lumber probably fell against the sides.

La Union Province.—The municipalities of the province reported a combined loss of ₱3,500 (up to August 29th), exclusive of the rectory and church in Bauang.

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ROADS

The Kennon Road was blocked for a few hours by a dislodged boulder which landed squarely between two large boulders remaining from the big slide of 1911. A few sticks of dynamite cleared the obstruction.

The Naguilian Road was blocked for a few hours by a rock slide at Kilometer 20 from Baguio. The material came down out of a V-shaped space between two fissures where weathering had taken place. The District Engineer of the La Union Province reported several slides and cracks on the Naguilian Road between Ribsuan and the Benguet boundary. This is a section of heavy grades and zig-zags where the road descends from the ridge to the valley of the Ribsuan river. The writer passed over this road four days after the earthquake and observed that none of the slides were as large as that at Kilometer 20. The cracks must have been very small because they were not sufficient to attract the attention of one who had not been informed of them.

DAKLAN HOT SPRINGS

A report that caused some apprenhension in Baguio was to the effect that the Daklan hot springs near Bokod were giving out lava. An investigation by a reliable person revealed that no change whatever had been observed in the condition and flow of the springs.

AFTERSHOCKS

The Vicentini vertical component seismograph recorded shocks of varying degrees of intensity at the following times during the night of the 24th and the morning of the 25th.

8.11 p. m.	11.05 p. m.
8.38 p. m.	11.12 p. m.
9.00 p. m.	11.40 p. m.
9.20 p. m.	3.14 a. m.
9.33 p. m.	3.24 a. m.
9.41 p. m.	5.27 a. m.

Many of these shocks were perceptible, those at 11.12 p. m. and at 3.24 a. m. being reported as especially strong. These two were reported felt in Bacnotan, 60 kilometers to the northwest of Baguio. The Vicentini driving clock gave some trouble on the 25th and 26th. During this time four shocks appear on the vertical record. It is possible that there were other shocks whose traces were superimposed while the record was not in motion.

August 27th	8.15 a. m.	Vertical shock of intensity III.
August 28th	10.03 a. m.	Recorded on Vicentini vertical.
August 28th	11.07 a. m.	Horizontal shock of intensity III.
August 28th	5.48 p. m.	Recorded on Wiechert. Felt by some.
September 1st	6.32 a. m.	
September 1st	10,26 a. m.	
September 3rd	10.08 a. m.	
September 3rd	10.23 a. m.	
September 3rd	6.08 p. m.	
September 6th	00.29 a. m.	Intensity III.
September 6th	01.04 a. m.	
September 8th	1.08 p. m.	
September 10th	8.48 p. m.	
September 12th	8.11 a. m.	
September 13th	8.36 a. m.	
September 17th	11.06 a. m.	
September 17th	11.09 a. m.	Intensity I.
September 19th	11.28 a. m.	" "
September 28th	00.17 a. m.	

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PREVIOUS STRONG EARTHQUAKES

August 23rd 1913.—Intensity VII in Baguio. Epicenter probably near Bokod, northeast of Baguio. Aftershocks until September 26th.

October 8th 1920.—Intensity VII in Baguio. Epicenter probably on the western slope of Santo Tomas mountain.

January 14th–16th 1929.—Intensity V in Baguio. Epicenter bear Bokod.

THE BAGUIO REGION

A brief description of the formation of the Baguio region is given by Smith and Eddington in the Philippine Journal of Science, Volume 6, No. 6, in an article entitled "Notes on the Economic Geology of the Baguio Mineral District". It is as follows:

The Baguio region was comparatively high ground when that about Manila and the Visayan Islands was under water. The rocks consisted of diorite. This land mass was eroded, the sediments being deposited in the sea round it. A volcanic period set in during which andesite flows spread over the country covering the sediments where they overlapped the basal mass. The region then sank. A reef building period then ensued and considerable limestone was deposited. At the close of the Miocene the land began to rise. This was the Miocene revolution and the elevation amounted to about 1,500 meters.

The epicenter of the present earthquake was on the western slope of this uplift.

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JULIO, 1932

9, 20h 26m 24s* [10, 4h 26m 24s] **SE de Mindanao.** Temblor sentido con intensidad III en Dávao, y también hacia el norte en Hinatuan y Talacogon. Su origen se hallaba entre Mindanao y los Países Bajos, Indias Orientales.

11, 8h 22m 45s* [11, 16h 22m 45s] **Sámar y SE de Luzón.** Temblor sentido hacia el norte de Sámar como también en Legaspi, SE de Luzón. Su origen se hallaba en el Abismo de Filipinas, al este del norte de Sámar.

13, 14h 39m [13, 22h 39m] **Catanduanes.** Ligero temblor oscilatorio sentido en Virac.

18, 5h 02m 26s* [18, 13h 02m 26s] **W de Luzón.** El origen del temblor se hallaba en el Mar de la China, 130 kilómetros al W de Manila. Intensidades de IV y V se experimentaron en Manila. También se sintió en Boac, Marinduque, hacia el SE, en las costas del norte de Mindoro y en la provincia de Tárlac. Dos personas fueron heridas en Balanga, Bataan. Grande excitación tuvieron los de Manila por el temblor.

26, 16h 40m 08s* [27, 0h 40m 08s] **SE de Luzón.** Ligero temblor de corta duración sentido en Daet.

29, 5h 35m [29, 13h 35m] **Masbate.** Temblor de intensidad II.

31, 4h 11m [31, 12h 11m] **NW de Luzón.** Ligero temblor sentido en Cabo Bojeador y Pasuquin.

31, 14h 30m [30, 22h 30m] **Hinatúan, Surigao.** Ligerísimo temblor sentido en Hinatúan.

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AGOSTO, 1932

2, 13h 18m [2, 21h 18m] **Mindanao.** Temblor muy ligero sentido en Butúan y Talacogon, en el Valle del Agusan, y en Hinatúan costa oriental de Mindanao.

5, 0h 34m 37s* [5, 8h 34m 37s] **Mindanao.** Ligero temblor sentido en Bual y Lebak, provincia de Cotabato.

5, 0h 48m 16s* [5, 8h 48m 16s] **Islas Batanes.** Ligero temblor sentido en Basco, duración 8 segundos.

6, 11h 35m 13s* [6, 19h 35m 13s] **SW de Luzón.** Ligero temblor sentido en Ambulong y Balayan, provincia de Batangas.

7, 13h 47m [7, 21h 47m] **Guinobatan, Albay.** Ligero temblor.

16, 10h 46m 42s* [16, 18h 46m 42s] **Baguio, Centro de Luzón.** Temblor de intensidad IV.

16, 17h 28m [17, 3h 28m] **Guam, Islas Marianas.** Ligero temblor registrado y sentido.

17, 0h 53m [17, 8h 53m] **NW de Luzón.** Ligero temblor de cortísima duración sentido en Cabo Bojeador y Pasuquin.

17, 3h 44m 48s* [17, 11h 44m 48s] **N del Centro de Luzón.** Temblor de intensidad V sentido en Baguio y con menos intensidad en los próximos distritos de Benguet y en los pueblos vecinos de la provincia de La Unión.

17, 4h 04m [17, 12h 04m] **Talacogon, Agusan.** Ligero temblor.

17, 6h 00m [17, 14h 00m] **Ganassi, Lanao.** Ligero temblor.

18, 12h 01m [18, 22h 01m] **Guam, Islas Marianas.** Temblor perceptible.

18, ... **Cotabato, Mindanao.** Temblor sentido durante la noche. No mencionan la hora de su ocurrencia.

18, 18h 04m 41s* [19, 2h 04m 41s] **Ormoc, W de Leyte.** Temblor de intensidad III y de 40 segundos de duración.

19, 8h 52m 32s* [19, 16h 52m 32s] **Centro de Luzón.** Temblor sentido en las provincias de Benguet, La Unión, Pangasinán y Nueva Vizcaya. En Baguio la intensidad fué de IV. El epicentro probablemente se hallaba en las montañas al sur de Baguio.

20, 9h 25m 01s* [20, 17h 25m 01s] **Centro de Luzón.** Temblor sentido con la misma intensidad y la misma extensión, como el del día 19. Los temblores sentidos en los días 17, 19 y 20 probablemente eran precursores del severo temblor del 24 del presente mes.

20, 20h 30m [21, 4h 30m] **Naguilian, La Unión.** Ligero temblor.

21, 4h 40m 05s* [21, 12h 40m 05s] **NE de Mindanao.** Ligerísimo temblor sentido en Butúan y en Cantilan. Repitió en Cantilan tres horas más tarde.

21, 14h 51m [21, 22h 51m] **N del Centro de Luzón.** Temblor de intensidad II sentido en Baguio y en Bokod.

21, 16h 16m 17s* [22, 0h 16m 17s] **SE de Luzón.** Temblor sentido en toda la parte SE de Luzón. En Sorsogón la intensidad fué de IV y III en Legaspi.

24, 12h 11m 07s* [24, 20h 11m 07s] **Centro de Luzón.** Temblor sentido en Luzón desde Aparri, extremo norte, hasta Calatagán, Batangas. El epicentro se hallaba en las montañas a unos 10 kilómetros al oeste de Baguio. Un informe especial de este temblor se dará en otro lugar de este boletín.

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24, 13h 48m [24, 21h 48m] **Talacogon, Agusan.** Ligero temblor sentido.

24, 16h 40m [25, 0h 40m] **Aringay, La Unión.** Temblor. Tres horas más tarde hubo otra sacudida, la cual se registró en Manila.

24, 21h 31m [25, 7h 31m] **Guam, Islas Marianas.** Temblor registrado y percibido.

24, 21h 50m [25, 5h 50m] **Benguet.** Temblor sentido en Bokod y Kapangan.

25, 5h 00m [25, 13h 00m] **Benguet.** Repetición sentida en Kapangan y en Itogon. Varias sacudidas se sintieron en Tubao, La Unión.

25, 17h 30m [26, 1h 30m] **Sagada, Bontoc.** Ligero temblor. Otra sacudida a las 20h 00m del 26 [27, 4h 00m].

25, 21h 30m [26, 5h 30m] **Bokod, Benguet.** Temblor. Probablemente una repetición del temblor de Baguio ocurrido el 24.

26, 14h 16m [26, 22h 16m] **Butúan, Agusan.** Temblor muy ligero de corta duración.

27, 1h 00m [27, 9h 00m] **Benguet.** Otra repetición del temblor de Baguio sentida en Kapangan, Bokod e Itogon, y en Tubao, La Unión.

27, 13h 55m [27, 21h 55m] **Romblón.** Ligero temblor.

28, 3h 07m [28, 11h 07m] **Benguet.** Otra repetición se sintió en Baguio, Bokod, Aringay, Naguilian y Tubao.

29, 5h 20m [29, 13h 20m] **Sagada, Bontoc.** Ligero temblor.

29, 13h 30m [29, 21h 30m] **Hinatúan, Surigao.** Ligero temblor.

29, 15h 36m 40s [29, 23h 36m 40s] **Baguio.** Ligera sacudida sentida por algunas personas.

30, 16h 46m 02s* [31, 0h 46m 02s] **NW de Luzón.** Temblor de intensidad V sentido en Vigan y con menos intensidad en Laoag, Pasuquin y Lubuagan. Su epicentro probablemente se hallaba en el Mar de la China.

31, 1h 35m [31, 9h 35m] **Cabo Bojeador.** Ligero temblor de corta duración.

31, 21h 00m [septiembre 1, 5h 00m] **Zamboanga.** Ligero temblor de 4 segundos de duración.

31, 22h 40m [septiembre 1, 6h 40m] **Benguet.** Ligero temblor sentido en Bokod y Kapangan.

OCTUBRE, 1932

1, 3h 45m [1, 11h 45m] **Hinatúan, Surigao.** Ligera sacudida.

1, 6h 19m [1, 14h 19m] **Cabo Bojeador.** Temblor de intensidad II, duración 5 segundos.

3, 8h 53m [3, 16h 53m] **Joló.** Temblor de intensidad III, duración 3 segundos. Repitió con la misma intensidad y duración a 19h 02m 01s* [4, 3h 02m 01s].

5, 1h 54m 45s* [5, 9h 54m 45s] **Basco, Islas Batanes.** Temblor de intensidad II, duración 6 segundos.

5, 13h 00m [5, 21h 00m] **Joló.** Ligero temblor. Ligera repetición a 10h 58m [18h 58m].

6, 20h 23m [7, 4h 23m] **Talacogon, Agusan.** Ligera sacudida.

10, 11h 10m [10, 19h 10m] **Lamitan, Basilan.** Ligera sacudida.

12, 7h 04m [12, 15h 04m] **Virac, Catanduanes.** Moderada sacudida.

12, 10h 21m 07s* [12, 18h 21m 07s] **Mindanao y Archipiélago de Joló.** Ligerísimo temblor sentido en Zamboanga y Joló. Repitió a 11h 09m 04s* [19h 09m 04s].

13, 23h 48m [14, 7h 48m] **Joló.** Ligerísimo temblor.

18, 10h 47m [18, 18h 47m] **Tacloban, Leyte.** Temblor de intensidad III, duración 3 segundos.

22, 16h 19m 15s* [23 0h 19m 15s] **Baguio.** Ligerísima sacudida.

29, 3h 54m [29, 11h 54m] **Cabo Bojeador.** Temblor de intensidad III, duración 5 segundos.

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NOVIEMBRE, 1932

1, $8^h\ 31^m\ 09^s$* [1, $16^h\ 31^m\ 09^s$] **Calbayog, Sámar.** Temblor de intensidad III, duración 9 segundos. Epicentro en el Mar de Sámar.

11, $2^h\ 20^m$ [11, $10^h\ 20^m$] **Baguio.** Temblor sentido por algunas personas.

13, $4^h\ 36^m$ [13, $12^h\ 36^m$] **Tacloban, Leyte.** Ligerísima sacudida. Sintióse con más intensidad hacia los pueblos del S de Tacloban.

14, $1^h\ 12^m\ 40^s$* [14, $9^h\ 12^m\ 40^s$] **Leyte y Sámar.** Sacudida muy fuerte en Tacloban con intensidad VI y acompañada de un fuerte ruido; duración unos 50 segundos. En el pueblo de Palo la intensidad fué mayor que en Tacloban. Su epicentro se hallaba en el Abismo de Filipinas.

17, $9^h\ 55^m\ 12^s$ [17, $19^h\ 55^m\ 12^s$] **Guam, Islas Marianas.** Temblor registrado por el sismógrafo y sentido.

20, $14^h\ 36^m$ [20, $22^h\ 36^m$] **Surigao, Mindanao.** Temblor de intensidad II, duración 8 segundos.

21, $22^h\ 28^m\ 59^s$* [22, $6^h\ 28^m\ 59^s$] **Basco, Islas Batanes.** Temblor de intensidad II, duración 8 segundos.

22, $13^h\ 26^m$ [22, $23^h\ 26^m$] **Guam, Islas Marianas.** Ligero temblor sentido en Agaña y Sumay.

25, $5^h\ 45^m$ [25, $13^h\ 45^m$] **Talacogon, Agusan.** Ligero temblor.

25, $13^h\ 20^m$ [25, $21^h\ 20^m$] **Cotabato, Mindanao.** Temblor de intensidad II sentido en Cotabato y Bual.

27, $12^h\ 29^m$ [27, $20^h\ 29^m$] **Odiongan, Tablas.** Temblor de intensidad II.

28, $7^h\ 57^m$ [28, $15^h\ 57^m$] **Cabo Bojeador.** Temblor de intensidad II, duración 4 segundos.

International Seismological Centre

DICIEMBRE, 1932

2, 2^h 05^m [2, 10^h 05^m] **Lubuagan, Provincia Montañosa.** Ligera sacudida.

2, 11^h 43^m 08^s* [2, 19^h 43^m 08^s] **Benguet y La Unión.** Temblor de intensidad IV en Baguio. También se sintió en Kapangan, Tubao y Aringay.

2, 23^h 30^m [3, 7^h 30^m] **Lubuagan, Provincia Montañosa.** Ligera sacudida.

3, 6^h 30^m [3, 14^h 30^m] **Pandan, Catanduanes.** Ligera sacudida.

4, 8^h 14^m 13^s* [4, 16^h 14^m 13^s] **Mindanao y Archipiélago de Joló.** Temblor de intensidad IV en Zamboanga. Se sintió en la misma área de Mindanao y en el Archipiélago de Joló como el temblor del 15 de septiembre. Repetición a 10^h 35^m 56^s* [18^h 35^m 56^s].

6, 20^h 20^m [7, 4^h 20^m] **Kapangan, Benguet.** Ligera sacudida.

6, 23^h 45^m 18^s* [7, 7^h 45^m 18^s] **Benguet.** Ligerísima sacudida sentida en Bokod, Baguio e Itogon. Otra sacudida se sintió en la misma área el día 12 a 16^h 54^m 55^s* [13, 0^h 54^m 55^s].

16, 7^h 16^m 49^s* [16, 15^h 16^m 49^s] **Mindanao.** Temblor de moderada intensidad sentido hacia la parte E de Mindanao, desde Butúan, Agusan, hasta Malita, Dávao. Su epicentro se hallaba hacia la parte S del Abismo de Filipinas.

21, 0^h 04^m [21, 8^h 04^m] **Talacogon, Agusan.** Ligera sacudida.

22, 13^h 53^m [22, 23^h 53^m] **Guam, Islas Marianas.** Ligera sacudida registrada por el sismógrafo y sentida en Agaña. Otra ligera sacudida sentida en Agaña y Sumay a 18^h 16^m [23, 4^h 16^m]. Todavía otra sacudida se sintió en Agaña el día 23 a 12^h 35^m [22^h 35^m].

25, 2^h 10^m [25, 10^h 10^m] **Baguio.** Sacudida de intensidad I.

27, 8^h 45^m 36^s* [27, 16^h 45^m 36^s] **Kagotugan, Pilar, Abra.** Ligero temblor.

28, 11^h 39^m 57^s* [28, 19^h 39^m 57^s] **Iba, Zambales.** Temblor de intensidad III, duración 4 segundos.

28, 18^h 18^m 13^s* [29, 2^h 18^m 13^s] **Basco, Islas Batanes.** Temblor de intensidad III, duración 6 segundos.

29, 5^h 58^m [29, 13^h 58^m] **Baguio.** Temblor de intensidad I.

29, 11^h 30^m [29, 19^h 30^m] **Mangatarem, Pangasinan.** Ligero temblor que duró 10 segundos.

29, 20^h 34^m [30, 4^h 34^m] **Talacogon, Agusan.** Temblor ligero.

30, 20^h 31^m 52^s* [31, 4^h 31^m 52^s] **Tacloban, Leyte.** Temblor de intensidad VI, duración 38 segundos. Despertó a los que dormían.

International Seismological Centre

NUMBER OF EARTHQUAKES FELT IN THE PHILIPPINES, FROM 1903 TO 1932

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1903	12	5	8	8	15	13	9	24	10	12	17	8	141
1904	22	10	10	9	6	8	11	5	11	15	4	6	117
1905	14	8	12	11	10	8	12	10	11	16	8	12	132
1906	13	6	5	12	6	11	9	9	9	11	5	7	103
1907	13	7	10	14	22	17	14	16	5	5	15	7	145
1908	17	6	11	6	13	9	5	11	8	10	15	11	122
1909	11	8	9	13	12	5	12	12	14	10	5	9	120
1910	13	13	14	12	23	18	22	8	12	21	23	17	196
1911	12	14	21	13	17	15	13	27	29	19	16	18	214
1912	14	21	28	16	15	18	22	15	15	14	12	12	202
1913	9	18	25	5	15	15	12	13	11	7	8	10	148
1914	15	17	12	10	5	11	14	12	13	10	13	14	146
1915	11	14	12	11	14	15	18	12	12	14	12	14	159
1916	13	15	12	7	8	8	15	18	20	15	7	5	143
1917	6	11	13	12	11	11	7	12	12	17	21	13	146
1918	12	17	8	12	19	11	16	14	11	13	20	14	167
1919	12	11	16	8	8	16	17	15	13	11	11	13	151
1920	19	11	12	7	15	10	8	18	8	18	12	9	147
1921	9	7	10	7	20	16	16	13	17	19	15	15	164
1922	15	12	16	13	21	15	13	14	11	14	17	11	172
1923	6	9	20	17	10	6	18	10	19	16	25	14	170
1924	11	12	15	14	15	8	13	14	15	13	7	12	149
1925	17	18	15	18	15	20	13	10	18	24	18	18	204
1926	23	16	11	13	13	4	13	12	7	18	10	18	158
1927	16	14	7	14	11	22	12	8	10	9	20	10	153
1928	11	14	11	15	7	15	6	9	5	5	7	9	114
1929	18	12	12	18	18	9	25	11	14	12	23	15	187
1930	10	13	11	9	10	8	10	15	17	14	9	7	133
1931	18	16	24	20	22	17	22	13	12	19	11	19	213
1932	17	17	18	19	19	16	8	37	16	15	12	20	214

The number of violent and destructive earthquakes (VII to X) during these years was 66. In 1913 there were 6; 1907, 5; 1915, 1919, 1923 and 1925, 4; 1910, 1917, 1918, 1920, 1921, 1922 and 1928, 3; 1904, 1905, 1912, 1924, 1929 and 1931, 2; 1903, 1909, 1911, 1916, 1926 and 1932, 1. Their monthly distribution is the following: January 4, February 2, March 6, April 7, May 6, June 3, July 4, August 5, September 7, October 4, November 10, and December 8.

NUMBER OF SEISMIC DISTURBANCES RECORDED AT MANILA, FROM 1903 TO 1932

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1903	21	20	13	15	16	6	16	16	8	13	9	14	167
1904	15	19	11	19	17	35	25	18	16	26	18	18	237
1905	30	23	18	22	22	29	28	9	24	26	14	29	274
1906	30	17	22	27	13	35	11	14	14	86	21	26	316
1907	16	12	21	32	35	17	19	15	21	14	43	14	259
1908	16	14	23	15	20	12	14	15	9	108	25	24	296
1909	21	24	24	22	25	14	26	15	20	6	13	7	217
1910	20	17	20	17	17	21	19	11	12	18	15	29	216
1911	16	19	30	22	24	30	31	35	30	28	28	22	315
1912	27	16	30	24	23	35	27	35	20	20	31	34	322
1913	44	20	37	61	42	25	22	41	36	24	13	6	371
1914	22	35	30	48	25	23	24	20	22	26	32	22	329
1915	27	19	21	32	38	33	28	28	30	24	27	31	338
1916	37	46	43	38	37	28	31	28	31	39	22	17	397
1917	31	27	27	35	47	34	39	33	27	43	38	25	406
1918	62	35	32	30	22	37	64	68	45	34	48	53	530
1919	37	31	42	44	47	45	42	23	48	20	24	17	420
1920	30	35	17	25	48	40	30	34	32	47	15	19	372
1921	19	23	37	20	80	35	42	25	40	19	24	27	391
1922	41	25	20	41	50	33	33	46	39	32	24	37	421
1923	16	42	34	31	49	20	38	35	46	30	53	22	416
1924	24	31	27	48	74	26	33	30	59	24	20	23	419
1925	36	27	34	28	77	43	26	22	35	38	97	35	498
1926	30	20	32	23	29	41	27	52	34	38	29	22	377
1927	27	28	24	36	39	36	36	32	16	33	32	13	352
1928	24	25	31	27	29	97	18	34	33	22	33	35	408
1929	67	41	46	35	39	74	51	43	32	28	45	47	548
1930	32	39	61	54	93	58	29	48	67	85	39	39	644
1931	77	74	86	63	76	70	97	37	62	65	51	49	807
1932	49	56	44	71	55	66	60	61	109	93	52	60	776

1903. Installation of Vicentini Seismograph.
1907. Installation of Omori type Horizontal Pendulums.
1911. Installation of Wiechert 1000 Kg. Inverted Pendulum.
1930. Installation of Galitzin-Wilip Seismographs. 3 Components.

No. 1. January, 1932.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

International Seismological Centre

Ø=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

	T_o	D	T_1	
N-S	12.43	100.5	12.59	11.52
E-W	11.80	100.5	11.91	11.40
Z	11.60	100.5	9.00	14.82

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.4	189	2.4	0.026
E-W	4.6	202	2.7	0.029

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 January				
No. 1 1st	PNE	8 41 47	530	Disturbed by microseisms. Z records
	SNE	8 42 49		light-struck.
	F	8 59		
No. 2 3rd	PNEZ	8 00 12	2310	Disturbed by microseisms.
	SNE	8 03 57		
	MNE	8 08 ca		
	F	8 30		
No. 4 5th	PNEZ	0 38 48	1905?	Disturbed by microseisms.
	SNE?	0 42 01		
	LNE?	0 43 39		
	MNE	0 45 24		
	F	1 16		
No. 6 5th	PNEZ	11 27 44	2578	Epicenter 13° N, 144° E by Manila and Guam. Felt in Guam.
	iSNE	11 31 47		Disturbed by microseisms.
	MNE	11 36 ca		
	F	11 46		
No. 7 6th	PNEZ	5 22 27	760	
	SNE	5 23 50		
	F	5 33		
No. 8 6th	PNEZ	14 31 18	3300?	Disturbed by microseisms.
	SNE?	14 36 10		
	ME	14 42 11		
	F	15 06		
No. 9 6th	PNEZ	17 02 40	3165	Disturbed by microseisms.
	SNE	17 07 23		
	LNE	17 10 30		
	F	17 43		
No. 11 9th	PNEZ	10 23 40	3925	0:10:21:26. 3° S, 152° E by Manila,
	SNE	10 34 11		Zikawei, Phu-Lien, Amboina, Hong Kong,
	LN	10 38 45		Kotta, Fordham.
	F	11 35		Baguio, dilatation. S-P=4010 Km.
				Horizontal data from the Wiechert.
				Disturbed by microseisms.
No. 12 10th	PNEZ	9 53 45	215	S and F from the Wiechert. Disturbed
	SNE	9 54 13		by microseisms.
	F	9 58		Baguio, 150 Km.

International Seismological Centre

M A N I L A O B S E R V A T O R Y

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

J A N U A R Y , 1 9 3 2

3rd	PNEZ	8	00	12	
	SNE	8	03	57	
5th	PNEZ	0	38	48	
	S?NE	0	42	01	
5th	PNEZ	11	27	44	Epicenter 13° N; 144° E by Manila and
	1SNE	11	31	47	Guam. Felt in Guam.
6th	PNEZ	14	31	18	
	S?NE	14	36	10	
6th	PNEZ	17	02	40	
	SNE	17	07	23	
9th	PNEZ	10	28	40	3° S; 152° E by Manila, Zikawei, Phu-
	SNE	10	34	11	Lien.
17th	PNEZ	7	54	04	
	S?NE	8	01	00	
17th	PNE	17	17	19	Felt at Guiuan, S of Samar.
	SNE	17	18	41	
18th	PNE	20	27	33	Compression. Felt at Basco (Batanes Is-
	SNE	20	28	46	lands), Aparri, and Cape Bojeador (N Luzon).
20th	PNEZ	15	12	17	
	SN	15	16	18	
24th	ePNEZ	3	54	04	Dilatation.
	SNE	4	02	02	
25th	PNEZ	2	02	33	
	SNE	2	11	00	
29th	PNEZ	13	48	44	Compression.
	SNE	13	54	50	
29th	PNE	15	46	43	Compression.
	SNE	15	52	44	
30th	PNEZ	3	12	26	
	SNE	3	18	35	
30th	PNEZ	7	20	04	
	SNE	7	26	16	
30th	PNEZ	12	48	31	
	SNE	12	53	23	
31st	PNEZ	1	25	02	
	SNE	1	31	02	
31st	PNEZ	4	42	33	
	SNE	4	48	34	
31st	PNEZ	16	08	43	
	SNE	16	14	49	

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

International Seismological Centre

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks
1932 January				
No. 13 11th	PNEZ	18 05 36	440	S and F from the Wiechert. Disturbed by microseisms.
	SNE	18 06 30		
	F	18 12		
No. 16 13th	eNEZ	8 00 16		Disturbed by microseisms.
	SN?	8 08 14		
	MNE	8 11 ca		
	F	8 30		
No. 19 16th	$\bar{P}$NEZ	4 13 12	140	Disturbed by microseisms.
	$\bar{S}$NE	4 13 30		
	F	4 15		
No. 20 16th	$\bar{P}$NEZ	4 19 03	110	Felt in Manila by some persons. Compression.
	$\bar{S}$NE	4 19 17		
	F	28		
No. 22 17th	PNEZ	7 54 04	5355?	Disturbed by microseisms.
	SNE?	8 01 00		
	F	8 52		
No. 23 17th	PNE	17 17 19	740	10° 30' N, 126° 25' E by Manila and Butuan. Felt at Guiuan S of Samar. P and S from the Wiechert.
	SNE	17 18 41		
	F	17 49		
No. 24 18th	PNE	20 27 33	650	Compression. Felt at Basco, Batanes Islands, Aparri and Cape Bojeador, N Luzon. From the Wiechert.
	SNE	20 28 46		
	F	20 50		
No. 26 20th	PNEZ	15 12 17	2545	Disturbed by microseisms.
	SN	15 16 18		
	MN	15 20 48		
	F	15 33		
No. 29 24th	ePNEZ	3 54 04	6000	O=3:44:08. Dilatation. In region of 3° N, 175° E by Manila, Hong Kong, Batavia.
	SNE	4 01 37		
	LNE	4 10 30		
	F	5 32		Disturbed by microseisms.
No. 31 25th	PNEZ	2 02 33	6910	Disturbed by microseisms.
	SNE	2 11 00		
	LNE?	2 16 29		
	ME	2 20 49		
	F	3 12		
No. 32 25th	$\bar{P}$Z	4 55 32	195	
	$\bar{S}$NZ	4 55 57		
	F	4 58		
No. 34 26th	PNE	5 04 03	5370?	
	SNE?	5 11 00		
	F	5 37		
No. 35 27th	PNEZ	12 23 04	220	
	$\bar{S}$NEZ	12 23 33		
	F	12 29		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 January				
No. 36 29th	PNEZ	13 48 44	4490	0=13:40:00. Compression. 7° 30' S, 155° E by Manila, Phu-Lien, Hong Kong, Zikawei, Batavia, Amboina, Medan.
	PR_1N	13 50 14		
	PR_3N	13 50 56		
	SNE	13 54 50		
	LNE	14 00 30		Hodgson's Travel Times.
	F	15 43		Horizontal data from the Wiechert. Baguio, S-P=4590 Km. Butuan, S-P= 3710 Km.
No. 37 29th	PNE	15 46 43	4420	Compression. Same epicenter as No. 36, by Manila, Hong Kong, Batavia, Medan, Amboina.
	SNE	15 52 44		
	F	16 53		From the Wiechert. Baguio, S-P=4580 Km. Butuan, S-P= 3710 Km.
No. 38 29th	PNEZ	19 07 27	4200?	
	SE?	19 13 15		
	F	19 35		
No. 39 29th	eNEZ	21 55 06	4480?	
	SNE?	22 01 11		
	F	22 44		
No. 40 30th	PNEZ	2 25 30	330	Baguio S-P=200 Km.
	SNEZ	2 26 13		
	F	2 35		
No. 41 30th	PNEZ	3 12 26	4560	Epicenter probably same as No. 36. Other phases very difficult to determine because overlapping with the preceding quake. Baguio, S-P= 4590 Km.
	SNEZ	3 18 37		
	F	5 20		
No. 42 30th	PNZ	7 19 11	5505?	Epicenter probably same as No. 36.
	SNE?	7 26 16		
	MNE	7 38 30		
	F	8 34		
No. 43 30th	PNZ	12 48 22	2655	
	SNE	12 52 31		
	F	13 12		
No. 44 30th	PNEZ	21 26 52	3560	
	SNE	21 32 00		In minute gap.
	F	22 11		

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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.	Dist. Km.	Remarks.
1932 January				
No. 45 31st	PNEZ	1 25 02	4390	Epicenter probably same as No. 36.
	SNE	1 31 02		
	LNE	1 36 39		
	MN	1 39 32		
	F	2 23		
No. 46 31st	PNEZ	4 42 33	4400	Epicenter probably same as No. 36.
	SNE	4 48 34		
	LNE	4 54 23		
	ME	4 57 58		
	F	5 44		
No. 47 31st	PNEZ	16 08 43	4490	Epicenter probably same as No. 36.
	SNE	16 14 49		
	LE?	16 20 18		
	ME	16 24 11		
	F	17 32		
No. 48 31st	PNEZ	21 42 15	2745?	
	SNE?	21 46 30		
	F	22 12		
No. 49 31st	ePNEZ	23 22 26	400	Felt at Aparri, N Luzon.
	SNE	23 23 16		
	F	23 38		

Thirteen insignificant or undecipherable disturbances in the following days of January: 4th, 5th, 8th, 12th(2), 13th(2), 16th, 20th(3), 24th and 25th.

No. 5. February, 1932.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

Ø=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP

	T_o	D	T_1	l
N-S	12.43	100.5	12.59	11.52
E-W	11.80	100.5	11.91	11.40
Z	11.60	100.5	9.00	14.82

WIECHERT. M=1000 Kg.

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.3	196	2.4	0.029
E-W	4.7	202	2.6	0.028

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932				
February				
No. 52	PNEZ	14 24 53	540	
1st	SNE	14 25 56		
	F	14 37		
No. 53	PNEZ?	21 46 23	730?	
1st	SNEZ?	21 47 44		
	F	22 14		
No. 54	PNEZ	7 10 18	4180?	
2nd	SNE?	7 16 05		
	F	7 37		
No. 56	PNEZ	6 35 31		O=6:15.8, 19.3° N, 75° W by U.S.C.G.S.
3rd	iNE	6 38 28		
	iNEZ	6 39 20		
	LNE	7 31 ca		
No. 57	PNE	7 38 57	1550?	No. 56 still recording.
3rd	SNE?	7 41 38		
	F	8 40		
No. 58	PEZ	14 39 07	4690	N-S cylinder stopped at 12:13.
3rd	SE	14 45 25		
	F	15 10		
No. 59	PNEZ	7 22 20	4645	
4th	iSNE	7 28 35		
	LNE	7 34 29		
	F	8 20		
No. 61	PNEZ	13 49 00	3080	
5th	SNE	13 53 37		
	LNE	13 56 30		
	F	14 44		
No. 63	PNZ	17 50 30	4820	
6th	SNE	17 56 56		
	LNE	18 03 22		
	F	18 16		
No. 65	PNZ	19 41 11	1850	E-W cylinder stopped at 7:04.
8th	SN	19 44 20		
	MN	19 48 00		
	F	20 12		

M A N I L A , P . I .

SEISMOLOGICAL BULIETIN OF THE OBSERVATORY.--Continued.

International Seismological Centre

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 February				
No. 66	PNZ	21 21 54	820	
8th	SN	21 23 23		
	mN	21 26 32		
	F	21 33		
No. 67	PNE	17 07 46	4235	
9th	SE	17 13 36		
	F	17 46		
No. 68	PNEZ	20 34 12	2545	
9th	SNE	20 38 13		
	F	20 54		
No. 69	eNEZ	11 06 28		
10th	ME	11 18 25		
	MN	11 19 ca		
	F	11 43		
No. 71	PNEZ	1 08 31	7390	Train of long waves in E-W compon-
12th	SNE	1 17 26		ent from 1:35 to 1:38.
	LNE	1 28 ca		
	MNE	1 34 43		
No. 72	PNEZ	2 07 13	1410	No. 71 still recording.
12th	SNE	2 09 39		
	LNE	2 10 51		
	F	2 38		
No. 73	PNEZ	19 17 42	2655	
13th	SNE	19 21 51		
	LNE	19 24 ca		
	MNE	19 26 30		
	F	20 3o		
No. 77	PNEZ	12 00 45	5880	
14th	SNE	12 08 11		
	LNE	12 17 ca		
	MNE	12 21 ca		
	F	12 54		
No. 78	PNEZ	23 2[illegible] 16	6735	O=23:14:04. Dilatation.
14th	SNE	23 3[illegible] 33		
	PSNE	23 32 49		
	SR_1E	23 37 10		
	P_cSS_cPNE?	23 40 06		
	LNE	23 43 20		
	ME	23 48 13		
15th	F	0 37		
No. 79	PNEZ	0 46 20	2635	
15th	SNE	0 50 27		
	F	1 19		
No. 81	$\overline{P}NZ$	18 23 34	145	Compression. Felt at Ambulong very
15th	$\overline{P}E$	18 23 36		slightly.
	$\overline{S}NE$	18 23 52		
	F	18 31		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 February				
No. 82 16th	ePN	13 59 43	7270	0=13:49:00. Dilatation.
	iPEZ	13 59 43		
	PR_1EZ	14 02 30		
	PR_2N	14 03 50		
	$SN\bar{E}$	14 08 31		
	SR_3N	14 17 15		
	$LN\bar{E}$	14 20 16		
	F	15 56		
No. 83 16th	$\bar{P}NEZ$	19 42 25	195	
	$\bar{S}NE$	19 42 50		
	F	19 45		
No. 84 17th	$\bar{P}NEZ$	15 51 22	145	
	$\bar{S}NE$	15 51 40		
	F	15 57		
No. 85 19th	ePNEZ	13 30 03	4120	
	SNE	13 35 47		
	F	13 50		
No. 86 21st	PNEZ	1 38 41	3035	
	SNE	1 43 15		
	LNE	1 46 07		
	ME	1 48 36		
	F	2 22		
No. 87 21st	PNEZ	4 23 13	265	
	$\bar{S}NEZ$	4 23 50		
	F	4 30		
No. 88 21st	PNEZ	7 33 17	495	Felt in northern Luzon.
	SNE	7 34 15		
	F	7 44		
No. 92 21st	$\bar{P}NE$	20 59 40	160	S in minute gap.
	$\bar{S}NE$	21 00 00		
	F	21 05		
No. 95 22nd	PNEZ	0 18 40	1280	
	SNE	0 20 53		
	LNE	0 22 06		
	MNE	0 23 46		
No. 96 22nd	PNE	0 38 24	1625	No. 95 still recording.
	SNE	0 41 13		
	LNE	0 42 37		
	MNE	0 44 12		
	F	1 25		
No. 98 22nd	PNEZ	14 03 24	280	Felt at Naga, SE Luzon.
	$\bar{S}NE$	14 04 04		
	F	14 06		

International Seismological Centre

M A N I L A , P . I .

SIEMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 February				
No. 99 23rd	PNEZ	0 33 40	9560	0=0;20:59
	SNE	0 44 20		
	SR_2E	0 54 33		
	SR_3E	0 56 40		
	LNE	1 02 42		
	MNE	1 09 23		
	F	2 50		
No. 100 23rd	PNEZ	20 19 56	5100	0=20:11:21. Compression.
	SNE	20 26 38		
	LNE	20 33 30		
	F	21 45		
No. 104 26th	PNEZ	11 33 27	1080	
	SNE	11 35 21		
	F	12 04		
No. 105 27th	$\overline{P}NEZ$	10 05 27	110	
	$\overline{S}NE$	10 05 41		
	F	10 08		

Twenty insignificant or undecipherable disturbances on the following days of February: 1st(2), 2nd, 4th, 6th, 7th, 11th, 13th, 14th(2), 15th, 21st(5), 22nd, 24th, 25th and 26th.

MANILA OBSERVATORY

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

MARCH, 1932

		h.	m.	s.	
6th	PNEZ	21	49	40	
	SNE	21	53	35	
8th	PNEZ	3	18	35	L and M not apparent.
	SNE	3	25	27	
8th	ePNE	18	12	03	
	SNE	18	21	26	
12th	PNEZ	8	55	59	
	SN	8	58	31	
14th	P'NEZ	23	02	46	7° N; 74° W by U.S.C.G.S. Continuous oscillations with no definite phases.
15th	iPZ	4	37	24	Dilatation. O=4:31:45. Felt in Guam,
	SN	4	41	43	Distance 215 Km.
	SE	4	41	51	Epicenter, approx. 12.6° N; 146.3° E as on July 17, 1931 and Nov. 3, 1931. Southeast slope of Nero Deep.
19th	PNEZ	11	05	11	Compression. O=10:59:03. Felt in
	SNE	11	09	51	Guam, distance 370 Km.
26th	PNEZ	0	10	24	63°N; 156°W, O=23:58:30 by U.S.C.
	SNEZ	0	20	06	G.S.
					Preceded at 0:06:38 by a slight disturbance from another earthquake.
					Zikawei P=0:08:41, dist. 6911 Km.
28th	PEZ	0	42	04	Compression.
	SNE	0	48	16	
30th	PNEZ	15	09	05	Compression.
	SNE	15	15	05	

International Seismological Centre

No. 9. March, 1932

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

Ø=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP

	T_o	D	T_1	l
N-S	12.43	100.5	12.59	11.52
E-W	11.80	100.5	11.91	11.40
Z	11.60	100.5	9.00	14.82

WIECHERT. M=1000 Kg.

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.4	190	2.3	0.029
E-W	4.6	197	2.5	0.033

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 March				
No. 107 3rd	iPNEZ	22 50 48	390	Felt at Calbayog, Samar.
	SEZ	22 51 36		Dilatation.
	SN	22 51 40		
	F	23 16		
No. 108 4th	PNEZ	23 28 33	5050	
	SNE	23 35 12		
	LNE?	23 42 31		
	MNE	23 45 56		
5th	F	0 09		
No. 109 6th	PNE	0 29 01	6540?	
	SNE?	0 37 06		
	F	1 00		
No. 110 6th	PNEZ	21 49 40	2470	
	SNE	21 53 35		
	LNE	21 55 40?		
	iMNE	21 57 47		
	F	22 42		
No. 111 7th	PNE	1 06 40	190	Felt slightly at Ambulong, Batangas.
	SNE	1 07 04		P in Z component defective.
	F	1 31		
No. 112 8th	PNEZ	3 18 35	5270	L and M not apparent.
	SNE	3 25 27		
	F	4 30		
No. 113 8th	PNEZ	4 39 43	6100	Compression.
	SNE	4 47 22		
	LNE	4 56 40		
	ME	5 01 ca		
	F	5 38		
No. 114 8th	ePNE	18 12 03	7890	0=18:00:48
	iPZ	18 12 03		
	SNE	18 21 26		
	PSNE	18 21 52		
	LN	18 34 51		
	MNE	18 40 28		
	F	19 40		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 March				
No. 115 10th	eNE?	5 42 34		From the Wiechert. Galitzin no records in this time, because the galvanometers were adjusting.
	F?	6 11		
No. 116 12th	PNEZ	6 36 11	530	Dilatation.
	SNE	6 37 13		
	F	6 42		
No. 117 12th	PNEZ	8 55 59	1465	
	SN	8 58 31		
	LNE	8 59 37		
	F	9 17		
No. 118 12th	P̄NEZ	12 31 17	135	
	S̄NE	12 31 34		
	F	12 34		
No. 119 12th	PNEZ	13 21 59	640	P in minute gap.
	SNE	13 23 11		Felt at Cape Bojeador, northern Luzon.
	mNE	13 25 24		
	F	14 02		
No. 121 14th	P̲NEZ	10 06 36	220	
	S̲NEZ	10 07 05		
	F	10 24		
No. 122 14th	PNE?	21 04 24	3835?	P and S not clear.
	SNE?	21 09 50		
	F	21 30		
No. 123 14th	P'NEZ	23 02 46	17090	7° N; 74° W; O=22:42:34 by U.S.C. G.S.
15th	F	1 02		Continuous oscillations with no definite phases.
No. 124 15th	iPZ	4 37 24	2810	O=4:31:45 Dilatation.
	ePNE	4 37 24		Epicenter, approx. 12.6° N; 146.3° E as on July 17, 1931 and Nov. 3, 1931. Southeast slope of Nero Deep.
	PR_1NE?	4 37 54		
	SN	4 41 43		
	SE	4 41 51		Felt in Guam, Δ=215 Km.
	SR_1NE	4 42 31		
	LNE	4 44 39		
	F	6 50		
No. 126 16th	PNEZ?	5 28 34	5170?	Disturbed by microseisms.
	SNE	5 35 19		
	LNE	5 42 30ca		
	F	6 25		

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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.	Dist. Km.	Remarks.
1932 March				
No. 127 19th	PNEZ	11 05 11	3120	0=10:59:03 Compression. Disturbed by microseisms.
	PR_2N	11 06 06		
	SNE	11 09 51		Approx. 16.5° N; 149° E by Manila. HongKong, Batavia.
	SR_1N	11 11 21		
	SR_2N	11 11 45		Felt in Guam, Dist. 370 Km.
	LNE	11 13 00		
	F	13 18		
No. 128 19th	PZ	23 17 00	3650?	Disturbed by microseisms.
	PNE	23 17 03		
	SNE?	23 22 17		
	MNE	23 25 00		
20th	F	0 40		
No. 130 22nd	PNEZ	14 04 16	3745	Disturbed by microseisms.
	SNE	14 09 36		
	F	14 41		
No. 132 24th	PNEZ	16 15 45	3495?	Disturbed by microseisms.
	SNE?	16 20 49		
	F	16 50		
No. 136 26th	PNEZ	0 10 24	8270	63° N; 156° W; 0=23:58:30 by U.S. C.G.S.
	SNEZ	0 20 06		
	LNE	0 34 40		Preceded at 0:06:38 by a slight disturbance from another earthquake.
	MNE	0 40 00ca		
	F	3 02		
No. 137 26th	PNE	9 56 59	2390	In the Banda Sea, N.E.I. by Manila, Batavia, HongKong.
	SNE	10 00 49		
	LNE	10 02 50		From the Wiechert.
	MNE	10 05 00		
	F	12 26		
No. 138 27th	PNEZ?	8 51 31	3020.	Disturbed by microseisms.
	SNE	8 56 04		
	LN	8 59 07		
	LE?	8 59 07		
	F	9 34		
No. 139 27th	PNEZ	9 59 01	2165	Disturbed by microseisms.
	SNE	10 02 35		
	F	10 38		
No. 140 27th	PNEZ	13 34 31	970	Butuan $\Delta = 2^\circ - 3^\circ$.
	SNE	13 36 04		
	LE	13 37 19		
	F	13 53		
No. 141 28th	PEZ	0 42 04	4590	Compression. Netherlands East Indies earthquake.
	PN	0 42 08		
	SNE	0 48 16		
	LE	0 57 40		
	F	2 18		

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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.	Dist. Km.	Remarks.
1932 March				
No. 144 30th	PNEZ	15 09 05	4390	Compression.
	SNE	15 15 05		
	LE	15 20 24		
	F	15 52		
No. 147 31st	PNEZ?	16 12 27	1480?	Disturbed by microseisms.
	SNE	16 15 00		
	F	16 32		

Fourteen insignificant or undecipherable disturbances in the following days of March: 2nd, 13th, 16th, 20th, 23rd, 25th(2), 26th, 29th, 30th(2), and 31st(3).

No. 13. April, 1932

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

φ=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

	T_o	D	T_1	μ^2	λ	K
N-S	12.43	100.5	12.59	.017	11.52	97
E-W	11.80	100.5	11.91	-.075	11.40	80
Z	11.60	100.5	9.00	1.250	14.82	200

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.4	201	2.3	0.029
E-W	4.6	200	2.6	0.026

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 April				
No. 150 1st	PNEZ	8 35 20	2020	
	SEZ	8 38 43		
No. 151 1st	PNEZ?	8 56 22	2545?	No. 150 still recording.
	SNE	9 00 23		
No. 152 1st	PNE?	9 20 23	2535	No. 151 still recording.
	SNE	9 24 23		
	F	9 49		
No. 156 3rd	PNEZ	20 50 34	8510	Compression.
	SNE	21 00 30		
	LNE	21 15 30ca		
	F	22 04		
No. 158 4th	iPNEZ	19 21 06	2000?	Dilatation from NE. In region of 27° N; 135° E by Zikawei, Manila, Hong Kong. Waves of 10 sec. period persist until 19:30:00.
	SNE?	19 24 27?		
	F	21 00		
No. 159 5th	PNEZ	5 09 52	2920	
	SNE	5 14 19		
	F	5 37		
No. 160 6th	PNEZ	0 49 37	1000	
	SNE	0 51 23		
	F	1 07		
No. 161 6th	ePNEZ	1 47 07	200	Disturbed by microseisms.
	SEZ	1 47 33		
	F	1 50		
No. 162 6th	PNEZ	8 22 37	245	Disturbed by microseisms.
	SNE	8 23 11		
	F	8 28		
No. 163 6th	PNEZ	9 15 25	2165	Dilatation. 31° N; 116° E by Zikawei, Hong Kong, Manila.
	SNE	9 19 00		S in minute gap.
	LNE	9 20 49		
	MNE	9 22 42		
	F	10 16		

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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.	Dist. Km.	Remarks.
1932 April				
No. 165 7th	PNEZ	21 37 14	1630	
	SNE	21 40 04		
	F	22 02		
No. 166 8th	PNEZ	12 03 36	3535?	
	SNE?	12 08 43		
	F	13 04		
No. 167 9th	$\underline{P}\overline{E}Z$	14 31 42	160	
	$\overline{S}NEZ$	14 32 02		
	F	14 37		
No. 171 11th	$\underline{P}NEZ$	1 04 00	220	Compression.
	$\overline{S}NEZ$	1 04 29		
	F	1 11		
No. 172 12th	$\underline{P}NEZ$	12 31 02	260	Probably east of Luzon, by Manila and Baguio.
	$\overline{S}NEZ$	12 31 39		
	F	12 40		
No. 173 12th	iPZ	23 59 40	3970	Compression.
	ePNE	23 59 41		
13th	SNE	0 05 19		
	LN	0 10 ca		
	F	1 25		
No. 174 13th	iPZ	4 03 40	2265	Dilatation. Moluccas according to Batavia.
	PNE	4 03 40		
	SNE	4 07 22		
	LN	4 09 19		
	F	5 06		
No. 175 14th	PNEZ	11 36 36	1800	
	SNE	11 39 40		
	LNE	11 41 20		
	MNE	11 42 44		
	F	12 06		
No. 176 14th	iPZ	17 03 20	2300	Compression.
	ePNE	17 03 20		
	SNEZ	17 07 04		
	LNE	17 09 02		
	MNE	17 11 07		
	F	17 45		
No. 177 15th	$e\underline{P}NEZ$	3 23 08	230	Compression. Slightly felt at Naga, SE Luzon.
	$i\overline{S}NEZ$	3 23 39		
	F	3 31		
No. 178 15th	$e\underline{P}NEZ$	4 31 24	235	
	$i\overline{S}NEZ$	4 31 56		
	F	4 38		

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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.	Dist. Km.	Remarks.
1932 April				
No. 180 17th	PNEZ	1 03 42	1120	Dilatation.
	SNEZ	1 05 39		
	LNE	1 06 47		
	ME	1 07 48		
	F	1 46		
No. 181 18th	PNEZ	4 54 42	2365	Compression from SE. Moluccas according to Batavia.
	SNEZ	4 58 31		
	F	5 45		
No. 182 18th	PNEZ	11 32 54	6165	
	SNE	11 40 37		
	LN	11 50 00		
	MNE	11 54 30		
	F	12 27		
No. 183 19th	PEZ	15 28 20	110	Dilatation.
	SEZ	15 28 34		N-S component not recording, 8:15 to 24:00.
	F	15 34		
No. 184 21st	PNEZ	13 58 08	440	
	SNEZ	13 59 02		
	F	14 06		
No. 185 22nd	PNEZ	5 03 40	3320	West Java according to Batavia.
	SNE	5 08 33		
	LNE?	5 11 00		
	F	6 10		
No. 186 22nd	PNEZ	7 26 31	215	
	SNE	7 26 59		
	F	7 30		
No. 188 23rd	cPEZ	4 22 24	5	
	iSNE	4 22 27		
	F	4 24		
No. 190 25th	PNEZ?	17 54 08	4360	
	SNE?	18 00 06		
No. 191 25th	eNEZ	18 17 39		No. 190 still recording.
	SNE	18 19 28		
	F	18 29		
No. 192 25th	ePNEZ	21 02 50	400	Felt in northern Luzon.
	iSNE	21 03 41		
	F	21 11		
No. 193 26th	PNEZ	8 15 04	10555	
	SNE	8 26 23		
	F	9 07		
No. 194 26th	PNEZ	10 59 18	90	
	SNE	10 59 30		
	F	11 01		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist.	Remarks.
1932 April				
No. 196 26th	ePNE?	12 45 07	5455	Disturbed by microseisms.
	SNE	12 52 09		
	F	13 02		
No. 197 26th	PNEZ?	13 43 19	1300?	Disturbed by microseisms.
	SNE	13 45 34		
	F	14 07		
No. 200 27th	PNE	14 37 41	970	Disturbed by microseisms.
	SNE	14 39 24		
	F	14 50		
No. 203 27th	PNEZ	17 24 17	1925	Disturbed by microseisms.
	SNE	17 27 33		
	F	17 39		
No. 217 29th	PNEZ	17 32 56	950	Compression.
	SNE	17 34 38		Compression at Butuan.
	F	19 56		Felt in eastern Mindanao. Epicenter in Philippine Deep, probably at 8° 20' N; 126° 53' E.
No. 218 29th	PNEZ	21 09 01	470	Felt in northern Luzon. Dilatation.
	SNE	21 09 57		
	F	21 27		

Thirty-one insignificant or undecipherable disturbances in the following days of April: 1st(3), 4th, 6ht, 9th(2), 10th, 16th, 22nd, 25th, 26th, 27th(4), 28th(11), 29th(2) and 30th(2).

M A N I L A O B S E R V A T O R Y

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

M A Y , 1 9 3 2

2nd	PNEZ	23 33 39	
	SNE	23 37 34	
4th	iPNEZ	5 08 26	Dilatation from SE. Molucoas
	SNE	5 11 19	by Manila and Butuan.
5th	iPEZ	4 15 46	Dilatation.
	ePN	4 15 46	
	SNEZ	4 19 33	
5th	PNE	8 35 56	
	SNE	8 45 21	
6th	iPZ	5 38 35	
	SNEZ	5 41 34	
10th	iPZ	14 27 55	Dilatation.
	SEZ	14 31 51	
11th	PNEZ	6 59 48	
	SE	7 05 20	
12th	iPNEZ	6 11 23	Dilatation from SE. Butuan △=
	SNEZ	6 14 31	1155km. Probably in rigion of 4° N; 134° E.
14th	iPNEZ	13 14 41	Celebes. N.E.I.
	SZ?	13 17 38	
17th	iPZ	13 01 39	Compression.
	ePNE	13 01 42	
	SNE	13 06 56	
17th	ePNEZ	17 34 11	
	SNE?	17 37 50	
17th	ePNE	22 26 06	
	SNE?	22 29 03	
18th	ePNEZ	18 56 17	
	SNE	19 04 46	
19th	ePNEZ	2 12 24	
	SNE	2 15 40	
20th	PNEZ	7 19 01	
	SNE	7 21 25	
21st	PNEZ	10 29 29	San Salvador, Central America.
	P'NE?	10 32 19	
22nd	PNEZ	11 40 46	Compression.
	SNE	11 50 17	
26th	PNEZ	5 20 12	
	SNE?	5 23 18	
26th	iPNEZ	16 19 48	Dilatation.
	iSNE	16 28 19	
26th	iPNEZ	20 33 54	
	iSNE	20 37 41	
26th	PNEZ	22 32 02	
	SNE	22 40 26	
27th	PNEZ	1 39 55	Dilatation.
	SNE	1 45 33	

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M A N I L A O B S E R V A T O R Y

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

A P R I L , 1 9 3 2

		h.	m.	s.	
4th	iPNEZ	19	21	06	Dilatation.
	iSN	19	23	05	
6th	PNEZ	9	15	25	Dilatation.
	SNE	9	19	00	In minute gap.
12th	iPZ	23	59	40	Compression.
	ePiE	23	59	41	
13th	SiE	0	05	19	
13th	iPZ	4	03	40	Dilatation.
	PNE	4	03	40	
	SNE	4	07	22	
14th	PNEZ	11	36	36	
	SNE	11	39	40	
14th	iPZ	17	o3	20	Compression.
	ePNE	17	03	20	
	SNEZ	17	07	04	
17th	PNEZ	1	03	42	Dilatation.
	SNEZ	1	05	39	
18th	PNEZ	4	54	42	Compression from SE.
	SNEZ	4	58	31	
18th	PNEZ	11	32	54	
	SNE	11	40	37	
26th	PNEZ	8	15	04	
	SNE	8	26	23	

No. 17. May, 1932

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

Ø=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

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

	T_o	V	ϵ	$\frac{r}{T_o^2}$
N-S	4.4	201	2.3	0.029
E-W	4.6	200	2.6	0.026

No. and Date	Phase	Greenwich Time h. m. s.	Distance Km.	Remarks.
1932 May				
No. 225 1st	ePNEZ?	15 53 27	2020?	No. 224 still recording.
	SNE	15 56 50		
	F	16 18		
No. 226 2nd	$\overline{P}NEZ$	8 30 21	180	
	$\overline{S}NE$	8 30 44		
	F	8 34		
No. 227 2nd	PNEZ	23 33 39	2480	In region of 30° N; 135° E by Osaka, Zikawei, Hong Kong, Manila.
	SNE	23 37 34		
	LN?	23 40 37		
	MNE	23 43 ca		
3rd	F	0 21		
No. 228 4th	iPNEZ	5 08 26	1675	Dilatation from SE. Boeol, N Celebes according to Batavia. Butuan △=960 Km.
	SNE	5 11 19		
	F	5 44		
No. 229 5th	iPEZ	4 15 46	2340	Dilatation. In region of 30° N; 136° E by Osaka, Zikawei, Hong Kong, Manila.
	ePN	4 15 46		
	SNEZ	4 19 33		
	LNEZ	4 21 36		
	F	4 53		
No. 230 5th	PNE	8 55 56	7930	
	SNE	8 45 21		
	LNE	8 59 ca		
	MNE	9 04 ca		
	F	9 27		
No. 231 6th	iPZ	5 38 35	1735	N. Celebes according to Batavia.
	ePNE	5 38 35		
	SNEZ	5 41 34		
	LNEZ	5 43 13		
	F	6 08		
No. 232 9th	iPZ	0 08 41	2430	Dilatation. Guam △=125 Km. Disturbed by microseisms.
	ePNE	0 08 41		
	SNEZ	0 12 34		
	F	0 19		

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

International Seismological Centre

No. and Date	Phase	Greenwich Time h. m. s.	Distance Km.	Remarks.
1932 May				
No. 233 9th	eNEZ	14 08 42		Disturbed by microseisms.
	SN?	14 11 29		
	MNE	14 14 35		
	F	14 33		
No. 234 10th	iPZ	14 27 55	2480	Dilatation.
	ePNE	14 27 55		Probably in N.E.I.
	SEZ	14 31 51		
	iNE	14 32 48		
	F	15 23		
No. 235 11th	iP̄Z	6 00 22	125	Dilatation.
	eP̄NE	6 00 22		Felt very slightly at Ambulong.
	S̄NE	6 00 38		
	F	6 12		
No. 236 11th	PNEZ	6 59 48	3780	
	SE	7 05 20		
	LNE	7 09 ca		
	F	8 20		
No. 237 11th	ePNEZ	9 40 52	880	Butuan △=220 Km.
	SNE	9 42 26		
	F	10 05		
No. 238 12th	iPNEZ	6 11 23	1840	Dilatation from SE. Ternate and N. Celbes according to Batavia.
	SNEZ	6 14 31		Butuan △=1155 Km.
	LNE	6 16 15ca		
	F	7 31		
No. 240 14th	iPNEZ	13 14 41	1720?	In region of 1° N; 129° E. Felt in southern and eastern Mindanao.
	SZ?	13 17 38		Destructive in ternate and Minahasa, according to Batavia.
	F	18 08		1° N; 124° E by J.S.A.
				3° N; 129° E; O=13:11:23 by U.S. C.G.S.
				Guam △=25°.
No. 241 15th	PNEZ	8 52 23	1535	Disturbed by microseisms.
	SNE	8 55 02		
	F	9 13		
No. 243 16th	P̄NEZ	22 13 08	235	Felt very slightly at Ambulong.
	S̄NE	22 13 40		
	F	22 17		
No. 244 17th	iPZ	13 01 39	3690	Compression.
	ePNE	13 01 42		18° S; 117° E by Manila and Batavia.
	SNE	13 06 56		Felt in E Java, Bali, Lombok, according to Batavia.
	LE	13 11 00		
	F	13 32		
No. 245 17th	ePNEZ	17 34 11	2230?	N. Celebes according to Batavia.
	SNE?	17 37 50		
	LNE	17 39 30ca		
	F	18 16		

International Seismological Centre

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Distance Km.	Remarks.
1932 May				
No. 246 17th	ePNEZ	19 13 12	235	Dilatation.
	SNEZ	19 13 44		Felt at Daet and Naga, SE Luzon.
	F	19 26		
No. 248 17th	ePNE	22 26 06	1710?	N. Celebes, according to Batavia.
	SNE?	22 29 03		
	LN?	22 30 31		
	F	22 53		
No. 251 18th	ePNEZ	18 56 17	6940	
	SNE	19 04 46		
	LNE	19 15 ca		
	F	20 32		
No. 252 19th	ePNEZ	2 12 24	1935	
	SNE	2 15 40		
	LNE	2 17 23		
	F	2 34		
No. 253 20th	PNEZ	7 19 01	1390	
	SNE	7 21 25		
	MN	7 24 10		
No. 254 20th	PNEZ	7 56 20	510	No 253 still recording.
	SNE	7 57 20		
	SNE	7 57 39		
	F	8 13		
No. 256 21st	PNEZ	10 29 29	15580	San Salvador, Central America.
	P NE?	10 32 19		13° N; 88° W; 0=10:10:11 by U.S. C.G.S.
	LNE	11 16 ca		13.8° N; 88.5 W; 0=10:10:17 by J.S.A.
	MNE	11 26 ca		
	F	12 47		
No. 257 21st	PNEZ	21 45 12	3420	
	SNE	21 50 12		
	F	22 20		
No. 258 22nd	PNEZ	11 40 46	8045	Compression.
	SNE	11 50 17		
	LNE	12 04 25		
	MNE	12 10 ca		
	F	13 36		
No. 259 24th	ePNEZ	11 14 24	490	Felt at Calbayog, NW Samar.
	SNEZ	11 15 22		
	F	11 26		
No. 260 24th	PNE	17 27 08	565	
	SNE	17 28 13		
	F	17 43		

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Distance Km.	Remarks
1932 May				
No. 262 26th	PNEZ	5 20 12	1820?	Disturbed by microseisms.
	SNE?	5 23 18		
	LNE?	5 24 52		
	F	6 12		
No. 263 26th	PNEZ	9 12 00	505	P in minute gap.
	SNEZ	9 13 19		
	F	9 27		
No. 264 26th	iPNEZ	16 19 48	6980	Dilatation. 23° S; 173° E by Amboina, Manila, Batavia, PhuLien, Zikawei.
	SNE	16 28 19		16° S; 173° E; O=16:09:33 by U.S. C.G.S.
	LNE	16 39 ca		S and L from the Wiechert.
	F	19 40		Guam △=45°.
No. 265 26th	iPNEZ	20 33 54	2340	N. Celebes, according to Batavia.
	iSNE	20 37 41		
	LNE?	20 39 44		
	F	21 10		
No. 266 26th	PNEZ	22 32 02	6855	
	SNE	22 40 26		
	F	23 15		
No. 267 27th	PNEZ	1 39 55	4030	Dilatation.
	SNE	1 45 33		
	F	2 10		
No. 268 27th	PNEZ	12 46 17	710	Dilatation.
	SNE	12 47 35		Felt at Surigao, NE Mindanao.
	F	13 29		
No. 269 28th	PNEZ	2 25 14	3600?	Dilatation.
	SNE?	2 30 25		Guam, △=21°.
	LNE?	2 34 23		
	MNE?	2 37 45		
	F	4 34		
No. 270 28th	PNEZ	5 06 45	1865	
	SNEZ	5 09 55		
	LNE	5 11 31		
	MN	5 13 13		
	F	6 18		
No. 271 28th	PNEZ	10 17 06	1320	Registered at Butuan, △= ±540 Km.
	SNEZ	10 19 23		
	LNE	10 20 40		
	MNE	10 22 00		
	F	10 55		

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SEISMOLOGICAL BULIETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Distance Km.	Remarks.
1932 May				
No. 273	iPNEZ	4 37 32	40	
31st	$\bar{S}$NE	4 37 38		
	F	4 38		
No. 274	eNEZ	10 17 30	1580?	Disturbed by microseisms.
31st	SNE?	10 20 14		
	F	10 35		
No. 275	ePNEZ	13 57 37	2720	Felt in Guam, Δ=200 Km.
31st	iSNE	14 01 50		
	LNE?	14 04 48		
	F	14 48		

Twelve insignificant or undecipherable disturbances in the following days of May: 1st(4), 14th, 15th, 17th, 18th(2), 20th, 25th and 30th.

No. 26. July, 1932.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

φ=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

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

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.2	200	2.3	0.029
E-W	4.4	229	2.6	0.033

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 July				
No. 343 1st	PNEZ	10 13 56	2645	
	SNEZ	10 18 04		
	LNE	10 20 29		
	F	10 44		
No. 345 2nd	PNEZ	2 15 55	2310	Dilatation.
	SNE	2 19 40		
	LN	2 21 42		
	MN	2 23 44		
	F	3 20		
No. 346 2nd	PZ	10 18 50	1650	Disturbed by microseisms.
	SNE	10 21 41		
	F	10 41		
No. 348 3rd	P̄NEZ	6 51 55	160	
	S̄NE	6 52 15		
	F	6 58		
No. 350 4th	PNEZ	1 43 53	1365	
	SNE	1 46 15		
	F	2 04		
No. 351 4th	PEZ	6 02 46	1000	
	SEZ	6 04 32		
	F	6 11		
No. 352 5th	PNEZ	10 57 53	3880	
	SNE	11 03 21		
	LNE	11 07 ca		
	MNE	11 11 07		
	F	12 24		
No. 357 7th	P'NE	16 35 08	13920	27.4°N, 113°W, 0=16:15:57 by U.S.C.G.S.
	L?NE	17 07 42		28°N, 113.5°W, 0=16:15:44 by J.S.A.
	F	19 12		
No. 365 9th	PNEZ	13 05 26	6015	Cpmpression. 0=12:55:54
	SNE	13 13 01		15°S, 167°E by Riverview, Manila, Amboina, Osaka.
	LNE	13 22 06		
	F	14 32		

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 July				
No. 366 9th	iPNEZ	20 26 24	950	Dilatation from southeast.
	iSNEZ	20 28 05		Felt at Davao.
	F	21 42		
No. 367 10th	PNEZ	0 58 00	3135	P in minute gap.
	SNE	1 02 41		
	LE	1 05 47		
	F	1 50		
No. 368 10th	PNEZ	7 52 14	3480	East of Japan.
	SNE	7 57 17		
	LNE	8 01 ca		
	ME	8 04 00		
	F	9 45		
No. 369 11th	iPEZ	8 22 45	555	Compression. Felt in Samar and SE Luzon.
	ePN	8 22 45		12° 38'N, 125° 40'E by Manila, Osaka,
	SNE	8 23 50		Baguio, as on July 19, 1922.
	$\bar{S}$NE	8 24 12		S ans $\bar{S}$ from the Wiechert.
	F	10 15		
No. 370 12th	P?NEZ	19 44 10		25°N, 110°W, 0=19:24:06 by U.S.C.G.S.
	iNE	19 53 40		25.6°N, 110.5°, 0=19:34:13 by J.B.A.
	LNE	20 17 51		
	F	22 06		
No. 372 14th	PNEZ	9 00 30	3035	Compression. In region of 5°N, 148°E
	SNE	9 05 04		by Amboina, Manila, Hong Kong.
	F	9 44		Disturbed by microseosms.
No. 375 16ht	PNEZ	21 12 48	5865	Disturbed by microseisms.
	SNE	21 20 13		
	F	22 15		
No. 377 17th	PNEZ	11 33 25	1625	
	SNE	11 36 14		
	F	11 48		
No. 378 17th	PNEZ	16 53 38	1145	Disturbed by microseisms.
	SNE	16 55 37		Butuan Δ=300 Km.
	F	17 40		
No. 379 17th	$\bar{P}$NEZ	19 17 17	135	
	$\bar{S}$NE	19 17 34		
	F	19 21		
No. 380 17th	PNEZ	21 34 08	2545	Disturbed by microseisms.
	SNE	21 38 09		
	F	21 52		
No. 381 17th	eNEZ	22 11 07		
	F	22 20		

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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.	Dist. Km.	Remarks.
1932 July				
No. 382 18th	iPNEZ	5 02 26	130	Felt in western and southwestern Luzon. In Manila with intensity V. 14° 33' N, 119° 54' E by Manila and Baguio. Wiechert pens disjointed.
	F	5 53		
No. 384 20th	PNEZ	20 17 42	7320	
	SNE	20 26 33		
	F	21 15		
No. 386 21st	iPEZ	12 45 08	2735	Compression from E. 2° S, 140° E by Riverview, Manila, Hong Kong, Koti.
	ePN	12 45 08		
	SNE	12 49 22		L from the Wiechert.
	L?NE	12 51 ca		Baguio $\Delta=25.7^{\circ}$.
	F	14 12		
No. 388 24th	PNEZ	8 54 01	1040	
	SNE	8 55 51		
	L?NE	8 56 45		
	F	9 38		
No. 391 25th	PNEZ	8 30 11	3610	Japan.
	SNE	8 35 23		Disturbed by microseisms.
	LNE	8 39 31		
	ME	8 42 22		
No. 392 25th	P?NEZ	9 33 27		Other phases not distinguishable.
	F	11 57		No. 391 still recording. 18.5° N, 103.5° W, O=9:12:40 by U.S. C.G.S.
No. 395 27th	PNEZ	21 24 37	2560	Netherlands East Indies. Felt at Darwin, Australia according to Adelaide.
	SNE	21 28 39		Horizontal data from the Wiechert.
	LNE	21 31 ca		Disturbed by microseisms.
	F	22 15		Baguio $\Delta=23.8^{\circ}$. Butuan $\Delta=17^{\circ}$.
No. 397 29th	PNE	1 29 29	480	18° 40' N, 122° 35' E by Manila and Baguio. Disturbed by microseisms.
	SNE	1 30 26		
	F	1 49		Baguio Δ=325 Km.

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 July				
No. 399 29th	PNEZ	21 01 59	1780	1°S, 123° 30'E by Manila and Riverview.
	SNE	21 05 01		
	F	21 42		S from the Wiechert. Disturbed by microseisms.
				Butuan △=12°.
No. 400 30th	PNEZ	7 07 04	575	Disturbed by microseisms.
	SNEZ	7 07 35		
	F	7 30		
No. 401 30th	PNEZ	12 17 23	1835	Dilatation.
	SNE	12 20 31		Disturbed by microseisms.
	F	13 01		

Twenty-eight insignificant or undecipherable disturbances in the following days of July: 1st(2), 2nd, 4th, 5th, 6th(2), 7th, 8th(4), 9th(3), 14th, 15th(2), 17th, 20th, 21st, 23rd, 24th(2), 26th(2), 28th 29th.

B U L L E T I N S R E C E I V E D

N O V E M B E R , 1 9 3 2

We thankfully acknowledge the receipt of the following and hope their continuance in the future.

S T A T I O N S	B U L L E T I N S
Barcelona	August 15, 1931 to May 26, 1932.
Riverview, Coll. Oby.	September, 1932.
Adelaide	October 1 to December 31, 1929 and September, 1932.
Wellington	March, 1931 and September, 1932.
Zurich	August 3 to September 29, 1932.
Osaka	August 24 to October 10, 1932.
U.S.C.G.S.	Radiogramof earthquakeof Oct. 30,1932
Saint Louis, Mo. J.S.A.	Prel. Bull. of earthquakes of Sept. 23, 26 and 29, and Oct. 2, 11, and 16, 1932, and Bull. of August and September, 1932.
Florissant	July and September, 1932.
Pasadena, Cal.	August and September, 1932.
Ottawa	September, 1932.
STRASBOURG:	
L'Institut	August, 1932.
Bureau Central	August, 1932.
Union International	August, 1932.
Parc St. Maur	August, 1932.
Hong Kong	Principal earthquakes of October, 1932 and Bulletin of August, 1932.
Apia	July to September, 1932.
Zikawei	Nos. 9 to 11: June 22 to September 26, 1932.
Peichiko, Nanking	Vol. 1, No. 1, July to September,1932.
Fordham	June to September, 1932.
Batavia	September 30 to October 16, 1932.
Melbourne	July 1 to September, 29, 1932.
Koti	Oct. 2 to Nov. 1, 1931, and Jan. 9 to February 25, 1932.
Georgetown, Washington	September, 1932.
Chiufeng	Pricipal earthquakes of September and October, 1932.
Palau, West Caroline Is.	Year, 1931.
Madagascar	May and June, 1932.
L'URSS, Central Asia	Nos. 1-4: January-December, 1931.
L'HRSS, Leningrad	Nos. 8-10: August-October, 1931.

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

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

International Seismological Centre

No. 26. July, 1932.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

International Seismological Centre

φ=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

	T_o	D	T_1		$\mathcal{H}^2$	K
N-S	12.43	100.5	12.59	11.52	0.017	97
E-W	11.80	100.5	11.91	11.40	-0.075	80
Z	11.60	100.5	9.00	14.82	1.250	200

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.2	200	2.3	0.029
E-W	4.4	229	2.6	0.033

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 July				
No. 343 1st	PNEZ	10 13 56	2645	
	SNEZ	10 18 04		
	LNE	10 20 29		
	F	10 44		
No. 345 2nd	PNEZ	2 15 55	2310	Dilatation.
	SNE	2 19 40		
	LN	2 21 42		
	MN	2 23 44		
	F	3 20		
No. 346 2nd	PZ	10 18 50	1650	Disturbed by microseisms.
	SNE	10 21 41		
	F	10 41		
No. 348 3rd	P̄NEZ	6 51 55	160	
	S̄NE	6 52 15		
	F	6 58		
No. 350 4th	PNEZ	1 43 53	1365	
	SNE	1 46 15		
	F	2 04		
No. 351 4th	PEZ	6 02 46	1000	
	SEZ	6 04 32		
	F	6 11		
No. 352 5th	PNEZ	10 57 53	3880	
	SNE	11 03 21		
	LNE	11 07 ca		
	MNE	11 11 07		
	F	12 24		
No. 357 7th	P'NE	16 35 08	13920	27.4°N, 113°W, O=16:15:57 by U.S.C.G.S.
	L?NE	17 07 42		28°N, 113.5°W, O=16:15:44 by J.S.A.
	F	19 12		
No. 365 9th	PNEZ	13 05 26	6015	Cpmpression. O=12:55:54
	SNE	13 13 01		15°S, 167°E by Riverview, Manila, Amboina, Osaka.
	LNE	13 22 06		
	F	14 32		

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 July				
No. 366 9th	iPNEZ	20 26 24	950	Dilatation from southeast.
	iSNEZ	20 28 05		Felt at Davao.
	F	21 42		
No. 367 10th	PNEZ	0 58 00	3135	P in minute gap.
	SNE	1 02 41		
	LE	1 05 47		
	F	1 50		
No. 368 10th	PNEZ	7 52 14	3480	East of Japan.
	SNE	7 57 17		
	LNE	8 01 ca		
	ME	8 04 00		
	F	9 45		
No. 369 11th	iPEZ	8 22 45	555	Compression. Felt in Samar and SE Luzon.
	ePN	8 22 45		12° 38'N, 125° 40'E by Manila, Osaka,
	SNE	8 23 50		Baguio, as on July 19, 1922.
	$\bar{S}$NE	8 24 12		S ans $\bar{S}$ from the Wiechert.
	F	10 15		
No. 370 12th	P?NEZ	19 44 10		25°N, 110°W, 0=19:24:06 by U.S.C.G.S.
	iNE	19 53 40		25.6°N, 110.5°, 0=19:34:13 by J.B.A.
	LNE	20 17 51		
	F	22 06		
No. 372 14th	PNEZ	9 00 30	3035	Compression. In region of 5°N, 148°E
	SNE	9 05 04		by Amboina, Manila, Hong Kong.
	F	9 44		Disturbed by microseosms.
No. 375 16ht	PNEZ	21 12 48	5865	Disturbed by microseisms.
	SNE	21 20 13		
	F	22 15		
No. 377 17th	PNEZ	11 33 25	1625	
	SNE	11 36 14		
	F	11 48		
No. 378 17th	PNEZ	16 53 38	1145	Disturbed by microseisms.
	SNE	16 55 37		Butuan Δ=300 Km.
	F	17 40		
No. 379 17th	$\bar{P}$NEZ	19 17 17	135	
	$\bar{S}$NE	19 17 34		
	F	19 21		
No. 380 17th	PNEZ	21 34 08	2545	Disturbed by microseisms.
	SNE	21 38 09		
	F	21 52		
No. 381 17th	eNEZ	22 11 07		
	F	22 20		

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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.	Dist. Km.	Remarks.
1932 July				
No. 382 18th	iPNEZ	5 02 26	130	Felt in western and southwestern Luzon. In Manila with intensity V. 14° 33' N, 119° 54' E by Manila and Baguio. Wiechert pens disjointed.
	F	5 53		
No. 384 20th	PNEZ	20 17 42	7320	
	SNE	20 26 33		
	F	21 15		
No. 386 21st	iPEZ	12 45 08	2735	Compression from E. 2° S, 140° E by Riverview, Manila, Hong Kong, Koti.
	ePN	12 45 08		
	SNE	12 49 22		L from the Wiechert.
	L?NE	12 51 ca		Baguio $\Delta=25.7^{\circ}$.
	F	14 12		
No. 388 24th	PNEZ	8 54 01	1040	
	SNE	8 55 51		
	L?NE	8 56 45		
	F	9 38		
No. 391 25th	PNEZ	8 30 11	3610	Japan.
	SNE	8 35 23		Disturbed by microseisms.
	LNE	8 39 31		
	ME	8 42 22		
No. 392 25th	P?NEZ	9 33 27		Other phases not distinguishable.
	F	11 57		No. 391 still recording. 18.5° N, 103.5° W, O=9:12:40 by U.S. C.G.S.
No. 395 27th	PNEZ	21 24 37	2560	Netherlands East Indies. Felt at Darwin, Australia according to Adelaide. Horizontal data from the Wiechert.
	SNE	21 28 39		
	LNE	21 31 ca		Disturbed by microseisms.
	F	22 15		Baguio $\Delta=23.8^{\circ}$. Butuan $\Delta=17^{\circ}$.
No. 397 29th	PNE	1 29 29	480	18° 40' N, 122° 35' E by Manila and Baguio. Disturbed by microseisms.
	SNE	1 30 26		
	F	1 49		Baguio Δ=325 Km.

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 July				
No. 399 29th	PNEZ	21 01 59	1780	1°S, 123° 30'E by Manila and Riverview.
	SNE	21 05 01		S from the Wiechert. Disturbed by microseisms.
	F	21 42		Butuan △=12°.
No. 400 30th	PNEZ	7 07 04	575	Disturbed by microseisms.
	SNEZ	7 07 35		
	F	7 30		
No. 401 30th	PNEZ	12 17 23	1835	Dilatation.
	SNE	12 20 31		Disturbed by microseisms.
	F	13 01		

Twenty-eight insignificant or undecipherable disturbances in the following days of July: 1st(2), 2nd, 4th, 5th, 6th(2), 7th, 8th(4), 9th(3), 14th, 15th(2), 17th, 20th, 21st, 23rd, 24th(2), 26th(2), 28th 29th.

International Seismological Centre

M A N I L A O B S E R V A T O R Y

SPECIAL BULLETIN OF PRINCIPAL EARTHQUAKES

A u g u s t , 1 9 3 2

3rd	PNEZ	9 37 17	
	SNE	9 41 11	
4th	PNEZ	5 14 30	
	SNE	5 18 14	
5th	PNEZ	0 48 17	Felt at Basco, Batan Islands.
	SNEZ	0 49 31	
11th	PNEZ	11 53 34	
	SNEZ	11 56 45	
12th	PNE	3 34 52	
	SNE	3 43 53	
13th	PNEZ	21 07 52	
	SNE	21 17 19	
14th	PNEZ	0 49 04	
	SNEZ	0 53 22	
14th	PNEZ	4 45 02	
	SNE	4 50 00	
20th	PZ	2 14 17	
	SNE	2 16 46	
21st	iPZ	4 17 53	Dilatation.
	iPNE	4 17 54	
	SNE	4 19 51?	
21st	PNEZ	12 40 05	
	SNEZ	12 42 38	
22nd	iPZ	11 17 31	Compression.
	SNE	11 21 34	
24th	iPNEZ	12 11 07	Dilatation. Seismograph in Baguio
	SNE	12 11 38	damged by the shock.
30th	PEZ	16 46 02	Felt on NW coast of Luzon.
	SE	16 46 46	

International Seismological Centre

B U L L E T I N-S R E C E I V E D

S E P T E M B E R , 1 9 3 2

We thankfully acknowledge the receipt of the following and hope their continuance in the future.

S T A T I O N S	B U L L E T I N S
Riverview College Observatory	July 2 to Sept. 30,1930 & July, 1932.
Adelaide	May 1 to Sept. 28, 1929; and July and August, 1932.
Apia, Samoa	April 1 to June 30, 1932.
San Fernando, Spain	May and June, 1932.
Oxford	The International Seismological Summary for 1928: July, August, September.
Madagascar	November and December, 1931, and March and April, 1932.
Ottawa	July, 1932.
Zurich	June and July, 1932.
Denver	May 14 to June 22, 1932.
St. Louis, J.S.A.	July, 1932, and Preliminary Bulletin of earthquakes of July 25 and August 12, 1932.
Buffalo,N.Y.	March 14 to April 29, 1932.
Little Rock,Ark.	April 4 to May 22, 1932.
Wellington and Christchurch	July, 1932.
Batavia	July 27 to August 14, 1932.
Hong Kong	April, May and June, 1932, and Principal earthquakes of August, 1932.
New Zealand	February, 1931.
Vienna	November 2, 1931 to May 27, 1932.
Graz	January 1 to March 31, 1932.
Innsbruck	April 14 to November 1, 1931.
Zikawei	May 28 to June 18, 1932, and Principal earthquakes of July and August, 1932.
Gottingen	April, May and June, 1932.
Stuttgart	January 1 to June 30, 1932.
U.S.C.G.S.	Radiogram of the earthquake of September 14, 1932.
Granada	January, February and March, 1932.
Sydney	July, 1932.
Osaka	Jan, Feb., March and April, 1932.
Zagreb	October 1, 1931 to March 31, 1932.
Toronto	June, 1932.
Taunus	May 20 to December, 1931.

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No. 34. September, 1932

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

Ø=14° 34' 42" N. λ=120° 58' 41" E h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

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

	T_o	V	ε	$\frac{x}{T_o^2}$
N-S	4.4	190	2.5	0.023
E-W	4.8	211	2.8	0.029

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 September				
No. 463 1st	PNEZ	1 58 35	2745	Compression.
	SNE	2 02 50		
	F	2 32		
No. 465 2nd	PNEZ	13 01 15	2920	Compression.
	SNEZ	13 05 42		
	F	13 48		
No. 468 3rd	PNEZ	12 05 26	3695	
	SNE	12 10 43		
	LNE	12 14 51		
	F	14 04		
No. 478 6th	$\overline{P}$NEZ	23 14 09	165	Compression.
	$\overline{S}$NE	23 14 30		
	F	23 25		
No. 479 7th	$\underline{P}$NEZ	0 54 56	345	
	$\overline{S}$NE	0 55 47		
	F	1 07		
No. 484 8th	eNE	7 42 09		Disturbed by microseisms.
	mN	8 01 30		
	mE	8 02 05		
	F	8 28		
No. 487 9th	PNEZ	6 50 32	2090	Laboeha, Batjan, Moluccas according to Batavia.
	SNE	6 54 00		
	LNE	6 55 38		
	MNE	6 57 40ca		
	F	8 18		
No. 489 9th	PNEZ	13 43 35	2165	Compression. Data after P from the Wiechert.
	SNE	13 47 09		
	LNE	13 49 ca		
	MNE	13 51 ca		
	F	15 38		
No. 490 9th	PN	22 34 41	1480	
	SNE	22 37 14		
	F	22 52		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 September				
No. 491 9th	PNEZ	23 04 54	2365	
	SNE	23 08 43		
	LNE	23 10 50		
	F	23 46		
No. 493 10th	PNEZ	22 52 54	1255?	
	S?NE	22 55 04		
	L?E	22 56 14		
	F	23 21		
No. 495 11th	PNEZ	4 19 36	1415	
	SNE	4 22 03		
	LNE	4 23 21		
	MNE	4 24 46		
	F	4 52		
No. 497 11th	ePNEZ	14 21 16	4820	
	SNEZ	14 27 42		
	LN	14 34 ?		
	MNE	14 37 30ca		
	F	15 13		
No. 507 15th	PNE	11 15 38	960	Felt in SW Mindanao and Sulu Archipelago. Intensity VI in Zamboanga, V in Jolo. In region 5° N, 122° E.
	SNE	11 17 20		From the Wiechert. Disturbed by microseisms.
	F	12 17		
No. 508 15th	P?NE	11 57 07		Aftershock. Felt at Zamboanga and Jolo. From the Wiechert. No. 507 still recording.
No. 509 15th	eN	14 15 34		From the Wiechert. Disturbed by microseisms.
	iN	14 18 03		New Zealand.
	F	14 54		39°S, 175°W, O=13:55.3 by U.S.C.G.S.
No. 513 18th	$\overline{P}$NEZ	11 58 20	75	Disturbed by microseisms.
	$\overline{S}$EZ	11 58 30		
No. 515 19th	$\overline{P}$NE	1 13 51	95	From the Wiechert.
	$\overline{S}$NE	1 14 03		
	F	1 16		
No. 516 19th	PNEZ	2 47 42	950?	Disturbed by microseisms.
	S?N	2 48 23		
	F	3 07		

International Seismological Centre

M A N I L A , P. I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 September				
No. 518 20th	eNEZ	10 52 28		Disturbed by microseisms.
No. 520 20th	PNEZ	15 49 44	4465?	Disturbed by microseisms.
	SNE?	15 55 48		
	LNE?	16 00 ca		
	F	16 45		
No. 524 23rd	P?NE	9 14 54	1845?	
	S?NE	9 18 03		
	iN	9 20 28		
	F	9 43		
No. 525 23rd	PZ	14 28 27	3520	O=14:21:45. Dilatation.
	PNE	14 28 29		Data after P from the Wiechert.
	SNE	14 33 34		45°N, 134°E, O=14:22:18 by U.S.C.G.S.
	LNE	14 37 22		
	MNE	14 40 ca		
	F	17 09		
No. 526 24th	eNEZ	4 35 42	2470	
	SNE	4 39 37		
	F	4 54		
No. 530 25th	eNEZ	7 13 04	2355?	
	S?NE	7 16 52		
	MN	7 21 04		
	F	7 35		
No. 531 25th	eNEZ	7 45 43	1480	
	SNE	7 48 16		
	F	8 05		
No. 533 25th	PNEZ	9 00 52	8175?	
	S?NE	9 10 29		
	F	10 07		
No. 537 25th	PNEZ	22 04 34	2065	Dilatation.
	SNE	22 08 00		
	LNE	22 09 42		
	F	23 54		
No. 538 25th	P̄NEZ	22 41 54	140	No. No. 537 still recording.
	S̄NE	22 42 12		

M A N I L A , P , I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

International Seismological Centre

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 September				
No. 539 26th	PNEZ	5 20 09	1030	Felt in eastern Mindanao.
	SNE	5 21 58		
	mN	5 23 40		
	mE	5 23 42		
	F	6 30		
No. 541 26th	PNEZ	19 33 26	9425	O=19:20:52. Dilatation?
	SNE	19 44 00		Greece.
	LNE	20 01 20		39.5°N,24°E, O=19:20:48 by U.S.C.G.S..
	MNE	20 07 56		
	F	23 05		
No. 545 27th	ePNZ	7 50 30	1265	E-W cylinder stopped at 4:04.
	SNZ	7 52 42		
	F	8 44		
No. 550 28th	ePNEZ	11 06 20	250	Compression.
	SNEZ	11 06 55		
	F	11 19		
No. 556 28th	PEZ	22 22 46	235	
	SNE	22 23 18		
	F	22 32		
No. 557 29th	iPZ	0 31 00	2310	Dilatation.
	ePNE	0 31 00		
	SNEZ	0 34 45		
	LE	0 36 51		
No. 559 29th	PEZ	4 10 04	9055	L and M not definite.
	PN	4 10 06		
	SNE	4 20 23		
	F	5 48		
No. 560 29th	eZ	10 48 40		
	F	11 23		
No. 564 29th	P?NEZ	17 28 16	2795?	
	SNE	17 32 34		
No. 565 29th	PNEZ	17 54 22	4435	No. 564 still recording.
	SNE	18 00 25		
	LNE	18 05 50		
	F	20 23		

Seventy insignificant or undecipherable disturbances on the following days of September: 1st, 3rd(2), 4th(4), 5th(5), 7th(3), 8th(3) 9th, 10th, 11th(6), 13th(3), 14th(2), 17th(3), 18th, 19th, 20th, 21st, 22nd, 23rd, 24th(3), 25th(4), 26th(3), 27th(4), 28th(6), 29th(4) and 30th(6).

International Seismological Centre

B U L L E T I N S R E C E I V E D

O C T O B E R , 1 9 3 2

We thankfully acknowledge the receipt of the following and hope their continuance in the future.

STATIONS	BULLETINS
[illegible]ew	July and August, 1932.
[illegible].S.C.G.S.	Radiograms of the earthquakes of September 23 and 26, 1932.
Saint Louis, Mo.,J.S.A.	Priliminary Bulletin of earthquakes of August 25, and September 8, 14 and 15, 1932.
Riverview College Oby.	August, 1932.
STRASBOURG:	
L'Institut	June and July, 1932.
Bureau Central	June and July, 1932.
Union International	June and July, 1932.
Parc St. Maur	June and July, 1932.
Moncalieri	Seismic observations of 1929.
Kiadvanyai, Budapest	Earthquake Catalogue of 1930 and 1931.
Budapest	Seismic observations of 1930 and 1931.
Mizusawa, Japan	Seismological observations of 1931.
Spain	Seismological Service of September to December, 1931.
Hong Kong	July, 1932, and Principal earthquakes of September, 1932.
[illegible]erth	April 25 to May 26, 1932.
[illegible]ydney Observatory	August, 1932.
Wellington	August, 1932.
Phu-Lien	April, May, June and July, 1932.
Pasadena	June and July, 1932, and monthly Report on local earthquakes of July, 1932.
Ottawa	August, 1932.
Firenze	April, May and June, 1932.
Ksara, Syria	Annual Report of Seismic Observations of 1922, 1923, 1925 and 1931.
Batavia	August 14 to September 30, 1932.
Berkeley	April 1 to September 30, 1931.
Madison, Wisc.	April 8 to June 30, 1932.
Georgetown, Washington	July and August, 1932.
Toronto	July and August, 1932.
La Plata	April, May, June and July, 1932.
Tokyo	January to March, 1932.

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No. 38. October, 1932.

M A N I L A , P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

Ø=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

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

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.4	190	2.4	0.021
E-W	4.8	199	2.7	0.024

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 October				
No. 575 1st	PEZ	15 12 31	1195	
	SNEZ	15 14 35		
	LE	15 15 44		
	F	15 46		
No. 578 2nd	P'Z	3 18 40	14065?	O=2:59:25
	P'NE	3 18 43		Disturbed by microseisms.
	SPSE?	3 40 34		12°N, 86°W, O=2:59:20 by U.S.C.G.S.
	iNE	4 00 11		10.9°N, 86.5°W, O=2:59:07 by J.S.A.
	LNE	4 07 ca		Group of 13.5 sec. waves, large amplitude.
	MNE	4 18 ca		
	F	5 44 ca		
No. 582 3rd	PEZ	4 57 22	400	Disturbed by micriseisms.
	SNE	4 58 23		
	F	5 07		
No. 583 3rd	PZ	5 14 11	200	Disturbed by microseisms.
	PNE	5 14 13		
	SNEZ	5 14 37		
	F	5 20		
No. 593 9th	PNEZ	12 52 00	1630	Disturbed by microseisms.
	SNE	12 54 49		
	LNE	12 56 11		
	ME	12 57 47		
	F	14 10		
No. 601 12th	PEZ	16 18 10	2560	Disturbed by microseisms.
	SNE	16 22 12		
	F	16 37		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULIETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 October				
No. 602 12th	PNEZ	19 48 08	3160?	Disturbed by microseisms.
	S?NE	19 52 51		
	F	20 24		
No. 603 13th	cNEZ	10 42 47	1980?	Disturbed by microseisms.
	S?N	10 46 06		
	F	10 59		
No. 616 15th	c$\overline{P}$NE	23 12 44	125	Dilatation.
	i$\overline{P}$Z	23 12 44		
	$\overline{S}$NE	23 13 00		
	F	23 23		
No. 617 16th	iPZ	12 19 29	7890	0=12:08:08. Compression.
	cPNE	12 19 29		54°N, 158°W, 0=12:08:08 by U.S.C.G.S.
	SNE	12 28 52		55°N, 155°W, 0=12:08:35 by J.S.A.
	PSE	12 29 18		
	PPPSE	12 29 34		
	LNE	12 42 ca		
	MNE	12 47 30ca		
	F	14 44		
No. 621 17th	PNEZ	13 33 10	4880	In region of New Britain by Manila and Riverview.
	SNE	13 39 39		
	LNE	13 46 00ca		
	F	15 25		
No. 624 18th	PNEZ	4 13 13	1635	Compression from SE. N.E.I.
	SNE	4 16 03		After P from the Wiechert.
	F	4 55		
No. 651 21st	PNEZ	18 27 30	1700	0=18:23:53
	SNE	18 30 26		Disturbed by microsiesms.
	LNE	18 31 50ca		
	F	20 10		
No. 653 23rd	P?NEZ	0 15 35	3610?	Disturbed by microseisms.
	S?NE	0 20 47		
	L?E	0 25 34		
	F	1 25		
No. 654 23rd	$\overline{P}$NE	9 57 02	95?	From the Wiechert. Disturbed by strong microsiesms.
	$\overline{S}$?NE	9 57 14		
	F	10 00		

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 October				
No. 655 23rd	P?NE	21 30 36	3745?	From the Wiechert. Disturbed by strong microseisms.
	S?N	21 35 56		
	F	22 ca		
No. 661 29th	eP?NEZ	11 24 06	3840?	Disturbed by microseisms.
	S?NE	11 29 32		
	LNE	11 33 44		
	F	12 16		
No. 662 30th	PZ	20 58 22	8235	0=20:46:48. Compression.
	PNE	20 58 23		Disturbed by microseisms.
	SNE	21 08 02		54°N, 156°W, 0=20:47:18 by U.S.C.G.S.
	LNE	21 22 34		
	F	23 10		
No. 664 31st	PNEZ	8 20 49	270	Disturbed by microseisms.
	SNEZ	8 21 27		
	F	8 24		

Seventy-four insignificant or undecipherable disturbances on the following days of October: 1st(4), 2nd(2), 3rd(5), 4th, 5th, 7th(2), 9th(3), 10th(3), 12th(3), 14th(7), 15th(5), 16th, 17th(3), 18th(3), 19th(11), 20th(7), 21st(6), 22nd, 24th(3), 25th, 29th and 31st.

No. 41. November, 1932.

International Seismological Centre

M A N I L A , P . I .

SEISMOLOGICAL BULIETIN OF THE OBSERVATORY

ϕ=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

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

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.4	191	2.5	0.025
E-W	4.8	205	2.7	0.028

No. and Date	Phase	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 November				
No. 665 1st	ePNEZ	8 31 09	470	Felt in Calbayog, Samar.
	SNE	8 32 05		Epicenter near 11° 50'N, 124° 10'
	F	8 45		E by Manila and Butuan.
No. 669 2nd	ePNEZ	11 22 40	13870?	0=11:06:49
	iP'NE	11 26 00		Disturbed by microseisms. P' in minute gap.
	$\overline{S_cP_c}\ \overline{P_cSN}$	11 34 31		
	LNE	12 06 14ca		23°S, 111°W, 0=11:03:25 by U.S. C. and G. S.
	MNE	12 16 06ca		
	F	13 30		23°S, 111°W, 0=11:03:27 by J.S.A.
No. 671 3rd	PZ	19 47 53	3445	Dilatation.
	PNE	19 47 56		
	SNEZ	19 52 54		
	LNE	19 56 30		
	F	21 09		
No. 672 4th	ePNEZ	8 15 37	295	
	SNE	8 16 17		
	mN	8 18 06		
	F	8 27		
No. 679 6th	$e\overline{P}NEZ$	21 51 13	135	
	$i\overline{S}NE$	21 51 30		
	F	22 20		

November 8 to 16 Galitzin records illegible by strong microseisms, due a typhoon in the Pacific, East of Luzon.

No. 682 8th	$\overline{P}NEZ$	1 18 40	180	Disturbed by microseisms.
	$\overline{S}NEZ$	1 19 03		
No. 683 8th	e?NEZ	1 20 20		Disturbed by microseisms.
	SNE	1 23 07		
	F	2 12		
No. 692 13th	PNE	4 53 02	3245	From the Wiechert. Disturbed by microseisms.
	SNE	4 57 50		0=4:46:43
	LNE	5 01 22		45°N, 137°E, 0=4:46:31 by U.S.C.G.S.
	iE	5 02 55		41°N, 135°E, 0=4;46:51, deep focus,
	F	5 30ca		by J.S.A.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

International Seismological Centre

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 November				
No. 693 14th	ePNE	1 12 40	630	From the Wiechert. Disturbed by microseisms.
	SNE	1 13 51		
	SNE	1 14 21		Felt in Samar and eastern Leyte.
	mN	1 15 01		Epicenter probably in the Philippine Deep.
	F	1 22		
No. 695 18th	PNE	2 49 55	130	From the Wiechert.
	SNE	2 50 12		
	F	2 55		
No. 696 18th	iPNEZ	13 50 13		Compression from SE. S unrecognizable.
	mE	13 52 50		After P from the Wiechert.
	mN	13 52 56		Felt in Ternate and Minahasa, N.E.I.
	F	14 46		
No. 701 21st	P?NEZ	3 09 42	1260?	Disturbed by microseisms.
	S?NE	3 11 23		Butuan Δ=580 Km.
	F	3 46		
No. 702 21st	PNEZ	22 28 59	650	Felt at Basco, Batan Islands.
	SNE	22 30 12		Disturbed by microseisms.
	SNE	22 30 42		
	mE	22 31 56		
	F	22 46		
No. 704 22nd	iPZ	14 56 14	2585	Compression. Disturbed by microseisms.
	ePNE	14 56 14		In the Banda Sea by Batavia, Amboina,
	SNE	15 00 17		Hong Kong, Manila.
	F	16 00		
No. 708 26th	iPZ	4 30 36	3610	Dilatation. Disturbed by microseisms.
	ePNE	4 30 36		
	SNE	4 35 48		
	LNE	4 39 45		
	F	6 10		
No. 709 27th	PNEZ	3 42 47	3145	Disturbed by microseisms.
	SNE	3 47 29		
	LNE	3 50 41		
	MN	3 53 47ca		
	F	4 46		
No. 712 27th	PNEZ	7 52 09	125	Disturbed by microseisms.
	SNE	7 52 25		
	F	7 56		
No. 714 29th	PNE	9 51 10	150	From the Wiechert. Disturbed by strong mocroseisms.
	SNE	9 51 29		
	F	9 54		Baguio Δ=165 Km.
No. 716 30th	P?NEZ	18 51 21	1535?	Disturbed by microseisms.
	SNE	18 54 00		
	L?E	18 55 20		
	F?	19 10		

Thirty-three insignificant or undecipherable disturbances in the following days of November: 1st(3), 3rd, 4th(2), 5th(2), 6th(2), 8th(8), 10th, 12th, 16th, 18th, 19th(3), 22nd, 25th(3), 27th(3) and 29th.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY

International Seismological Centre

Ø=14° 34' 42" N. λ=120° 58' 41" E. h=2.40 m. Alluvium.

GALITZIN-WILIP WIECHERT. M=1000 Kg.

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

	T_o	V	ε	$\frac{r}{T_o^2}$
N-S	4.4	193	2.4	0.026
E-W	4.8	209	2.5	0.034

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 December				
No. 717 2nd	PNE	2 34 31	930	
	SE	2 36 10		
	F	2 42		
No. 718 2nd	PNEZ	11 43 08	270	Felt at Baguio with intensity IV.
	SNEZ	11 43 46		
	F	11 49		
No. 720 3rd	ePNEZ	6 31 12		Disturbed by microseisms.
	S?E	6 41 43		
	iN	6 45 51		
	F	7 15		
No. 722 4th	eNEZ	5 07 10		
	S?NE	5 12 23		
	F	5 32		
No. 723 4th	PNEZ	8 14 13	1545	Dilatation. Minahasa and E Borneo according to Batavia.
	PR_1NE	8 14 20		
	SNE	8 16 53		Felt at Zamboanga and Jolo with intensity IV.
	LNE	8 18 10		
	F	10 00		After P from the Wiechert.
No. 724 4th	PNEZ	10 35 56	1545	Felt at Jolo with intensity III.
	SNE	10 38 36		After P from the Wiechert.
	F	11 40		

5th. Typhoon in the Pacific, southeast of Luzon. 6th to the east of Luzon. Galitzin records illegible.

December 7th and 8th Galitzin records illegible, because of strong microseisms due to northeast monsoosn.

No. 726 7th	PZ	23 45 18	245	Disturbed by strong microseisms.
	SZ	23 45 52		
No. 727 8th	eNE	12 43 52		From the Wiechert. Disturbed by strong microseisms.

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 December				
No. 733 11th	P?NEZ	4 33 08	2980?	Disturbed by microseisms.
	S?NZ	4 37 38		
	MNE	4 42 58ca		
	F	5 16		
No. 734 11th	PNEZ	8 56 43	550	Disturbed by microseisms.
	SNE	8 58 09		
	F	9 08		
No. 736 15th	PNEZ	19 35 15	580	After P from the Wiechert. Disturbed by microseisms.
	SNE	19 36 21		
	SNE	19 36 47		
	mN	19 37 01		
	mE	19 38 08		
	F	20 10		
No. 737 16th	PNE	7 16 49	880	Felt at Davao, intensity III and in Butuan, intensity I.
	SNE	7 18 23		From the Wiechert. Disturbed by microseisms.
	F	7 30		
No. 738 20th	PNEZ	7 16 54	580	Disturbed by microseisms.
	SNE	7 18 00		
	F	7 25		
No 740 20th	iPZ	15 17 34	980	Dilatation.
	ePNE	15 17 34		Disturbed by microseisms.
	SNE	15 19 18		
	LNE	15 20 14		
	F	16 10		
No. 742 21st	PNEZ	6 28 29	7280	Disturbed by microseisms.
	SNE	6 37 17		Galitzin horizontal records undecipherable after S because of overlapping swings. Conspicuous group of 26 seconds period waves on Z component from 6:58 to 7:03.
	F	9 38		38.7°N, 117.8°W, 0=6:10:15 by U. S. C.G.S.
No. 744 23rd	P?NZ	18 25 22	3735?	Disturbed by microseisms.
	SNE	18 30 41		
	LNE	18 35 07		
	F	19 07		
No. 747 24th	PNEZ	6 36 50	3510	Dilatation. Eastern New Guinea by Manila, Hong Kong, Chiufeng.
	SNE	6 41 55		After P from the Wiechert. Disturbed by microseisms.
	LNE	6 45 30ca		
	F	7 57		
No. 749 25th	iPNEZ	2 11 04	3670	Compression from NW. In the region of 39°N, 100°E.
	SNE	2 16 19		After P from the Wiechert.
	LNE	2 20 19		38°N, 96.5°E, 0=2:04:33 by U.S.C.G.S.
	MNE	2 23 30ca		
	F	4 43		

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SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No. and Date	Phase.	Greenwich Time h. m. s.	Dist. Km.	Remarks.
1932 December				
No. 757	PNEZ	16 10 10	1290	
26th	SNE	16 12 24		
	LNE	16 13 50ca		
	F	16 26		
No. 758	eNEZ	16 38 00	3320?	
26th	SNE	16 42 53		
	F	17 08		
No. 761	PNEZ	21 17 36	1270	Compression from the North.
26th	SNE	21 19 48		After P from the Wiechert.
	LNE	21 21 00		
	MNE	21 22 17		
	F	22 00		
No. 762	PNEZ	22 35 40	1745	
26th	SNE	22 38 40		
	LNE	22 40 10		
	MNE	22 42 00		
	F	23 28		
No. 763	PNEZ	8 45 36	390	
27th	SNE	8 46 24		
	F	9 02		
No. 764	PNEZ	10 20 13	220	
27th	SNE	10 20 42		
	F	10 25		
No. 766	PNEZ	11 39 57	135	Compression. Felt at Iba, west coast
28th	SNE	11 40 14		of Luzon.
	F	11 54		
No. 768	PNEZ	18 18 13	1820	Dilatation.
28th	SNE	18 20 30		
	ME	18 23 40		
	F	18 40		
No. 774	iPNEZ	20 31 52	540	Compression from SE. Felt at Tacloban,
30th	SNE	20 32 55		intensity VI.
	SNE	20 33 19		
	F	20 56		

Thirty-three insignificant or undecipherable disturbances in the following days of December: 2nd, 3rd, 6th, 9th(2), 10th(3), 12th, 20th(2), 23rd, 24th(3), 25th(7), 26th(2), 28th(2), 30th(4) and 31st.