THE MINERAL INDUSTRIES EXPERIMENT STATION

College of Mineral Industries

THE PENNSYLVANIA STATE UNIVERSITY

DEPARTMENT OF GEOPHYSICS AND GEOCHEMISTRY

SEISMOLOGICAL OBSERVATORY.

SEISMOGRAPH REPORT XXI

1948

University Park, Pennsylvania

PENNSYLVANIA'S COLLEGE OF MINERAL INDUSTRIES

Division of Earth Sciences

Geology - Mineralogy - Geophysics - Geochemistry - Meteorology - Geography

Division of Mineral Engineering

Mineral Economics - Mining - Mineral Preparation - Petroleum and Natural Gas

Division of Mineral Technology

Ceramic Technology

Fuel Technology

Metallurgy

DEPARTMENT OF GEOPHYSICS AND GEOCHEMISTRY

SEISMOGRAPH REPORT XXI

1948

THE PENNSYLVANIA STATE UNIVERSITY
MINERAL INDUSTRIES EXPERIMENT STATION
GEOPHYSICAL LABORATORY
Project C-19

Seismograph Report XXI

1948

College of Mineral Industries
University Park, Penna., U.S.A.

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

$\phi = 40^\circ\ 48'$ N $\lambda = 77^\circ\ 52'$ W H = 354 m

The geocentric coordinates are (courtesy of Gutenberg and Richter):

A = $40^\circ\ 36'$ N $\lambda = 77^\circ\ 52'$ W H = + 3 km.

Please address all communications to:

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College of Mineral Industries
University Park, Penna., U.S.A.

During the period covered by this report two instruments were in intermittent operation. Both were of the Galitzen type. They were sensitive to NW - WE and SE - SW components of horizontal motion until November 30 when they were re-oriented to N - S and E - W components. Starting in July, a third instrument of the same type, sensitive to the vertical component was put in operation. The horizontal instruments recorded photographically while the vertical recorded through a pen galvanometer. The drum speed for all components was about 1.5 cm/min.

The time was controlled by a Stromberg clock which was compared daily with signals from radio station WWV. The time accuracy of the NW - SE instrument was about ± 2 sec. Because of mechanical difficulties, the drum speed of the NE - SW recorder was not constant, and times obtained solely from records of this instrument may have an error of as much as 4 secs. For certain intermittent periods, the timing break circuit of this instrument seems to have not been in operation, and although earthquakes were recorded they have not been reported.

The periods of the horizontal seismometers were 20 sec. undamped, while those of galvanometers were 2.5 seconds. The resistance of the seismometer coils were 110 ohms each; and of the galvanometers, 25 ohms with shunts of 30 ohms.

The instruments were undergoing repairs during part of August.

Date	Phase and component		G.M.C.T.	Remarks
6 Jan. '48	iP	NE	17:31:08	Epicenter: 16.5°N, 98°W
	ePP	NE	17:33:51	Oaxaca, Mexico
	iPP	NE	17:34:39	O = 17:23:24
	i	NE	17:35:01	Δ = 3350 km
	iS	NE	17:36:19	Courtesy U.S.C.G.S.
24 Jan. '48	i	NE	18:06:32	Epicenter: 10°N, 122°E
	i	NE	18:11:54	Off South west coast of
	i	NE	18:15:24	Panay, P. I.
	e	NE	18:16:37	O = 17:46:36
				Δ = 14,800 km.
				Courtesy of U.S.C.G.S.
				Δ = 14,600 km.
9 Feb. 48	eP	NE	13:10:30	Epicenter: 37°N, 26°E
	ePP	NE	13:13:05	Aegean Sea
	iS	NE	13:20:05	O = 12:58:24
	iPPS	NE	13:20:53	Δ = 8500 km.
	e	NE	13:32:39	Courtesy U.S.C.G.S.
11 Feb. '48		NW		Surface waves observed between 16:03:- and 16:16:-
				Epicenter: 64°N, 147°W
				Central Alaska
				O = 15:41:54
				Δ = 5100 km.
				Courtesy U.S.C.G.S.
18 Feb. '48	ePP?	NE	20:39:14	Epicenter: 82°N, 43°E
				Arctic Region
				O = 20:29:48
				Δ = 4750 km.
				Courtesy U.S.C.G.S.
24 Feb. '48	e	NW		Seismic activity observed at 08:34:-
28 Feb. '48	iP	NE	02:05:48	Epicenter: 53 1/2°N, 133°W
	ePP	NE	02:07:22	Queen Charlotte Islands
	eS	NE	02:13:30	region
				O = 01:58:06
				Δ = 4300 km.
1 March '48	e	NE	01:34:34	Epicenter: 3°S, 130 1/2°E
	i	NE	01:34:56	Off West Coast of New Guine
	i	NE	01:35:22	O = 01:12:42
	iSKS?	NE	01:39:06	Δ = 15,300 km.
	iSKKS	NE	01:41:22	Courtesy U.S.C.G.S.
	e	NE	01:46:34	
	e	NE	01:47:51	
	e	NE	01:48:33	
	e	NE	01:54:19	

Date	Phase and component		G.M.C.T.	Remarks
17 April '48	iPP	NE,W	16:29:26	Epicenter: 33°N, 135 1/2°E
	ePKS?	NE	16:31:31	Off southern coast of
	iS	NW,NE	16:36:54	Honshu Island, Japan
	ePS	NE	16:38:19	O = 16:11:30
	eSS	NW	16:43:43	Δ = 11,300
	eP'P'	NW	16:50:23	Courtesy U.S.C.G.S.
21 April '48	iP	NE	20:27:06	Epicenter: 19°N, 69 1/2°W
	iS	NE	20:31:18	Near Northeast Coast of
				Dominican Republic
				O = 20:22:00
				Δ = 2500 km.
				Courtesy U.S.C.G.S.
22 April '48	eP	NE	00:33:22	Aftershocks of April 21
	iS	NE	00:37:33	Δ = 2500 km.
	iP	NE	13:14:05	Courtesy U.S.C.G.S.
	iS	NE	13:18:12	Epicenter:
				O = 13:08:56
				Δ = 2650 km.
23 April '48	eP	NW,NE	11:55:24	Epicenter:
	iS	NW,NE	11:59:27	O = 11:50:16
				Δ = 2650 km.
9 May '48	eL	NW	03:06:00	Epicenter: 30°N, 129°E
				Off Southern Coast of
				Kyushu, Japan
				O = 02:08:48
				Δ = 11,800 km.
				Courtesy U.S.C.G.S.
11 May '48	iP	NW	09:05:36	Epicenter: 17°S, 71°W
	ePcP	NW	09:06:20	Southern Peru
	i	NW	09:09:38	O = 08:55:42
	iS	NW	09:13:31	Δ = 6400 km.
				Courtesy U.S.C.G.S.
14 May '48	eP	NW	22:41:19	Epicenter: 54 1/2°N, 161°W
	iS	NW	22:48:47	South of Alaska Peninsula
	iScS	NW	22:51:[illegible]	O = 22:31:42
	iSS	NW	22:52:35	Δ = 6100 km.
				Courtesy U.S.C.G.S.
25 May '48	No clear beginning, starts at about 07:30			Epicenter: 30°N, 99 1/2°E
				Sikang Province, China
				O = 07:11:18
				Δ = 12,200 km.
				Courtesy U.S.C.G.S.

Date	Phase and component		G.M.C.T.	Remarks
26 May '48	iS	NW	09:33:00	Epicenter: 56°N, 156°W
	iScS	NW	09:35:37	South of Alaska Peninsula
				O = 09:16:42
				Δ = 5700 km.
				Courtesy U.S.C.G.S.
27 June '48	iS	NE	21:55:39	Epicenter: 56°N, 158°W
	iScS	NE	21:58:09	South of Alaska Peninsula
				O = 21:39:12
				Δ = 5800 km.
				Courtesy U.S.C.G.S.
28 June '48	iP?	NE	07:27:18	Epicenter: 36°N, 136 1/2°E
	iPPP	NE	07:31:08	West Coast of Honshu Island,
	iPKS?	NE	07:33:16	Japan
	iS	NE	07:37:42	O = 07:13:30
				Δ = 10,800 km.
				Courtesy U.S.C.G.S.
15 July '48	iP'	NW	11:09:27	Epicenter: 10°N, 104°W
	iP''	Z	11:10:26	Pacific Ocean, 550 miles off
	ePP	Z	11:10:55	Southwest Coast of Mexico
	iS	NW,NE,Z	11:15:25	O = 11:02:00
				Δ = 4300 km.
				Courtesy U.S.C.G.S.
16 July '48	iP(?)	NW	07:18:36	Epicenter: 14 1/2°N, 92°W
	ePcP	NW	07:21:25	Near Coast of Guatemala
	i S(?)	NE	07:23:04	O_1 = 07:12:30
	i	NW	07:25:34	Δ = 3200 km.
				depth = 100 km.
				Courtesy U.S.C.G.S.
20 July '48	iP	NW	11:12:05	Epicenter: 17°S, 74.5°W
	ePP	NW	11:14:12	Off S.W. Coast of Peru
	iPPP	NW	11:15:36	O = 11:12:24
	iScP?	NW	11:16:30	Δ = 6550 km.
	eS	NW	11:20:24	d = 100 km.
				Courtesy U.S.C.G.S.
24 July '48	iP	NW	06:15:00	Epicenter: 35°N, 24°E
	iPP	NW	06:17:52	Near S.W. Coast of Crete
	ePPP	NW	06:19:34	O = 06:03:12
	iS	NW	06:24:42	Courtesy U.S.C.G.S.
				Δ = 8300 km.
8 Sept. '48	ePP	Z	15:28:00	Epicenter: 21°S, 174°W
	i	Z	15:28:59	Tonga Islands Region
	i	Z	15:30:48	O = 15:09:12
	iPS	Z	15:37:32	Δ = 12,000 km.
	iSS	Z	15:43:22	Courtesy U.S.C.G.S.

Date	Phase and component		G.M.C.T.	Remarks
28 Sept. '48		Z	22:47:-	Surface waves Epicenter: 23°N, 94°E Burma 0 = 21:36:36 Δ = 12,900 km. Courtesy U.S.C.G.S.
5 Oct. '48	iP	N,Z	20:25:22	Epicenter: 38°N, 58°E
	iPP	N,E,Z	20:28:48	Near Turkmen S.S.R., Iran
	e	E	20:30:03	border
	iS	N,E	20:35 46	0 = 20:12:06
	iPS	Z	20:37:32	Δ = 10,300 km.
1 Nov. '48	i	N	12:18:17	Seismic activity observed
	i	N	12:27:18	between 10:16:- and 12:02:-
19 Nov. '48	iP	N	01:10:46	Epicenter: 9°N, 84°W
	iPP	N	01:11:48	Near coast of western
	iS	N	01:15:42	Costa Rica
	iScS	N	01:19:44	0 = 01:04:18
	e	N	01:23:24	Δ = 3550 km.
				d = about 100 km.
				Courtesy U.S.C.G.S.
4 Dec. '48	iP	N,E,Z	00:29:07	Epicenter: 21 1/2°N, 106 1/2°W
	iPcP	E	00:31:14	Off West Coast of Mexico
	iS	N,E	00:35:14	0 = 00:22:48
	e	E,Z	00:41:42	Δ = 3450 km.
				Courtesy U.S.C.G.S.
4 Dec. '48	iP	E	23:49:30	Epicenter:33.9°N. 116.4°W
	iS	E	23:54:54	Southern California
				0 = 23:43:15
				Δ = 3450 km.
				Courtesy U.S.C.G.S.
5 Dec. '48	e	E	06:47:17	Epicenter: 53°S, 158°E
	i	E	06:49:15	Southeast of New Zealand
	e	E	06:50:00	0 = 06:26:24
			07:09:06	Δ = 15,900 km.
				Courtesy U.S.C.G.S.
6 Dec. '48		E		Seismic activity observed between 13:11:- and 13:48:-
16 Dec. '48		E		Seismic activity observed between 08:11:- and 08:45:-
17 Dec. '48		E		Seismic activity observed between 11:53:- and 11:57:-

Date	Phase and component		G.M.C.T.	Remarks
23 Dec. '48	iP	N	08:52:24	Epicenter: 56°N, 166°E
	iS	N	09:01:30	Off East Coast of Kamchatka
	eSSS	N	09:09:17	O = 08:41:18
	e	N	09:16:35	d = about 100 km.
				Courtesy U.S.C.G.S.
				Δ = 7700 km.
29 Dec. '48		E	13:09:40	Surface Waves
				Epicenter: 39.5°N, 120.2°W
				Northeastern California
				O = 12:53:29
				Δ = 3600 km.
				Courtesy U.S.C.G.S.
30 Dec. '48	iP	N	23:57:18	Epicenter: 51°N, 131°W
	iPP	E	23:58:41	Off Coast of British Columbia
	iS	N,E	00:02:58	O = 23:49:54
				Δ = 4200 km.
				Courtesy U.S.C.G.S.

We acknowledge with thanks receipt of the following bulletins and other publications between 2 June 1954 and 14 June 1955:

Arkansas Univ., Seis. Bull.	April - Dec. 1954; Jan., Feb., March 19
Australia Bur. Min. Res. Geoph. Obs. Bulletin	Jan. 1954; Feb. 1954 - Jan. 1955
Australia Bur. Min. Res. Geoph. Obs. Report	Feb. - Aug., Oct. - Dec. 1954; Jan. 195
Barcelona, Seis. Bull.	1952
Buenos Aires, Seis. Bull.	June, July, Nov., 1954; Jan. - May 1955
California Univ., Seis. Bull.	1946, 1952, 1953
Cartuja, Bull. Provisional Seis. Bulletin	Pages 1 - 50 1953
Chile, Seismic Bulletin	Jan. - June, Oct. - Dec. 1954
Cleveland, Seis. Bull.	Feb., March, April 1954
Coimbra, Seis. Bull.	April - June 1954
Copenhagen, Seis. Bull.	1947, 1949, 1953
Czechoslovakia, Seis. Bull. Prague, Cheb, Hurbanovo, Prelim. Seis. Bull.	1953 Feb. 1954 - Jan. 1955

Djakarta, Seis. Bull.	Jan. - Dec. 1954
Fordham, Preliminary Seis. Bull.	Feb., March, April, May, June, Nov., 1954
Hamburg, Geophy. Obs. Report	March 1 - Dec. 31, 1954
Harvard, Seis. Bull.	Jan. 1 - June 30, 1953
Helwan, Seis. Report	1945, 1948
Istanbul, Preliminary Seis. Bull.	Sept. - Dec. 1952 July, Sept., Oct., 1953 Jan. - Sept., 1954 Jan., February 1955
Jerusalem, Seis. Bull.	5 May 1954 - 31 March 1955
La Plata, Seis. Bull.	Jan., Aug., 1950: Jan., July, Nov. 1951
Luiro (I.R.S.A.L.)	May 1 - Dec. 31, 1953
Madagascar, Seis. Bull.	Oct. - Dec., 1953 Jan. - June, 1954
Manila, Seis. Report	March - Dec., 1954 Jan., Feb., 1955
New Zealand, Seis. Report	July 1951 - March 1952
Ottawa Seis. Bull. Western Division Eastern Division	 July 1953 - Dec. 1954 July - Sept. 1953
Pasadena, Preliminary Seis. Bull. Bulletin	March 17, 1954 - April 10, 1955 1953
Perth, Seis. Bull.	Oct. 1953 - Dec. 1954
Pittsburgh, Seis. Bull.	Jan. - Dec. 1954
Queenland Univ., Seis. Report	October 1952
Quetta, Seis. Bull.	Feb. - Dec. 1954
Rabaul, Seis. Bull.	April, Dec., 1954
Rathfarnham Castle, Seis. Report	Jan. 1 - Dec. 31, 1954
Reykjavik, Seis. Bull.	1954
Rome, Seis. Bull.	Jan. 1954 - March 1955
Santa Clara, Seis. Bull.	1953 Dec. - March 1955
Schweizerisches Erdbebulletin	1954 Feb. - March 1955

Strasbourg, Seis. Bull.	1949; Nov. Dec., 1953; April 10, 1954 - April 10, 1955
Tacubaya, Seis. Bull.	April 1954 - Feb. 1955
Taiwan Weather Bureau, Seis. Bull. Earthquake report	Jan. - June 1954 1951
Tokyo Central Meteorological Observatory, Seis. Bull., Geophysical Magazine	May, June, July, Dec., 1953; Jan., - Sept., 1954; Feb., March 1955
U. S. Coast and Geodetic Survey, Seis. Bull.	Jan. Dec. 1947; Jan., Feb., March, Oct., Nov., Dec., 1950; May 1954 - April 1955
Uppsala, Seis. Bull.	Jan., - Dec., 1953
Wellington, Seis. Bull.	July - Dec. 1953
West Virginia Univ. Seis. Report	1954
Uccle	Liste des Stations Seis.
U. S. Coast and Geodetic Survey Prelim. Det. epicenters	102-54 to 213-54, S21-54 to S52-54, 1-55 to 13-55, 15-55 to 34-55, 40-55 to 42-55

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