

$\phi = 40^{\circ} 47'' \text{ N}$   
 $\lambda = 73^{\circ} 53' 8'' \text{ W}$   
 $h = 24 \text{ m}$   
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Jan. 1	P?	11	30	04	32.5	Appeared on short period Benioff
	cP		31	47		On Galitzin vertical
	S		37	10		Approx. epicenter 15°N, 98°W (USCGS)
1	iP	23	46	31	95	
	PR <sub>2</sub>		52	48		
	SKKS	24	01	29		
	M		28	-		
2	iP	22	33	50	32	Epicenter
	iS		39	09		15,7°N, 98,0°W
	M		52	-		(USCGS)
7	i	02	32	43.7	235 kms.	Local?
			33	10.6		
7	e	16	04	38		
	e		11	16		
	e		21	12		
	M		34	-		
8	e	13	44	-		Few long waves.
10	i	16	29	12.0		Local
	iS			17.8		
	Max			19.0		
10	i	17	59	37.1		Deep focus
	i			44.4		
	i			47.0		
	i			59.3		
10	e	18	26	-		Few long waves
11	e?	15	25	20	100	
	e(P)			31	approx.	
	e		29	52		
	iPR <sub>1</sub>			56		
	eSKS		36	18		
	iPPS		38	52		
	M	16	08			
16	i	21	50	12.0		Deep focus
	i			20.6		
20	i	20	28	06.7		
	i			15.1		

$\phi = 40^{\circ} 1' 47'' \text{ N}$   
 $\lambda = 73^{\circ} 53' 8'' \text{ W}$   
 $h = 24 \text{ m}$   
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Jan. 22	e	03	09	-		Surface waves lasting about 6 mins.
	22 i	15	46	44		Deep focus
	22 i	15	50	09		Deep focus
	23 eP	08	44	03	71	Epicenter 21.2°N, 156.1°W (USCGS)
	iP			07		
	ipP			30		
	iP <sub>c</sub> P			39		
	iS		53	21		
	iPS			47		
	iS <sub>c</sub> S		54	14		
	eSR <sub>1</sub>		58	13		
	iSR <sub>1</sub>	09	02	07		
	M		12	-		
	24 eP(?)	10	45	56	85	Epicenter near 71°S, 47°W (USCGS)
	iP		46	02		
	e		50	37		
	e		51	20		
	e		55	34		
	eS(?)		56	30		
	e		59	40		
	SR <sub>2</sub>	11	05	42		
	25 e	17	58	-		Heavy microseisms
	M	18	06	-		
	26 e	04	12	-		Surface waves lasting about 10 mins.
Feb. 1	iP	19	10	39		Deep focus
	eP'	19	23	27	138	Epicenter: 5°S, 131°E (USCGS)
	iP'			42		
	i			45		
	i		24	10		
	i		25	07		
	i		26	15		
	I } PR, ?			44		
	iSKS		30	21		
	i			28		
	i		32	21		
	i		37	02		
	M	20	20	-		

$\phi = 40^{\circ} 51' 47'' \text{ N}$   
 $\lambda = 73^{\circ} 53' 8'' \text{ W}$   
 $h = 24 \text{ m}$   
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Feb. 1 (cont)	e	20	09	12	38	These phases are super- imposed on the long waves above; they are tentatively identified as body waves multiply refracted through the core.
	i			31		
	e			44		
	f			54		
3	iP M	16	03	52 -		
3	i	18	07	28		Deep focus
3	i	19	11	11		Deep focus
3	e	20	47	-		A few surface waves
4	e(S) M	10	03	23 -		
4	eP ePR <sub>1</sub> eS M	10	35	12 08 14 -	38	
5	iP PR <sub>1</sub> PR <sub>2</sub> P.F S M	02	30	26 25 59 53 57 -	34	Epicenter 5.0°N, 76.0°W (Strasbourg)  4.5°N, 75.9°W (USCGS)
6	e	08	12	-		Surface waves
7	e	02	22	-		Surface waves
8	e e e i i i	07	21	08 23 09 35 46 13		
8	eP iS e e c	14	29	24 50 07 16 24	42	
13	iP SR <sub>1</sub> M	08	22	51 03 -	95	Approximate epicenter 33°S, 179°W (USCGS)

$\varphi = 40^{\circ} 51' 47'' \text{ N}$   
 $\lambda = 73^{\circ} 53' 8'' \text{ W}$   
 $h = 24 \text{ m}$   
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Feb. 14	iP	03	06	52	100	
	ipP?		07	06		
	iSKS?		17	26		
	iPS?		19	39		
	i		22	49		
	i		32	12		
	M		46	-		
15	iP	03	36	08	45	Epicenter 18°N, 25°W (USCGS)
	iPR <sub>1</sub>		37	56		
	iS		42	53		
	iSR <sub>1</sub>		46	23		
15	iP	07	05	35		
	i(PR <sub>1</sub> )		07	12		
	S		12	20		
	e(SR <sub>1</sub> )		15	32		
19	i	07	34	53		Deep focus
24	i	03	28	57.6		Deep focus
	i		29	06.6		
24	i	03	53	04.4		Deep focus
	i			12.7		
26	i	07	59	20		Deep focus
27	i	00	34	10		Deep focus
27	i	01	42	03		Deep focus
March 1	e	14	14	04		
	i		19	10		
2	i	07	53	33		Deep focus
4	i	02	35	36		Deep focus
6	e	03	03	-		Surface waves
6	e	08	31	-		Surface waves
8	eP'	05	56	09	130	
	ePR <sub>1</sub>		58	20		
	ePR <sub>2</sub>	06	01	25		
	eSKS		03	20		
	e		04	06		
	e			41		

$\phi = 40^{\circ} 51' 47'' \text{ N}$   
 $\lambda = 73^{\circ} 53' 8'' \text{ W}$   
 $h = 24 \text{ m}$   
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
March 8 (cont.)	e	06	06	40		
	e		13	22		
	M		44	-		
8	i	05	54	27		Deep focus
8	i	08	09	40		Deep focus
9	e	03	02	25		
9	e	05	25	18	35.5	Approx. epicenter 6.1°N, 83.0°W (USCGS)
			29	35		
11	i	02	13	26		Deep focus
11	e	02	16	58		Deep focus
11	i	15	02	03		Deep focus
13	i	17	56	40		Deep focus
14	e	01	57	-		Surface waves
14	e	06	17	-		Surface waves
19	i	19	26	55		Deep focus
20	e	09	56	48		Deep focus
20	i	15	04	57		Deep focus
21	e	02	13.8	-		Long waves
21	i	08	27	46		Deep focus
22	i	06	04	46		Deep focus
22	i	10	46	35		Deep focus
22	iP	15	29	51	41	Epicenter 55.0° N 131.3° W
	e		31	19		
	i			29		
	cS		35	43		
	iS		36	11		
	iSR <sub>1</sub>		39	11		
	T		46	-		

$\phi = 40^{\circ} 51' 47'' N$   
 $\lambda = 73^{\circ} 53' 8'' W$   
 $h = 24 \text{ m}$   
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G <sub>p</sub> M.T.			Distance degrees	Remarks
		h.	m.	s.		
March 22 (cont)	M	15	46	-		
22	iP	22	35	25	40	After shock of quake at 15 h.
	ePR <sub>1</sub>		36	57		
	iPR <sub>1</sub>		37	14		
	eS		41	38		
	L		48	08		
	M		52	-		
23	e	14	17	58		
	M		29	-		
24	eP	16	56	32	55	
	iS	17	04	21		
	iS <sub>c</sub> S		06	29		
	M		18	-		
25	iP	08	28	20		
	i			22		
	eS		32	52		
	M		40	-		
25	e	16	24	06		
	M		52	-		
31	i	10	15	38		Deep focus
31	e	23	01	-		Surface waves
April 2	eP <sup>?</sup> (?) PS(?)	06	19	59	138	
			34	41		
2	i	21	36	32		Deep focus
4	i	21	27	42		Deep focus
	i		30	45		
13	iP	02	55	59	61	Epicenter 39.5°N, 15.0°E (Strasbourg)
	i		56	31		
	i		57	09		
	i			31		
	iS	03	04	23		
	e		05	30		
	e		08	08		
	M		18	-		
14	iP	01	35	00	62.5	
	iP <sub>c</sub> P		36	00		
	PR <sub>1</sub>		38	33		
	eS		43	35		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = +.210  
 b = -.726  
 c = +.654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Willp  
 Milne-Shaw  
 Wood-Anderson  
 (Short-Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
April 14 (cont)	eS <sub>c</sub> S(?) M	01	45	31		
			52	-		
16	M	20	38	-		P and S barely perceptible
17	i	09	16	12		Deep focus
17	iP iS M	14	49	41	59	
			57	55		
		15	16	-		
18	iP iS M	11	11	12	75	Epicenter 39.5°N, 33.5°E (USCGS) 38.9°N, 32.7°E (Strasbourg)
			20	56		
			44	-		
20	e e e e e e e M	06	47	23		
			52	54		
			54	21		
			55	25		
			57	07		
				37		
		07	12	00		
			35	-		
22	iP iPR, eS eSR, e i M	04	23	20	39	
			24	50		
			29	25		
			32	15		
			35	41		
			36	41		
			41	-		
23	i e e M	00	47	03		
			53	01		
			56	00		
		01	36	-		
23	i	02	25	22		Deep focus
24	e	01	09	-		Long waves
24	i	13	21	19		Deep focus
25	i	01	52	44		Deep focus
25	e	09	31	-		Long waves
25	e	12	05	-		Long waves

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
April 25	F S	17	14 19	08 11	30	
26	i	08	00	21		Deep focus
26	i	13	12	51		Deep focus
26	i	16	04	53		Deep focus
28	e	06	27	-		Surface waves

J. J. L., S. J.

W. A. L.



$\phi = 40^{\circ} 1' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

9.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
May 3	i	01	02	43		
3	iP iP <sub>c</sub> P iS	02	21 24 26	41 07 47	30	USCGS gives 18°N 99°W and depth of 100 km.
4	i	06	09	32		Deep focus
4	i	21	10	15		Deep focus?
5	i	00	34	59		Deep focus
5	i	06	34	17		Deep focus
5	iP i iS	15	58 59	50 57 02	94 kms	
6	i	07	05	30		Deep focus
6	eP iS M	18	23 28 35	39 42 --	30	Felt in Nicaragua USCGS gives 13°N, 87°W
8	i i i e i i	14	08 09 13 22 25 34	13 33 29 16 24 41		
8	i i	14 15	58 01	54 35		Deep focus or late phases of above shock?
9	i	06	39	27		Deep focus
11	eP iS M	14 14 15	51 56 07	26 51 **	33	USCGS gives 16.9°N 101.0° W.

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

10.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
May 12	e	16	00	14		USCGS gives $8^{\circ}$ S, $147^{\circ}$ E, $\Delta = 14,600$ kms.
	i			50		
	i			02 08		
	i			12 09		
	i			13 10		
	i			18 27		
	eL			34 --		
M	46 --					
15	i	04	57	25		Deep focus
16	iP <sub>1</sub>	19	24	04.8		$\Delta = 28$ kms. Harvard Travel Times
	iS <sub>1</sub>			08.0		
	i			09.9		
	i			11.7		
	Max.			13.2		
17	iP	19	46	25		$\Delta = 230$ kms. approx.
	i			27		
	iS			52		
19	i			53		
19	eP	17	27	47	122	Epicenter $2^{\circ}$ N, $125^{\circ}$ E approx. (Strasbourg); near $0.5^{\circ}$ N $119^{\circ}$ E (USCGS)
	iP			28 00		
	iP'			30 51		
	i			31 43		
	iPS			43 11		
	iSR <sub>1</sub>			49 02		
	iSR <sub>2</sub>			54 32		
	i			18 00 53		
	eL			10 --		
	M			19 --		
19	i	18	54	32		Deep focus
20	iP <sub>2</sub>	19	34	02.9		$\Delta = 163$ kms, Harvard Travel Times Probably a blast
	iP <sub>1</sub>			04.0		
	iS <sub>2</sub>			22.0		
	iS <sub>1</sub>			23.7		
	i			25.5		
21	iP <sub>2</sub>	21	08	27.9		$\Delta = 180$ kms Harvard Travel Times Probably a blast
	i			29.4		
	i			32.0		
	iS <sub>2</sub>			49.1		
	i			50.6		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

11.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
May 22	i	03	06	04		Deep focus
	i			13		
22	eP	08	06	25		
	M			09 00 --		
23	iP	07	32	00		Epicenter $36^{\circ}$ N, $141^{\circ}$ E (USCGS)
	iPR <sub>1</sub>			35 51		
	iSKS			43 33		
	eSR <sub>1</sub>			49 50		
	eL	08	03	29		
	M			14 --		
23	eP	08	40	36.5		
	iP			38.0		
24	iP <sub>1</sub>	18	16	16.7		$\Delta = 110$ kms Harvard Travel Times
	iS <sub>1</sub>			30.2		
	Max.			35.3		
27	i	06	57	32		Deep focus
	i			07 01 11		
27	i	21	34	28		Deep focus
28	iP	10	21	24	38	Epicenter $43^{\circ}$ N, $125^{\circ}$ W (USCGS)
	iPR <sub>1</sub>			22 50		
	iS			27 24		
	e			30 13		
	e			31 50		
	f			34 32		
	e			56		
	M			38 --		
28	iP	16	54	59		
	iSKS	17	05	29		
	i		06	47		
	M		32	--		
30	iP'	14	50	24		Epicenter $20^{\circ}$ S $169^{\circ}$ E
	i			45		
	i			56 00		
	iSKS			57 14		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galtzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

12.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
May 30 contd	i	15	00	38		
	i		01	13		
	i		02	14		
	i		07	39		
	M		35	--		
31	e	08	53	14		
	e		57	16		
June 3	i	20	15	42		Deep focus?
5	e	01	25	17		
	e		30	42		
	M(?)		43	--		
	e	02	16	17		
	e		21	40		
	M(?)		37	--		
9	eP†	19	34	24	128	Epicenter 2° S 128° E USCGS.
	iPR <sub>1</sub>		37	19		
	iSKP		38	12		
	iPR <sub>2</sub>		40	22		
	e		44	24		
	i		50	35		
	e		58	02		
	M	20	39	--		
	eP	22	43	53		$\Delta = 625$ kms.
	iS		44	59		Epicenter ca. 44.5°N
	i		45	04		63° W (NESA)
10	eP	10	08	29	115	Epicenter 25° N, 125° E (USCGS)
	ePR <sub>1</sub>		12	52		
	eSKS		19	06		
	eSKKS		20	05		
	iPS		22	34		
	i		23	45		
	e		29	41		
	M		55	--		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

13.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
June 10	eP	18	12	29	32	Epicenter $16.5^{\circ}$ N, $98^{\circ}$ W
	iS		17	47		
	M		30	--		
11	e	01	14	09		Deep focus
15	i	05	11	36		Deep focus?
	iP	07	55	14	71	Epicenter $32^{\circ}$ S $68^{\circ}$ W (USCGS)
	iS	08	04	33		
16	eP	02	29	37	108	Epicenter $29^{\circ}$ N, $128^{\circ}$ E (USCGS)
	e		33	51		
	iPR <sub>1</sub>		34	11		
	iPR <sub>2</sub>		36	35		
	eSKS		40	19		
	iFS		43	43		
	M	03	24	--		
20	i	14	12	12		Deep focus
	i		13	16		
21	iP	00	03	39		Epicenter $41.3^{\circ}$ N, $77.3^{\circ}$ E (Strasbourg)
	i		07	03		
	iPR <sub>1</sub>			32		
	i		09	31		
	iSKS(?)		14	27		
	i		16	13		
	M		46	--		
22	i	06	57	58		Deep.
22	P(?)	23	27	05		
	i		29	15		
	i		30	05		
23	P	01	15	09	74 ca.	
	PR <sub>1</sub>		18	08		
	S		24	43		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = +.210  
 b = -.726  
 c = +.654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

14.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks	
		h.	m.	s.			
June 24	P'	13	10	08	123	Epicenter $20^{\circ}$ S $169^{\circ}$ E (USCGS)	
	PR <sub>1</sub> (?)		14	08			
	e		15	57			
	i		25	31			
	e		27	34			
	e		28	30			
	M	59	--				
25	P	23	53	53	48.6	Epicenter $77^{\circ}$ N $2^{\circ}$ E (Strasbourg)	
	PR <sub>1</sub>		55	53			
	S		00	01			
	M		17	--			
28	P	19	24	07	31	Epicenter $18.2^{\circ}$ N $100.3^{\circ}$ W (Strasbourg) $19^{\circ}$ N, $100^{\circ}$ W (USCGS)	
	PR <sub>1</sub>			57			
	S		29	12			
29	e	19	13	13			
	i			22			
	i		19	28			
	i		31	23			
	M		44	--			
30	i	17	05	19		Epicenter $24^{\circ}$ S, $167^{\circ}$ E (USCGS)	
	i		17	20			
	M		57	--			
July 2	P(?)	21	11	12			
	S(?)		17	10			
4	i <sub>z</sub>	21	33	27			
	M		22	23			--
5	e	02	24	19			
	e		31	19			
	e		44	37			
	M		03	15			--
5	M	04	06	--		Preliminaries in previous shock.	

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = +.210  
 b = -.726  
 c = +.654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

15.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
July 5	$e_z$	22	27	38		
	$e_E$		33	12		
	$e_z$		39	12		
	$M_1$	23	13	--		
	$M_2$		21	--		
	$M_3$		28	--		
6	$e_z$	01	15	25		
6	$e_z$		43	21		
	$e_E$		45	49		
	$M_1$	02	35	--		
	$M_2$		38	--		
	$M_3$		45	--		
	$M_4$		55	--		
7	$iP_1$	23	41	08.5		$\Delta = 145$ kms.
	$iS_1$			25.6		
	Max			28.5		
14	$iP$	23	50	49		
	$e$		57	09		
	$e$		58	39		
	$e$	00	02	55		
	$M$		36	--		
15	$iP$	22	47	11.3		NLSA gives ca $48^{\circ}$ N $67.5^{\circ}$ W as epicenter
	$i$			16.9		
	$i$			49.5		
	$i$			53.5		
	$i$			55.5		
	$i$	48		00.8		
	Max			03.0		
20	$iP$	00	35	57		Epicenter $38.3^{\circ}$ N $23.8^{\circ}$ E (Strasbourg)
	$e$		36	54		
	$e$		37	38		
	$e$		44	00		
	$S$		45	18		
22	$iP$	07	55	03	36	Epicenter $18.9^{\circ}$ N $107^{\circ}$ W (USCGS)
	$e$			33		
	$e$		56	19		
	$i$			25		
	$iS$	08	00	51		
	$M$		08	--		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

16.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
July 24	iP	13	22	20	60.4	Epicenter 53° N, 167° W (USCGS)
	ePR <sub>1</sub>		24	37		
	iS		30	32		
28	i	08	29	27		Deep focus
29	iP <sub>1</sub>	07	44	15		Local earthquake felt in Bronx, Manhattan, Staten Island, West- chester County, New Jersey. $\Delta = 54$ kms.
	iP <sub>1</sub> P <sub>1</sub>			16		
	iS <sub>1</sub>			21.5		
	L			25.5		
29	iP'	13	26	02	145	Epicenter 1° N, 96° E USCGS
	ePR <sub>1</sub>		28	52		
	e		29	38		
	iSKP		54			
	e	31	58			
	e	34	06			
	eSR <sub>1</sub>	47	28			
	M <sub>1</sub>	14	34	--		
	M <sub>2</sub>		36	--		
Aug. 2	iP <sub>1</sub>	09	02	34.5		Epicenter 41°05' N, 73°42' W (NESA) about 5 miles east of White Plains, N.Y. Felt in Westchester County N.Y. and Fair- field County, Conn. $\Delta = 28.5$ kms.
	i			35.3		
	i			36.0		
	iS <sub>1</sub>			38.0		
				40.0		
		41.0				
2	i	11	07	21		Deep focus
3	i <sub>E</sub>	13	28	21		
	i <sub>Z</sub>		40	05		
	i <sub>Z</sub>		41	35		
	e <sub>E</sub>		46	13		
	M		57	--		



$\phi = 40^{\circ} 1' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

17.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Aug 4	iP <sub>z</sub>	09	05	08	12.5	Epicenter 24° S, 65.4° W (USCGS)
	iz					
	iz					
	iz					
	iz					
	iS					
	i <sub>E</sub>					
	e <sub>E</sub>					
M	39	--				
6	i <sub>r</sub>	16	22	20	45.5	Quarry blast in So. Bethlehem, N.Y. (NLSA) $\Delta = 185$ kms.
	iP <sub>1</sub>					
	i					
	iS					
	iS <sub>1</sub>					
8	e <sub>z</sub>	18	42	01	26	
	e <sub>z</sub>					
	iz					
	i <sub>E</sub>					
8	iP <sub>2</sub>	18	45	20.0	41.3	Quarry blast near Hudson, N.Y. (NLSA)
	i <sub>1</sub>					
	i					
	i					
	iS <sub>2</sub>					
16	i <sub>1</sub>	04	46	32.5	116°	Very pronounced Epicenter 24° N, 95° E (USCGS) 22.6° N, 94.6° E (Strasbourg)
	iP <sub>1</sub>					
	i <sub>E</sub>					
	i <sub>E</sub>					
	i <sub>E</sub>					
	i <sub>E</sub>					
	M <sub>1</sub> ?					
	M <sub>2</sub> ?					
18	i	09	49	45	24	Long waves very weak.
	i					
	i					
	e					

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

18.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Aug. 21	i	12	01	31		Deep focus
21	i	16	29	31		Deep focus ?
21	e	16	41	48		
	i		45	31		
	i		47	38		
22	i	12	50	19		$\Delta = 630$ kms. Epicenter near Orrington, Maine (NESA)
	i			29		
	i			33		
	i			48		
	iS <sub>2</sub>		51	00		
	i			05		
23	iP <sub>1</sub>	03	36	45.5		Epicenter ca 40°15' N 74°15' W. in vicinity of Freehold, N.J. (NESA)
	i			48.5		
	iS <sub>1</sub>			56.5		
	Max		37	01.0		
23	iP <sub>1</sub>	05	05	07.5		Repetition of the New Jersey shock at .03
	i			11.1		
	i			12.2		
	iS <sub>1</sub>			18.0		
	i			19.1		
	Max			22.6		
23	iP <sub>1</sub>	05	23	32.6		Felt in Westchester County, N.Y.
	iS <sub>1</sub>			36.0		
23	iP <sub>1</sub>	07	03	40.2		Repetition of New Jersey shocks at .03 , 05.
	i			43.7		
	i			46.1		
	iS <sub>1</sub>			52.5		
	Max			56.8		
23	iP <sub>1</sub>	07	11	59.1		Felt in Westchester County, N.Y.
	iS <sub>1</sub>		12	02.3		
23	iP <sub>1</sub>	11	11	21.3		After shock of New Jersey shocks at 03, 05, 07.
	iS <sub>1</sub>			32.6		
	Max			36.5		
24	i <sub>2</sub>	16	03	28		
24	iP <sub>1</sub>	17	57	25.0		
	iS <sub>1</sub>			28.5		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = +.210  
 b = -.726  
 c = +.654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

19.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Aug. 25	iP'	01	47	37		Amplitude of M about half that of P' on vertical Galitzin
	iz			49		
	ez		48	05		
	iz		51	01		
	iz			31		
	eE		52	19		
	eE		53	31		
	M	03	02	--		
26	iP <sub>2</sub>	19	55	54.2		$\Delta = 158$ kms. Harvard Travel Times
	i			55.1		
	iS <sub>2</sub>		56	13.0		
	i			15.4		
	i			17.1		
27	iP <sub>1</sub>	22	36	38.3		$\Delta = 70$ kms. Felt in Trenton, N.J.
	iS <sub>1</sub>			49.5		
	Max			52.3		
27	iP <sub>1</sub>	22	37	24		P <sub>1</sub> obscured by previous quake
	iS <sub>1</sub>			35.6		
	Max			39.0		
29	eF	15	43	03		Destructive in the Philippines
	eE			52 55		
	iE	16	01	22		
	M <sub>1</sub>			34 --		
	M <sub>2</sub>			40 --		
30	eP(?)	12	08	43		Excellent records of surface waves.
	e			52		
	e		11	06		
	e			22		
	eE		12	16		
	iE		21	15		
	iE		28	45		
	M <sub>1</sub>	13	00	--		
	M <sub>2</sub>		04	--		
	M <sub>3</sub>		06	--		
	M <sub>4</sub>		14	--		
	M <sub>5</sub>		17	--		
	M <sub>6</sub>		21	--		
	M <sub>7</sub>		24	--		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

20.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Aug. 31	cP	18	03	38	31	
	e			40		
	e		05	30		
	cE		06	47		
	iz		07	26		
	iE		14	24		
	M		53	--		
Sept. 1	iP <sub>Z</sub>	22	54	44	31	Epicenter 13.1°N 89.4°W (USCGS) There may be an iS on east Galitzin at 22-59-20 but it is in minute mark
	iz			55		
	iz		57	41		
	iS <sub>N</sub>		59	52		
	M	23	10	--		
	i	15	50	00:0		Deep focus?
	i			16.5		
3	cE	04	53	38		
	M	05	05	--		
3	M	06	55	--		
7	iP(?)	02	17	23.5		
7	cP	04	22	41		
	iE		30	29		
	cN		31	56		
	iSR <sub>1</sub> (?)		42	30		
	M <sub>1</sub>	05	09	--		
	M <sub>2</sub>		17	--		
	M <sub>3</sub>		18.5	--		
	M <sub>4</sub>		21	--		
7	eP <sub>Z</sub>	13	18	37		E-W component obscured by micros.
	iP <sub>Z</sub>			48		
	iz		19	37		
	iN		26	39		
	iN		27	49		
	iN		30	12		
	iN		35	32		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

21,

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Sept, 7	i	23	20	47.0 48.5 52.0 54.0 57.0		NESA Bulletin no. 5 gives H = 23-18-18
8	i Max	20	44	31.0 38.7		Probably S phases of local quake.
10	iP <sub>2</sub> iS <sub>2</sub> i i	14	26 27	58.0 19.0 20.8 25.1		$\Delta = 180$ kms.
10	i i i i	14	52	49.2 51.1 55.0 57.0		Deep focus?
12	iP iS M	06	18 23 35	02 54 --	36.5	
12	i	15	08	32		Deep focus?
14	iP iS	18	00 01	40.5 04.0		$\Delta = 205$ kms.
15	iP iS	18	21 22	43.2 03.6		$\Delta = 172$ kms.
17	iP iP iS iS	03	37 40 41	26 56 44 05	17	Felt in Arkansas and Tennessee
17	iP iE M(?)	17	34 35 38	11.5 10 --		
17	iP	19	03 04	49.0 55.5 00.5 02.5		
18	iP iE M	04	01 11 37	49 17 --		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

22.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Sept. 19	i	08	42	44.0		Deep focus
19	i	12	14	35		Deep focus
20	i	14	04	48		Deep focus?
22	i	14	31	55		Deep focus?
27	e	02	45	41		
	e		57	38		
	e		59	00		
	M	03	33	--		
27	e	10	36	44		
	e		49	56		
	M	11	24	--		
28	i	04	38	20.5		Deep focus
				26.0		
				29.0		
28	eL (?)	18	34	06		
	eL		39	32		
	eSKS (?)		41	02		
	eN		42	06		
	eZ		43	34		
	eL		44	59		
	eL (?)	19	07	37		
	M		20	--		
29	i	19	20	04.0		Deep focus?
	i			08.5		
29	i	22	02	04.2		Deep focus?
				08.0		
				10.0		
29	i	23	46	48		
	e		48	56		Surface waves
	i		49	51		very weak.
	i		50	02		
	e		52	02		
	i			26		
	i		53	09		

J. J. L., S. J.  
 W. A. L.

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

23.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Oct. 2	i i	10	36 40	46 29		Recorded also at Weston; see NES Bulletin no. 7
4	eL M	09	23 34	-- --		
5	M	01	01	--		
6	i? i i i i	17	14	25.8 36.1 39.0 40.1 43.1 max.		
7	eL M	17	38 53	-- --		
10	eN M	03	13 27	-- --		
10	iP' ipP' iPR <sub>1</sub> iSKP <sub>Z</sub> ipPKS <sub>NE</sub> i(SKS) <sub>N</sub> i(SKSP) <sub>N</sub> M	21	07 09 10 11 13 20 58.5	22 45 53 49 13 14 14 --	135	Epicenter : 1°N, 125°E (USCGS) 2.1°N 126.4°E (Strasbourg) 1.0°N, 125.0°E (JSA) Very strong. Note in Nature p. 949, Nov 26, 1938 Brunner's chart gives depth ca. 100kms.
12	iP iPS eN M	00 01	47 58 00 33	41 37 33 --	87	37°N, 142°E (Strasbourg)
12	i i i i	16	23	46.2 47.8 48.0 52.0		
13	M	16	45	--		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Gaitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

24.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks	
		h.	m.	s.			
Oct. 13	i	17	33	12.7			
	i			19.9			
	i			24.5			
	i			27.5 max.			
	i			30.7			
14	e <sub>z</sub>	16	13	17			
	i <sub>E</sub>			15			07
	e <sub>zNE</sub>			18			09
	i	17	14	06.5			
	i			09.0			
16	iP	02	28	40		Preliminary of teleseism with epi- center 43.3°N, 3.0°W (Strasbourg)?	
	i			45			
17	i <sub>z</sub>	15	40	28		No surface waves.	
	i <sub>NE</sub>			49			33
	e <sub>zN</sub>			51			01
19	eP	04	26	29		Epicenter 49.7°N, 90.5°E (Strasbourg). Great Atlas Moun- tains, Central Asia. Note in Nature Oct. 29, 1938	
	iP			31.5			
	eSKS	05	10	37			11
	M			--			--
19	i <sub>z</sub>	21	18	50		Deep focus.	
20	iP'	02	38	56.5	146.5	Epicenter 9°S 123°E (Strasbourg) 10°S 123°E (USCGS). Depth about 100 kms. by Brunner's chart. Note in Nature Dec. 31, 1938.	
	ipP'			39			23.5
	iPR <sub>1</sub>			42			29.0
	i <sub>z</sub>			46			13.0
	i <sub>z</sub>						44
	i(SKS) <sub>NE</sub>			48			58
	i <sub>z</sub>			50			29
	i <sub>z</sub>	03	01	56	40		
	i <sub>E</sub>			00			
	i <sub>z</sub>			24.0	- - - - -	Late body Phase?	
	i <sub>N</sub>	35	--	34		Appeared on short period only.	
	M			--			
	20	i <sub>z</sub>	10	12	21.5		
i <sub>z</sub>		15			54.0		



$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

25.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Oct. 20	e <sub>N</sub>	11	26	32		
	i <sub>E</sub>		31	00		
	e <sub>N</sub>		42	54		
	M?		47	--		
21	iP <sub>1</sub>	07	20	02.1	35 kms.	
	iP <sub>1</sub> P <sub>1</sub>			03.6		
	iS <sub>1</sub>			06.3		
	i			07.2	max.	
	i			08.8		
	i			11.7		
	i			15.0		
21	e <sub>Z</sub>	21	37	18		
	M		48	--		
22	e <sub>N</sub>	00	32	02		
	M		45	--		
22	i	13	22	55.0		Deep focus.
22	iP <sub>2</sub>	16	11	03.5	190 kms.	Albany blast at
	iS <sub>2</sub>			24.7		16h 10m 25s;
	i			26.2		42°31.2'N, 73°51.3'W
	i			27.5	max.	(NESA no.8)
23	M	03	32	--		
23	e <sub>Z</sub>	05	14	21		
	i <sub>Z</sub>			52.8		
	e <sub>N</sub>		19	11		
	e <sub>E</sub>		20	19		
	M <sub>Z</sub>		23.5	--		
23	e <sub>Z</sub>	15	21	40		Records obscured by
	i <sub>Z</sub>			48		heavy 8 sec. micros.
	I <sub>N</sub> (?)	16	01.5	--		
	M <sub>Z</sub>		14.5	--		
25	i	00	22	04		Deep focus?
27	i	17	13	54		Deep focus?
29	M	14	10	--		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

26.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks		
		h.	m.	s.				
Oct. 29	i	23	12	32.8	.	Dilatation		
	i			35.0				
	i			36.1				
	i			38.8				
30	i	08	38	06.5	.	Compression		
	i			07.9				
	i			09.1				
	i			10.0				
31	i	20	44	07.8	.			
31	i	21	29	01.5	.			
	i			02.5				
	i			03.6				
	i			10.0				
31	i	21	44	33.5	.			
Nov. 1	i	18	48	45	.			
2	iP	05	48	40.5	.	Surface waves weak.		
	iz			54.8				
	iz			58.6				
	ez			49			14	
	ez						47	
	e <sub>z</sub> NE			54			22	
	iz						28	
	iz			55			30	
	M			06			04	--
	2			i			07	37
2	e <sub>z</sub> NE	09	15	1--	.			
5	iP	08	56	49	96	Epicenter		
	ipP			57			18	
	isP						33	
	iPR1			09			00	41
	iSKSNE			07			34	
	iE			08			02	
	iE						19	
	iNE						34	
	iSP			09			25	
	iN						35	
						36.8°N, 139.6°E (JSA)		
						38°N, 141°E (USCGS)		
						36°N, 141°E (Strasbourg)		
						Depth about 90kms.		
						Notes in Nature on		
						this series of shocks:		
						Dec. 10, 24, Vol. 142.		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

27.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Nov. 5 (cont.)	iN	09	09	47		Late body phase?
	iz		11	21		
	iN		22	16		
	eN		32	05		
	M		45	--		
5	iP	11	03	40		Repetition of preceding shock.
	iPR <sub>1</sub>		07	33		
	iSKS <sub>NE</sub>		14	40		
	iE		15	07		
	iE			37		
	i <sub>NE</sub>		28	35		
	eL		35	49		
	M		45	--		
5	i	12	02	04		
6	iP	09	07	20	96	Dilatation. Epicenter 36°N, 144°E (USCGS).
	iPR <sub>1</sub>		11	20		
	iz		13	11		
	iz		15	09		
	iSKS <sub>NE</sub>		17	57	- - - -	
	iSKKS <sub>NE</sub>		18	26	- - - -	
	iN		19	38		
	i(SP) <sub>z</sub>		20	39		
	M		48	--		
					-the second being very strong.	
6	iP	21	52	19		After shock of preceding shock at 09 h.
	iPR <sub>1</sub>		56	11		
	iz		57	09		
	iSKS <sub>NE</sub>	22	02	48		
	iz		19	53		
	M		33.3	--		
7	iE	02	03	07		
	M		40	--		
7	i <sub>NE</sub>	19	57	39		
	M	20	34.5	--		
9	e <sub>NE</sub> (?)	09	34	01		Galitzin vertical not working; beginning obscured by micros.
	i <sub>NE</sub>		40	42		
9	i	20	37	42.5		S phases of distant local?
	i			44.8		

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = + .210  
 b = - .726  
 c = + .654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

28.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks	
		h.	m.	s.			
Nov. 9	i	22	16	03.3			
	i(?)			05.1			
	i			24.0			
	i			25.5			
10	eNE	11	10	55			
	eE		11	49			
	eNE		18	37			
	eE		27	33			
	M		49	--			
10	iP	15	28	04	}	Short period Benioff	
	iz		31	39			
	eNE		32	06			
	eN		34	26			
	eN		39	08			
10	eiP	20	28	12	} 55	Compressions	
	iP			19			13 mm. deflection on Galitzin vertical
	iPR1		30	29			50 mm. " "
	iS		35	57			75 mm. " E.
	M		51	--			Long period Benioff
							Epicenter $56^{\circ}$ N, $159^{\circ}$ W (USCGS) $57^{\circ}$ N, $159^{\circ}$ W (Strasbourg) $55.6^{\circ}$ N, $157.7^{\circ}$ W (JSA) Notes in Nature Nov. 19, Dec. 3, 10, 1938.
10	i	21	43	22		These phases were written on short period Benioff only; masked on other records by surface waves of shock at 10d 20h.	
	i	22	00	29			
	i		05	13			
	i			22			
	e		24	49			
	i		41	46			
11	i	00	03	56			
	i		18	53			
11	eP	01	07	12		Compressions.	
	iP			23		Aftershock of earthquake at 10d 20h.	
	iS <sup>NE</sup>		14	57			
	M	02	32	--			
11	i	04	16	57			
11	M	06	32	----			

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

29

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Nov.	11	i	07	23	39	Deep focus? Recorded also at Weston; see NESA no. 9.
	12	i	06	26	24	
	12	eP ePR <sub>1</sub> iS <sub>E</sub>	15	02 05 12	22 34 34	81
	13	i	00	41	52	
	13	iz iz	05	12 14	19 09	
	13	iP ipP iz iPR <sub>1</sub> iPR <sub>2</sub> iSKS <sub>NE</sub> iS <sub>NE</sub> M	13	26	17 42 48 29 30 31 32 36 36 37 09 14 12 --	85 Compressions Epicenter 46.0°N, 149.4°E (JSA) Depth about 80 kms.
	13	cP <sub>Z</sub> ePR <sub>1</sub> ez eN iSKS <sub>E</sub> M	22	45	37 49 44 53 21 55 46 56 24 23 32 --	109
	14	i(P) M	12 13	25 14	11 --	Preliminaries obscured by large and irregular microseisms.
	15	iz iz iz iz iE iE iE iE	10	01	34.2 43.3 47.7 02 00.8 09 25 43 22 13 24 35	Dilatation
	15	iz M?	21 22	19 34	53 --	Heavy microseisms all day.

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short-Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

30.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Nov. 16	M	06	11	--		
17	iP	04	04	06	53.5	Epicenter 55°N, 158°W (USCGS)
	iS <sub>NE</sub>		11	43		
	iS <sub>cS</sub> <sub>NE</sub>		13	52		
	M		29	--		
18	i <sub>z</sub>	14	32	10		
	e <sub>E</sub>		37	08		
	e <sub>E</sub>		38	32		
	e <sub>N</sub>		41	44		
18	iP <sub>2</sub>	16	47	49.0	152 kms.	Harvard Travel Times Recorded at Harvard and Weston see NESA no. 10
	iS <sub>2</sub>		48	06.8		
18	i	22	20	57.4	497 kms.	S phases of quake reported from Morris- burg, Ont. Epicenter 44°45'N, 75°15'W NESA no. 10
	i		21	13.4		
	i			18.3		
18	eP <sub>z</sub>	23	34	13	53	
	eS <sub>N</sub>		41	43		
	M		59	--		
19	eP <sub>z</sub>	05	52	08	95	
	eSKS <sub>NE</sub>	06	02	25		
	M		32	--		
22	iP	01	27	33	97	Epicenter 37°N, 142°E (USCGS) 36.3°N, 141.6°E (JSA) Depth greater than normal.
	iPR <sub>1</sub>		31	23		
	i <sub>z</sub> <sub>N</sub>			55		
	iSKS <sub>NE</sub>		38	13		
	iS <sub>N</sub>			55		
	iSP <sub>z</sub>		40	21		
	M	02	20	--		
23	i <sub>z</sub>	17	08	22		Probably local blasts
	i <sub>z</sub>		13	09		
25	M	00	25	--		
26	i <sub>z</sub>	07	50	55		Probably S phases of distant local; see NESA no. 10.
	i <sub>z</sub>		51	09		
	i <sub>z</sub>			13		

$\varphi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = +.210  
 b = -.726  
 c = +.654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

31.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Nov. 28	$i_z$	06	38	24		
28	$i_z$	22	54	41		Probably local blasts.
	$i_z$	23	01	22		
30	$ePR_1$	02	47	13	95	Epicenter $37^{\circ}$ N, $142^{\circ}$ E (USCGS) $37.5^{\circ}$ N, $141.3^{\circ}$ E (JSA)
	$iSKS_N$		53	53		
	$iSE$		54	33		
	$M(?)$	03	26	--		
Dec. 1	$e_z(?)$	02	31	59		
	$e_z$		33	17		
	$i_{zNE}$		41	01		
	$i_N$		42	13		
	(M)	03	16	--		
	1	$i$	12	04	55	A series of short period disturbances registered on short period Benioff vertical.
		$i$		11	51	
		$i$		19	05	
		$i$		29	27	
		$i$		35	49	
		$i$		43	46	
	1	$i_z$	23	29	37.0	Deep focus. The second disturbance at 34 m was in the activity of the first; it was difficult to pick the beginning of the second train of phases.
		$i_z$			45.8	
		$i_z$		30	02.5	
		-----			-----	
		$i_z$	23	34	00.3	
		$i_z$			05.0	
		$i_z$			18.0	
	2	$i_z$	10	00	08	Deep focus.
	2	$i_z$	17	29	31	Deep focus?
	3	M	13	16	--	
	3	M	18	03	--	
	4	M	17	32	--	
	5	$i_z$	18	05	12	

$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilip  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

32.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks		
		h.	m.	s.				
Dec. 6	$i_z$	19	22	05.0		Microseisms severe throughout day.		
	$i_z$			05.8				
	$i_z$			13.0				
6	$i_z$	19	38	22.2		Reported felt in Verona, N.Y.		
	$i_z$			24.0				
	$i_z$			25.0				
7	$e_L$	00		04.3--		Preliminaries obscured by microseisms particularly on Z and E.		
	M			09.8--				
7	$e_z$	13	44	42		Obscured by microseisms, particularly on Z and E.		
	$e_E$	14	01	43				
	$e_N$		02	01				
	M		29	--				
9	$i_P$	04	04	34	51			
	$e_N$			11			55	
	$i_{SE}$						58	- - - -
	$i_{PSE}$			12			14	- - - -
	$e_L$			22.5--				
	M			28			--	
12	M	03	32	--				
12	$i_z$	07	49	37		Deep focus.		
13	$i_z$	09	27	54	- - - -	Short period		
	$i_z$			28			24	- - - -
	$e_{i_zN}$			30			40	- - - -
13	M	14	42	--				
13	M	18	25	--				
13	$i_z$	20	29	42		S phases of distant local?		
	$i_z$			51.5max.				
16	$e_{i_z}(P')$	17	40	44		Strong		
	$e_z$			43			24	
	$i_z$						42	
	$i_{EN}(PKS)$			44			17	
	M			18			37	--



$\phi = 40^{\circ} 51' 47''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 h = 24 m  
 a = +.210  
 b = -.726  
 c = +.654

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

33.

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Dec. 16	iP M	19	04 28	08 --		Compression. Other phases lost in disturbance of shock at 17h; P on short period clear and sharp.
16	e <sub>z</sub> N M	23 24	49 28	01 --		
17	e <sub>N</sub> M	17	23.5 35	-- --		
18	e <sub>E</sub>	21	11	07		Followed by surface waves.
18	e <sub>N</sub>	22	41	--		Surface waves.
19	i <sub>z</sub> e <sub>NE</sub> i <sub>NE</sub> e <sub>z</sub> i <sub>z</sub> i <sub>z</sub> i <sub>E</sub> M <sub>z</sub> N	18       19	14 34 35 36   47 22	25 21 25 28 31 40 07 --	- - - - } } }	Short period Benioff Galitzins  Short period Benioff Galitzins  Phases from several distinct shocks?
21	iP  i <sub>z</sub> e <sub>N</sub> M <sub>z</sub> N	{ 12   13 14	46   50 18	23 24 36 -- --	}   }	Small compression Large dilatation  Weak
22	e.	18	05	--		Surface waves.
23	i <sub>z</sub> e <sub>N</sub> (?) e <sub>L</sub> N M	18	24 32 44 48.5	10 00 -- --		Dilatation
25	i <sub>z</sub> i <sub>z</sub> i <sub>z</sub>	07	49	07 17 29 max.		

$\phi = 40^{\circ} - 51' 4''$  N  
 $\lambda = 73^{\circ} 53' 8''$  W  
 $h = 24$  m  
 $a = +.210$   
 $b = -.726$   
 $c = +.654$

# FORDHAM UNIVERSITY

## NEW YORK CITY

### Instrumental Bulletin of the Seismic Observatory

INSTRUMENTS:  
 Wiechert  
 Galitzin-Wilp  
 Milne-Shaw  
 Wood-Anderson  
 (Short Period)  
 Benioff  
 Foundation:  
 Fordham Gneiss

34.

Date 1938	Phase	G.M.T.			Distance degrees	Remarks
		h.	m.	s.		
Dec. 26	$i_z$	22	13	34		Deep focus
	$i_z$	15	14	08		
	$i_z$			11		
	$i_z$	16	53	00		
30	$i_z$	12	19	40		Deep focus.
31	M	00	49	--		
31	$i_z$	16	29	16		Dilatation
	$i_z$			28		

J. J. L., S. J.  
 W. A. L.