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PITTSBURGH, PENNSYLVANIA

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STATION CONSTANTS AND INSTRUMENTS

Latitude—40° 26.7' North.

Longitude—79° 57.2' West.

Lithological foundation—Birmingham Shale—Pennsylvania age.

Elevation—273 meters above sea level.

Instruments

Two Wenner horizontal seismographs (Orientation N 30° W and N 60° E)

One Benioff vertical seismograph (long-period recording only)

(The above instruments operate with photographic recording.)

Time Service and Control

Time marks are given by two Observatory master clocks. One is a special astronomical type (used as stand-by) while the other is a Frodsham astronomical clock (used for routine work).

Time signals are recorded automatically (or manually, depending on weather conditions) several times daily. These signals are transmitted from Washington, D. C. via Stations NSS and WWV.

The average clock drift is one-half second per day.

Instrument Constants

Magnification curves for the Wenner seismographs were given in No. 1, Vol. 1 of this Bulletin. The magnification curve for the Benioff is not yet completed. The "nominal" magnification for this instrument is approximately 24,000.

New Instrument Vault

A new instrument vault has been built in the Cathedral of Learning to house the mechanically recording pendula. Included in this vault will be an interferometer-type tiltmeter and a well-gage recorder.

Visual Recorder

A visual recorder, adapted to the Wenner seismometer, is being used currently on an experimental basis.

MICROSEISMIC ACTIVITY

These data have been evaluated according to the following scale:

HORIZONTAL AMPLITUDE	DESIGNATION
Less than 2 microns	Below normal
Between 2 and 3 microns	Normal
More than 3 microns	Above normal

	DATE	EVALUATION
January	1 - 6	Slightly above normal
	6 - 13	Considerably above normal
	13 - 31	Above normal
February	1 - 6	Slightly above normal
	6 - 19	Above normal
	19 - 22	Considerably above normal
	22 - 26	Above normal
	26 - 27	Slightly above normal
	27 - 28	Above normal
	28 - 29	Considerably above normal
March	1 - 4	Considerably above normal
	4 - 7	Above normal
	7 - 11	Slightly above normal
	11 - 18	Above normal
	18 - 19	Considerably above normal
	19 - 20	Above normal
	21 - 26	Slightly above normal
	26 - 31	Above normal
	April	1 - 10
10 - 12		Normal
12 - 16		Slightly above normal
16 - 21		Above normal
21 - 22		Slightly above normal
22 - 25		Normal
25 - 30		Slightly above normal

(4)

MICROSEISMIC ACTIVITY

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	DATE	EVALUATION
May	1 - 5	Slightly above normal
	5 - 6	Normal
	6 - 7	Slightly below normal
	7 - 12	Normal
	12 - 19	Slightly above normal
	19 - 31	Normal
	June	1 - 2
2 - 9		Slightly below normal
9 - 14		Normal
14 - 18		Slightly above normal
18 - 19		Normal
19 - 25		Below normal
25 - 28		Normal
29 - 14 July		Station closed
July	14 - 19	Slightly below normal
	19 - 21	Normal
	21 - 26	Below normal
	26 - 27	Normal
	27 - 31	Below normal
August	1 - 5	Below normal
	5 - 7	Normal
	7 - 13	Below normal
	13 - 14	Normal
	14 - 16	Below normal
	16 - 31	Normal
	21 - 23	Below normal
	23 - 26	Normal
	26 - 29	Slightly above normal
29 - 31	Normal	
September	1 - 5	Normal
	5 - 9	Slightly above normal
	9 - 10	Above normal
	10 - 11	Slightly above normal
	11 - 12	Normal

	DATE	EVALUATION
September	12 - 16	Slightly above normal
	16 - 18	Above normal
	18 - 19	Slightly above normal
	19 - 22	Normal
	22 - 27	Slightly above normal
	27 - 29	Above normal
	29 - 30	Slightly above normal
October	1 - 3	Normal
	3 - 4	Slightly above normal
	4 - 6	Above normal
	6 - 9	Slightly above normal
	9 - 13	Above normal
	13 - 18	Slightly above normal
	18 - 28	Above normal
	28 - 29	Slightly above normal
	29 - 31	Above normal
November	1 - 3	Considerably above normal
	3 - 5	Above normal
	5 - 9	Considerably above normal
	9 - 14	Above normal
	14 - 16	Considerably above normal
	16 - 19	Above Normal
	19 - 20	Considerably above normal
	20 - 30	Above normal
December	1 - 14	Above normal
	14 - 15	Slightly above normal
	15 - 19	Above normal
	19 - 21	Slightly above normal
	21 - 24	Above normal
	24 - 26	Considerably above normal
26 - 31	Above normal	

SECTION ON SEISMIC DATA

Earthquakes for which preliminary phases have been identified or for which preliminary epicenters have been worked out are numbered in the left-hand column as of No. 1, September 8, 1939. It was on this date that our new station was placed in operation.

SEISMIC DATA

GNWCH DATE	COMPNT.	PHASE	GMT	
Jan 3	Z	iP	10-13-14	U.S.C.G.S. gives H = 10h 05m 05s
	NW	i	10-19-15	Lat. 16°N Long. 99°W
Jan. 12	Z	e	20-21-32	U.S.C.G.S. gives H = 20h 11m 38s
	H	i	20-25-40	Lat. 53°N Long. 167° W
Jan. 13	Seismic activity centering about 05h 20m G.C.T.			
Jan. 31	Z	e	20-22-52	U.S.C.G.S. gives H = 20h 16m 43s
	H	iS	20-27-49	Lat. 15½° N Long. 93½°W
Feb. 11	Z	i	07-19-33	U.S.C.G.S. gives H = 07h 01m 07s G.C.T.
	Z	i	07-21-59	Lat. 6°S Long. 110° E
	H	i	07-28-39	
Feb. 14	Z	iPKP	03-57-48	U.S.C.G.S. gives H = 03h 38m 06s G.C.T.
	H	i	03-58-17	Lat. 8°S Long. 125° E
	H	iPP	04-00-41	
	H	i	04-01-22	
Feb. 25	NW	i	01-20-11	U.S.C.G.S. gives H = 01h 17m 00s GCT
	NW	e	01-41-50	Aftershock H = 01h 55m 33s G.C.T. Lat. 17° S Long. 173½° W
343 Feb. 26	Z	iP	11-40-13	Δ (S-P) = 5665 Km = 51° H = 11-31-
	Z	iPP	11-41-19	Lat. 14½° S Long. 70° W
	Z	i	11-41-38	
	H	iS	11-47-35	

GNWCH DATE	COMPNT.	PHASE	GMT	
	Z	eP	15-45-24	U.S.C.G.S. gives H = 15h 39m 23s G.C.T.
	H	i	15-50-43	Lat. $11\frac{1}{2}^{\circ}$ N Long. $86\frac{1}{2}^{\circ}$ W
Mar. 4	Z	iP	01-35-52	U.S.C.G.S. gives H = 01h 22m 41s G.C.T.
	H	i	01-36-10	Lat. $42\frac{1}{2}^{\circ}$ N Long. $143\frac{1}{2}^{\circ}$ E
	H	iS?	01-46-29	
	Other phases indiscernible because of overlapping trace			
	Z	i	04-06-25	
	Z	i	07-52-57	
344	Z	iP	20-09-07	$\Delta(S-P) = 87.8^{\circ} = 9755$ km H = 19-56-20
	H	iS	20-19-51	U.S.C.G.S. gives H = 19h 56m 10s G.C.T. Lat. 42° N Long. 146° E
Mar. 5	Z	i	04-01-59	
	NW	iS	15-57-05	
Mar. 7	Seismic activity centering about 08h 20m G.C.T.			
Mar 19	Z	iP?	11-16-11	U.S.C.G.S. gives H = 10h 57m 09s G.C.T.
	H	i	11-17-49	Lat. $9\frac{1}{2}^{\circ}$ N Long. 127° E
	NW	iS?	11-25-42	
Mar. 22	Seismic activity centering about 17h 18m G.C.T.			
Mar. 25	H	i	18-34-23	U.S.C.G.S. gives H = 04h 08m 26s G.C.T. Lat. $16\frac{1}{2}^{\circ}$ S Long. 176° W
Apr. 4	Z	i	03-04-36	
Apr. 14	Z	i	23-47-55	
	H	i	23-56-35	

GNWCH DATE	COMPNT.	PHASE	GMT	
Apr. 15	H	i	06-23-29	
	H	i	19-27-21	
Apr. 16	Z	i	03-52-30	
May 8	Seismic activity centering about 22h 05m G.C.T.			
May 9	Z	e	18-16-32	
345	May 13	Z	19-37-52	$\Delta(S-P) = 29.7^{\circ} = 3300$ Km H = 19h 31m 42s
	H	iP	19-42-55	U.S.C.G.S. gives H = 19h 31m 45s G.C.T. Lat. $10\frac{1}{2}^{\circ}$ N Long. 85° W
346	May 14	Z	21-16-55	$\Delta(S-P) = 25.4^{\circ} = 2820$ Km H = 21h 11m 26s
	Z	iP	21-16-57	
	H	iS	21-11-26	U.S.C.G.S. gives H = 21h 11m 36s G.C.T. Lat. $16\frac{1}{2}^{\circ}$ N Long. $86\frac{1}{2}^{\circ}$ W
May 15	Seismic activity centering about 19h 05m G.C.T.			
May 16	Seismic activity centering about 06h 07m G.C.T.			
May 19	Z	i	18-44-47	U.S.C.G.S. gives H = 18h 32m 24s G.C.T.
	H	i	18-55-30	Lat. 43° N Long. $144\frac{1}{2}^{\circ}$ E
May 24	Z	e	02-09-44	U.S.C.G.S. gives H = 01h 59m 05s G.C.T.
	H	iS?	02-18-02	Lat. $21\frac{1}{2}^{\circ}$ S Long. 71° W
May 28	Z	i	08-12-12	
	H	i	08-16-19	
	H	i	08-22-13	
June 10	Seismic activity centering about 10h 50m G.C.T.			

GNWCH DATE	COMPNT.	PH SE	GMT	
347 June 11	Z	ep	07-43-02	$\Delta(S-P) = 71.4^\circ = 7935 \text{ Km}$ H = 00h 31m 45s
	Z	ip	07-43-06	U.S.C.G.S. gives H = 00h 31m 32s G.C.T.
	H	iS	07-52-24	Lat. 32° S Long. $67\frac{1}{2}^\circ \text{ W}$
June 19	Seismic activity centering about 13h 40m G.C.T.			
	NW	i	21-29-48	
June 20	NW	e	06-15-15	
	Z	iP	09-38-45	
	Z	i	09-39-09	
July 15	Seismic activity centering about 06h 32m G.C.T.			
July 17	NE	i	16-35-21	
348 July 18	H	iP?	18-51-23	$\Delta(S-P) = 7890 \text{ Km}$ H = 18-40-09
	H	eS?	19-00-43	U.S.C.G.S. gives H = 18h 39m 40s G.C.T. Lat. 23° S Long. $114\frac{1}{2}^\circ \text{ W}$
July 21	Z	iP	11-58-42	$\Delta(S-P) = 30^\circ = 3435 \text{ Km}$ H = 11-52-21
	H	iS	12-04-39	U.S.C.G.S. gives H = 11h 52m 11.5s G.C.T. Lat. 35.1° N Long. 118° W
349 July 23	H	i	00-45-04	$\Delta(\text{Calc}) = 30.9^\circ = 3435 \text{ Km}$ H = 00-38-27
	H	iS	00-50-00	U.S.C.G.S. gives H = 00h 38m 33s G.C.T. Lat. 35.1° N Long. 118.9° W
	H	e	13-23-35	
	H	i	13-28-41	

GNWCH DATE	COMPNT.	PHASE	GMT	
July 24	Z	i	22-22-06	U.S.C.G.S. gives H = 22h 09m 20s G.C.T.
	H	i	22-31-45	Lat. $42\frac{1}{2}^\circ \text{ N}$ Long. $145\frac{1}{2}^\circ \text{ E}$
July 25	Seismic activity centering about 19h 30m G.C.T. Seismic activity centering about 20h 10m G.C.T.			
350 July 29	Z	iP	07-10-05	$\Delta(S-P) = 31.1^\circ = 3455 \text{ Km}$ H = 07-03-43
	H	iS	07-15-18	
	H	i	07-17-31	U.S.C.G.S. gives H = 07h 03m 45s G.C.T. Lat. 35° N Long. 119° W
	H	i	07-20-04	
Aug. 15	Seismic activity centering about 00h 32m G.C.T.			
Aug. 18	Seismic activity centering about 13h 40m G.C.T.			
351 Aug. 20	Z	iP	15-31-56	$\Delta(S-P) = 34.9^\circ = 3880 \text{ Km}$ H = 15-25-01
	H	iS	15-37-36	U.S.C.G.S. gives H = 15h 24m 59s G.C.T. Lat. 43° N Long. 127° W
Aug. 22	H	eP?	22-52-39	
	H	i	22-57-38	
	H	i	22-58-08	
352 Sept. 9	Z	iP	13-01-08	$\Delta(S-P) = 30^\circ = 8335 \text{ Km}$ H = 12-54-56
	Z	i	13-01-36	
	H	iS	13-06-13	
Sept. 22	Seismic activity centering about 12h 10m G.C.T.			
353 Sept. 24	Z	ip	20-38-22	$\Delta(S-P) 43.3^\circ = 5480 \text{ Km}$ H = 20-29-34
	H	eS?	20-45-33	U.S.C.G.S. gives H = 20h 29m 30s G.C.T. Lat. $56\frac{1}{2}^\circ \text{ N}$ Long. 157° W

GNWCH DATE	COMPNT.	PHASE	GMT	
Sept. 27	Z	iP?	19-17-27	U.S.C.G.S. gives H = 19h 05m 46s G.C.T.
	H	i	19-27-05	Lat. 50½° N Long. 157° E
Sept 30	Seismic activity centering about 14h 25m G.C.T.			
Oct. 3		i	07-43-40	U.S.C.G.S. gives H = 07h 36m 45s G.C.T.
		i	07-49-02	Lat. 6½° S Long. 83°
Oct. 10	Seismic activity centering about 19h 15m G.C.T.			
354 Oct. 14	Z	iP	22-06-01	Δ (S-P) = 12.95° = 895Km
	H	iS	22-08-35	H = 22-03-27 G.C.T.
Oct 18	Seismic activity centering about 06h 30m G.C.T.			
	H	i	12-06-49	U.S.C.G.S. gives H = 11h 57m 36s G.C.T.
	H	i	12-11-25	Lat. 13° N Long. 46° W
Oct. 20	Z	e	01-14-30	U.S.C.G.S. gives H = 01h 04m 35s GCT
	Z	i	01-15-50	Lat. 57° N Long. 57° W
355 Oct. 28	Z	iP	11-34-42	Δ (S-P) = 22.2° = 2465Km H = 04-29-45 G.C.T.
	H	i	11-35-03	U.S.C.G.S. gives H = 04h 29m 51s GCT
	H	iS	11-38-45	Lat. 18½° N Long. 73½° W
356 Nov. 4	Z	iP	17-09-57	Δ (S-P) 73.1° = 8120Km H = 16-58-30 G.C.T.
	Z	i	17-10-01	
	Z	i	17-10-10	U.S.C.G.S. gives H = 16h 58m 20s GCT
	H	iS	17-19-29	Lat. 52½° N Long. 159° E

other phases indiscernible

GNWCH DATE	COMPNT.	PHASE	GMT	
	Z	i	17-40-19	
	Z	i	17-40-31	
	Z	i	19-50-19	
	Z	i	21-00-39	
	Z	i	22-04-41	
	Z	i	22-30-59	
	Z	i	23-40-50	
Nov. 5	Z	i	02-31-52	
	Z	i	06-09-47	
	Z	i	12-46-11	
357	Z	iP	13-18-02	Δ (S-P) = 73.1 = 8120Km H = 13-08-05 G.C.T.
	H	iS	13-27-34	Kamchatka?
	Z	i	15-00-34	
Nov. 6	Z	e	19-57-47	
Nov. 7	H	i	21-10-40	
Nov. 22	H	iS?	08-03-23	U.S.C.G.S. gives H = 07h 46m 37s G.C.T.
	H	iSS?	08-05-01	Lat. 35.8° N. Long. 121.1° W
Dec. 6	Seismic activity centering about 11h 45m G.C.T.			
Dec. 7	Z	eP?	01-01-13	
	Z	i	01-01-15	
	H	i	01-10-11	
Dec. 10	Z	iP	06-06-35	Δ (S-P) = 46.6° = 5180Km H = 05-58-08
	H	iS	06-13-30	U.S.C.G.S. gives H = 05h 58m 06s G.C.T. Lat. 71° N Long. 7° W
Dec. 11	Z	i	09-10-28	
	H	e	09-20-20	
Dec. 14	Z	i	06-08-54	

358	Dec. 17	Z	iP	23-16-01	$\Delta (S-P) = 76.5^\circ = 8500^\circ \text{Km}$ H=23-04-14
		H	iS	23-25-50	
359	Dec. 22	Z	iP	22-26-04	$\Delta (S-P) = 73.1^\circ = 8120 \text{Km}$ H=22-24-37
		H	iS	22-45-37	U.S.C.G.S. gives H=22h 24m 41s G.C.T. Lat. 54° N Long. $160\frac{1}{2}^\circ \text{ E}$
	Dec. 24	Seismic activity centering about 19h 45m GCT			
	Dec. 25	Z	e	04-27-58	