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International
Seismological
Centre
1950

THE PENNSYLVANIA STATE COLLEGE
MINERAL INDUSTRIES EXPERIMENT STATION
GEOPHYSICAL LABORATORY

Seismograph Report XIII

1 January to 31 August 1950

School of Mineral Industries
State College, Penna., U.S.A.

Locality: The station is located in a vault under the central wing of the School of Mineral Industries Building. The instruments are mounted on a concrete pillar separated from the foundations and anchored to bedrock (dolomite). The geographic coordinates are:

$\phi - 40^{\circ} 48' N$ $\wedge - 77^{\circ} 52' W$ $H - 354 m$

The geocentric coordinates are (according to Gutenberg and Richter):

$\lambda - 40^{\circ} 36' N$ $\wedge - 77^{\circ} 52' W$ $H - +3 km.$

Please address all communications to:

Geophysical Laboratory
Mineral Sciences Bldg.
State College, Pennsylvania

From 1 January to 29 August 1950 two seismographs were in continuous operation. Both are of the galitzin type, being sensitive to the north-south and east-west components of horizontal motion. They record photographically. Both instruments record at a rate of $1\frac{1}{2}$ cms./min. The free period of each is 10 seconds. No record has been kept of damping or sensitivity of these instruments, though they were constant during this period. On 29 August the east-west recording instrument was withdrawn from service because of a breakdown in the clock mechanism of the recording drum drive.

On 3 February a vertical component instrument was put in operation using an electronic amplifier to drive a pen type galvanometer making an ink record. This was an experimental set-up and the sensitivity and period were changed several times with no record being kept of the changes. The drum speed of this instrument was 1.56 cms/min.

The time is controlled by a Stromberg clock, which is compared daily with signals from radio station WWV. The time accuracy of the north-south and vertical instruments was about ± 1 sec. Because of mechanical difficulties, the drum speed of the east-west recorder was not constant, and times obtained solely from the records of this instrument may have an error of as much as 4 sec. From 1 April to 25 May there is an uncertainty of 1 minute in all times given,

Date	Phase and component			G. M. C. T.	Remarks
1 Jan. '50	N,E				Seismic activity between the hours of 03:08:- and 03:22:-
2 Jan. '50	i P	N		00:47:45	Epicenter: 19°N, 67.5°W Near West Coast of Puerto Rico Dist. = 2500 Km. O = 00:42:26 Courtesy U.S.C.G.S.
	e	N		00:51:39	
	e S	N,E		00:51:47	
	e	N,E		00:53:10	
	M	N,E		01:01:-	
2 Jan. '50	N,E				Seismic activity recorded between 16:14:- and 16:40:-
3 Jan. '50	e P	N		03:12:06	Epicenter: 18°N, 121°E Northern Tip of Luzon Dist. = 13,300 Km. O = 02:51:50 Courtesy U.S.C.G.S.
	e S	N		03:21:55	
3 Jan. '50	e	N		11:29:42	
	c	N		11:35:27	
	M	N		12:09:-	
10 Jan. '50	M	N		03:29:-	Epicenter: 11°N, 103°W Off Southern Mex. Dist. = 4200 Km. O = 03:05:42 Courtesy U.S.C.G.S. Partially obscured by Microseisms.
22 Jan. '50	M	N		05:03:-	Epicenter: 28°N, 53°E Near Southern Coast of Iran. O = 04:07:15 Courtesy U.S.C.G.S. Dist. = 11,000 Km. Amplitude small.
24 Jan. '50	e P(?)	E		17:06:54	Epicenter: 14.5°S, 167°E New Hebrides Depth = 150 Km. Dist. = 13,000 Km. O = 16:47:18 Courtesy U.S.C.G.S.
	i	E		17:12:22	
	e	E		17:13:32	
	i S	N		17:14:44	
	e SP	E		17:16:26	
	e	E		17:17:20	
	e SS	N		17:22:54	
27 Jan. '50	N,E				Seismic activity between 20:03:00 and 20:20:00

Date	Phase and component		G. M. C. T.	Remarks
30 Jan. '50	i P	N	01:09:51	Epicenter: 54°S 71°W 50 miles South of Punta Arenas O = 00:56:32 Courtesy U.S.C.G.S. Dist. = 10,400 Km.
	i PP	N	01:13:30	
	i S	N,E	01:20:16	
	i	N	01:29:10	
	i	N	01:29:48	
	eL	N	01:42:30	
3 Feb. '50	e	N	00:02:23	Epicenter: 22°N, 100.5° Southwestern Yunnan Province, China Dist. = 13,100 Km. O = 23:33:38 Courtesy U.S.C.G.S.
	e TS	N	00:03:34	
	e TTS	N	00:04:50	
	e	N	00:13:50	
3 Feb. '50	e	N	03:21:04	Epicenter: 22°N, 100.5°E S.W. Yunnan Prov., China Dist. = 13,100 Km. O = 02:51:46 Courtesy U.S.C.G.S.
	i	E	03:22:46	
	e	N	03:33:06	
	i	E	03:36:30	
	i	N	03:36:46	
	M	N	03:59:	
3 Feb. '50		N,E		Seismic activity between the hours of 17:12:- and 17:50:-
4 Feb. '50	M	N	02:41:30	Epicenter: 54°N, 162°W Aleutians Dist. = 6300 Km. O = 02:07:53 Courtesy U.S.C.G.S.
5 Feb. '50	i PP	N,E	01:45:50	Epicenter: 50°S, 164°E Off Southern Coast of New Zealand Dist. = 15,200 Km. O = 01:23:30 Courtesy U.S.C.G.S.
	e	N	02:08:30	
	M	N,Z	02:43:-	
7 Feb. '50	i S	E	11:00:00	Epicenter: 46°N 152°E Kurile Is. region Dist. = 9,100 Km. O = 10:37:22 Courtesy U.S.C.G.S.
	i	N	11:00:21	
	i	N	11:06:37	
	M	N	11:35:-	
8 Feb. '50	i S	E	18:32:26	Epicenter: 48°N, 27.5°W North Atlantic Dist. = 4000 Km. O = 18:19:51 Courtesy U.S.C.G.S.
	M	N	18:40:14	
10 Feb. '50		N,E		Weak Seismic activity around 20:36:-
11 Feb. '50	M	N	02:49:30	Very weak seismic activity.

Date	Phase and component		G. M. C. T.	Remarks
12 Feb. '50	i S	N,E	22:42:19	Epicenter: 19°S, 178°E Fiji Island region Dist. = 12,700 Km. O = 22:14:55 Courtesy U.S.C.G.S.
	i TS	E	22:43:54	
	i	N	22:48:25	
	i	E	22:49:01	
	i	N,E	22:52:18	
	i	E	22:53:24	
	i	N	22:55:11	
	M	E	23:17:20	
	M	N	23:18:00	
17 Feb. '50	i P	N,E,Z	03:53:29	Epicenter: 13.5°N, 91°W Near Coast of Guatemala Depth = 100 Km. Dist. = 3200 Km. O = 03:47:21 Courtesy U.S.C.G.S.
	i	N	03:54:13	
	i S	N,E,Z	03:58:13	
	e L	E,Z	03:59:51	
25 Feb. '50		N,E		Seismic activity recognizable at 11:00:-
28 Feb. '50	i P	N,E,Z	10:33:03	Epicenter: 46°N, 143.5°E Off North Coast Of Hokkaido, Japan Depth = 350 Km. O = 10:20:58 Courtesy U.S.C.G.S. Dist. = 9,600 Km.
	e	Z	10:34:17	
	i ScS	N,E,Z	10:42:59	
1 March '50		N,E		Seismic activity recorded between 09:46:- and 10:18:-
2 March '50	i	N,Z	18:58:28	Epicenter: 59.5°S, 34°W Sandwich Isl. region O = 18:39:47 Courtesy U.S.C.G.S. Dist. = 12,000 Km.
	i	E	18:58:36	
	i	N	19:05:32	
	i	N	19:06:43	
	M	E	19:38:-	
3 March '50	i	E	11:08:02	Epicenter: 23°S, 175.5°W Tonga Isl. region O = 10:43:52 Courtesy U.S.C.G.S. Dist. = 12,000 Km.
	e	E	11:15:12	
	e	N	11:21:16	
	M	E	11:14:30	
7 March '50	i PT	N,E,Z	02:28:42	Epicenter: 10°N 124°E Philippine Islands Dist. = 13,900 Km. O = 02:07:46 Courtesy U.S.C.G.S.
	i	N	02:33:38	
	i	E	02:35:34	
	M	E	03:22:30	
	M	N	03:32:30	
12 March '50		N		Seismic activity recognizable between 07:37:- and 07:45:-

Date	Phase and component		G. M. C. T.	Remarks
14 March '50	i P	N,E,Z	03:18:38	Epicenter: 8°S, 74°W Eastern Peru Depth = 150 Km Dist = 5400 Km Courtesy U.S.C.G.S.
	i S	N,E	03:25:28	
	i sS	N,E,Z	03:26:27	
	i ScS	E	03:28:10	
27 March '50	i P	N,E	13:15:18	Epicenter: 53.5°N, 173°E Aleutian Isl. region O = 13:04:04 Courtesy U.S.C.G.S. Dist. = 7400 Km
	i S	N,E	13:24:00	
	i ScS	N	13:25:10	
	i	N	13:26:02	
	i	E	13:26:47	
	e	N,E	13:28:33	
	e L	N,E	13:31:31	
	M	E	13:45:30	
27 March '50	M	N	13:50:25	
27 March '50	i P'	N,E,Z	21:38:00	Epicenter: 5.5°S, 103°E Southern Coast of Sumatra Depth - Slightly deeper than normal. Dist. = 16,250 Km O = 21:18:32 Courtesy U.S.C.G.S.
	i	N	21:48:39	
29 March '50	e	Z	18:02:37	Epicenter: 3°S, 137.5°E Northern New Guinea Dist. = 14,500 Km O = 17:41:07 Courtesy U.S.C.G.S.
	i	E,Z	18:03:40	
4 April '50		N,E		Seismic activity recorded between 02:58:- and 03:11:-
4 April '50		N		Weak seismic activity recorded between 04:46:- and 05:01:-
4 April '50	i	N,E	19:07:32	
	i S	N,Z	19:07:51	
	i	E	19:08:36	
	e	E	19:10:56	
	i	Z	19:11:15	
	i	N	19:13:30	
	i SS	E	19:13:39	
	i	N	19:14:00	
	i	E	19:15:43	
	i	E	19:18:15	
	e	N	19:18:32	
	e L	N	19:20:35	

Date	Phase and component			G.M.C.T.	Remarks
5 April '50	i	N		01:36:31	Epicenter: 52°N, 177°W Aleutian Isl. region Dist. = 7100 Km O = 01:17:15
	i	E		01:37:00	
	i	N,E		01:38:22	
	i	E		01:38:56	
	i	N		01:39:37	
	i	E		01:40:03	
	e	L	E	01:52:25	
14 April '50	i	S	N,E	20:22:05	Epicenter: 36°S, 103°W 600 miles South of Easter Isl. Dist. = 8,900 Km O = 19:59:58 Courtesy U.S.C.G.S.
	i		N	20:23:02	
	i		N	20:24:17	
	i		N	20:27:43	
	i		N	20:28:43	
	e		N,E	20:32:00	
15 April '50	i		N	10:54:17	Very weak seismic activity on E and Z
	i		N	10:58:13	
15 April '50	e		E	12:55:18	Slight activity visible on N and Z
15 April '50	i		N	14:59:01	Epicenter: 14°N, 91°W Near Coast of Guatemala Depth = 100 Km Dist. = 3200 Km O = 14:51:25 Courtesy U.S.C.G.S.
	e	(PcP?)	N	15:01:26	
	e		N	16:02:25	
		M	N	16:11:33	
16 April '50		M	N,E	20:09:10	Weak seismic activity on Z
18 April '50	i(S?)		N	14:48:17	Epicenter: 4.5°S, 106°W Pacific Ocean, about 1100 Miles Southwest of Galapagos Islands Dist. = 5650 Km O = 14:31:46 Courtesy U.S.C.G.S.
	i(S?)		E	14:48:24	
	i(ScS?)		E	14:51:16	
	M		N	15:03:25	
20 April '50	i	P	N,E,Z	10:03:19	Epicenter: 45°W, 150°E Kurile Is. Region Dist. = 9,350 Km O = 09:50:44 Courtesy U.S.C.G.S.
	i		N	10:13:19	
	i	S	N,E	10:13:38	
	i	ScS	N,E,Z	10:14:10	
	i	PPS	N,E	10:14:45	
	i		N	10:15:18	
	i	SS	E,Z	10:19:37	
	e		N,E	10:23:49	
	e	L	N	10:28:59	
		M	N	10:49:-	
25 April '50			N,E		Seismic activity recognizable around 23:00:00

Date	Phase and component		G.M.C.T.	Remarks
26 April '50	i P	E,Z	07:18:36	Epicenter: 34°N, 135°E Near Southern Coast of Honshu, Japan Depth = Slightly deeper than normal Dist. = 11,150 O = 07:04:48 Courtesy U.S.C.G.S. Surface waves unusually weak.
	i	E,Z	07:24:15	
	e	N,E	07:26:31	
	i S	N,E,Z	07:29:04	
	i	Z	07:30:36	
	i PS	E	07:31:39	
	e SS	N,E	07:36:41	
30 April '50	i P	N,Z	10:40:33	Epicenter: 24.5°S, 112.5°W 250 miles NW of Easter Is. Dist. = 8000 Km O = 10:29:03 Courtesy U.S.C.G.S.
	i S	N	10:49:57	
	i ScS	N	10:50:47	
	i SS	N	10:54:44	
30 April '50	i	N,Z	23:56:18	Epicenter: 4.5°N, 82.5°W. Pacific - off Panama Coast Dist. = 4000 Km O = 23:49:22 Courtesy U.S.C.G.S.
	e	N,Z	00:01:25	
	M	N	00:10:40	
6 May '50	i	N	20:48:33	
	i	N,E	20:51:13	
	i	E	20:52:23	
	i	N	20:52:26	
7 May '50	i P'?	E	06:55:59	Epicenter: Macquarie Is. region O = 06:36:05 Dist. = 16,000 Km
	i PP?	E	06:59:30	
	i PPP?	E	07:01:40	
	i SKS?	E	07:02:45	
8 May '50				Seismic (?) activity around 19 hrs. 18 min.
9 May '50	i S	N	11:41:12	Epicenter: 41°N, 58°E Turkmen O = 11:17:10 Dist. = 10,100 Km Courtesy U.S.C.G.S.
	i PS	N	11:42:12	
	M	N	12:13:30	
10 May '50	i	E,Z	00:00:09	Epicenter: 17°S, 41.5°E Near Northern Coast of Madagascar O = 23:39:19 (10 May '50) Courtesy U.S.C.G.S. Dist. = 14,500 Km
	e	Z	00:11:57	
	e	E	00:19:39	
	i	Z	00:23:40	
	e (L?)	N	00:32:30	
	M	E	00:49:-	
13 May '50		N,E		Slight seismic activity recognizable between 18:52:- and 19:09:-

Date	Phase and component			G.M.C.T.	Remarks
15 May '50	i	E		03:40:38	Epicenter: Gulf of Calif. O = 03:32:41 Courtesy U.S.C.G.S.
	M	N		03:49:45	
17 May '50	i SKS	NE		12:08:59	Epicenter: 39°N, 130.5° E Sea of Japan, off east Korean Coast Dist. = 10,750 Km O = 11:46:46 Courtesy U.S.C.G.S. Depth = 600 Km
	i S	E		12:09:42	
	i sS	E		12:13:33	
	e SS	E		12:16:44	
	e SSS	E		12:21:01	
17 May '50	i P	E,Z		18:00:01	Epicenter: Off Coast of Honshu, Japan O = 17:46:12 Courtesy of U.S.C.G.S. Dist. = 11,000 Km
	i PP	E		18:04:22	
	i S	E		18:11:12	
17 May '50	e	E		18:32:40	Epicenter: 20°S, 169°E New Hebrides region Dist. = 13,500 Km O = 18:13:13 Courtesy U.S.C.G.S. Some of these pulses might represent activity from the previous quake.
	i	E		18:33:27	
	i PP	E		18:34:00	
	i	N		18:34:13	
	i	E		18:39:20	
	i	E		18:40:17	
	i	N		18:42:59	
	i PS	E		18:43:45	
	i	E		18:44:21	
	i PPS	E		18:45:02	
	i	E		18:52:06	
	i	E		18:58:48	
	e L	E,Z		19:14:-	
	M	N		19:19:20	
	M	E,Z		19:25:40	
19 May '50	i PP?	E,Z		02:58:32	Epicenter: 20.5°S, 169°E New Hebrides region Dist. = 13,500 Km O = 02:38:10 Courtesy U.S.C.G.S.
	e	E		02:59:09	
	i	N,E		02:59:29	
	i SKS?	E		03:01:09	
	i	E		03:04:00	
	e	N		03:05:24	
	e PS	N		03:08:24	
	M	E		03:47:30	
	M	N		03:53:30	
19 May '50	e L	N		07:47:10	Epicenter: 20.5°S, 169°E. New Hebrides region Dist. = 13450 Km O = 07:05:31 Courtesy U.S.C.G.S.
19 May '50	i	E		14:04:58	Seismic activity continued for an hour after this pulse
20 May '50		N,E			Seismic activity between the hours of 03:24:49 and 03:33:06

Date	Phase and component			G.M.C.T.	Remarks
20 May '50	i S	N		09:48:40	Epicenter: 29°N, 43.5°W N. Atlantic Dist. = 3,350 Km O = 09:37:27 Courtesy U.S.C.G.S.
	i L	N		09:49:41	
22 May '50		N,E			Seismic Activity recognizable at 11:47:-
22 May '50		N			Seismic Activity recognizable at 20:09:30
25 May '50	i S	N		08:49:54	Epicenter: 65.5°N, 151.5°W About 100 miles NW of Fairbanks, Alaska Dist. = 5,200 Km O = 08:35:32 Courtesy U.S.C.G.S.
	i L	N		08:53:36	
25 May '50	i PP	Z		18:54:33	Epicenter: 13°N, 142.5°E About 150 miles west of Guam Depth = 100 Km Dist. = 12,800 Km O = 18:35:00
	i pPP	Z		18:54:49	
	i sPP	N,Z		18:55:12	
	i	Z		18:58:40	
	i SKS	N		19:00:10	
	i	E		19:00:16	
	i	N		19:01:17	
	i S	N,E		19:02:02	
	i pS	N,E,Z		19:02:41	
	e SKSP	N,E,Z		19:03:58	
	e sPS	E		19:04:45	
	i	N,E		19:06:18	
26 May '50	e P'?	E		01:36:24	Epicenter: 20°S, 169°E New Hebrides region Depth = 100 Km Dist. = 13,400 Km O = 01:17:14 Courtesy U.S.C.G.S.
	e	E		01:37:58	
	i	E		01:38:45	
	e	E		01:39:16	
	i	N,E		01:46:39	
	i	E		01:46:45	
	i	E		01:48:51	
	e	E		01:55:47	
	i	E		01:58:00	
	i	E		01:58:47	
	M	N		02:22:30	
	M	E		02:29:-	
27 May '50		N			Seismic Activity recognizable at 13:08:-
28 May '50		N,E			Seismic activity recognizable at 02:05:-
30 May '50		N			Seismic activity recognizable at 01:47:-

Date	Phase and component		G.M.C.T.	Remarks
31 May '50		N		Seismic activity recognizable at 14:12:-
5 June '50	i P	N,Z	11:25:20	Epicenter: 87°N, 45°E North Polar region Dist. = 5650 Km O = 11:16:12 Courtesy U.S.C.G.S.
	i PP	N,E	11:27:09	
	i	N	11:29:09	
	e S	N,Z	11:32:27	
	M	N	11:46:50	
7 June '50	i P	N,E,Z	17:00:41	Epicenter: 40°S, 76.5°W Northern Peru Depth = 100 Km Dist. = 4,900 Km O = 16:52:34 Courtesy U.S.C.G.S.
	i PP	N,Z	17:02:18	
	i	E	17:03:29	
	i	N	17:06:12	
	i	N,E,Z	17:06:45	
	i S	N,E,Z	17:07:07	
	M	N,E,Z	17:11:25	
8 June '50	i	N,E,Z	16:25:50	Epicenter: 45.5°S, 15°W South of Tristan da Cunha Depth - possibly greater than normal Dist. = 11,400 Km O = 16:07:33 Courtesy U.S.C.G.S.
	i	N,E,Z	16:26:47	
	i	N,E	16:32:12	
	i	N,E,Z	16:34:56	
11 June '50	e	N	22:32:12	Epicenter: South Pacific Ocean, approx. 1200 miles southwest of New Zealand O = 22:11:12 Courtesy U.S.C.G.S. Dist. = 15,600 Km
	M	N	23:30:-	
12 June '50		N		Seismic activity recognizable at 23:48:-
14 June '50	e	N	03:33:06	No Observable disturbance on the E
	M	N	03:48:-	
15 June '50	e PP	N,E	07:30:39	Epicenter: 12.5N, 44.5W Mid Atlantic O = 07:21:18 Courtesy U.S.C.G.S. Dist. = 4600 Km
	e S	N,E	07:35:03	
	e L	N	07:37:55	
17 June '50	M	N	17:11:-	
18 June '50	M	N	07:18:-	
19 June '50	i P'	Z	12:56:35	Epicenter: 8°S, 112°E E. Java Dist. = 16,250 Km O = 12:36:58 Courtesy U.S.C.G.S.
	e	N,E,Z	12:56:48	
	e	Z	12:58:04	
	e	Z	12:59:20	
	i	N,Z	13:00:09	
	e	E	13:00:12	
	i	N,E,Z	13:01:03	
	M	N	14:12:-	

Date	Phase and component		G.M.C.T.	Remarks
19 June '50		N		Seismic activity recognizable at 18:50:32
19 June '50				Seismic activity recognizable at 20:18:36
20 June '50	M	N	14:43:-	Epicenter: 74.5°N, 8°E 400 miles NE of Jan Mayen Islands. O = 14:11:45 Courtesy U.S.C.G.S. Dist. = 4900 Km.
21 June '50		N,E	07:13:-	Strong seismic activity. No time marks on records. Epicenter: 21°S, 169°E New Hebrides Dist. = 13,500 Km O = 06:55:39 Courtesy U.S.C.G.S.
23 June '50	e L M	N N	04:00:43 04:08:30	Epicenter: 13°N, 93°W Off coast of Guatemala Depth possibly greater than normal. Dist. = 3400 Km O = 03:48:12 Courtesy U.S.C.G.S.
24 June '50	e i i e i e e e e M M	N,E E E N E E E E N E E N	22:45:40 22:45:49 22:46:21 22:46:42 22:48:28 22:50:34 22:51:25 22:52:51 22:54:59 22:55:35 23:35:- 23:41:30	Epicenter: 19.5°S, 168.5°E New Hebrides region Dist. = 13,500 Km O = 22:25:31 Courtesy U.S.C.G.S.
25 June '50	e e e e e e M	N N N N N N N	11:28:12 11:28:32 11:31:59 11:33:53 11:44:12 11:44:58 12:16:-	Epicenter: 5°N, 127°E Off S.E. Coast of Mindanao, Philippine Is. Dist. = 14,500 Km O = 11:05:51 Courtesy U.S.C.G.S.
27 June '50	e S e PS e PPS M	E E E N	16:05:14 16:06:11 16:06:45 16:43:-	Epicenter: 45.5°N, 140°E Off N.W. Coast of Hokkaido, Japan. Dist. = 9750 Km O = 15:41:54 Courtesy U.S.C.G.S.

Date	Phase and component		G.M.C.T.	Remarks
1 July '50	e	N	06:57:23	Start of weak seismic activity.
2 July '50	i P	N	22:56:38	Epicenter: 4°N, 73.5°W Central Columbia O = 22:49:24 Courtesy U.S.C.G.S. Dist. = 4040 Km
	i PP	N	22:57:57	
	e S	N,E	23:02:15	
	M	N	23:16:-	
3 July '50	e	N,E	10:23:35	Epicenter: 8°N, 141.5°E Caroline Is. region Dist. = 13,250 Km O = 10:03:36 Courtesy U.S.C.G.S.
	e(S?)	N	10:31:18	
	e PS	N	10:33:30	
	M	N	11:03:-	
5 July '50				Seismic Activity recognizable at 04:40:-
5 July '50	e L	N	18:55:41	Epicenter: 62°N, 155°W Southern Alaska O = 18:30:08 Courtesy U.S.C.G.S. Dist. = 5200 Km.
7 July '50	e PP	E	17:14:49	Epicenter: 11°S, 163°E Solomon Island region O = 16:54:10 Courtesy U.S.C.G.S. Dist. = 13,400 Km.
	e S	N,Z	17:22:20	
	M	N	18:04:30	
9 July '50	e S	N	02:01:38	Epicenter: 33°S, 112°W About 500 miles Southwest of Easter Islands Dist. = 8900 Km O = 01:39:29 Courtesy U.S.C.G.S.
9 July '50	i	N	16:33:45	Epicenter: 36.5°N, 70.5°E Northern North-west Frontier Province, Pakistan Dist. = 11,000 Km O = 16:10:26 Courtesy U.S.C.G.S.
	i	N	16:35:27	
	i	N	16:37:37	
	e	N	16:39:37	
	M	N	16:55:30	
10 July '50	M	N	07:00:-	Seismic activity recognizable for approx. an hour, starting about 0630
11 July '50	i	E	19:56:52	Seismic ?
12 July '50	e S	N,E	01:51:33	Epicenter: 2°N, 101°W 700 miles northwest of Galapagos Islands O = 01:36:42 Courtesy U.S.C.G.S. Dist. = 5,000 Km
	e SS	N,E	01:53:48	
	M	N	02:04:-	

Date	Phase and component		G.M.C.T.	Remarks
12 July '50	e P	N	11:19:15	Epicenter: 53°N, 166°W Aleutian Islands Region Dist. = 6300 Km O = 11:09:15 Courtesy U.S.C.G.S.
	i	N,E	11:27:11	
	e ScS	N	11:28:56	
	e SS	N	11:30:35	
	e L	N	11:31:47	
	M	N	11:53:30	
12 July '50		N,E		Seismic activity recognizable between the hours of 18:09:- and 18:28:-
13 July '50	e PP	N	04:21:25	Epicenter: 27.5°N, 139.5°E Bonin Islands region Depth = 500 Km Dist. = 11,500 Km O = 04:03:50 Courtesy U.S.C.G.S.
	i SKS	N,E	04:26:51	
	e SKKS?	E	04:27:33	
	i S?	E	04:28:02	
	e SP?	N,E	04:29:33	
	e	E	04:30:00	
14 July '50		N,E		Weak seismic activity starts at 12:38:-
17 July '50	i	E	18:56:04	
	i	E	18:59:52	
	e	E	19:02:32	
20 July '50	i	N	09:58:28	Epicenter: 17.0°S, 174°E Fiji Islands region Dist. = 12,750 O = 09:30:48 Courtesy U.S.C.G.S.
	e	N	10:00:21	
	e	N	10:10:08	
	M	N	10:27:40	
21 July '50	i	E	14:46:21	Sharp pulse, followed by over 4 hours of seismic activity.
21 July '50	i	E	20:51:24	Epicenter: 15.5°S, 168.5°E New Hebrides Islands Dist. = 13,100 Km O = 20:32:01 Courtesy U.S.C.G.S.
	i PP	E	20:52:23	
	i	E	20:52:46	
	i	E	20:54:20	
	i	E	20:59:16	
	i	N	21:00:11	
	i	N	21:01:45	
	i	E	21:01:57	
22 July '50		N		Seismic activity recognizable at 24:01:-
23 July '50		N		Seismic activity recognizable between 23:42:- and 24:25:-
23 July '50		N		Seismic activity recognizable between 16:00:- and 17:00:-

Date	Phase and component		G.M.C.T.	Remarks
25 July '50	M	N	18:33:-	Epicenter: 31°N, 42°W Atlantic Ocean Dist. = 3350 O = 18:15:00 Courtesy U.S.C.G.S.
26 July '50	i P M	N N	08:36:45 08:48:00	Off Coast of Dominican Republic O = 08:31:28 Courtesy U.S.C.G.S. Dist. = 2600 Km
26 July '50		N		Seismic activity between 17:54:- and 18:15:-
27 July '50	M	N	11:46:30	Epicenter: 33°N, 115.5°W S. California Dist. = 3450 Km O = 11:29:24 Courtesy U.S.C.G.S.
28 July '50	M	N	03:42:30	
28 July '50	i P i M	E E N	05:15:16 05:21:57 05:60:35	Epicenter: 13°S, 167°E Santa Cruz Islands O = 04:55:13 Courtesy U.S.C.G.S. Dist. = 17,000 Km
28 July '50	i P e e e	E N E N,E	18:05:14 18:05:44 18:06:28 18:06:54	Epicenter: 33°N, 115.5°W Southern California Dist. = 3450 Km O = 17:58:12 Courtesy U.S.C.G.S.
29 July '50	M	N	15:08:40	Epicenter: 33°N, 115.5°W Southern California Dist. = 3450 Km O = 14:36:33 Courtesy U.S.C.G.S.
29 July '50	i i e i e (L?) M	N N N N N N	22:09:28 22:10:01 22:10:34 22:11:33 22:14:52 23:00:35	
1 Aug. '50	M M	N E	08:54:21 08:56:24	Epicenter: 33°N, 115.5°W Southern California Dist. = 3450 Km. O = 08:37:18 Courtesy U.S.C.G.S.

Date	Phase and component		G.M.C.T.	Remarks
1 Aug. '50	M	N	10:13:-	Epicenter: 42.5°N 145°E Off Southeastern Coast of Hokkaido, Japan Dist. = 9850 Km O = 09:11:39 Courtesy U.S.C.G.S.
2 August '50	e (S?)	E	11:17:36	Epicenter: 12°N, 143°E Mariana Islands region Depth = Slightly deeper than normal. O = 10:50:07 Courtesy U.S.C.G.S. Dist. = 13,100 Km.
	i (SP?)	N,E	11:19:30	
	M	N	11:58:30	
3 August '50	i P	N,E	22:24:46	Epicenter: 10°N, 69.5°W Northwestern Venezuela Dist. = 3,500 Km O = 22:18:18 Courtesy U.S.C.G.S.
	i (PP?)	N,E	22:25:40	
	i S	N,E	22:30:04	
	M	N,E	22:36:33	
5 August '50	e P'	E	09:36:19	Epicenter: 50°S, 164°E Auckland Island region Dist. = 15,300 Km O = 09:16:48 Courtesy U.S.C.G.S.
	i	N	09:36:39	
	e PP	E	09:38:57	
	e	N	09:39:05	
	i	N,E	09:39:50	
	e	N	09:40:23	
	i PKS	N	09:40:36	
7 August '50	i P'	N,E	03:03:56	Epicenter: 6°N, 126°E Southeastern Coast of Mindanao, Philippine Is. Dist. = 14,350 Km. O = 02:44:44 Courtesy U.S.C.G.S.
	i	N	03:05:47	
	e	E	03:06:04	
	i	N,E	03:07:16	
	i	N	03:07:54	
	i	E	03:07:16	
	i	E	03:08:30	
	i	E	03:09:39	
	i	E	03:10:02	
	i	N,E	03:12:44	
	i	E	03:13:06	
	e	E	03:13:22	
7 August '50	e	E	16:09:38	Epicenter: 1°N, 126°E Molucca Passage Dist. = 14,850 Km O = 15:47:23 Courtesy U.S.C.G.S.
	i	N,E	16:10:12	
	i	E	16:10:24	
7 August '50		E		Seismic Activity recorded between 1800 - 2100
8 August '50	M	N	05:33:40	Epicenter: 55°N, 134.5°W Southeast Alaska O = 05:12:00 Courtesy U.S.C.G.S. Dist. = 4,400 Km
	M	E	05:33:-	

Date	Phase and component		G.M.C.T.	Remarks
9 Aug. '50		N,E		Weak seismic activity from 18:15:22 to 20:12:10
10 Aug. '51		N		Seismic activity recognizable at 21:23:-
13 Aug. '50	i P	N,E	16:48:22	Epicenter: 19.5N, 70.5W Near Coast of Santo Domingo Dist. = 2450 Km O = 16:43:20
	i	N,E	16:48:57	
	i	N	16:49:33	
	i S	N,E	16:52:30	
	M	N	17:01:48	
14 Aug. '50	i P	N,E	23:01:35	Epicenter: 27°S 62.5°W Northern Argentina Depth = about 700 Km Dist. = 7650 Km O = 22:51:28 Courtesy U.S.C.G.S.
	i (pP?)	N	23:03:40	
	e	N	23:04:45	
	i	E	23:06:24	
	i	N,E	23:09:57	
	i	N	23:13:35	
15 Aug. '50	e P	N	14:24:10	Epicenter: 28.5N, 97E Tibet-India Border region Dist. = 12,400 Km O = 14:09:30 Courtesy U.S.C.G.S.
	e	E	14:24:31	
	i PP	E,Z	14:28:48	
	e L	Z	15:04:-	
	M	Z	15:18:-	
16 Aug. '50		N,E		Weak Seismic activity starting at approximately 16:39:-
17 Aug. '50		N,E		Weak seismic activity starting at approximately 02:55:-
17 Aug. '50		N		Weak seismic activity recognizable at 16:42:-
17 Aug. '50		N		Weak seismic activity recognizable at 18:09:-
18 Aug. '50	e	N	01:29:25	Epicenter: 28.5N 97°E Region of China-Burma India border. Dist. = 12,400 Km. O = 01:07:49 Courtesy U.S.C.G.S.
	i SKS	N	01:33:00	
	i SKKS	N	01:33:57	
	e	N	01:36:18	
	e PS	N	01:36:33	
	i PPS	N	01:37:43	
18 Aug. '50		N,E		Seismic activity recognizable at 17:41:-
22 Aug. '50		N		Seismic activity recognizable between 14:24:- and 14:39:-
22 Aug. '50		N		Seismic activity recognizable between 20:07:- and 20:32:-
22 Aug. '50		N		Seismic activity recognizable between 21:42:- and 22:00:-

Date	Phase and component		G.M.C.T.	Remarks
23 Aug. '50		N	19:54:25	Seismic activity recognizable between 04:10:- and 04:32:-
23 Aug. '50	M	N	19:54:25	Epicenter: China - Burma or India border region O = 18:46:57 Courtesy U.S.C.G.S. Dist. = 12,400 Km
24 Aug. '50		N,E		Seismic activity recognizable at 18:03:-
25 Aug. '50		N,E		Seismic activity recognizable at 02:35:-
26 Aug. '50	i S e SS M	N N N	04:55:57 04:59:35 05:07:-	Epicenter: 65°N, 162°W about 150 miles N.W. of Nome. Dist. = 5700 Km O = 04:39:27 Courtesy U.S.C.G.S.
26 Aug. '50	M	N	07:40:-	Epicenter: 19°S, 170°E New Hebrides region Depth = about 100 Km O = 07:12:29 Courtesy U.S.C.G.S.
27 Aug. '50	e e e i	E N,E N E	00:59:50 01:01:54 01:04:57 01:05:-	Beginning probably not recorded. Surface waves not pronounced.
27 Aug. '50				Seismic activity recognizable at 16:00:04
30 Aug. '50	e M	N N	07:14:00 08:06:30	Epicenter: 3.5°S, 130.5°E Off W. Coast of New Guinea Dist. = 14,950 Km O = 06:51:03 Courtesy U.S.C.G.S.
31 Aug. '50	eP i iPP i e	N N N N N	07:24:50 07:26:38 07:26:50 07:28:10 07:36:53	Epicenter: 6°N, 126°E Off Southern Coast of Mindanao, Philippine Is. Dist. = 14,300 Km O = 07:05:35 Courtesy U.S.C.G.S.

We acknowledge with thanks receipt of the following bulletins and other publications between May 17 and Oct. 1, 1951.

<u>Bulletin</u>	<u>Date</u>
California Univ., Bulletin of the Seismographic Stations - April-June, 1945	Jan.-March, 1950
California Institute of Technology - Seis. Lab.	
Pasadena Preliminary Bulletin No. 74 -----	April-August, 1951
Copenhagen - Geodaetisk Institut - Bulletin of the	
Seismological Station -----	1949
Dublin Seismological Observatory, Seis. Bull. -----	Jan.-June, 1951
Helwan Seismological Bulletin -----	March-June, 1951
Japan Central Meteorological Observatory	
Seismological Bulletin -----	Jan.-Feb., 1951
Seismological Report -----	Dec., 1950 Jan., 1951
Journal of the Meteorological Society of Japan -----	June, 1951
Vol. XXIX No. 3, 5, 6, 7 -----	July, 1951
Jesuit Seismological Association - Preliminary Bulletin --	Jan.-April, 1951
Kandilli Rasathanesi - Bulletin Seismique Preliminaire ---	April-July, 1951
Kobe Marine Observatory, Bulletin -----	March, 1951
Lamont Geological Observatory - Seismological Bulletin ---	Sept.-Dec., 1950 Jan.-April, 1951
Milano - Rivista Di Geofisica Applicata -----	1951
Ottawa Seismological Bulletin - Dominion Observatory -----	Jan.-April, 1951
Publications of the Dominion Observatory, Vol. XIV	
Bibliography of Seismology, No. 8 -----	July-Dec., 1950
Perth Observatory - Seismologic Station Bulletin -----	Jan.-June, 1951
Potsdam Seismometrische Beobachtungen -----	1949
Praha Seismological Bulletin -----	March-June, 1951
Reykjavik, Iceland - Seismological Bulletin -----	1944, 1950
Rome Istituto Nazionale di Geofisica -----	March-April, 1951
Schweizerisches Erdbebenbulletin -----	April-June, 1951
Strasbourg Bureau Central Seismologique - Union Geodesique	
Et Geophysique Internationale - Bulletin Mensuel -----	May, July, March, 1951
Trieste Seismological Bulletin - Osservatorio Geofisico --	April, 1951
U. S. Coast and Geodetic Survey - Seismological Bulletin	Jan.-March, 1946 Jan.-March, 1949
Preliminary Determinations -----	No's. 104-50 to 154-50 1-51 to 111-51. S37-50 to S53-50, S1-51 to S31-51
Wellington Seismological Observatory	
Provisional Bulletin -----	Jan.-May, 1951
Earthquakes in New Zealand during the years -----	1948, 1949

The Geophysical Laboratory
Mineral Sciences Bldg.
State College, Penna.
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THE PENNSYLVANIA STATE COLLEGE
MINERAL INDUSTRIES EXPERIMENT STATION
GEOPHYSICAL LABORATORY

Seismograph Report XIV

1 September to 31 December 1950

School of Mineral Industries
State College, Penna., U.S.A.

Locality: The station is located in a vault under the central wing of the School of Mineral Industries Building. The instruments are mounted on a concrete pillar separated from the foundations and anchored to bedrock (dolomite). The geographic coordinates are:

$\phi - 40^{\circ} 48' N$ $- 77^{\circ} 52' W$ $H - 354 m$

The geocentric coordinates are (according to Gutenberg and Richter):

$A - 40^{\circ} 36' N$ $- 77^{\circ} 52' W$ $H - + 3 km.$

Please address all communications to:

Geophysical Laboratory
Mineral Sciences Bldg.
State College, Pennsylvania

From 1 September to 31 December 1950 two seismographs were in continuous and one (the east-west component) in intermittent operation. After 2 October all three were in continuous operation. All are of the Galitzin type. The two horizontal components record photographically, the vertical records through an electronic amplifier which drives a pen type galvanometer. The recording rate is approximately $1\frac{1}{2}$ cms. per minute. No record is kept of damping or sensitivity of the instruments, which is changed occasionally.

The time is controlled by a Stromberg clock, which is compared daily with signals from radio station WWV. The time accuracy of the north-south and vertical instruments was about ± 1 sec. Because of mechanical difficulties, the drum speed of the east-west recorder was not constant, and times obtained solely from the records of this instrument may have an error of as much as 4 sec.

Date	Phase and component	G. M. C. T.	Remarks
1 Sept. '50	N,E		Weak seismic activity starting about 0400
2 Sept. '50	i P N,E e PP N,E i S N,E i N,E e G E M E M N	02:57:24 02:59:29 03:05:35 03:07:12 03:11:37 03:23:30 03:25:30	Epicenter: 52.5°N, 169°W Aleutians O = 02:47:23 Δ = 6550 Km. Courtesy U.S.C.G.S. Depth probably deeper than normal
2 Sept. '50	E		Seismic activity recognizable at approx. 1700
3 Sept. '50	E		Long waves recognizable at 05:06:-
3 Sept. '50	N,E		Seismic activity recognizable at 19:30:-
5 Sept. '50	N,E		Seismic activity recognizable at 04:42:-
9 Sept. '50	e PKS E e SKS E e N e E e SS N M N	10:42:51 10:47:34 10:50:31 10:52:43 10:58:47 11:31:-	Epicenter: 4°S 153°E New Britain Region O = 10:21:40 Δ = 13,400 Km Courtesy U.S.C.G.S.
10 Sept. '50	i S N,E i N i PS N,E M N	03:46:09 03:46:32 03:47:37 04:27:-	Epicenter: 35°N, 140°E Near Coast of Hon shu, Japan O = 03:21:20 Δ = 10,750 Km Courtesy U.S.C.G.S.
10 Sept. '50	e P' E i E e N,E i N,E i N,E i E i N i N i PS N,E i N i SS E i P'P'E M N M E	15:34:57 15:35:23 15:35:56 15:37:09 15:41:28 15:42:53 15:43:32 15:44:39 15:46:36 15:52:12 15:52:27 15:53:49 16:09:- 16:20:-	Epicenter: 14°S 167°E New Hebrides Islands region O = 15:15:57 Courtesy U.S.C.G.S. Δ = 13,500 Km

Date	Phase and component		G. M. C. T.	Remarks
13 Sept. '50				Seismic activity recognizable around 12:00:-. Pulses obscured by microseisms
13 Sept. '50				Seismic activity recognizable about 00:15:-. Pulses obscured by microseisms.
14 Sept. '50	i pPP	N,E	09:28:39	Epicenter:
	e	N	09:34:46	Halmahera Island
	i	N	09:35:01	Region
	i pPS	N	09:39:07	O = 09:06:08
	e SS	N,E	09:45:25	Depth = 206
	M	E	10:32:25	Courtesy U.S.C.G.S.
	M	N	10:37:-	Δ = 14,900 Km
16 Sept. '50	i S	N,E	01:12:05	Epicenter: 4°S, 104.5°W
	i	N	01:12:27	about 1000 miles
	i ScS	N,E	01:14:16	west of Galapagos
	e SS	N,E	01:15:33	Islands
	M	N	01:25:30	O = 00:55:36
	M	E	01:29:00	Courtesy U.S.C.G.S.
				Δ = 5,600 Km
16 Sept. '50	i pP	N	22:09:19	Epicenter: 52.5°N, 178°E
	i	N	22:10:06	Aleutian Islands Region
	i S	N	22:17:36	O = 21:58:15
				Depth = 100 Km
				Δ = 7,300 Km
				Courtesy U.S.C.G.S.
19 Sept. '50	N			Seismic activity recognizable at 20:58:-. Microseisms mask activity.
21 Sept. '50	M	N	00:21:20	Epicenter: 9°S, 67°E
				Indian Ocean
				O = 22:51:02
				Courtesy U.S.C.G.S.
				Δ = 15,200 Km
22 Sept. '50	i P	N,Z	08:03:42	Epicenter:
	i	N	08:05:09	25°S, 114°W
	e	N	08:05:57	Easter Island Region
	i S	N	08:13:15	O = 07:52:07
	e	N	08:17:31	Δ = 8,200 Km
	i	N	08:21:37	Courtesy U.S.C.G.S.
	M	N	08:34:10	

Date	Phase and component		G. M. C. T.	Remarks
23 Sept. '50	i S	N	00:18:42	Epicenter: 18°S, 177°W Fiji Islands Region O = 23:53:29 (22 Sept. '50) Δ = 12,100 Km h = 450 Km Courtesy U.S.C.G.S.
	e pS	N	00:21:08	
	i SS	N	00:26:26	
	e	N	00:28:20	
	i sSS	N	00:28:59	
	e SSS	N	00:30:26	
27 Sept. '50	i P	N	03:43:52	Epicenter: 20°N, 109°W off W. Coast of Mexico O = 03:36:55 Δ = 3750 Km Courtesy U.S.C.G.S.
	i S	N	03:49:10	
	e L	N	03:50:48	
28 Sept. '50		N		Seismic activity between the hours of 0400 and 0600
28 Sept. '50	M	N	22:08:35	Epicenter: 54.5°N, 134.5°W Queen Charlotte Islands region O = 21:47:01 Courtesy U.S.C.G.S. Δ = 4,600 Km
29 Sept. '50	e P	N,Z	06:38:52	Epicenter: 19°N, 107°W off Coast of Colima, Mexico O = 06:32:14 Δ = 3650 Km Courtesy U.S.C.G.S.
	i	N,Z	06:38:57	
	i	N	06:39:05	
	i	N,Z	06:39:18	
	i	Z	06:39:22	
	i	N,Z	06:39:28	
	i	Z	06:39:44	
	i	Z	06:39:48	
	i (PP?)	N,Z	06:39:55	
	i PPP	Z	06:40:20	
	i (PcP?)	Z	06:41:27	
	i S	N	06:44:17	
	i	Z	06:44:27	
	M	N	06:51:50	
	M	Z	06:53:25	
30 Sept. '50	e PP	N	07:48:13	Epicenter: 28°N, 94°E Northern Assam, India O = 07:28:54 Courtesy U.S.C.G.S. Δ = 12,400 Km
	i	N	07:50:21	
	i SKS	N	07:54:10	
	i SKKS	N	07:55:02	
	e	N	07:57:28	
	i PS	N	07:57:46	
	e PPS	N	07:58:44	
	M	N	08:41:55	

Date	Phase and Component		G. M. C. T.	Remarks
2 Oct. '50	e L M	N N	11:57:30 12:04:38	Epicenter: 21°N, 109°W off West Coast of Mexico O = 11:43:30 Courtesy U.S.C.G.S. Δ = 3,800 Km
3 Oct. '50	M M	E N	09:31:5- 09:31:5-	Epicenter: Western Alaska, 150 miles Northeast of Nome O = 09:04:03 Courtesy U.S.C.G.S.
3 Oct. '50	e L M	E E	12:56:11- 12:59:5-	Epicenter: 65.5°N, 128°W Western Yukon, Canada O = 12:40:08 Δ = 4,200 Km Courtesy U.S.C.G.S.
4 Oct. '50		N,E		Seismic activity recognizable between 00:01:- and 00:31:-
4 Oct. '50		N,E		Seismic activity begins at 19:01:-
5 Oct. '50	e PS e SS i M	E E N E	01:10:55 01:17:40 01:18:02 01:49:30	Epicenter: 18.5°S, 170°E New Hebrides Islands region O = 00:41:07 Δ = 13,250 Km Courtesy U.S.C.G.S.
5 Oct. '50	e P i i pP i (sP?) i PP i M	N,E,Z Z E,Z Z Z Z Z	16:15:46 16:16:03 16:16:10 16:16:25 16:16:54 16:18:20 16:29:-	Unable to read time mark due to strong activity Epicenter: 10.5°N, 85°W Northwestern Costa Rica. O = 16:09:34 Depth = 100 Km Δ = 3,450 Km Courtesy U.S.C.G.S.
6 Oct. '50	i P i S M M	N N,E E N	08:21:06 08:25:37 08:29:35 08:35:25	Epicenter: 20°N, 66°W off Coast of northern Puerto Rico O = 08:16:02 Δ = 2,550 Km Courtesy U.S.C.G.S.

Date	Phase and component		G. M. / C. T.	Remarks
6 Oct. '50	i P	N	11:25:33	Epicenter: 17°N, 68°W off Southwest Coast of Puerto Rico O = 11:20:05 Δ = 2,900 Km Courtesy U.S.C.G.S.
	i S	E	11:30:27	
	M	E	11:29:-	
6 Oct. '50	i S	E	12:52:43	Epicenter: 17°N, 68°W off Southwest Coast of Puerto Rico O = 12:43:03 Δ = 2,900 Km Courtesy U.S.C.G.S.
	M	E	12:56:5-	
8 Oct. '50	e P'	N	03:42:32	Epicenter: 4°S, 128°E Molucca Islands O = 03:23:09 Δ = 15,300 Km Courtesy U.S.C.G.S.
	i	Z	03:42:36	
	i	E	03:42:48	
	i	N, E, Z	03:45:19	
	i PP	N, Z	03:45:35	
	i	N, E	03:46:12	
	i	Z	03:46:26	
	M	E	04:43:-	
	M	N	04:47:-	
8 Oct. '50	M	E	11:26:10	Epicenter: 32°N, 41°W Mid-Atlantic Ocean O = 11:09:38 Courtesy U.S.C.G.S. Δ = 3,200 Km
	M	N	11:27:40	
8 Oct. '50	M	E	16:58:1-	Epicenter 32°N, 41°W Mid-Atlantic Ocean O = 16:40:36 Courtesy U.S.C.G.S. Δ = 3,200 Km.
	M	N	16:58:5-	
10 Oct. '50		N, E		Seismic Activity from 1700 - 1800
11 Oct. '50		N, E		Seismic Activity from 0200 - 0300
14 Oct. '50		N, E		Seismic Activity between 17:58:- and 18:08:-
15 Oct. '50		N, E		Seismic Activity between 15:18:- and 15:42:-
17 Oct. '50	e S	N, E	15:07:32	Epicenter: Costa Rica O = 14:56:16 Depth = 100 Km Courtesy U.S.C.G.S.

Date	Phase and component		G.M.C.T.	Remarks
17 Oct. '50	M	E	22:24:50	Epicenter: 9.5°N, 85°W Off West Coast of Costa Rica O = 22:07:23 Depth = slightly deeper than normal Courtesy U.S.C.G.S.
18 Oct. '50		N,E		Seismic activity begins about 03:59:-
19 Oct. '50		N,E		Seismic activity begins about 10:48:-
20 Oct. '50	i P	N	07:50:06	Epicenter: 19°N, 64°W Off NE Coast of Puerto Rico O = 07:44:30 Courtesy U.S.C.G.S. Δ = 2850 Km
	i S	N	07:54:04	
	i	N,E	07:54:18	
	i	N,E	07:54:27	
	M	E	07:59:45	
	M	N	08:02:36	
21 Oct. '50	i S	E	04:37:44	Epicenter: 18.5°S, 174°W Tunga Island region O = 04:12:59 Courtesy U.S.C.G.S. Δ = 12,000 Km Depth = 200 Km
	e pS	E	04:38:26	
	i sS	N,E	04:39:10	
	e	E	04:40:29	
	e SS	N	04:45:25	
	i sSS	E	04:46:37	
21 Oct. '51	e	E	09:07:22	
	e	N,E	09:15:36	
21 Oct. '50	i P	N,E,Z	09:49:30	Epicenter: 17.5°N, 106°W Off Coast of Colima, Mexico O = 09:42:58 Courtesy U.S.C.G.S. Δ = 3,600 Km
	e PP	N,E,Z	09:50:32	
	i	E,Z	09:51:15	
	i	N	09:53:00	
	i	E,Z	09:53:28	
	i S	N,E	09:54:58	
23 Oct. '50	M	N	15:15:00	Epicenter: Guatemala Foreshock O = 15:03:40 Depth = 100 Km Courtesy U.S.C.G.S.
23 Oct. '50	i P	N,E,Z	16:19:22	Epicenter: 14.5°N, 92°W Near Coast of Guatemala O = 16:13:24 Depth = 100 Km Δ = 3250 Km Courtesy U.S.C.G.S.
	ipP	N,Z	16:19:40	
	is ^p	N	16:19:55	
	i	E,Z	16:20:02	
	i	N	16:20:13	
	i (PP?)	E,Z	16:20:18	
	i (sPP?)	Z	16:20:46	
	i	Z	16:21:43	
	i	Z	16:22:42	
	i	N	16:22:58	
	i S	N,E,Z	16:24:25	
	isS	Z	16:24:47	

Date	Phase and component		G.M.C.T.	Remarks
23 Oct. '50	M	E	21:50:45	Epicenter: Guatemala aftershock O = 21:32:06 Depth = 100 Km Courtesy U.S.C.G.S.
	M	N	21:51:45	
24 Oct. '50	M	E	01:11:00	Epicenter: Guatemala aftershock O = 23:49:10 (23 Oct. '51) Depth = 100 Km Courtesy U.S.C.G.S.
	M	N	01:12:30	
24 Oct. '50	M	E	06:09:00	Epicenter: 14.5°N, 92°W Guatemala aftershock O = 05:50:24 Depth = 100 Km Δ = 3250 Km Courtesy U.S.C.G.S.
	M	N	06:10:00	
24 Oct. '50	M	E	09:47:20	Epicenter: Guatemala aftershock O = 09:28:57 Depth = 100 Km Courtesy U.S.C.G.S.
	M	N	09:48:20	
24 Oct. '50	M	N	16:14:50	Epicenter: Guatemala aftershock O = 15:55:12 Depth = 100 Km Courtesy U.S.C.G.S.
25 Oct. '50		N,E		Seismic activity recognizable between 0500 and 0600
25 Oct. '50		N		Seismic activity recognizable between 0800 and 0900
25 Oct. '50	M	E	09:55:-	Epicenter: 6.5°S, 155°E Solomon Islands region O = 08:44:07 Courtesy U.S.C.G.S.
25 Oct. '50		N		Seismic activity between 14:47:- and 14:53:-
26 Oct. '50		N		Seismic activity between 01:18:- and 01:28:-

Date	Phase and component		G.M.C.T.	Remarks
26 Oct. '50	e	E	04:15:26	Epicenter: 32°S, 178°W Kermadec Islands region O = 03:49:55 Δ = 13,050 Km Courtesy U.S.C.G.S.
	i SS	N	04:26:03	
	M	E	04:54:00	
26 Oct. '50	e SKS	E	16:04:22	Epicenter: 32°S, 178°W Kermadec Islands region O = 15:38:43 Δ = 13,050 Km Courtesy U.S.C.G.S.
	e	E	16:05:34	
	i PS	E	16:08:38	
	e SS	E	16:15:05	
	M	E	16:41:25	
28 Oct. '50		N,E		Seismic activity recognizable between 1000 and 1100
28 Oct. '50	e P	N	22:21:44	Epicenter: 15°N, 91.5°W Western Guatemala O = 22:15:48 Depth = 100 Km Δ = 3,175 Km Courtesy U.S.C.G.S.
	e PcP	N,E	22:24:43	
	e S	N,E	22:26:25	
	e sS	N,E	22:27:14	
	i PcS	N,E	22:28:20	
	M	E	22:32:29	
	M	N	22:35:18	
30 Oct. '50		E		Seismic activity recognizable at 03:15:-
30 Oct. '50		N,E		Seismic activity recognizable between 18:24:- and 18:51:-
31 Oct. '50		N,E		Seismic activity recognizable between 05:21:- and 05:35:-
31 Oct. '50		N,E		Seismic activity starting about 20:40:-
31 Oct. '50	e S	E	19:34:03	Epicenter 1°N 26°W Mid Atlantic Ocean O = 19:15:22 Courtesy U.S.C.G.S. Δ = 6750 km
	i SS	Z	19:37:47	
	e L	E	19:44:00	
31 Oct. '50	e S	N	20:33:54	Epicenter 23.5°N 108°W Gulf of California O = 20:22:30 Δ = 3450 km Courtesy U.S.C.G.S.
	e S	E	24:34:00	
1 Nov. '50		N		Seismic activity recognizable about 02:34:4-

Date	Phase and component		G. M. C. T.	Remarks
1 Nov. '50	M	N	14:05:0-	Epicenter: 10°N, 85°W Near West Coast of Costa Rica O = 12:45:32 Depth = 100 Km Δ = 3,500 Km Courtesy U.S.C.G.S.
2 Nov. '50	i P'	N,E,Z	15:47:15	Epicenter: 6°S, 129.5°E Banda Sea region O = 15:27:49 Δ = 15,400 Km Courtesy U.S.C.G.S.
	i	N,E,Z	15:47:35	
	i	E,Z	15:48:07	
	i	E	15:48:16	
	i PP	N	15:50:03	
	i	N,E,Z	15:50:26	
	i	N	15:50:51	
	i SKS	N,Z	15:54:26	
	M	N	16:08:50	
	M	E	16:45:20	
5 Nov. '50	i P	N	16:41:22	Epicenter: 14.5N, 92 W Near West Coast of Guatemala O = 16:35:20 Δ = 3,100 Km Courtesy U.S.C.G.S.
	i	E	16:41:39	
	e S	E	16:45:44	
	M	E	16:52:00	
	M	N	16:54:20	
5 Nov. '50	i P	N,E	17:51:18	Epicenter: 33°N, 134.5°E Off Coast of Shikoku, Japan O = 17:37:25 Δ = 11,300 Km Courtesy U.S.C.G.S.
	i	N	17:55:56	
	i	E	17:57:49	
	i	N,E	17:58:16	
	e	N	17:59:17	
	i S	N,E	18:02:48	
	M	E	18:40:30	
	M	N	18:43:25	
6 Nov. '50	e	E	22:52:28	Epicenter: 7.5°S, 155.5°E Solomon Islands region O = 22:22:05 Δ = 13,650 Km Courtesy U.S.C.G.S.
	e PS	N	22:52:35	
	M	E	23:33:-	
	M	N	23:31:-	
8 Nov. '50	i PP	E	02:38:41	Epicenter: 9.5°S, 159.5°E Solomon Islands region O = 02:18:09 Δ = 13,600 Km Courtesy U.S.C.G.S.
	i	E	02:40:19	
	i	E	02:44:07	
	i SKS	N,E	02:44:15	
	i SKKS	E	02:45:28	
	i	N,E	02:45:41	
	i (PS?)	N,E	02:48:34	
	i	N	02:49:39	
	i (PPS?)	E	02:50:10	
	i	N	02:53:40	
	i SS	N	02:54:58	
	M	N	03:14:50	
	M	E	03:23:3-	
	M	Z	03:24:3-	

Date	Phase and component		G. M. C. T.	Remarks
9 Nov. '50	N,E			Seismic activity between the hours of 04:35:- 2nd 04:53:-
10 Nov. '50	N,E			Seismic activity recognizable at 02:28:-
11 Nov. '50	E			Seismic activity between 03:49:- and 04:06:-
11 Nov. '50	N,E			Seismic activity between 09:41:30 and 10:06:-
11 Nov. '50	N,E			Seismic activity between 14:08:46 and 14:19:-
14 Nov. '50	M	N	05:38:50	Epicenter 11°S, 161°E Solomon Islands region O = 04:23:46 Courtesy U.S.C.G.S. Δ = 13,700 Km
	M	E	05:39:05	
14 Nov. '50	M	E	09:38:20	Epicenter: 11°S, 161°E Solomon Islands Region O = 08:32:34 Courtesy U.S.C.G.S. Δ = 13,700 Km
14 Nov. '50	E			Weak seismic activity recognizable about 22:00:-
17 Nov. '50	i P	N,E,Z	19:34:36	Epicenter: 17°N, 100.5°W Near West Coast of Mexico O = 19:28:18 Δ = 3,450 Km Courtesy U.S.C.G.S.
	e	E	19:35:10	
	i S	N,E	19:39:35	
	i	E	19:40:55	
	M	N	19:50:15	
22 Nov. '50	i P	N,E,Z	10:27:09	Epicenter: 51°N, 176°W Aleutian Islands region Depth - possibly greater than normal O = 10:16:26 Δ = 7,200 Km Courtesy U.S.C.G.S.
	i	N,E,Z	10:27:15	
	i	Z	10:28:31	
	i	Z	10:35:14	
	i S	N,E,Z	10:35:37	
	i	E	10:36:19	
	i	N,E	10:36:41	
	i	E,Z	10:36:52	
	i S _c S	N	10:37:06	
	i	E,Z	10:37:29	
	M	E	10:54:40	
	M	N	10:56:10	

Date	Phase and component		G. M. C. T.	Remarks
24 Nov. '50	N,E			Seismic activity between 20:03:- and 22:00:-
25 Nov. '50	N,E			Seismic activity between 06:14:- and 07:00:-
1 Dec. '50	i P	N,Z	14:58:11	Epicenter: 14°N, 47°W Mid Atlantic about 800 miles off NE Coast of Brazil O = 14:51:00 Depth = 100 Km Courtesy U.S.C.G.S. Δ = 4,200 Km
	i	Z	14:58:42	
	i PP	N,E,Z	14:59:31	
	i P _c P	Z	15:00:20	
	i	N,E	15:00:49	
	i	N	15:02:49	
	i	N,E	15:03:21	
	i S	N,E	15:03:55	
	i	Z	15:04:10	
	e L	N,E	15:05:51	
	M	E	15:10:-	
2 Dec. '50	i P	N,Z	15:27:13	Epicenter: 8°S, 71.5°W Western Brazil O = 15:19:20 Depth = 650 Km Δ = 5,450 Km Courtesy U.S.C.G.S.
	i	N	15:27:33	
	e P _c P	Z	15:28:23	
	i s _c P	Z	15:30:17	
	i s _c PP	N	15:32:22	
	i S	N,E,Z	15:33:23	
	i	E	15:35:55	
	i	N	15:36:00	
	i s _c S	N,E	15:37:00	
	i	N	15:37:19	
	i	E	15:39:12	
2 Dec. '50	i P'	Z	20:10:27	Epicenter: 18°S, 167°E New Hebrides Islands region O = 19:51:45 Δ = 13,400 Km Courtesy U.S.C.G.S.
	i	N	20:11:20	
	i	E	20:12:06	
	i PP	N,E,Z	20:12:20	
	i	N	20:13:43	
	i SKS	E	20:17:40	
	i	N	20:18:08	
	i SKKS	N	20:18:41	
	i	N	20:19:01	
	i PS	E	20:21:47	
	M	N	21:00:00	
	M	Z	21:00:25	
	M	E	21:01:00	
3 Dec. '50	N,E			Seismic activity starting about 07:30:-
3 Dec. '50	i	E	08:17:39	Epicenter: 17.5°S, 167°E New Hebrides Islands region O = 07:47:33 Courtesy U.S.C.G.S. Δ = 13,400 Km
	M	E	08:59:00	

Date	Phase and component		G. M. C. T.	Remarks
4 Dec. '50	i	N	08:11:35	Epicenter: 18°S, 167°E
	M	N	08:48:13	New Hebrides Islands region
	M	E	08:49:36	O = 07:38:02
				Δ = 13,400 Km Courtesy U.S.C.G.S.
4 Dec. '50	e P'	E	16:47:05	Epicenter: 5°S, 153.5°E
	i PP	N, E, Z	16:48:18	New Britian region
	i pPP	Z	16:48:48	O = 16:28:01
	i p	E	16:48:58	Depth = 100 Km
	i sPP	N	16:49:05	Δ = 13,600 Km
	i	N	16:55:47	Courtesy U.S.C.G.S.
	i	N	16:56:57	
	e	N	16:57:40	
8 Dec. '50		N	16:58:30	
	M	E	02:01:58	Epicenter: New Hebrides Islands region O = 00:58:37 Courtesy U.S.C.G.S.
9 Dec. '50	i P	N, E, Z	21:49:21	Epicenter: 24°S, 67.5°W
	i	Z	21:49:36	Northern Argentina
	i P _c P	E, Z	21:49:54	China border region
	i P _c	E, Z	21:50:32	O = 21:38:56
	i PP	E, Z	21:52:09	Depth = 200 Km
	i sPP	E, Z	21:53:10	Δ = 7,400 Km
	i	N	21:53:14	Courtesy U.S.C.G.S.
	i	N	21:57:26	
	i S	N, E, Z	21:57:48	
	i	E, Z	21:58:00	
10 Dec. '50	i P	N	03:00:31	Epicenter: 14.5°S, 76.5°W
	i P _c P	Z	03:01:11	Near South Coast of Peru
	i	N	03:02:10	O = 02:50:40
	i	N	03:03:26	Depth = 60 Km
	e	N	03:07:24	Δ = 6,250 Km
	i S	N	03:07:45	Courtesy U.S.C.G.S.
10 Dec. '50	i PP	N, Z	13:42:28	Epicenter: 28.5°S, 179°W
	i	N, Z	13:42:45	Kermadec Islands region
	i sPP	N	13:44:12	O = 13:23:10
	i SKS	N	13:47:44	Depth = 300 Km
	i	N	13:48:57	Δ = 12,900 Km
	i S	N	13:49:54	Courtesy U.S.C.G.S.
	e	N	13:51:54	
	e	N	13:55:41	
	i	N	13:57:10	

Date	Phase and component		G. M. C. T.	Remarks
12 Dec. '50	N,E			Seismic activity from 02:50:- to 03:30:-
13 Dec. '50	N,E			Seismic activity recognizable about 01:31:-
14 Dec. '50	i p ^{P?}	N,E	02:07:48	Epicenter: 19.5°S, 176°W
	i	N	02:11:20	Tonga Islands region
	i	N	02:12:28	O = 01:52:47
	i	E	02:14:20	Depth = 200 Km
	i SKS	N,E	02:17:11	Δ = 12,100 Km
				Courtesy U.S.C.G.S.
14 Dec. '50	e L	N,E	13:37:15	Epicenter: 40.1°N, 120.2°W
				Northern California
				O = 13:24:21
				Δ = 3,550 Km
				Courtesy U.S.C.G.S.
14 Dec. '50	i P	N,E	14:21:55	Epicenter: 17°N, 98°W
	i	Z	14:22:00	Southern Mexico (Felt)
	i	Z	14:24:46	O = 14:15:50
	i	N	14:25:39	Δ = 3,300 Km
	i S	N	14:27:07	Courtesy U.S.C.G.S.
16 Dec. '50	N,E			Seismic activity begins around 11:06:-
18 Dec. '50	i P	N,E,Z,	08:10:27	Epicenter: 15°N, 90°W
	i PP	N	08:11:38	Guatemala
	i	N	08:13:02	O = 08:04:46
	i P _c P	Z	08:13:21	Depth = 200 Km
	i S	N,E,Z	08:15:01	Δ = 3,100 Km
	i S _c P	N	08:16:25	Courtesy U.S.C.G.S.
	i	E	08:16:31	
18 Dec. '50	N,E			Seismic activity starts at about 16:07:5-
19 Dec. '50	M	E	21:45:40	Epicenter: 15°N, 35°W
	M	N	21:46:50	North Atlantic Ocean
				O = 21:27:22
				Courtesy U.S.C.G.S.
22 Dec. '50	M	E	10:28:44	Epicenter:
	M	N	10:32:31	Nicaragua Islands region
				O = 09:10:36
				Courtesy U.S.C.G.S.

Date	Phase and component		G. M. C. T.	Remarks
24 Dec. '50	E			Seismic activity between 1700 and 1800
26 Dec. '50	M	N, E	14:14:09	Epicenter: 17°N, 98°W S. Mexico O = 13:51:43 Δ = 3,250 Km Courtesy U.S.C.G.S.
27 Dec. '50	M	N	23:34:28	Epicenter:
	M	E	23:38:45	Leeward Islands O = 23:19:24 Depth = 100 Km Courtesy U.S.C.G.S.
29 Dec. '50	N, E			Seismic activity recognizable around 1300
29 Dec. '50	M	N	20:30:48	Epicenter: 17°N, 63°W
	M	E	20:36:07	Leeward Islands O = 20:16:29 Depth = 100 Km Courtesy U.S.C.G.S.
30 Dec. '50	M	E	07:44:25	Epicenter: Kermadec Islands region O = 06:42:56 Depth = 100 Km Courtesy U.S.C.G.S.
30 Dec. '50	M	E	13:23:45	Epicenter: 1°S, 77°W Central Equador O = 13:02:20 Depth = 200 Km Courtesy U.S.C.G.S.
31 Dec. '50	M	E	10:02:55	Epicenter: Leeward Islands O = 09:46:28 Depth = 100 Km Courtesy U.S.C.G.S.

We acknowledge with thanks receipt of the following bulletins and other publications between Oct. 2 and Dec. 23, 1951:

International
Seismological
Centre

<u>Bulletin</u>	<u>Date</u>
Cleveland Seismological Observatory -----	March-August, 1951
Coimbra, Instituto Geofisico -----	Years, 1941 - 1944
Dublin Seismological Observatory - Seis. Bulletin -----	July-Sept., 1951
Djakarta Seismological Bulletin -----	July-Sept., 1950
Helwan Seismological Bulletin -----	July-Sept., 1951
Japan Central Meteorological Observatory - Seis. Bull. -	March-May, 1951
The Results of Marine Meteorological and Oceanographical Observations -----	Year, 1948
The Geophysical Magazine - Vol. XXII No. 4 -----	August, 1951
Journal of the Meteorological Society of Japan - Vol. XXIX, No. 8 August, No. 9 Sept., No. 10 Oct. Year, 1951	
Jesuit Seismological Association Preliminary Bulletin -	March-May, 1951
Kandilli Rasathanesi - Bulletin Seismique Preliminaire	August-Sept., 1951
La Plata, Republica Argentina Observatorio Astronomico De La Universidad Nacional Boletin Seismologico -----	Year, 1949
Manila, Seismic Bulletin -----	July-August, 1951
Mexico Nacional Universidad - Instituto of Geofisica --	Oct., 1951
New Zealand Journal of Sciences and Technology Observations of ScS near an Earthquake Epicentre Sec. B, Vol. 31, No. 2 -----	Sept., 1949
Wave Periods in New Zealand Local Earthquakes -----	Oct., 1950
Ottawa Seismological Bulletin - Dominion Observatory --	Aug.-Dec., '50 Jan.-Aug., 1951
Praha Seismological Bulletin -----	July, 1951
Rome, Istituto Nazionale di Geofisica -----	July-Sept., 1951
Santa Clara (California) -----	Sept.-Nov., 1951
Schweizerisches Erdbebenbulletin -----	July-Sept., 1951
Strasbourg Bureau Central Seismologique - Bulletin Mensuel -----	April-Oct., 1951
Tananarive, Madagascar - Bulletin Seismique -----	Year, 1950
U. S. Coast and Geodetic Survey - Seismological Bull. -	April-June, 1946
Preliminary determinations of epicenter -----	Nos. 112-51 to 145-51 S32-51-S50-51
U. S. Dept. of Commerce - Snow Cover Surveys by Eastern Snow Conference -----	1950-1951
Uppsala Meteorologiska Institutionen -----	1951
Observations seismographiques l'Observatoire meteorologique d'Uppsala -----	July, 1949 - June, 1950
Wellington Seismological Observatory - Provisional Bulletin -----	June, July, 1951

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