

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF JANUARY 14, 1936

1.

Tentative Epicenter: 28°2 S., 62°8 W., in Santiago del Estero Province, Argentina. E-W control poor.
Depth of focus by Brunner Depth Chart 590 km.
Provisional H = 14h12m25s

Stations of the Jesuit Seismological Association

Saint Louis,

iP	14h22m43s	$\Delta_{S-P} = 71^{\circ}6$
ipP	14 24 45	$\Delta_{meas} = 71^{\circ}6$
iS	14 31 14	
iSP	14 31 48	
esS	14 34 50	

Florissant,

iP	14h22m44s	$\Delta_{S-P} = 71^{\circ}6$
ipP	14 24 46	$\Delta_{meas} = 71^{\circ}7$
i	14 31 09	
iS	14 31 15	
iSP	14 31 49	
isS	14 34 51	

Georgetown, (By telegram, courtesy Science Service)

iP	14h22m35s	$\Delta_{S-P} = 68^{\circ}6$
ipP	14 24 25	$\Delta_{meas} = 68^{\circ}4$
e	14 24 31	
iS	14 30 42	
e	14 30 44	
isS	14 34 14	
e	14 36 39	
iSR ₂	14 37 49	
e(L)	14 42 00	

Cincinnati, (By mail, courtesy V. C. Stechschulte, S.J.)

iP	14h22m35s	$\Delta_{P-H} = 70^{\circ}3$
ipP	14 24 37	$\Delta_{S-P} = 70^{\circ}5$
iPR ₁	14 25 05	$\Delta_{meas} = 70^{\circ}3$
iPR ₂	14 26 52	
e	14 30 55	
iS	14 31 00	
i	14 31 21	
iSP	14 31 35	
isS	14 34 47	
iM	14 50 25	

PRELIMINARY BULLETIN

1.

EARTHQUAKE OF JANUARY 14, 1936 (continued)

Stations of the Jesuit Seismological Association

Buffalo, (By telegram, courtesy Science Service)

iP	14h22m51s	$\Delta_{P-H} = 72^{\circ}9$
ipP	14 24 50	$\Delta_{meas} = 72^{\circ}5$
iSP	14 32 08	
i	14 34 22	
i	14 37 28	

Stations of the United States Coast and Geodetic Survey

Honolulu, (By mail, courtesy U. S. C. and G. S.)

eL	15h35m00s	$\Delta_{meas} = 104^{\circ}0$
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Other Stations

Charlottesville, (By mail, courtesy U. S. C. and G. S.)

iP	14h22m20s	$\Delta_{P-H} = 67^{\circ}8$
e	14 24 08	$\Delta_{meas} = 67^{\circ}8$
epP	14 24 18	
e	14 26 49	
e	14 30 16	
iS	14 30 35	
i	14 31 25	
epPS	14 33 54	
e	14 34 04	
e	14 36 55	

Philadelphia, (By mail, courtesy U. S. C. and G. S.)

iP	14h22m29s	$\Delta_{P-H} = 69^{\circ}2$
ipP	14 24 30	$\Delta_{meas} = 69^{\circ}2$
iS	14 30 49	
iSP	14 31 26	
i	14 31 33	
esS	14 34 28	
eSR ₁	14 35 26	
eSR ₂	14 38 24	

State College, Pennsylvania (By mail, courtesy U.S.C. and G.S.)

iP	14h22m37s	$\Delta_{P-H} = 70^{\circ}5$
ipP	14 24 37	$\Delta_{meas} = 70^{\circ}3$
e	14 30 55	
iS	14 31 08	
sS	14 34 47	
iM	14 50 25	

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PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF FEBRUARY 15, 1936.

2.

Tentative Epicenter: Vicinity of $4^{\circ}5$ S, $133^{\circ}0$ E.
H = 12h46m56s. Depth of focus normal.

Stations of the Jesuit Seismological Association

Florissant.

iPR ₁	13h08m02s	$\Delta_{PR_1-H} = 128^{\circ}1$
iSKP	13 09 26	$\Delta_{meas.} = 128^{\circ}1$
eSKS	13 13 02	
ePS	13 18 16	
iSR ₁	13 25 10	
iSR ₂	13 29 56	
e(L)	13 47 26	

Saint Louis.

ePR ₁	13h08m02s	$\Delta_{PR_1-H} = 128^{\circ}1$
ePS	13 18 10	$\Delta_{meas.} = 128^{\circ}3$
eSR ₁	13 25 08	
eSR ₂	13 29 58	
eM	13 56 38	

Buffalo. (By mail, courtesy U.S.C. and G.S.)

iPR ₁	13h08m34s	$\Delta_{PR_1-H} = 133^{\circ}1$
iSKP	13 09 44	$\Delta_{meas.} = 133^{\circ}1$
iPR ₂	13 11 01	
eSR ₁	13 26 20	
e	13 40 28	
eL	13 49 28	

Stations of the United States Coast and Geodetic Survey

Honolulu. (By mail, courtesy U.S.C. and G.S.)

eP	12h56m28s	$\Delta_{S-H} = 72^{\circ}6$
i	12 58 37	$\Delta_{meas.} = 72^{\circ}2$
iS	13 07 50	
i(L)	13 17 50	

Sitka. (By mail, courtesy U.S.C. and G.S.)

eP	13h00m00s	$\Delta_{S-P} = 91^{\circ}3$
eS	13 11 00	$\Delta_{meas.} = 94^{\circ}7$

(Heavy Microseisms)

PRELIMINARY BULLETIN

2.

EARTHQUAKE OF FEBRUARY 15, 1936 (continued)

Tucson. (By telegram, courtesy Science Service)

e(P)	13h02m24s	$\Delta_{S-H} = 114^{\circ}7$
e(PR ₁)	13 06 58	$\Delta_{\text{meas.}} = 114^{\circ}3$
eS	13 14 22	
e(PS)	13 16 24	
eSR ₁	13 22 18	
e	13 32 30	
eL	13 40 30	

San Juan. (By mail, courtesy U.S.C. and G.S.)

P ₂	13h07m11s	$\Delta_{P_2-H} = 156^{\circ}1$
e(PR ₁)	13 11 29	$\Delta_{\text{meas.}} = 156^{\circ}8$
eSR ₁	13 30 29	

Other Stations

Manila. (By mail, courtesy U.S.C. and G.S.)

iP	12h51m57s	$\Delta_{S-P} = 22^{\circ}6$
iS	12 56 04	$\Delta_{\text{meas.}} = 22^{\circ}6$

College, (Fairbanks, Alaska) (By mail, courtesy U.S.S. and G.S.)

P	12h59m50s	$\Delta_{P-H} = 89^{\circ}2$
(SKS)	13 10 18	$\Delta_{\text{meas.}} = 89^{\circ}2$
PS	13 11 30	
	13 13 05	
	13 14 58	
	13 22 16	

Burlington. (By mail, courtesy U.S.C. and G.S.)

ePR ₁	13h08m41s	$\Delta_{PR_1-H} = 134^{\circ}3$
iPKS	13 09 45	$\Delta_{\text{meas.}} = 134^{\circ}0$
ePS	13 19 01	
eSR ₁	13 26 25	
i	13 27 54	
eL	13 40 00	

Charlottesville. (By mail, courtesy U.S.C. and G.S.)

ePR ₁	13h08m55s	$\Delta_{PR_1-H} = 136^{\circ}6$
eL	13 44 00	$\Delta_{\text{meas.}} = 136^{\circ}9$

Philadelphia (By mail, courtesy U.S.C. and G.S.)

eSKP	13h09m48s	$\Delta_{PPS-H} = 136^{\circ}0$
eSKS	13 13 24	$\Delta_{\text{meas.}} = 136^{\circ}3$
ePPS	13 21 02	
iSR ₁	13 26 59	
e	13 31 48	
eL	13 46 02	

Macelwane, S.J.
tor

C. G. Dahm
Instructor

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF APRIL 1, 1936

3.

Epicenter in the vicinity of $2^{\circ}5'N$, $123^{\circ}5'E$. Depth of focus of the order of 75 km. Tentative $H = 02h09m16s$.

Stations of the Jesuit Seismological Association

<u>Florissant,</u>	eP	2h25m08s	$\Delta_{P-H} = 128^{\circ}2$
	epP	2 25 26	$\Delta_{meas} = 128^{\circ}2$
	eP ¹	2 28 19	
	i	2 28 30	
	iPR ₁	2 30 14	
	i	2 30 46	
	iSKP	2 31 40	
	iSKS	2 35 25	
	isSKS	2 35 58	
	iSKKS	2 37 12	
	iS	2 38 28	
	iPS	2 40 30	
	iPPS	2 41 42	
	iSR ₁	2 47 23	
	iSR ₂	2 52 09	
	eL	3 10 16	
	M	3 24 50	
<u>Saint Louis,</u>	eP ¹	2h28m17s	$\Delta_{PR_1-H} = 128^{\circ}0$
	i	2 28 32	$\Delta_{meas} = 128^{\circ}4$
	ePR ₁	2 30 15	
	e	2 30 47	
	iSKP	2 31 31	
	iSKS	2 35 28	
	esSKS	2 35 56	
	iSKKS	2 37 11	
	i	2 40 15	
<u>Buffalo,</u>	eSR ₁	2 47 06	
	(By telegram, courtesy Science Service)		
	i(P ¹)	2h28m33s	$\Delta_{PR_1-H} = 128^{\circ}9$
	iPR ₁	2 30 22	$\Delta_{meas} = 130.1$
	iPR ₂	2 33 17	
	i	2 33 29	
	iSKS	2 35 29	
	iPPS	2 42 12	
<u>Fordham,</u>	iSR ₁	2 47 12	
	(By telegram, courtesy Science Service)		
	iP ¹	2h28m22s	$\Delta_{P^1-H} = 132^{\circ}8$
	iPR ₁	2 31 08	$\Delta_{meas} = 133^{\circ}6$
	i	2 31 18	
	eSKP	2 31 56	

PRELIMINARY BULLETIN

3.

EARTHQUAKE OF APRIL 1, 1936 (continued)

Stations of the Jesuit Seismological Association

Georgetown, (By telegram, courtesy Science Service)

eP'	2h28m32s	$\Delta_{PR_1-H} = 134^{\circ}.2$
iP'	2 28 38	$\Delta_{meas} = 134^{\circ}.2$
iPR ₁	2 30 55	
i	2 31 24	
iSKP	2 32 04	
iSKKS	2 37 55	
iPSKS	2 40 57	
iPPS	2 43 04	
iSS	2 48 31	
L	3 12 00	

Stations of the United States Coast and Geodetic Survey

Honolulu, (By mail, courtesy U. S. C. and G. S.)

i(P)	2h21m42s	$\Delta_{S-H} = 79^{\circ}.8$
iS	2 31 14	$\Delta_{meas} = 78^{\circ}.3$
iL	2 44 14	

Sitka, (By mail, courtesy U. S. C. and G. S.)

iP	2h22m34s	$\Delta_{PR_1-H} = 94^{\circ}.5$
PP	2 26.2	$\Delta_{meas} = 93^{\circ}.8$
i(SKS)	2 33 03	
L	2 52 00	

Ukiah, (By telegram, courtesy U. S. C. and G. S.)

e	2h24m02s	$\Delta_{SKS-H} = 106^{\circ}.0$
iSKS	2 34 06	$\Delta_{meas} = 106^{\circ}.1$

Tucson, (By telegram, courtesy Science Service)

ePR ₁	2h28m52s	$\Delta_{PR_1-H} = 117^{\circ}.4$
iSKS	2 34 58	$\Delta_{meas} = 118^{\circ}.0$
eSKKS	2 36 10	
ePPS	2 38 40	
eSR ₁	2 45 00	
e	2 48 50	
eL	3 01 30	

San Juan, (By mail, courtesy U. S. C. and G. S.)

eP' ₂	2h29m22s	$\Delta_{P'_2-H} = 155^{\circ}.9$
eSR ₁	2 52 29	$\Delta_{meas} = 157^{\circ}.0$

EARTHQUAKE OF APRIL 1, 1936 (continued)Other StationsManila, (By telegram, courtesy Science Service)

iP	2h12m11s	$\Delta_{P-H} = 12^{\circ}2$
e	2 13 47	$\Delta_{meas} = 12^{\circ}2$

Hong Kong, (By mail, courtesy U. S. C. and G. S.)

P	2h14m07s	$\Delta_{P-H} = 22^{\circ}2$
		$\Delta_{meas} = 21^{\circ}6$

Zikawei, (By mail, courtesy U. S. C. and G. S.)

P	2h15m08s	$\Delta_{S-P} = 28^{\circ}5$
S	2 19 57	$\Delta_{meas} = 28^{\circ}5$

College, (Fairbanks) Alaska, (By mail, courtesy U.S.C. and G.S.)

eP	2h22m00s	$\Delta_{S-H} = 86^{\circ}0$
(PP)	2 26 42	$\Delta_{meas} = 86^{\circ}8$
iS	2 32 18	
PS	2 33 18	
(SS)	2 37 30	
SSS	2 42 12	
iL	2 48 42	

Victoria, (By mail, courtesy U. S. C. and G. S.)

18h23m00s	$\Delta_{P-H} = 101^{\circ}0$
	$\Delta_{meas} = 103^{\circ}0$

Berkeley, (By telegram, courtesy Science Service)

epP	2h23m43s	$\Delta_{pP-H} = 106^{\circ}5$
iSKS	2 34 08	$\Delta_{meas} = 107^{\circ}2$
(L)	2 54 38	

Pasadena, (By telegram, courtesy Science Service)

iP	2h23m56s	$\Delta_{PR_1-H} = 111^{\circ}3$
(P')	2 28 00	$\Delta_{P-H} = 112^{\circ}7$
PR ₁	2 28 18	$\Delta_{meas} = 111^{\circ}7$
(SKS)	2 34 30	
(S)	2 25 51	
(SR ₂)	2 49 13	
M	5 10 52	

Tortosa, Observatori del Ebro, (By radiogram, courtesy Rev. Luis Rodas, S.J.)

pP'	2h28m04s	$\Delta_{meas} = 112^{\circ}7$
sPS	2 38 34	

PRELIMINARY BULLETINEARTHQUAKE OF APRIL 1, 1936 (continued)Other StationsAnn Arbor, (By telegram, courtesy Science Service)

PP	2h30m24s	$\Delta_{PP-H} = 129^{\circ}.4$
SKS	2 35 12	$\Delta_{meas} = 128^{\circ}.8$
iSKKS	2 37 24	
(PS)	2 41 06	
SS	2 47 30	
eSR ₂	2 52 36	
e(L)	3 04 06	

State College of Pennsylvania, (By mail, courtesy H. Landsberg)

i	2h32m14s	$\Delta_{meas} = 132^{\circ}.4$
e(S)	2 38 10	
	2 51 13	
L	3 20 00	
M	3 33 00	

Philadelphia, (By mail, courtesy U. S. C. and G. S.)

epP'	2h28m40s	$\Delta_{meas} = 134^{\circ}.0$
i(pPR ₁)	2 31 15	
iPSKS	2 40 26	
i	2 50 10	
e	2 54 39	

J. B. Macelwane, S.J.
DirectorC. G. Dahm
InstructorE R R A T A

In Preliminary Bulletin No. 42
change 21.⁰OW. to 21.⁰ON.

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15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF APRIL 19, 1936

4.

Tentative Epicenter $9^{\circ}08'$, $156^{\circ}00'E$. H = 05h07m12s.

Stations of the Jesuit Seismological Association

Florissant,

eP	5h21m59s	$\Delta_{PR_1-H} = 113^{\circ}08'$
iPR ₁	5 26 39	$\Delta_{meas.} = 113^{\circ}09'$
eSKS _E	5 32 37	
i	5 33 30	
iSKKS	5 33 47	
i	5 34 57	
iPS	5 36 08	
iSR ₁	5 42 20	
eSR ₂	5 46 43	
eL	5 59 43	
eM	6 06 43	

St. Louis,

ePR ₁	5h26m39s	$\Delta_{PR_1-H} = 113^{\circ}08'$
ePS	5 36 10	$\Delta_{meas.} = 114^{\circ}01'$

Cincinnati, (By mail, courtesy Victor C. Stechschulte, S.J.)

iPR ₁	5h27m08s	$\Delta_{PR_1-H} = 118^{\circ}00'$
ePS	5 37 00	$\Delta_{PS-H} = 118^{\circ}04'$
eL	6 10 00	$\Delta_{meas.} = 118^{\circ}04'$

Georgetown, (By telegram, courtesy Science Service)

eP'	5h26m14s	$\Delta_{PR_1-H} = 123^{\circ}08'$
iPR ₁	5 27 49	$\Delta_{meas.} = 124^{\circ}00'$

Fordham, (By telegram, courtesy Science Service)

ePR ₁	5h28m05s	$\Delta_{PS-H} = 126^{\circ}01'$
eS	5 35 44	$\Delta_{meas.} = 125^{\circ}09'$
iPS	5 38 02	
e	5 45 34	
i	6 01 34	
	6 09 32	
	6 23 16	
	6 36 00	

Stations of the United States Coast and Geodetic Survey

Honolulu, (By telegram, courtesy Science Service)

iP	5h16m36s	$\Delta_{P-H} = 54^{\circ}04'$
eL	5 31 36	$\Delta_{meas.} = 54^{\circ}05'$

PRELIMINARY BULLETIN

4.

EARTHQUAKE OF APRIL 19, 1936 (continued)

Stations of the United States Coast and Geodetic Survey

Tucson, (By telegram, courtesy Science Service)

eP	5h20m44	$\Delta_{P-H} = 97^{\circ}1$
ePR ₁	5 24 50	$\Delta_{\text{meas.}} = 97^{\circ}3$
eS	5 32 08	
ePPS	5 33 41	
e	5 39 14	
eL	5 52 00	

Chicago, (By mail, courtesy U.S.C. and G.S.)

i(P')	5h26m11s	$\Delta_{\text{meas.}} = 115^{\circ}3$
i	5 35 51	
	5 40 51	

San Juan, (By mail, courtesy U.S.C. and G.S.)

e(P')	5h26m24s	$\Delta_{SKP-H} = 140^{\circ}0$
eSKP	5 30 10	$\Delta_{\text{meas.}} = 138^{\circ}1$

Other Stations

Manila, (By telegram, courtesy Science Service)

iP	5h15m04s	$\Delta_{S-P} = 42^{\circ}1$
iS	5 21 18	$\Delta_{\text{meas.}} = 42^{\circ}1$

Apia, (By mail, courtesy U.S.C. and G.S.)

iP	5h13m42s	$\Delta_{SR1-P} = 31^{\circ}9$
iSR ₁	5 21 04	$\Delta_{\text{meas.}} = 31^{\circ}9$

College, (Fairbanks, Alaska) (By mail, courtesy U.S.C. and G.S.)

Time apparently incorrect

5h18m40s	$\Delta_{\text{meas.}} = 84^{\circ}3$
5 29 28	
5 34 04	
5 43 49	

Pasadena, (By mail, courtesy C.F. Richter)

iP	5h20m18s	$\Delta_{P-H} = 91^{\circ}7$
iPP	5 24 16	$\Delta_{\text{meas.}} = 91^{\circ}7$
iPPP	5 26 03	
eSKS	5 30.9	
eSKKS?	5 31 19	
iS	5 31 28	
iPS	5 32 24	
eL	5 48.4	

PRELIMINARY BULLETINEARTHQUAKE OF APRIL 19, 1936 (continued)Other StationsDes Moines, (By mail, courtesy U.S.C. and G.S.)

ePS	5h36m00s	$\Delta_{PS-H} = 112^{\circ}3$
eSR ₁	5 42 12	$\Delta_{meas.} = 111^{\circ}0$
e(SR ₂)	5 46 50	
e(L)	6 04 00	

Charlottesville, (By mail, courtesy U.S.C. and G.S.)

ePR ₁	5h27m40s	$\Delta_{PR_1-H} = 122^{\circ}5$
e	5 33 46	$\Delta_{meas.} = 123^{\circ}3$
ePS	5 37 35	
e(SR ₁)	5 44 18	
e(L)	5 59 22	

Burlington, (By mail, courtesy U.S.C. and G.S.)

iPR ₁	5h27m55s	$\Delta_{PR_1-H} = 124^{\circ}7$
ePS	5 37 43	$\Delta_{meas.} = 125^{\circ}0$
eSR ₁	5 45 00	
e	5 48 00	
i(L)	6 04 37	

Philadelphia, (By telegram, courtesy Science Service)

iPR ₁	5h28m01s	$\Delta_{PS-H} = 124^{\circ}7$
PS	5 38 02	$\Delta_{meas.} = 125^{\circ}0$
	5 55 16	
iL	6 05 07	

J.B. Macelwane, S.J.
Director

C.G. Dahm
Instructor

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5.

EARTHQUAKE OF APRIL 23, 1936

Epicenter 50°5 N, 178°E.

H = 23h14m34s

Depth of Focus 100 km. by Brunner Depth Chart.

Stations of the Jesuit Seismological Association

Florissant,

iP	23h24m41s
ipP	23 25 04
iS	23 33 03
i	23 33 10
esS	23 33 44
i	23 34 35

$\Delta_{S-P} = 62^{\circ}2$
 $\Delta_{meas} = 62^{\circ}2$

Saint Louis,

iP	23h24m43s
ipP	23 24 56
e	23 33 11
i	23 33 26
e(sS)	23 33 32

$\Delta_{P-H} = 62^{\circ}40$
 $\Delta_{meas.} = 62.4$

Buffalo, (By telegram, courtesy Science Service)

iP	23h25m06s
iS	23 33 50

$\Delta_{S-P} = 66^{\circ}$
 $\Delta_{meas.} = 65.7$

Fordham, (By telegram, courtesy Science Service)

iP	23h25m34s
iS	23 34 40
	23 36 30
	23 42 30

$\Delta_{S-P} = 70^{\circ}$
 $\Delta_{meas.} = 69^{\circ}4$

Stations of the United States Coast and Geodetic Survey

Sitka, (By mail, courtesy U.S.C. and G. S.)

iP	23h20m10s
eS	23 24 54

$\Delta_{S-P} = 28^{\circ}$
 $\Delta_{meas.} = 28^{\circ}$

Honolulu, (By mail, courtesy U.S.C. and G. S.)

(S) 23h28m

$\Delta_{meas} = 35^{\circ}$

Ukiah, (By telegram, courtesy Science Service)

e(P)	23h22m06s
es	23 28 32
	23 32 00

$\Delta_{S-H} = 42^{\circ}$
 $\Delta_{meas.} = 42^{\circ}$

PRELIMINARY BULLETIN

5.

EARTHQUAKE OF APRIL 23, 1936 (continued)

Stations of the United States Coast and Geodetic Survey

Tucson, (By telegram, courtesy Science Service)

iP	23h23m46s	$\Delta_{S-P} = 54^{\circ}.3$
eS	23 31 22	$\Delta_{\text{meas.}} = 54^{\circ}.3$
eL	23 39 30	

Other Stations

College (Fairbanks) Alaska (By mail, courtesy U.S.C. and G.S.)

P	23h19m33s	$\Delta_{S-P} = 22.6$
S	23 23 33	$\Delta_{\text{meas.}} = 22^{\circ}.6$
sS	23 24 06	
(L)	23 25 18	
	23 30 33	
	23 35 12	

Berkeley, (By telegram, courtesy Science Service)

eP	23h22m27s	$\Delta_{P-H} = 43^{\circ}.4$
e(S)	23 28 47	$\Delta_{\text{meas.}} = 43^{\circ}.4$

Charlottesville, (By mail, courtesy U.S.C. and G.S.)

eP	23h25m24s	$\Delta_{P-H} = 68^{\circ}.8$
e(S)	23 34 00	$\Delta_{\text{meas.}} = 69^{\circ}.3$
e	23 43 12	
eL	23 47 48	

Philadelphia, (By mail, courtesy U.S.C. and G.S.)

iP	23h25m31s	$\Delta_{S-P} = 69^{\circ}.8$
e	23 29 50	$\Delta_{\text{meas.}} = 69.4$
iS	23 34 36	
eSR ₁	23 39 08	
eL	23 45 25	

James B. Macelwane, S.J.
Director

G. G. Dahm
Instructor

A. J. Westland, S.J.
Graduate Fellow

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

18 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

6.

EARTHQUAKE OF APRIL 27, 1936Epicenter $16^{\circ}3' N$, $87^{\circ}7' W$.

H = 06h31m06s

Depth of focus about 60 km. by the Brunner Depth Chart.

Stations of the Jesuit Seismological AssociationFlorissant,

iP	6h36m00s	$\Delta_{S-P} = 22^{\circ}4$
ipP	6 36 12	$\Delta_{\text{meas.}} = 22^{\circ}4$
iS	6 40 01	
isS	6 40 23	

Georgetown, (By telegram, courtesy Science Service)

iP	6h36m22s	$\Delta_{S-P} = 24^{\circ}6$
iS	6 40 42	$\Delta_{\text{meas.}} = 24^{\circ}3$

Fordham, (By telegram, courtesy Science Service)

eP	6h36m41s	$\Delta_{S-P} = 26^{\circ}8$
eS	6 41 19	$\Delta_{\text{meas.}} = 27^{\circ}2$

Buffalo, (By telegram, courtesy Science Service)

iP	6h36m45s	$\Delta_{S-P} = 27^{\circ}6$
e	6 40 12	$\Delta_{\text{meas.}} = 27^{\circ}6$
eS	6 41 29	
eL	6 44 20	

Stations of the United States Coast and Geodetic SurveySan Juan, (By mail, courtesy U.S.C. and G.S.)

eP	6h35m31s	$\Delta_{S-P} = 20^{\circ}8$
eS	6 39 18	$\Delta_{\text{meas.}} = 20^{\circ}8$
eL	6 40 58	

Chicago, (By telegram, courtesy Science Service)

e(P)	6h36m50s	$\Delta_{S-H} = 25^{\circ}6$
eS	6 41 00	$\Delta_{\text{meas.}} = 25^{\circ}3$
eL	6 46 00	

Other StationsCharlottesville (By mail, courtesy U.S.C. and G.S.)

eP	6h36m04s	$\Delta_{S-P} = 23^{\circ}4$
	6 40 14	$\Delta_{\text{meas.}} = 23^{\circ}1$
	6 42 50	

PRELIMINARY BULLETINEARTHQUAKE OF APRIL 27, 1936. (continued)Other StationsPhiladelphia, (By telegram, courtesy Science Service)

eP	6h36m30s	$\Delta_{S-P} = 26^{\circ}.4$
iS	6 41 05	$\Delta_{\text{meas.}} = 26^{\circ}.0$
iL	6 45 18	

Madison, (By telegram, courtesy Science Service)

P	6h36m46s	$\Delta_{P-H} = 27^{\circ}.1$
eS	6 41 32	$\Delta_{\text{meas.}} = 26^{\circ}.8$
eL	6 47 34	
iM	6 50 49	

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

7.

EARTHQUAKE OF MAY 20, 1936

Tentative Epicenter: $7^{\circ}7' S.$ $159^{\circ}6' E.$
 H = 03h05m21s Depth of focus normal.

Stations of the Jesuit Seismological Association

Florissant,

iP	3h19m57s
iP'	3 23 47
iPR ₁	3 24 25
iSKS	3 30 29
iSKKS	3 31 11
iS	3 32 19
iPS	3 34 00
iPPS	3 35 13
iSR ₁	3 39 59
eL	3 52.1
iM	3 59.1

$\Delta_{P-H} = 110^{\circ}6'$
 $\Delta_{meas} = 110^{\circ}6'$

Saint Louis,

eP'	3h23m30s
ePR'	3 24 28
eSKS	3 30 30
eSKKS	3 31 33
ePS	3 33 59
ePPS	3 35 10
eSR ₁	3 40 05
M	4 02 50

$\Delta_{SKS-H} = 110^{\circ}6'$
 $\Delta_{meas} = 110^{\circ}9'$

Cincinnati, (By mail, courtesy V. C. Stechschulte, S.J.)

eP	3h20m17s
i	3 23 27
iPR ₁	3 25 01
e	3 27 14
PS	3 34 46

$\Delta_{P-H} = 114^{\circ}8'$
 $\Delta_{meas} = 115^{\circ}1'$

Buffalo, (By telegram, courtesy Science Service)

eP	3h20m28s
iPR ₁	3 25 30
ePS	3 35 10

$\Delta_{PS-H} = 118^{\circ}5'$
 $\Delta_{meas} = 118^{\circ}5'$

Georgetown, (By telegram, courtesy Science Service)

eP	3h30m42s
eP'	3 24 15
ePR ₁	3 25 47
iSKS	3 31 15
e	3 32 51
e	3 35 44

$\Delta_{P-H} = 120^{\circ}6'$
 $\Delta_{meas} = 120^{\circ}7'$

PRELIMINARY BULLETIN

7.

EARTHQUAKE OF MAY 20, 1936 (Continued)

Stations of the Jesuit Seismological Association

Fordham, (By telegram, courtesy Science Service)

iPR ₁	3h25m51s	$\Delta_{PR_1-H} = 122^{\circ}8$
iSKS	3 31 15	$\Delta_{meas} = 122^{\circ}4$
iSKKS	3 32 51	
ePS	3 35 45	
e	3 38 15	
eSR ₁	3 42 51	

Stations of the United States Coast and Geodetic Survey

Sitka, (By mail, courtesy U. S. C. and G. S.)

eP	3h17m46s	$\Delta_{P-H} = 83^{\circ}4$
iP	3 17 55	$\Delta_{meas} = 83^{\circ}5$
iS	3 28 17	
iS	3 28 26	
eL	3 41 08	

Ukiah, (By telegram, courtesy Science Service)

eP	3h17m56s	$\Delta_{S-P} = 85^{\circ}4$
eS	3 28 30	$\Delta_{meas} = 85^{\circ}4$

Tucson, (By telegram, courtesy Science Service)

eP	3h18m45s	$\Delta_{S-P} = 94^{\circ}5$
e	3 29 20	$\Delta_{meas} = 93^{\circ}8$
eS	3 30 00	
ePS	3 31 20	
eSR ₁	3 36 30	
eL	3 48 00	

Other Stations

Manila, (By telegram, courtesy Science Service)

iP	3h13m32s	$\Delta_{S-P} = 44^{\circ}4$
iS	3 20 13	$\Delta_{meas} = 44^{\circ}4$

Honolulu, (By mail, courtesy U. S. C. and G. S.)

iP	3h14m28s	$\Delta_{S-P} = 51^{\circ}0$
i	3 14 33	$\Delta_{meas} = 50^{\circ}7$
iS	3 21 50	
iL	3 28 50	

PRELIMINARY BULLETIN

7

EARTHQUAKE OF MAY 20, 1936 (Continued)

Other Stations

Berkeley, (By telegram, courtesy Science Service)

e	3h20m11s	$\Delta_{\text{meas}} = 85^{\circ}7$
e	3 30 41	
e	3 53 15	
e	3 48 25	

Victoria, (By mail, courtesy U. S. C. and G. S.)

3h18m00s $\Delta_{\text{meas}} = 87^{\circ}2$

Madison, (By telegram, courtesy Science Service)

PR ₁	3h24m36s	$\Delta_{\text{PS-H}} = 111^{\circ}8$
SKS	3 30 37	$\Delta_{\text{meas}} = 110^{\circ}9$
PS	3 34 04	
SR ₁	3 40 10	

Charlottesville, (By mail, courtesy U. S. C. and G. S.)

e	3h26m34s	$\Delta_{\text{meas}} = 120^{\circ}0$
eSKS	3 31 15	
e	3 35 30	
e	3 41 44	
L	4 08 16	

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15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

8.

EARTHQUAKE OF MAY 27, 1936

Tentative Epicenter: 24°2 N. 85°3 E.
H = 06h19m27s Focal Depth Normal

Stations of the Jesuit Seismological Association

Saint Louis,

ePR ₁	6h38m29s	$\Delta_{PS-H} = 112^{\circ}06$
iSKS	6 44 34	$\Delta_{meas} = 112^{\circ}02$
e	6 48 02	
iPS	6 48 18	
eL	7 11.0	

Buffalo, (By telegram, courtesy Science Service)

eP	6h33m32s	$\Delta_{PS-H} = 106^{\circ}04$
eP'	6 37 16	$\Delta_{meas} = 106^{\circ}04$
iPR ₁	6 37 58	
ePR ₂	6 40 22	
iPS	6 47 14	
iPPS	6 48 16	
i	6 55 26	

Fordham, (By telegram, courtesy Science Service)

eP'	6h36m42s	$\Delta_{PS-H} = 108^{\circ}00$
ePR ₁	6 38 00	$\Delta_{meas} = 107^{\circ}05$
i	6 38 07	
iPR ₂	6 40 25	
iSKS	6 44 12	
iPS	6 47 31	
iPPS	6 48 27	
e	6 51 05	
i	6 56 05	
e	7 02 05	

Georgetown, (By telegram, courtesy Science Service)

eP	6h33m41s	$\Delta_{PS-H} = 109^{\circ}08$
iPR ₁	6 38 21	$\Delta_{meas} = 110^{\circ}02$
iSKS	6 44 27	
iPS	6 47 54	
e	6 54 01	

Cincinnati, (By mail, courtesy V.C. Stechschulte, S.J.)

eP	6h33m52s	$\Delta_{PS-H} = 111^{\circ}02$
eP'	6 37 30	$\Delta_{meas} = 111^{\circ}01$
PR ₁	6 38 30	
PR ₂	6 41 02	
e	6 47 18	
PS	6 48 04	

EARTHQUAKE OF MAY 27, 1936 (continued)Stations of the United States Coast and Geodetic SurveySitka, (By mail, courtesy U.S.C. and G.S.)

eP	6h32.2m	$\Delta_{P-H} = 87^{\circ}4$
eS	6 42.6	$\Delta_{\text{meas}} = 87^{\circ}4$
eL	7 04.0	

Honolulu, (By mail, courtesy U.S.C. and G.S.)

i	6h43m57s	(time doubtful)
i	6 52 14	$\Delta_{\text{meas}} = 101^{\circ}3$
i	6 57 24	
eL	7 08 04	

Tucson, (By telegram, courtesy Science Service)

ePR ₁	6h39m16s	$\Delta_{PS-H} = 117^{\circ}3$
eSKKS	6 46 23	$\Delta_{\text{meas}} = 116^{\circ}8$
ePS	6 49 05	
eSR ₁	6 55 30	
e	7 00 18	
eL	7 16 00	

Other StationsPhulien, (By mail, courtesy U.S.C. and G.S.)

P	6h24m13s	$\Delta_{P-H} = 21^{\circ}1$
S	6 28 10	$\Delta_{\text{meas}} = 20^{\circ}7$

Zi-Ka-wie, (By telegram, courtesy Science Service)

P	6h25m49s	$\Delta_{P-H} = 31^{\circ}1$
S	6 31 14	$\Delta_{\text{meas}} = 31^{\circ}1$

Manila, (By telegram, courtesy Science Service)

iP	6h26m29s	$\Delta_{S-P} = 35^{\circ}8$
iS	6 32 15	$\Delta_{\text{meas}} = 35^{\circ}8$

Tortosa, Observatorio del Ebro

(By radiogram, courtesy Rev. Luis Rodes, S.J.)

iP	6h30m07s	$\Delta_{P-H} = 65^{\circ}7$
iS	6 38 59	$\Delta_{\text{meas}} = 68^{\circ}1$

College, (Fairbanks) Alaska,

(By mail, courtesy U.S.C. and G.S.)

iP	6h31m19s	$\Delta_{P-H} = 77^{\circ}3$
PR ₁	6 34 18	$\Delta_{\text{meas}} = 77^{\circ}5$
	6 37 12	
iS	6 41 15	
	6 44 03	
R ₁	6 52 18	
L	7 03 12	

PRELIMINARY BULLETIN

8.

EARTHQUAKE OF MAY 27, 1936 (continued)

Other Stations

Victoria, (By telegram, courtesy Science Service)

6h33m00s

$\Delta_{\text{means}} = 108.5$

Pasadena, (By mail, courtesy C. F. Richter)

eP ¹	6h37m33s
iPR ₁	6 38 54
iPR ₂	6 41 19
iSKS	6 44 26
iPS	6 48 31
ePKKP	6 48 32
eL	7 14.6

$\Delta_{\text{PR}_1-\text{H}} = 113.7$
 $\Delta_{\text{means}} = 113.0$

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

9.

EARTHQUAKE OF MAY 28, 1936

Tentative Epicenter $9^{\circ}0' N$, $103^{\circ}5' W$. $H = 18h49m11s$
Depth about 270 km.

Stations of the Jesuit Seismological Association

Florissant,

iP	18h55m15s	$\Delta_{S-P} = 32^{\circ}0$
ipP	18 56 06	$\Delta_{meas} = 32^{\circ}0$
iPR ₁	18 56 30	
iS	19 00 11	
isS	19 01 52	

Saint Louis,

iP	18h55m15s	$\Delta_{P-H} = 32^{\circ}0$
ipP	18 56 10	$\Delta_{meas} = 32^{\circ}0$
iPR ₁	18 56 27	
isP	18 56 44	
eS	19 00 16	
isS	19 02 04	
iSR ₁	19 02 30	

Cincinnati, (from original seismograms)

iP	18h55m38s	$\Delta_{P-H} = 34^{\circ}6$
ipP	18 56 38	$\Delta_{meas} = 34^{\circ}6$
iPR ₁	18 56 52	
isP	18 57 01	
ipPR ₁	18 57 34	
iS	19 00 50	
iScP	19 01 50	
isS	19 02 28	
iSR ₁	19 03 11	

Loyola, Chicago, (By mail, courtesy A. R. Schmitt, S.J.)

iP	18h55m52s	$\Delta_{P-H} = 36^{\circ}2$
iPR ₁	18 56 59	$\Delta_{meas} = 35^{\circ}6$
iS	19 01 35	
iSR ₁	19 03 32	

Georgetown, (By telegram, courtesy Science Service)

iP	18h56m13s	$\Delta_{P-H} = 38.7$
ipP	18 57 28	$\Delta_{meas} = 38^{\circ}3$
iS	19 01 58	

Buffalo, (By telegram, courtesy Science Service)

iP	18h56m27s	$\Delta_{S-P} = 40^{\circ}1$
iPR ₁	18 57 54	$\Delta_{meas} = 40^{\circ}1$
i	19 01 36	
iS	19 02 15	
i	19 02 46	
iSR ₁	19 04 32	

EARTHQUAKE OF MAY 28, 1936 (continued)Stations of the Jesuit Seismological AssociationFordham, (By telegram, courtesy Science Service)

iP	18h56m36s	$\Delta_{P-H} = 41^{\circ}7$
ipP	18 58 05	$\Delta_{meas} = 41^{\circ}4$
iS	19 02 43	
iSR ₁	19 05 35	
e	19 10 52	

Stations of the United States Coast and Geodetic SurveyTucson, (By telegram, courtesy Science Service)

eP	18h54m04s	$\Delta_{P-H} = 24^{\circ}0$
eS	18 58 22	$\Delta_{meas} = 24^{\circ}0$
e	19 00 45	

Chicago, (By telegram, courtesy Science Service)

iP	18h55m45s	$\Delta_{P-H} = 35^{\circ}6$
iS	19 01 22	$\Delta_{meas} = 35^{\circ}6$
i	19 06 00	

San Juan, (By mail, courtesy U. S. C. and G. S.)

eP	18h56m13s	$\Delta_{P-H} = 38^{\circ}7$
iS	19 01 59	$\Delta_{meas} = 37^{\circ}7$
i	19 05 00	

Sitka, (By mail, courtesy U. S. C. and G. S.)

eP	18h58.3	$\Delta_{P-H} = 55^{\circ}7$
eS	19 05.9	$\Delta_{meas} = 54^{\circ}0$
e	19 12.0	

Other StationsPasadena, (By mail, courtesy C. F. Richter)

iP	18h54m42s	$\Delta_{P-H} = 28^{\circ}4$
eS	18 59 34	$\Delta_{meas} = 28^{\circ}4$
i	19 01 21	

Berkeley, (By telegram, courtesy Science Service)

eP	18h55m26s	$\Delta_{P-H} = 33^{\circ}4$
S	19 00 48	$\Delta_{meas} = 33^{\circ}4$
	19 04 16	
	19 07 26	

Des Moines, (By telegram, courtesy Science Service)

ePR ₁	18h56m38s	$\Delta_{S-H} = 34^{\circ}5$
e	18 57 22	$\Delta_{meas} = 33^{\circ}7$
eS	19 00 47	
eSR ₁	19 02 43	
e	19 03 31	
e	19 03 39	

PRELIMINARY BULLETIN

9.

EARTHQUAKE OF MAY 28, 1936 (continued)

Other Stations

Huancayo, (By mail, courtesy U.S.C. and G.S.)

iP	18h56m03s	$\Delta_{P-H} = 37^{\circ}3$
i	19 06 39	$\Delta_{meas} = 35^{\circ}7$

State College of Pennsylvania, (By telegram, courtesy Science Service)

eP	18h56m12s	$\Delta_{P-H} = 38^{\circ}7$
ePR ₁	18 58 01	$\Delta_{meas} = 38^{\circ}9$
eSR ₁	19 04 18	
e	19 14 12	
e	19 18 08	

Victoria, (By telegram, courtesy Science Service)

P	18h56m40s	$\Delta_{P-H} = 42^{\circ}5$
		$\Delta_{meas} = 42^{\circ}6$

Burlington, (By mail, courtesy U.S.C. and G.S.)

iP	18h57m02s	$\Delta_{P-H} = 45^{\circ}2$
PR ₁	18 58 42	$\Delta_{meas} = 44^{\circ}3$
iS	19 03 35	
eSR ₁	19 06 48	
e	19 10 10	

Ottawa, (By telegram, courtesy Science Service)

eP	18h56m56s	$\Delta_{P-H} = 44^{\circ}4$
ePR ₁	18 58 40	$\Delta_{meas} = 43^{\circ}7$
iS	19 03 23	
iSR ₁	19 06 18	
e	19 10 00	

Honolulu, (By telegram, courtesy Science Service)

e	18h58m20s	$\Delta_{meas} = 53^{\circ}8$
i	19 03 09	
i	19 05 56	
i	19 12 56	

Manila, (By mail, courtesy U.S.C. and G.S.)

	19h08m20s	$\Delta_{meas} = 130^{\circ}4$
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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

10.

EARTHQUAKE OF JUNE 3, 1936

Tentative Epicenter: 40°7 N, 125°5 W.

H = 09h15m20s

Depth about 50 km.

Stations of the Jesuit Seismological AssociationFlorissant,

eP	9h20m58s
ipP	9 21 09
isP	9 21 23
iPR ₁	9 21 34
iS	9 25 40
isS	9 26 03
iSR ₁	9 27 01
eL	9 28.1
iM	9 30.6

 $\Delta_{P-H} = 26^{\circ}8$ $\Delta_{\text{meas}} = 26^{\circ}8$ Saint Louis,

iP	9h21m00s
ipP	9 21 11
iPR ₁	9 21 43
iPR ₂	9 21 54
iS	9 25 40
isS	9 26 04
eSR ₁	9 26 54
eL	9 27.7
iM	9 30.7

 $\Delta_{S-P} = 27^{\circ}0$ $\Delta_{\text{meas}} = 27^{\circ}0$ Loyola, Chicago (By mail, courtesy A. R. Schmitt, S.J.)

eP	9h21m11s
ePR ₁	9 21 57
e	9 23 27

 $\Delta_{P-H} = 28^{\circ}2$ $\Delta_{\text{meas}} = 28^{\circ}2$ Buffalo,

(By telegram, courtesy Science Service)

iP	9h22m08s
iSR ₁	9 30 10
i	9 31 32

 $\Delta_{P-H} = 34^{\circ}7$ $\Delta_{\text{meas}} = 34^{\circ}7$ Georgetown,

(By mail, courtesy U.S.C. and G.S.)

eP	9h22m27s
eP	9 22 34
PR ₁	9 23 49
iS	9 28 16
iSR ₁	9 31 34
iL	9 34 +

 $\Delta_{P-H} = 36^{\circ}9$ $\Delta_{\text{meas}} = 36^{\circ}9$ Fordham,

(By telegram, courtesy Science Service)

iP	9h22m37s
ipP	9 22 46
iPR ₁	9 24 19
eS	9 28 45
e	9 32 55
e	9 36 25
e	9 38 55

 $\Delta_{P-H} = 38^{\circ}3$ $\Delta_{\text{meas}} = 38^{\circ}3$ 

Stations of the United States Coast and Geodetic Survey.

<u>Ukiah</u> , (By telegram, courtesy Science Service)		
i	9h15m51s	$\Delta_{\text{meas}} = 2^{\circ}3$
i	9 15 54	
<u>Tucson</u> , (By telegram, courtesy Science Service)		
eP	9h18m43s	$\Delta_{\text{P-H}} = 14^{\circ}5$
eS	9 22 04	$\Delta_{\text{meas}} = 14^{\circ}5$
eL	9 23 18	
<u>Sitka</u> , (By mail, courtesy U.S.C. and G.S.)		
P	9h19m26s	$\Delta_{\text{P-H}} = 17.9$
iS	9 22 52	$\Delta_{\text{meas}} = 17^{\circ}5$
<u>Chicago</u> , (By telegram, courtesy Science Service)		
eP	9h21m00s	$\Delta_{\text{S-H}} = 28^{\circ}3$
eS	9 26 00	$\Delta_{\text{meas}} = 28^{\circ}5$
e	9 32 40	

Other Stations

<u>Berkeley</u> , (By telegram, courtesy Science Service)		
e	9h16m10s	$\Delta_{\text{meas}} = 3^{\circ}8$
e	9 17 20	
e	9 18 42	
<u>Victoria</u> , (By telegram, courtesy Science Service)		
P	9h17m14s	$\Delta_{\text{P-H}} = 7^{\circ}7$ $\Delta_{\text{meas}} = 7^{\circ}7$
<u>Bozeman</u> , (By mail, courtesy U.S.C. and G.S.)		
eP	9h18m11s	$\Delta_{\text{P-H}} = 11^{\circ}8$
e	9 22 22	$\Delta_{\text{meas}} = 11^{\circ}5$
<u>Des Moines</u> , (By telegram, courtesy Science Service)		
eP	9h20m37s	$\Delta_{\text{P-H}} = 24^{\circ}6$
e	9 21 32	$\Delta_{\text{meas}} = 23^{\circ}7$
eS	9 24 59	
e	9 28 15	
<u>State College of Pennsylvania</u> , (By mail, courtesy U.S.C. and G.S.)		
e	9h25m35s	$\Delta_{\text{meas}} = 35^{\circ}6$
e	9 34 36	
e	9 38 12	
<u>Charlottesville</u> , (By mail, courtesy U.S.C. and G.S.)		
eP	9h22m22s	$\Delta_{\text{P-H}} = 36^{\circ}2$
eS	9 27 56	$\Delta_{\text{meas}} = 36.2$
eL	9 32 12	
<u>Ithaca</u> , (By mail, courtesy U.S.C. and G.S.)		
iP	9h22m30s	$\Delta_{\text{P-H}} = 37^{\circ}3$
iPR ₁	9 23 44	$\Delta_{\text{meas}} = 37^{\circ}0$
eS	9 28.1	
e	9 32.6	
e	9 35.0	
e	9 36.0	
<u>Ottawa</u> , (By telegram, courtesy Science Service)		
eS	9h28m06s	$\Delta_{\text{S-H}} = 36^{\circ}2$
e	9 33 51	$\Delta_{\text{meas}} = 36^{\circ}2$
e	9 36 21	
e	9 38 45	
e	10 00 00	

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

Earthquake of June 10, 1936

11.

Tentative Epicenter: $5^{\circ}4$ S, $147^{\circ}0$ E.
H = 08h23m20s. Depth about 150 km by
the Brunner Depth Chart



Stations of the Jesuit Seismological Association

Florissant,

ep ¹	8h41m45s	$\Delta_{PR_1-H} = 118^{\circ}6$
iPR ₁	8 43 07	$\Delta_{meas} = 118^{\circ}6$
ipPR ₁	8 43 42	
iSKP	8 44 34	
iPR ₂	8 45 50	
iSKS	8 48 20	
iSKKS	8 49 34	
iS	8 50 47	
iSP	8 52 53	
isSP	8 53 58	
iSR ₁	8 59 11	
iSR ₂	9 03 42	
eL	9 19 08	
eM	9 27 27	

Cincinnati, (Taken from original records)

iPR ₁	8h43m16s	$\Delta_{SP-H} = 125^{\circ}6$
eSP	8 53 12	$\Delta_{meas} = 123^{\circ}0$
iPPS	8 54 51	
eSR ₁	9 00 21	

Buffalo, (By telegram, courtesy Science Service)

iP ¹	8h42m05s	$\Delta_{P^1-H} = 125^{\circ}6$
iPR ₁	8 43 55	$\Delta_{meas} = 125^{\circ}2$
esSP	8 54 43	
i	8 56 24	
eL	9 16 23	

Georgetown, (By mail, courtesy U.S.C. and G.S.)

iP ¹	8h42m10s	$\Delta_{P^1-H} = 128^{\circ}4$
i	8 43 22	$\Delta_{meas} = 128^{\circ}0$
iPR ₁	8 44 13	
SKP	8 45 29	
eSP	8 54 22	
iPPS	8 56 53	
e	8 57 52	
eSR ₁	9 01 07	

PRELIMINARY BULLETIN

11.

Earthquake of June 10, 1936

Stations of the Jesuit Seismological Association

Fordham, (By telegram, courtesy Science Service)

ePR ₁	8h44m18s	$\Delta_{PR_1-H} = 129.2$
ePR ₂	8 46 56	$\Delta_{meas} = 129.3$
isSP	8 55 19	
i	8 57 04	
eSR ₁	9 01 28	
e	9 14 56	
eL	9 21 56	

Stations of the United States Coast and Geodetic Survey

Sitka, (By telegram, courtesy Science Service)

iP	8h35m55s	$\Delta_{P-H} = 88.1$
iS	8 46 23	$\Delta_{meas} = 88.1$
iSP	8 47 21	
eL	8 59 00	

Other Stations

Adelaide, (Taken from Station Bulletin)

iP	8h29m24s	$\Delta_{P-H} = 30.6$
iS	8 34 10	$\Delta_{meas} = 30.6$

Manila, (Taken from Special Station Bulletin)

iP	8h29m42s	$\Delta_{S-P} = 32.6$
iS	8 34 58	$\Delta_{meas} = 32.6$

Taihoku, (Taken from Station Bulletin)

P	8h30m37s	$\Delta_{P-H} = 39.2$
S	8 36 26	$\Delta_{meas} = 39.2$

Apia, (Taken from Station Bulletin)

iP	8h30m54s	$\Delta_{P-H} = 41.4$
		$\Delta_{meas} = 41.4$

Chiufeng, (Taken from Station Bulletin)

iP	8h32m31s	$\Delta_{P-H} = 53.5$
pP	8 33 08	$\Delta_{meas} = 53.7$
iS	8 39 49	
sS	8 40 55	
iSR ₁	8 43 21	
L	8 47 33	
M	8 49 51	

PRELIMINARY BULLETIN

11.

Earthquake of June 10, 1936

Other Stations

Honolulu, (By telegram, courtesy Science Service)

iP	8h33m16s	$\Delta_{P-H} = 61^{\circ}0$
iS	8 42 06	$\Delta_{\text{meas}} = 60^{\circ}3$
iL	8 48 16	

Victoria, (By mail, courtesy U.S.C. and G.S.)

P	8h36m18s	$\Delta_{P-H} = 93^{\circ}2$
		$\Delta_{\text{meas}} = 93^{\circ}8$

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

Earthquake of July 31, 1936

17.

Tentative Epicenter: $22^{\circ}7' N$, $110^{\circ}7' W$.
H = 17h41m00s. Depth of focus 40 km by
the Brunner Depth Chart.

Stations of the Jesuit Seismological Association

Saint Louis,

eP	17h46m08s	$\Delta_{P-H} = 23^{\circ}6'$
iP	17 46 11	$\Delta_{meas} = 23^{\circ}6'$
ipP	17 46 16	
isP	17 46 30	
eS	17 50 05	
isS	17 50 17	
eSR ₁	17 50 59	
eL	17 51 54	
iM	17 54 11	

Florissant,

eP	17h46m08s	$\Delta_{P-H} = 23^{\circ}6'$
iP	17 46 11	$\Delta_{meas} = 23^{\circ}6'$
ipP	17 46 17	
isP	17 46 31	
iS	17 50 04	
isS	17 50 17	
iSR ₁	17 50 59	
iL	17 52 23	
iM	17 53 38	

Fordham, (By telegram, courtesy Science Service)

eS	17h53m27s	$\Delta_{S-H} = 35^{\circ}1'$
eSR ₁	17 55 37	$\Delta_{meas} = 35^{\circ}8'$
eSR ₂	17 56 23	
eL	17 58 35	
e	17 59 15	

Stations of the United States Coast and Geodetic Survey

Tucson, (By telegram, courtesy Science Service)

eP	17h42m32s	$\Delta_{S-P} = 9^{\circ}5'$
eS	17 44 28	$\Delta_{meas} = 9^{\circ}5'$
eL	17 44 58	

Chicago, (By telegram, courtesy Science Service)

ePR ₁	17h47m14s	$\Delta_{S-H} = 27^{\circ}7'$
eS	17 51 34	$\Delta_{meas} = 27^{\circ}3'$
eL	17 54 24	

PRELIMINARY BULLETIN

17.

Earthquake of July 31, 1936 (continued)

Other Stations

Pasadena, (By telegram, courtesy Science Service)

iP	17h44m07s	$\Delta_{P-H} = 13^{\circ}1$
iS	17 46 45	$\Delta_{meas} = 13^{\circ}1$
eL	17 47 20	

Berkeley, (By telegram, courtesy Science Service)

eP	17h45m17s	$\Delta_{S-P} = 18^{\circ}1$
eS	17 48 30	$\Delta_{meas} = 18^{\circ}1$
eL	17 49 30	

Des Moines, (By mail, courtesy U.S.C. and G.S.)

eSR ₁	17h51m08s	$\Delta_{meas} = 23^{\circ}6$
e	17 51 30	
eL	17 52 16	

Victoria, (By mail, courtesy U.S.C. and G.S.)

P	17h46m45s	$\Delta_{P-H} = 27^{\circ}5$
		$\Delta_{meas} = 27^{\circ}6$

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

Earthquake of August 18, 1936

Tentative Epicenter: 17°0 N, 104°5 W. 18.
 H = 07h07m04s. Depth of focus 80 km by
 the Brunner Depth Chart.

Stations of the Jesuit Seismological Association

<u>Saint Louis,</u>	iP	7h12m24s	$\Delta_{P-H} = 25^{\circ}2$ $\Delta_{meas} = 25^{\circ}2$
<u>Florissant,</u>	eP	7h12m24s	$\Delta_{P-H} = 25^{\circ}2$ $\Delta_{meas} = 25^{\circ}2$
	iP	7 12 25	
	ipP	7 12 39	
	iPR ₁	7 13 15	
	iPR ₂	7 13 24	
	eS	7 16 46	
	iS	7 16 47	
	isS	7 17 11	
	eSR ₁	7 18 02	
	iL	7 19 03	
	eM	7 20 04	

Georgetown, (By telegram, courtesy Science Service)

iP	7h13m34s	$\Delta_{P-H} = 32^{\circ}8$ $\Delta_{meas} = 32^{\circ}6$
iPR ₁	7 14 22	
i	7 16 27	
eS	7 18 32	
e	7 18 52	
eL	7 22 32	

Fordham, (By telegram, courtesy Science Service)

eP	7h13m58s	$\Delta_{P-H} = 35^{\circ}7$ $\Delta_{meas} = 35^{\circ}7$
ePR ₁	7 15 13	
eSR ₁	7 22 10	
eL	7 25 20	
e	7 26 02	
e	7 27 10	

Other Stations

Pasadena, (By mail, courtesy R.E. Rogers)

iP	7h11m40s	$\Delta_{P-H} = 20^{\circ}9$ $\Delta_{meas} = 20^{\circ}9$
eS	7 15 31	
eL	7 17 08	

Philadelphia, (By telegram, courtesy Science Service)

(S)	7h19m01s	$\Delta_{meas} = 34^{\circ}5$
(L)	7 24 56	
	7 26 03	
	7 29 14	

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

Earthquake of August 22, 1936

19.

Tentative Epicenter: 22°3 N, 121°5 E.
H = 06h51m38s. Depth of focus 50-60 km.
by the Brunner Depth Chart. Formosa.

Stations of the Jesuit Seismological Association

Saint Louis,

ePR ₁	7h10m54s	$\Delta_{PR_1-H} = 112^{\circ}.7$
ePR ₂	7 13 29	$\Delta_{meas} = 112^{\circ}.4$
iSKS	7 16 51	
iSKKS	7 17 54	
esSP	7 20 26	
ePPS	7 20 47	
eSR ₁	7 26 51	
eL	7 41 40	
eM	7 49 30	

Florissant,

eP	7h06m18s	$\Delta_{p-H} = 112^{\circ}.2$
eP [†]	7 09 57	$\Delta_{meas} = 112^{\circ}.2$
iPR ₁	7 10 57	
ipPR ₁	7 11 10	
iPR ₂	7 13 28	
iPR ₃	7 15 21	
eSKS	7 16 47	
iSKKS	7 17 47	
eS	7 18 23	
eSP	7 19 54	
iPPS	7 20 42	
iSR ₁	7 26 47	
eSR ₂	7 31 12	
eL	7 41 56	
eM	7 50 43	

Weston, (By telegram, courtesy Science Service)

iPR ₁	7h11m02s	$\Delta_{PR_1-H} = 114^{\circ}.4$
ePR ₃	7 15 24	$\Delta_{meas} = 114^{\circ}.4$
eSP	7 20 45	
eSR ₁	7 27 34	
	7 30 08	

Georgetown, (By telegram, courtesy Science Service)

eP [†]	7h10m18s	$\Delta_{PR_1-H} = 116^{\circ}.4$
ePR ₁	7 11 25	$\Delta_{meas} = 116^{\circ}.6$
eSKS	7 17 07	
iPS	7 21 09	

PRELIMINARY BULLETIN

19.

Earthquake of August 22, 1936

Stations of the United States Coast and Geodetic Survey

Sitka, (By mail, courtesy U.S.C. and G.S.)

iP	7h03m37s	$\Delta_{S-H} = 78^{\circ}.3$
iPR ₁	7 06 15	$\Delta_{meas} = 78^{\circ}.4$
iS	7 13 21	
eL	7 28.1	

Tucson, (By telegram, courtesy Science Service)

eP	7h05m50s	$\Delta_{P-H} = 106^{\circ}.3$
ePR ₁	7 10 12	$\Delta_{meas} = 106^{\circ}.4$
eSKS	7 16 22	
eSP	7 19 31	
eSR ₁	7 25 30	
eL	7 41 50	

Other Stations

Hongkong, (By mail, courtesy U.S.C. and G.S.)

Pn	6h53m18s	$\Delta_{P-H} = 7^{\circ}.0$
Sn	6 54 45	$\Delta_{meas} = 7^{\circ}.0$

Manila, (By mail, courtesy U.S.C. and G.S.)

iPn	6h53m26s	$\Delta_{P-H} = 7^{\circ}.6$
iS*	6 55 26	$\Delta_{meas} = 7^{\circ}.6$

Zi-ka-wei, (By mail, courtesy U.S.C. and G.S.)

iPn	6h53m43s	$\Delta_{P-H} = 8^{\circ}.8$
iS*	6 56 08	$\Delta_{meas} = 8^{\circ}.8$

Phu Lein, (By mail, courtesy U.S.C. and G.S.)

iP	6h54m48s	$\Delta_{P-H} = 13^{\circ}.7$
iS	6 57 48	$\Delta_{meas} = 14^{\circ}.0$

Fairbanks, Alaska, (By mail, courtesy U.S.C. and G.S.)

iP	7h02m48s	$\Delta_{S-P} = 70^{\circ}.2$
PR ₁	7 05 12	$\Delta_{meas} = 70^{\circ}.2$
iS	7 12 00	
iSR ₁	7 17 18	
eSR ₂	7 20 06	
iM	7 30 00	

Honolulu, (By mail, courtesy U.S.C. and G.S.)

iP	7h03m17s	$\Delta_{S-P} = 74^{\circ}.2$
iS	7 12 49	$\Delta_{meas} = 74^{\circ}.3$
iL	7 26 39	

Earthquake of August 22, 1936 (continued)Other StationsVictoria, (By mail, courtesy U.S.C. and G.S.)

P	7h04m29s	$\Delta P-H = 89^{\circ}2$
		$\Delta_{\text{meas}} = 89^{\circ}0$

Berkeley, (By telegram, courtesy Science Service)

eP	7h05m00s	$\Delta P-H = 95^{\circ}4$
e	7 08 03	$\Delta_{\text{meas}} = 95^{\circ}4$
eSKS	7 15 29	

Pasadena, (By mail, courtesy R. E. Rogers)

iP	7h05m21s	$\Delta P-H = 100^{\circ}2$
i	7 08 29	$\Delta_{\text{meas}} = 100^{\circ}4$
eSKS	7 16 00	
eL	7 37.4	

State College of Pennsylvania, (By mail, courtesy U.S.C. and G.S.)

ePR ₁	7h11m12s	$\Delta PR_1-H = 115^{\circ}3$
ePR ₃	7 15 39	$\Delta_{\text{meas}} = 114^{\circ}6$
eL ₃	7 50.9	
M	8 01.6	

Philadelphia, (By mail, courtesy U.S.C. and G.S.)

iPR ₁	7h11m22s	$\Delta PR_1-H = 116^{\circ}8$
PR ₂	7 13 54	$\Delta_{\text{meas}} = 116^{\circ}0$
PR ₃	7 15 44	
SKS	7 17 03	
	7 21 18	
SR ₁	7 27 12	
	7 37 15	

San Juan, (By mail, courtesy U.S.C. and G.S.)

ePR ₁	7h13m27s	$\Delta_{\text{meas}} = 139^{\circ}0$
e	7 15 38	
eSKS	7 17 22	

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF AUGUST 23, 1936

20.

Destructive in the northern tip of Sumatra according to Batavia and Strasbourg. Inconsistencies in the data seem to have arisen from the overlapping of the previous earthquake at the nearer stations and the character of the initial phase at more distant ones. According to the Florissant records $pP'-P'$ is 23 seconds so that the depth of focus is approximately 90 km. Assuming an epicenter at

$$\phi = 598 \text{ N}, \quad \lambda = 9594 \text{ E}, \text{ and } H = 21h12m19s$$

a fair agreement of observed and measured distances is obtained by use of the Brunner Focal Depth-Time-Distance Chart.

Medan, (Bulletin, Bureau Central, Strasbourg)

iP	21h13m18s	$\Delta_{P-H} = 3^{\circ}7$
		$\Delta_{\text{meas}} = 3^{\circ}8$

Batavia, (Bulletin, Bureau Central Strasbourg)

iP	21h16m16s	$\Delta_{P-H} = 17^{\circ}5$
		$\Delta_{\text{meas}} = 16^{\circ}4$

Malabar, (Bulletin, Bureau Central Strasbourg)

iP	21h16m23s	$\Delta_{P-H} = 17^{\circ}7$
S	21 19 40	$\Delta_{S-P} = 17^{\circ}4$
		$\Delta_{\text{meas}} = 18^{\circ}1$

Phu Lien, (Bulletin, Bureau Central Strasbourg)

iP	21h16m39s	$\Delta_{P-H} = 19^{\circ}3$
iS	21 20 14	$\Delta_{S-P} = 19^{\circ}3$
		$\Delta_{\text{meas}} = 18^{\circ}6$

Nanking, (Bulletin, Bureau Central Strasbourg)

iP	21h19m02s	$\Delta_{P-H} = 34^{\circ}5$
iS	21 24 31	$\Delta_{S-P} = 34^{\circ}6$
		$\Delta_{\text{meas}} = 34^{\circ}1$

Chiufeng, (Station Bulletin)

iP	21h19m43s	$\Delta_{P-H} = 39^{\circ}3$
iPR ₁	21 21 18	$\Delta_{S-P} = 39^{\circ}2$
iS	21 25 43	$\Delta_{\text{meas}} = 39^{\circ}2$
SR ₁	21 28 11	

PRELIMINARY BULLETIN

20.

EARTHQUAKE OF AUGUST 23, 1936

Tananarive, (Bulletin, Bureau Central Strasbourg)

i	21h21m21s	$\Delta_{S-H} = 53^{\circ}2$
eS	21 28 57	$\Delta_{meas} = 53^{\circ}2$

Ksara, (Bulletin, Bureau Central Strasbourg)

iP	21h22m38s	$\Delta_{P-H} = 62^{\circ}3$
iS	21 30 48	$\Delta_{S-P} = 61^{\circ}7$
		$\Delta_{meas} = 61^{\circ}7$

Belgrad, (Bulletin, Bureau Central Strasbourg)

iP	21h23m52s	$\Delta_{P-H} = 75^{\circ}7$
iS	21 33 28	$\Delta_{S-P} = 75^{\circ}7$
		$\Delta_{meas} = 75^{\circ}7$

Prague, (Bulletin, Bureau Central Strasbourg)

iP	21h24m20s	$\Delta_{P-H} = 80^{\circ}6$
iS	21 34 15	$\Delta_{S-P} = 79^{\circ}8$
		$\Delta_{meas} = 79^{\circ}9$

Trieste, (Bulletin, Bureau Central Strasbourg)

iP	21h24m20s	$\Delta_{P-H} = 80^{\circ}6$
i(S)	21 34 12.6	$\Delta_{S-P} = 79^{\circ}6$
		$\Delta_{meas} = 80^{\circ}3$

Copenhagen, (Bulletin, Bureau Central Strasbourg)

iP	21h24m27s	$\Delta_{P-H} = 81^{\circ}8$
iSKKS	21 34 31	$\Delta_{meas} = 81^{\circ}4$

Florence, (Ximeniano) (Bulletin, Bureau Central Strasbourg)

iP	21h24m30s	$\Delta_{P-H} = 82^{\circ}5$
	21 36 36	$\Delta_{meas} = 81^{\circ}9$

Coire, (Bulletin, Bureau Central Strasbourg)

eP	21h24m34.1s	$\Delta_{P-H} = 83^{\circ}4$
e	21 36 45	$\Delta_{meas} = 83^{\circ}2$

Zurich, (Swiss Service Bulletin)

eP	21h24m37.1 s	$\Delta_{P-H} = 83^{\circ}9$
eS	21 34 52.4	$\Delta_{S-P} = 83^{\circ}9$
		$\Delta_{meas} = 83^{\circ}9$

PRELIMINARY BULLETIN

20.

EARTHQUAKE OF AUGUST 23, 1936

Capetown, (Station Bulletin)

i	21h24m38s	$\Delta_{S-H} = 81^{\circ}8$
PR ₁	21 27 53	$\Delta_{meas} = 82.4$
iS _E	21 34 38	

Strasbourg, (Station Bulletin)

iP	21h24m39s	$\Delta_{P-H} = 84^{\circ}2$
iS	21 34 59	$\Delta_{S-P} = 84^{\circ}2$
		$\Delta_{meas} = 84^{\circ}3$

Tunis, (Bulletin, Bureau Central Strasbourg)

P	21h24m40s	$\Delta_{P-H} = 84^{\circ}3$
		$\Delta_{meas} = 83^{\circ}0$

Basel, (Bulletin, Bureau Central Strasbourg and
Swiss Service Bulletin)

e	21h24m41.1s	$\Delta_{S-H} = 84^{\circ}1$
eS	21 35 01.1	$\Delta_{meas} = 84^{\circ}3$

Nuchatel, (Bulletin, Bureau Central Strasbourg, and
Swiss Service Bulletin)

eP	21h24m43.5s	$\Delta_{P-H} = 85^{\circ}1$
eS	21 35 05	$\Delta_{S-P} = 85^{\circ}1$
		$\Delta_{meas} = 84^{\circ}9$

DeBilt, (Bulletin, Bureau Central Strasbourg)

iP	21h24m49s	$\Delta_{P-H} = 86^{\circ}1$
sSKS	21 35 15	$\Delta_{meas} = 85^{\circ}8$

Uccle, (Bulletin, Bureau Central Strasbourg)

iP	21h24m51s	$\Delta_{P-H} = 86^{\circ}5$
iSKS	21 35 11	$\Delta_{meas} = 86^{\circ}6$

Barcelona, (Bulletin, Bureau Central Strasbourg)

P	21h24m55s	$\Delta_{P-H} = 87^{\circ}4$
	21 35 42	$\Delta_{meas} = 88^{\circ}8$

Paris, (Bulletin, Bureau Central Strasbourg)

iP	21h24m58s	$\Delta_{P-H} = 88^{\circ}0$
i	21 35 48	$\Delta_{meas} = 87^{\circ}7$

Algiers, (Bulletin, Bureau Central Strasbourg)

iP	21h25m05s	$\Delta_{P-H} = 89^{\circ}2$
iSKS	21 35 23	$\Delta_{meas} = 88^{\circ}7$

PRELIMINARY BULLETIN

EARTHQUAKE OF AUGUST 23, 1936

20.

Kew, (Station Bulletin)

iP	21h25m06s	$\Delta_{S-P} = 89^{\circ}2$
i	21 25 28	$\Delta_{meas} = 89^{\circ}2$
eSKS	21 35 28	
iS	21 35 48	

Stonyhurst, (Bulletin, Bureau Central Strasbourg)

iP	21h25m10s	$\Delta_{P-H} = 90^{\circ}3$
iS	21 35 57	$\Delta_{S-P} = 90^{\circ}3$
		$\Delta_{meas} = 90^{\circ}3$

Ebro(Tortosa) (Bulletin, Bureau Central Strasbourg)

iP	21h25m22s	$\Delta_{P-H} = 92^{\circ}6$
iSKS	21 35 37	$\Delta_{meas} = 90^{\circ}2$

San Fernando, (Bulletin, Bureau Central Strasbourg)

eP	21h25m38s	$\Delta_{P-H} = 95^{\circ}8$
iSKS	21 35 41	$\Delta_{meas} = 96^{\circ}2$

Fairbanks Alaska (Courtesy Science Service)

iP	21h25m40s	$\Delta_{P-H} = 96^{\circ}2$
e	21 32 18	$\Delta_{meas} = 96^{\circ}0$

Sitka, (Courtesy Science Service)

eP	21h26m21s	$\Delta_{P-H} = 104^{\circ}9$
epPKP	21 30 38	$\Delta_{meas} = 105^{\circ}3$

Honolulu, (Courtesy Science Service)

ipP'	21h30m32s	$\Delta_{pP'-H} = 103^{\circ}5$
i	21 36 51	$\Delta_{meas} = 103^{\circ}3$
i	21 40 57	

Pasadena, (Courtesy Science Service)

iP'	21h31m16s	$\Delta_{P'-H} = 128^{\circ}4$
i	21 33 34	$\Delta_{meas} = 128^{\circ}3$
i	21 34 35	
e	21 34 44	

Ottawa, (Courtesy Science Service)

P'	21h31m18s	$\Delta_{P'-H} = 129^{\circ}0$
(PR ₁)	21 33 24	$\Delta_{meas} = 128^{\circ}3$

PRELIMINARY BULLETIN

20.

EARTHQUAKE OF AUGUST 23, 1936

Weston,

(Courtesy Science Service)

i(P')	21h31m22s	$\Delta_{P-H} = 132^{\circ}0$
i	21 33 38	$\Delta_{\text{meas}} = 130^{\circ}6$

Tucson,

(Courtesy Science Service)

e	21h31m27s	$\Delta_{P'-H} = 135^{\circ}8$
eP'	21 31 32	$\Delta_{\text{meas}} = 135^{\circ}8$
eSKP	21 34 55	

Florissant,

iP'	21h31m30s	$\Delta_{P'-H} = 135^{\circ}5$
ipP'	21 31 53	$\Delta_{\text{meas}} = 135^{\circ}8$
iPR ₁	21 34 01	
iSKP	21 35 00	
ipSKP	21 35 30	
iPR ₂	21 36 55	

Georgetown,

(Courtesy Science Service)

P'	21h31m32s	$\Delta_{pP'-H} = 136^{\circ}2$
pP'	21 31 52	$\Delta_{\text{meas}} = 135^{\circ}1$
	21 32 09	

San Juan,

(Courtesy Science Service)

e	21h31m59s	
e	21 35 42	$\Delta_{\text{meas}} = 150^{\circ}5$
e	21 44 44	

J. B. Macelwane, S.J.
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F. Robertson
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Graduate Fellows

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

21.

EARTHQUAKE OF SEPTEMBER 19, 1936

Tentative Epicenter $\phi = 4^{\circ}3'N$, $\lambda = 97^{\circ}8'E$. H = 01h01m58s
Depth about 100 km. according to the Brunner Depth Chart.

Station of the Jesuit Seismological Association

Florissant,

eP'	1h21m09s	$\Delta P'-H = 136^{\circ}5$
eSKP	1 24 42	$\Delta_{\text{meas}} = 136^{\circ}5$
L	2 05 15	

Station of the United States Coast and Geodetic Survey

Tucson (By telegram, courtesy Science Service)

eP'	1h21m05s	$\Delta P'-H = 134^{\circ}7$
SKP	1 24 34	$\Delta_{\text{meas}} = 134^{\circ}7$

Other Stations

Bucarest (Station Bulletin)

eP	1h13m24s	$\Delta P-H = 74^{\circ}5$
iS	1 22 52	$\Delta S-P = 74^{\circ}4$
		$\Delta_{\text{meas}} = 74^{\circ}1$

Hamburg (Station Bulletin)

iP	1h14m23s	$\Delta P-H = 85^{\circ}2$
eS	1 24 50	$\Delta S-P = 85^{\circ}2$
		$\Delta_{\text{meas}} = 85^{\circ}2$

Kew (Station Bulletin)

iP	1h14m57s	$\Delta P-H = 92^{\circ}1$
PR ₁	1 19 08	$\Delta S-P = 92^{\circ}1$
iS	1 25 54	$\Delta_{\text{meas}} = 92^{\circ}1$

PhuLien (By mail, courtesy U.S. C. and G.S.)

PR ₁	1h06m13s	$\Delta PR_1-H = 18^{\circ}8$
S	1 09 42	$\Delta_{\text{meas}} = 18^{\circ}5$

Manila (By mail, courtesy U.S. C. and G.S.)

P	1h07m16s	$\Delta P-H = 25^{\circ}0$
s	1 12 04	$\Delta_{\text{meas}} = 25^{\circ}0$

J. B. Macelwane, S.J.
Director

R. R. Heinrich
Graduate Fellow

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF SEPTEMBER 25, 1936

22.

Tentative Epicenter $42^{\circ}5' N$, $131^{\circ}0' W$. H = 12h53m30s
Depth about 30 km.

Stations of the Jesuit Seismological Association

Saint Louis,

eP	12h59m40s	$\Delta_{S-P} = 31^{\circ}$
epP	13 00 00	$\Delta_{meas} = 31^{\circ}$
ePR ₁	13 00 24	
eS	13 04 40	
esS	13 05 20	

Florissant,

eP	12h59m39s	$\Delta_{S-P} = 31^{\circ}$
ipP	12 59 59	$\Delta_{meas} = 31^{\circ}$
isP	13 00 19	
ePR ₁	13 00 26	
iS	13 04 45	
isS	13 05 19	

Fordham,

S	13h07m28s	$\Delta_{S-H} = 42^{\circ}$
e	13 07 48	$\Delta_{meas} = 42^{\circ}$
eSR ₁	13 10 30	

Stations of the United States Coast and Geodetic Survey

Sitka, (By mail, courtesy U.S. C. and G. S.)

eP	12h57m00s	$\Delta_{S-P} = 15^{\circ}$
eS	12 59 57	$\Delta_{P-H} = 15^{\circ}$

Tucson, (By telegram, courtesy Science Service)

eP	12h57m44s	$\Delta_{S-P} = 19^{\circ}.2$
eS	13 01 14	$\Delta_{meas} = 19^{\circ}$

Honolulu, (By mail, courtesy U.S. C. and G.S.)

PR ₁	13h01m04s	$\Delta_{PR_1-H} = 31^{\circ}$
SR ₂	13 07 24	$\Delta_{meas} = 31^{\circ}$

PRELIMINARY BULLETIN

EARTHQUAKE OF SEPTEMBER 25, 1936

22.

Other Stations

Victoria, (By telegram, courtesy Science Service)

P	12h55m10s	$\Delta_{P-H} = 7^0$ $\Delta_{meas} = 7^0$
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Pasadena, (By mail, courtesy U.S. C. and G.S.)

iP	12h56m32s	$\Delta_{P-H} = 13^0.2$
e(S)	12 58.8	$\Delta_{meas} = 13^0.2$

Butte, (By mail, courtesy U.S. C. and G.S.)

eP	12h56m30s	$\Delta_{P-H} = 13^0$ $\Delta_{meas} = 14^0.7$
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College (Fairbanks, Alaska)

(By mail, courtesy U.S. C. and G.S.)

ipP	12h59m08s	$\Delta_{pP-H} = 25^0.0$
PR ₁	12 59 44	$\Delta_{meas} = 24^0.3$
	13 05 11	

Burlington, (By mail, courtesy U.S. C. and G.S.)

ePR ₁	13h02m38s	$\Delta_{PR_1-H} = 41^0.3$
eS	13 07 18	$\Delta_{meas} = 41^0.3$
eL	13 15 53	

Philadelphia, (By mail, courtesy U.S. C. and G.S.)

ePR ₁	13h02m37s	$\Delta_{PR_1-H} = 40^0.8$
eS	13 06 57	$\Delta_{meas} = 41^0.4$
isS	13 07 27	
SR ₁	13 09 27	

J. B. Macelwane, S.J.
Director

G. J. Brunner, S.J.
Professor of Geophysics

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

23

EARTHQUAKE OF OCTOBER 5, 1936

Tentative Epicenter $3^{\circ}0' N$, $126^{\circ}4' E$. H = 09h44m34s
Depth by Brunner Depth Chart 100 km.

Stations of the Jesuit Seismological Association

Florissant,

iP'	10h03m26s	$\Delta_{P'-H} = 127^{\circ}$
ipP'	10 03 50	$\Delta_{meas} = 127^{\circ}$
iPR ₁	10 05 24	
iSKP	10 06 57	
iPR ₂	10 08 35	
iSKS	10 10 07	
iSKKS	10 12 09	
iS	10 13 39	
isS	10 14 14	

Saint Louis,

eP'	10h03m25s	$\Delta_{P'-H} = 126^{\circ}09'$
		$\Delta_{meas} = 127^{\circ}$

Buffalo, (By telegram, courtesy Science Service)

iP'	10h03m32s	$\Delta_{P-H} = 129^{\circ}$
iSKP	10 05 43	$\Delta_{meas} = 129^{\circ}01'$
i	10 07 51	

Fordham, (By telegram, courtesy Science Service)

iP'	10h03m38s	$\Delta_{P'-H} = 132^{\circ}06'$
ipP	10 03 54	$\Delta_{meas} = 132^{\circ}06'$
iSKP	10 06 06	
i	10 07 09	
e	10 13 00	
e	10 16 13	

Weston, (By mail, courtesy U.S. C. and G.S.)

P'	10h03m36s	$\Delta_{P'-H} = 132^{\circ}00'$
		$\Delta_{meas} = 132^{\circ}00'$

Stations of the United States Coast and Geodetic Survey

San Juan,

eP'	10h04m13s	$\Delta_{P'-H} = 156^{\circ}00'$
epP'	10 04 45	$\Delta_{meas} = 156^{\circ}00'$
iPR ₁	10 08 37	

PRELIMINARY BULLETIN

23

EARTHQUAKE OF OCTOBER 5, 1936

Other Stations

Manila, (By mail, courtesy U.S. C. and G.S.)

iP	9h47m43s	$\Delta_{P-H} = 13^{\circ}4$
iS	9 50 44	$\Delta_{\text{meas}} = 13^{\circ}1$

Phu-Lien, (By mail, courtesy U.S. C. and G.S.)

P	9h50m05s	$\Delta_{S-P} = 27^{\circ}3$
S	9 54 44	$\Delta_{P-H} = 26^{\circ}5$
		$\Delta_{\text{meas}} = 26^{\circ}5$

Zi-ka-wei, (By mail, courtesy U.S. C. and G.S.)

P	9h50m28s	$\Delta_{S-P} = 29^{\circ}0$
S	9 55 19	$\Delta_{P-H} = 29^{\circ}0$
		$\Delta_{\text{meas}} = 29^{\circ}0$

College, (Fairbanks, Alaska)

(By mail, courtesy U.S. C. and G.S.)

iP	9h56m28s	$\Delta_{S-P} = 85^{\circ}5$
iS	9 58 02	$\Delta_{\text{meas}} = 85^{\circ}7$
	10 06 52	

Victoria, (By mail, courtesy U.S. C. and G.S.)

P	9h58m30s	$\Delta_{P-H} = 104^{\circ}0$
		$\Delta_{\text{meas}} = 101^{\circ}4$

Pasadena, (By letter, courtesy C. F. Richter)

iP	9h58m52s	$\Delta_{S-P} = 109^{\circ}5$
iP'	10 02 54	$\Delta_{P-H} = 109^{\circ}0$
iPR ₁	10 03 22	$\Delta_{\text{meas}} = 109^{\circ}5$
iPR ₂	10 06 09	
iS	10 11 01	
iPS	10 12 48	
iPKKP	10 14 09	
eP'P'	10 21 50	

Philadelphia, (By mail, courtesy U.S. C. and G.S.)

P'	10h03m49s	$\Delta_{P'} = 132^{\circ}2$
SKP	10 06 49	$\Delta_{\text{meas}} = 132^{\circ}2$
S	10 15 45	
SR ₁ (?)	10 23 24	

J. B. Macelwane, S.J.
Director,

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF OCTOBER 23, 1936

24.

Tentative Epicenter: $\lambda = 60^{\circ}8' N.$ $\phi = 149^{\circ}4' W.$
 H = 06h24m27s. Depth by Brunner Depth Chart
 about 25 km.

Stations of the Jesuit Seismological Association

Florissant,

iP	6h32m16s	$\Delta_{P-H} = 42^{\circ}2$
ipP	6 32 21	$\Delta_{S-P} = 42^{\circ}2$
iS	6 38 42	$\Delta_{meas} = 42^{\circ}2$
isS	6 39 01	

Saint Louis,

eP	6h32m18s	$\Delta_{P-H} = 42^{\circ}4$
ipP	6 32 24	$\Delta_{S-P} = 42^{\circ}5$
iPR ₂	6 34 17	$\Delta_{meas} = 42^{\circ}4$
iS	6 38 41	
isS	6 38 52	
SR ₁	6 41 24	

Loyola, (Chicago) (By mail, courtesy Rev. A.R. Schmitt, S.J.)

eP	6h32m08s	$\Delta_{P-H} = 41^{\circ}1$
iS	6 38 25	$\Delta_{S-P} = 41^{\circ}4$
		$\Delta_{meas} = 41^{\circ}3$

Buffalo, (By telegram, courtesy Science Service)

iP	6h32m40s	$\Delta_{P-H} = 45^{\circ}0$
PR ₁	6 42 34	$\Delta_{meas} = 44^{\circ}9$

Weston, (By telegram, courtesy Science Service)

iP	6h33m07s	$\Delta_{P-H} = 48^{\circ}6$
SP	6 41 21	$\Delta_{meas} = 48^{\circ}4$

Georgetown, (By telegram, courtesy Science Service)

iP	6h33m07s	$\Delta_{P-H} = 48^{\circ}6$
		$\Delta_{meas} = 48^{\circ}6$

Fordham, (By telegram, courtesy Science Service)

iP	6h33m08s	$\Delta_{P-H} = 48^{\circ}8$
iPcP	6 34 12	$\Delta_{meas} = 48^{\circ}7$

Stations of the United States Coast and Geodetic Survey

Tucson, (By telegram, courtesy Science Service)

eP	6h31m45s	$\Delta_{P-H} = 38^{\circ}2$
eS	6 37 54	$\Delta_{meas} = 38^{\circ}2$

PRELIMINARY BULLETINStations of the United States Coast and Geodetic SurveyHonolulu, (By mail, courtesy U.S.C. and G.S.)

iP	6h32m00s	$\Delta_{P-H} = 40^{\circ}0$
eS	6 38 07	$\Delta_{S-P} = 39^{\circ}8$
		$\Delta_{\text{meas}} = 40^{\circ}0$

Chicago, (By telegram, courtesy Science Service)

iP	6h32m13s	$\Delta_{P-H} = 41^{\circ}5$
iS	6 38 28	$\Delta_{S-P} = 41^{\circ}4$
		$\Delta_{\text{meas}} = 41^{\circ}5$

San Juan, (By mail, courtesy U.S.C. and G.S.)

eP	6h35m39s	$\Delta_{P-H} = 71^{\circ}0$
		$\Delta_{\text{meas}} = 71^{\circ}3$

Other StationsVictoria, (By telegram, courtesy Science Service)

P	6h28m56s	$\Delta_{P-H} = 19^{\circ}8$
		$\Delta_{\text{meas}} = 19^{\circ}6$

Bozeman, (By mail, courtesy U.S.C. and G.S.)

iP	6h30m16s	$\Delta_{P-H} = 27^{\circ}6$
		$\Delta_{\text{meas}} = 27^{\circ}2$

Berkeley, (By telegram, courtesy Science Service)

P	6h30m29s	$\Delta_{P-H} = 29^{\circ}1$
		$\Delta_{\text{meas}} = 28^{\circ}8$

Pasadena, (By mail, courtesy C. F. Richter)

iP	6h31m05s	$\Delta_{P-H} = 33^{\circ}0$
		$\Delta_{\text{meas}} = 33^{\circ}7$

Madison, (By telegram, courtesy Science Service)

eP	6h31m54s	$\Delta_{P-H} = 39^{\circ}3$
iS	6 38 07	$\Delta_{S-P} = 39^{\circ}6$
SR ₁	6 40 50	$\Delta_{\text{meas}} = 39^{\circ}5$

Ottawa, (By telegram, courtesy Science Service)

eP	6h 32m 35s	$\Delta_{P-H} = 44^{\circ}4$
		$\Delta_{\text{meas}} = 44^{\circ}4$

PRELIMINARY BULLETIN

24.

Other Stations

State College, (By telegram, courtesy Science Service)

iP	6h32m55s	$\Delta_{P-H} = 46^{\circ}9$ $\Delta_{meas} = 46^{\circ}8$
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Philadelphia, (By telegram, courtesy Science Service)

iP	6h33m09s	$\Delta_{P-H} = 48^{\circ}8$
eS	6 40 13	$\Delta_{S-P} = 48^{\circ}7$ $\Delta_{meas} = 48^{\circ}7$

Harvard, (By mail, courtesy Miss M.P. Collins)

iP	6h33m06s	$\Delta_{P-H} = 48^{\circ}8$
iS	6 40 18	$\Delta_{meas} = 48^{\circ}8$

Columbia, (By mail, courtesy U.S.C. and G.S.)

P	6h33m28s	$\Delta_{P-H} = 51^{\circ}2$
S	6 40 48	$\Delta_{S-P} = 51^{\circ}2$ $\Delta_{meas} = 50^{\circ}7$

Manila, (By mail, courtesy U.S.C. and G.S.)

iP	6h36m16s	$\Delta_{P-H} = 77^{\circ}0$ $\Delta_{meas} = 76^{\circ}9$
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Phu Lien, (By mail, courtesy U.S.C. and G.S.)

P	6h36m18s	$\Delta_{S-P} = 78^{\circ}3$
S	6 46 22	$\Delta_{meas} = 78^{\circ}3$

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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF NOVEMBER 13, 1936

25.

Tentative Epicenter: $\phi = 56^{\circ}7' \text{ N}$, $\lambda = 162^{\circ}3' \text{ E}$.
 $H = 12\text{h}31\text{m}37\text{s}$. Depth by the Brunner Chart 40
to 50 km.

Stations of the Jesuit Seismological AssociationLoyola, (By mail, courtesy A. R. Schmitt, S.J.)

iP	12h42m15s	
ePR ₁	12 44 50	$\Delta_{P-H} = 65^{\circ}8$
i(S)	12 51 13	$\Delta_{\text{meas}} = 65^{\circ}8$
iSR ₂	12 58 20	

Florissant,

iP	12h42m19s	
ipP	12 42 27	$\Delta_{S-P} = 66^{\circ}9$
iPcP	12 42 51	$\Delta_{P-H} = 66^{\circ}8$
ePR ₁	12 44 52	$\Delta_{\text{meas}} = 66^{\circ}9$
ePR ₂	12 46 11	
iS	12 51 12	
isS	12 51 26	
iSP	12 51 37	
iPPPS	12 51 43	
iSR ₁	12 55 41	

Saint Louis,

eP	12h42m22s	
iP	12 42 24	$\Delta_{P-H} = 67^{\circ}0$
epP	12 42 30	$\Delta_{S-H} = 67^{\circ}1$
ipP	12 42 32	$\Delta_{\text{meas}} = 67^{\circ}0$
iS	12 51 18	
isS	12 51 31	
eL	13 02.7	
eM	13 07.3	

Buffalo, (By telegram, courtesy Science Service)

iP	12h42m32s	
i	12 44 48	$\Delta_{P-H} = 68^{\circ}4$
i(PR ₁)	12 45 06	$\Delta_{S-H} = 68^{\circ}3$
iS	12 51 30	$\Delta_{\text{meas}} = 68^{\circ}2$
i(PPS)	12 52 38	

Cincinnati, (By mail, courtesy V. G. Stechschulte, S.J.)

iP	12h42m37s	$\Delta_{S-H} = 69^{\circ}1$
iS	12 51 41	$\Delta_{P-H} = 69^{\circ}3$
		$\Delta_{\text{meas}} = 69^{\circ}1$

EARTHQUAKE OF NOVEMBER 13, 1936 (con't)Stations of the Jesuit Seismological AssociationLittle Rock,

iP	12h42m39s	
ipPE	12 42 50	$\Delta_{P-H} = 69.6$
pPN	12 42 51	$\Delta_{S-H} = 69.4$
eSE	12 51 42	$\Delta_{\text{meas}} = 69.5$
eSN	12 51 43	
ess	12 51 59	

Weston, (By telegram, courtesy Science Service)

iP	12h42m52s	$\Delta_{S-H} = 71.5$
iPR ₁	12 45 40	$\Delta_{P-H} = 71.7$
iS	12 52 10	$\Delta_{\text{meas}} = 71.7$

Fordham, (By telegram, courtesy Science Service)

iP	12h42m54s	$\Delta_{P-H} = 72.0$
iPR ₁	12 45 32	$\Delta_{S-P} = 72.5$
ipPR ₂	12 47 22	$\Delta_{\text{meas}} = 72.2$
i(S)	12 52 08	
i(SP)	12 53 01	
i(sSP)	12 53 14	
e	12 55 11	
isSR ₁	12 57 24	
i	12 59 10	
i	13 02 23	
i(L)	13 04 05	
e(M)	13 08 01	
e	13 16 39	

Stations of the United States Coast and Geodetic SurveyUkiah, (By telegram, courtesy Science Service)

eP	12h40m28s	$\Delta_{P-H} = 50.3$
iS	12 47 47	$\Delta_{S-H} = 50.5$
(SR ₂)	12 52 50	$\Delta_{\text{meas}} = 50.4$

Tuscon, (By telegram, courtesy Science Service)

eP	12h41m53s	$\Delta_{P-H} = 62.5$
eS	12 50 16	$\Delta_{\text{meas}} = 62.3$
eSR ₁	12 54 30	$\Delta_{S-H} = 62.1$
essSR ₂	12 57 26	
e(L)	13 01 54	

Chicago, (By telegram, courtesy Science Service)

iP	12h42m15s	$\Delta_{P-H} = 65.8$
iS	12 50 55	$\Delta_{\text{meas}} = 65.5$
i(sSR ₂)	12 58 52	$\Delta_{S-H} = 65.4$

PRELIMINARY BULLETIN

25.

EARTHQUAKE OF NOVEMBER 13, 1936 (con't)

Stations of the United States Coast and Geodetic Survey

San Juan, (By mail, courtesy U.S.C. and G.S.)

eP	12h44m55s	$\Delta_{P-H} = 94.8$
epPR ₁	12 48 54	$\Delta_{meas} = 94.8$
e?	13 01 02	

Other Stations

College, (Fairbanks, Alaska) (By mail, courtesy U.S.C. and G.S.)

iP	12h37m00s	$\Delta_{P-H} = 25.1$
i(sS)	12 41 30	$\Delta_{meas} = 24.8$

Zikawei, (By mail, courtesy U.S.C. and G.S.)

P	12h38m48s	$\Delta_{P-H} = 37.5$
	12 42 50	$\Delta_{meas} = 37.7$

Victoria, (By telegram, courtesy Science Service)

P	12h39m33s	$\Delta_{P-H} = 43.1$
		$\Delta_{meas} = 43.5$

Honolulu, (By mail, courtesy U.S.C. and G.S.)

iP	12h39m55s	$\Delta_{P-H} = 46.0$
iS	12 46 35	$\Delta_{meas} = 46.0$
i(SR ₁)	12 50 15	$\Delta_{S-H} = 45.6$

Berkeley, (By telegram, courtesy Science Service)

P	12h40m36s	$\Delta_{P-H} = 51.5$
S	12 48 04	$\Delta_{S-H} = 51.8$
SR ₁	12 53 29	$\Delta_{meas} = 51.7$

Bozeman, (By mail, courtesy U.S.C. and G.S.)

iP	12h40m40s	$\Delta_{P-H} = 51.8$
PR ₁	12 42 43	$\Delta_{meas} = 51.9$
isSP	12 48 51	
(SR ₁)	12 51 39	

Manila, (By mail, courtesy U.S.C. and G.S.)

iP	12h40m44s	$\Delta_{P-H} = 52.6$
i(SR ₂)	12 53 32	$\Delta_{meas} = 52.6$

PRELIMINARY BULLETIN

25.

EARTHQUAKE OF NOVEMBER 13, 1936 (con't)

Other Stations

Pasadena, (By telegram, courtesy Science Service)

iP	12h41m16s	
epPR ₂	12 44 39	$\Delta_{iP-H} = 56^{\circ}9$
e(S)	12 48 59	$\Delta_{\text{meas}} = 56^{\circ}9$
i(sS)	12 49 26	
i(SR ₂)	12 55 23	

Madison, (By telegram, courtesy Science Service)

eP	12h42m05s	$\Delta_{P-H} = 64^{\circ}4$
eS	12 50 36	$\Delta_{S-H} = 63^{\circ}7$
e(L)	12 57 48	$\Delta_{\text{meas}} = 64^{\circ}0$

Ann Arbor, (By telegram, courtesy Science Service)

iP	12h42m24s	
e	12 47 06	$\Delta_{P-H} = 67^{\circ}1$
i(S)	12 51 24	$\Delta_{\text{meas}} = 66^{\circ}8$
i	12 52 36	
i(sSR ₂)	12 59 06	

Ottawa, (By mail, courtesy U.S.C. and G.S.)

eP	12h42m28s	$\Delta_{P-H} = 67^{\circ}9$
(PR ₁)	12 44 50	$\Delta_{S-H} = 67^{\circ}1$
iS	12 51 18	$\Delta_{\text{meas}} = 67^{\circ}3$
e(L)	13 03 00	

State College, Pennsylvania, (By telegram, courtesy Science Service)

eP	12h42m47s	
i(pP)	12 42 50	$\Delta_{P-H} = 70^{\circ}8$
(PR ₁)	12 45 25	$\Delta_{S-H} = 69^{\circ}1$
e	12 47 12	$\Delta_{\text{meas}} = 70^{\circ}3$
e(S)	12 51 30	
(sSP)	12 52 46	
e?	12 53 00	

Philadelphia, (By telegram, courtesy Science Service)

iP	12h42m54s	$\Delta_{P-H} = 72^{\circ}0$
i(pPR ₂)	12 47 32	$\Delta_{\text{meas}} = 72^{\circ}0$
i(S)	12 52 09	
(SR ₂)	12 00 24	
(M)	12 08 40	

J. B. Macelwane, S.J.
Director

F. Robertson
Graduate Fellow

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

26.

EARTHQUAKE OF NOVEMBER 19, 1936

Tentative Epicenter: $\phi = 14^{\circ}3' \text{ N.}$ $\lambda = 90^{\circ}7' \text{ W.}$
 $H = 21\text{h}10\text{m}30\text{s.}$ Depth nearly 100 km. by the
 Brunner Depth Chart.

Stations of the Jesuit Seismological AssociationLittle Rock,

eP	21h15m02s	$\Delta_{P-H} = 20^{\circ}6'$
pP	21 15 13	$\Delta_{\text{meas}} = 20^{\circ}4'$
iS	21 18 56	

Saint Louis,

eP	21h15m40s	$\Delta_{P-H} = 24^{\circ}4'$
ipP	21 15 55	$\Delta_{\text{meas}} = 24^{\circ}4'$
iPR ₁	21 16 06	
sP	21 16 21	
eS	21 19 48	
iS _S	21 20 13	
iL	21 22 55	
M	21 26 00	

Florissant,

iP	21h15m41s	$\Delta_{P-H} = 24^{\circ}5'$
ipP	21 15 57	$\Delta_{\text{meas}} = 24^{\circ}5'$
iPR ₁	21 16 09	
ipPR ₁	21 16 17	
isP ₁	21 16 23	
iPcP	21 19 20	
iS	21 19 49	
isS	21 20 15	
isSR ₁	21 21 18	
M	21 26.3	

Georgetown, (By telegram, courtesy Science Service)

iP	21h16m10s	$\Delta_{P-H} = 27^{\circ}5'$
S	21 20 48	$\Delta_{S-P} = 27^{\circ}5'$
		$\Delta_{\text{meas}} = 27^{\circ}4'$

Loyola, (By mail, courtesy A. R. Schmitt, S.J.)

eP	21h16m15s	$\Delta_{P-H} = 27^{\circ}6'$
iS	21 21 37	$\Delta_{\text{meas}} = 28^{\circ}0'$

Buffalo, (By telegram, courtesy Science Service)

iP	21h16m34s	$\Delta_{P-H} = 30^{\circ}2'$
iS	21 21 38	$\Delta_{\text{meas}} = 30^{\circ}4'$

Fordham, (By telegram, courtesy Science Service)

iP	21h16m33s	$\Delta_{P-H} = 30^{\circ}0'$
ipP	21 16 52	$\Delta_{\text{meas}} = 30^{\circ}4'$
iS	21 21 36	

EARTHQUAKE OF NOVEMBER 19, 1936 (con't)

Stations of the United States Coast and Geodetic Survey

San Juan, (By mail, courtesy U.S.C. and G.S.)

eP	21h15m35s	$\Delta_{P-H} = 24^{\circ}0$
eS	21 20 01	$\Delta_{meas} = 24^{\circ}1$
eL	21 22 39	

Tucson, (By telegram, courtesy Science Service)

eP	21h15m53s	$\Delta_{P-H} = 25^{\circ}8$
eS	21 19 24	$\Delta_{meas} = 25.7$
eL	21 22 00	

Ukiah, (By telegram, courtesy Science Service)

eP	21h17m38s	$\Delta_{P-H} = 37^{\circ}9$
S	21 23 35	$\Delta_{meas} = 37^{\circ}8$

Other Stations

State College, (By telegram, courtesy Science Service)

iP	21h16m21s	$\Delta_{P-H} = 28^{\circ}8$
PR ₁	21 17 16	$\Delta_{meas} = 28^{\circ}7$
PcP	21 19 29	
iS	21 21 15	

Ann Arbor, (By telegram, courtesy Science Service)

iP	21h16m24s	$\Delta_{P-H} = 29^{\circ}0$
PR ₁	21 17 12	$\Delta_{meas} = 28^{\circ}7$
iS	21 21 16	
SR ₁	21 22 46	

Ottawa, (By telegram, courtesy Science Service)

iP	21h17m04s	$\Delta_{P-H} = 33^{\circ}6$
iS	21 22 30	$\Delta_{meas} = 33^{\circ}5$

Berkeley, (By mail, courtesy U.S.C. and G.S.)

P	21h17m27s	$\Delta_{P-H} = 36^{\circ}5$
S	21 23 17	$\Delta_{meas} = 36^{\circ}6$

Victoria, (By telegram, courtesy Science Service)

P	21h18m18s	$\Delta_{P-H} = 43^{\circ}0$
		$\Delta_{meas} = 43^{\circ}5$

J. B. Macelwane, S.J.
Director

R. R. Heinrich
Graduate Fellow

CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF NOVEMBER 22, 1936

27.

Tentative Epicenter: $\lambda = 13^{\circ}7' N$, $\phi = 90^{\circ}7' W$.
 H = 18h19m25s. Depth nearly 100 km. by the
 Brunner Depth Chart.

Stations of the Jesuit Seismological Association

Little Rock,

iP	18h24m04s	$\Delta_{P-H} = 24^{\circ}1$
ipP	18 24 18	$\Delta_{S-P} = 23^{\circ}9$
iPR ₁	18 24 30	$\Delta_{meas} = 24^{\circ}1$
iS	18 27 47	
isS	18 28 23	
iSR ₁	18 28 37	

Florissant,

iP	18h24m42s	$\Delta_{P-H} = 25^{\circ}1$
ipP	18 24 56	$\Delta_{S-P} = 25^{\circ}1$
iPR ₂	18 25 14	$\Delta_{meas} = 25^{\circ}1$
iS	18 28 59	
isS	18 29 24	
eSR ₁	18 30 03	
eSR ₂	18 30 45	

Georgetown, (By telegram, courtesy Science Service)

eP	18h25m06s	$\Delta_{P-H} = 27^{\circ}7$
eS	18 29 44	$\Delta_{S-P} = 27^{\circ}6$
		$\Delta_{meas} = 27^{\circ}8$

Buffalo, (By telegram, courtesy Science Service)

iP	18h25m33s	$\Delta_{P-H} = 30^{\circ}6$
iPR ₁	18 26 45	$\Delta_{meas} = 30^{\circ}9$
i(S)	18 30 29	
i	18 31 27	

Fordham, (By mail, courtesy U.S.C. and G.S.)

iP	18h25m33s	$\Delta_{P-H} = 30^{\circ}6$
i(PR ₁)	18 26 30	$\Delta_{S-P} = 31^{\circ}0$
iS	18 30 37	$\Delta_{meas} = 30^{\circ}8$
iL	18 34 42	
i	18 38 58	

Weston, (By mail, courtesy U.S.C. and G.S.)

iP	18h25m53s	$\Delta_{P-H} = 33^{\circ}0$
eS	18 31 10	$\Delta_{S-P} = 32^{\circ}9$
eL	18 35 11	$\Delta_{meas} = 33^{\circ}2$
eM	18 37 41	

PRELIMINARY BULLETIN
EARTHQUAKE OF NOVEMBER 22 (continued)

27.

Stations of the United States Coast and Geodetic Survey

San Juan, (By mail, courtesy U.S.C. and G.S.)

eP	18h24m32s	$\Delta_{P-H} = 24^{\circ}1$
eS	18 28 56	$\Delta_{\text{meas}} = 24^{\circ}1$

Tucson, (By telegram, courtesy Science Service)

eP	18h24m52s	$\Delta_{P-H} = 26^{\circ}2$
eS	18 29 19	$\Delta_{S-P} = 26^{\circ}3$
eL	18 32 20	$\Delta_{\text{meas}} = 26^{\circ}3$

Ukiah, (By telegram, courtesy Science Service)

eP	18h26m37s	$\Delta_{P-H} = 38^{\circ}2$
eS	18 32 36	$\Delta_{S-P} = 39^{\circ}0$
		$\Delta_{\text{meas}} = 38.4$

Honolulu, (By mail, courtesy Science Service)

i	18h38m35s	$\Delta_{\text{meas}} = 64^{\circ}5$
eL	18 49 00	

Other Stations

Columbia, (By mail, courtesy U.S.C. and G.S.)

eP	18h24m14s	$\Delta_{P-H} = 22^{\circ}3$
(S)	18 28 18	$\Delta_{\text{meas}} = 22^{\circ}3$
L	18 31 40	

State College, (By telegram, courtesy Science Service)

eS	18h30m09s	$\Delta_{S-H} = 29^{\circ}1$
e(sS)	18 30 58	$\Delta_{\text{meas}} = 29^{\circ}3$
esSR ₁	18 32 49	
eL	18 36 36	
M	18 38 00	

Ann Arbor, (By telegram, courtesy Science Service)

eP	18h25m06s	$\Delta_{S-P} = 29^{\circ}4$
PR ₂	18 26 06	$\Delta_{\text{meas}} = 29^{\circ}2$
eS	18 30 00	
SR ₁	18 31 36	

Philadelphia, (By mail, courtesy U.S.C. and G.S.)

iP	18h25m22s	$\Delta_{P-H} = 29^{\circ}4$
ipP	18 25 35	$\Delta_{S-P} = 29^{\circ}2$
eS	18 30 06	$\Delta_{\text{meas}} = 29^{\circ}6$
iS	18 30 12	
iSR ₂	18 32 41	
i	18 33 35	
i(M)	18 37 39	

PRELIMINARY BULLETINEARTHQUAKE OF NOVEMBER 22 (continued)Other StationsOttawa, (By mail, courtesy U.S.C. and G.S.)

eP	18h26m03s	$\Delta P-H = 34^{\circ}1$
i(pPR ₁)	18 27 24	$\Delta S-P = 33^{\circ}7$
iS	18 31 26	$\Delta_{\text{meas}} = 34^{\circ}2$
eL	18 36 00	

Burlington, (By mail, courtesy U.S.C. and G.S.)

iP	18h26m03s	$\Delta P-H = 34^{\circ}1$
ePR ₁	18 27 02	$\Delta S-P = 34^{\circ}4$
iS	18 31 30	$\Delta_{\text{meas}} = 34.3$
eL	18 34 01	

Victoria, (By telegram, courtesy Science Service)

P	18h27m22s	$\Delta P-H = 43^{\circ}9$
		$\Delta_{\text{meas}} = 44^{\circ}0$

J. B. Macelwane, S.J.
Director

R. R. Heinrich
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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY



EARTHQUAKE OF DECEMBER 20, 1936

28.

Tentative epicenter $\phi = 14^{\circ}2'N$, $\lambda = 88^{\circ}6'W$.
 H = 02h43m29s Depth nearly normal.
 Destructive in San Vicente and several
 other nearby towns of Salvador.

Stations of the Jesuit Seismological Association

Little Rock,

iP	2h48m12s	$\Delta_{P-H} = 20^{\circ}9$
iPR ₂	2 48 41	$\Delta_{S-P} = 20^{\circ}7$
eS	2 52 02	$\Delta_{meas} = 20^{\circ}8$
iPcP	2 52 21	
eSR ₁	2 52 48	
eL	2 53 52	

Saint Louis,

eP	2h48m19s	$\Delta_{P-H} = 24^{\circ}5$
iP	2 48 53	$\Delta_{S-P} = 24^{\circ}5$
iS	2 53 12	$\Delta_{meas} = 24^{\circ}5$
eL	2 55 23	
eM	2 56 59	

Florissant,

eP	2h48m50s	$\Delta_{P-H} = 24^{\circ}6$
iP	2 48 52	$\Delta_{S-P} = 24^{\circ}6$
ePR ₁	2 49 14	$\Delta_{meas} = 24^{\circ}7$
eS	2 53 14	
iS	2 53 23	
e(L)	2 56.2	
e(M)	2 58.2	

Georgetown, (By telegram, courtesy Science Service)

eP	2h49m13s	$\Delta_{P-H} = 26^{\circ}9$
eS	2 53 55	$\Delta_{S-P} = 26^{\circ}8$
		$\Delta_{meas} = 26^{\circ}7$

Buffalo, (By mail, courtesy U.S.C. and G.S.)

e	2h53m52s	$\Delta_{meas} = 29^{\circ}9$
e(SR ₁)	2 56 23	
e	2 57 32	
e	2 58 56	

PRELIMINARY BULLETINEARTHQUAKE OF DECEMBER 20, 1936Stations of the United States Coast and Geodetic SurveySan Juan, (By mail, courtesy U.S.C. and G.S.)

iP	2h48m22s	$\Delta_{P-H} = 21^{\circ}8$
eS	2 52 34	$\Delta_{meas} = 21^{\circ}9$
eL	2 54 29	

Tucson, (By telegram, courtesy Science Service)

eP	2h49m15s	$\Delta_{P-H} = 27^{\circ}1$
e	2 54 04	$\Delta_{meas} = 27^{\circ}3$
eS	2 54 19	
eL	2 58 07	

Other StationsState College, (By mail, courtesy U.S.C. and G.S.)

e(SR ₁)	2h55m20s	$\Delta_{meas} = 28^{\circ}0$
M	3 01.5	

Philadelphia, (By mail, courtesy U.S.C. and G.S.)

e(P)	2h49m27s	$\Delta_{P-H} = 28^{\circ}4$
i	2 55 10	$\Delta_{meas} = 28^{\circ}4$
i	2 57 51	
eL	2 58 00	

Burlington, (By mail, courtesy U.S.C. and G.S.)

P	2h50m12s	$\Delta_{P-H} = 33^{\circ}2$
e(S)	2 55 31	$\Delta_{meas} = 33^{\circ}1$
eSR ₁	2 57 29	
L	3 00	

Pasadena, (By mail, courtesy Charles F. Richter)

(P)	2h50m06s	$\Delta_{S-H} = 33^{\circ}5$
S	2 55.7	$\Delta_{meas} = 33^{\circ}4$

Victoria, (By mail, courtesy U.S.C. and G.S.)

3h01m48s	$\Delta_{meas} = 44^{\circ}8$
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James B. Macelwane, S.J.
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CENTRAL STATION OF THE JESUIT SEISMOLOGICAL ASSOCIATION

15 NORTH GRAND BOULEVARD, ST. LOUIS, MO., U.S.A.

PRELIMINARY BULLETIN

29.

IN COOPERATION WITH SCIENCE SERVICE AND THE UNITED STATES COAST AND GEODETIC SURVEY

EARTHQUAKE OF DECEMBER 21, 1936

Tentative Epicenter: $\lambda = 131^{\circ}3$ W, $\phi = 53^{\circ}2$ N.
 H = 19h03m09s Depth probably normal.

Difficulties of interpretation were encountered as a result of the quake from the same focus which followed this one by about 25 minutes. Florissant records indicate the possibility of a third quake.

Stations of the Jesuit Seismological AssociationFlorissant,

eP	19h09m32s	$\Delta_{P-H} = 31^{\circ}2$
iPR ₁	19 10 25	$\Delta_{S-P} = 31^{\circ}2$
iPR ₂	19 10 42	$\Delta_{meas} = 31^{\circ}3$
eS	19 14 46	
iSR ₁	19 16 24	

Saint Louis,

eP	19h09m35s	$\Delta_{P-H} = 31^{\circ}5$
iPR ₁	19 10 27	$\Delta_{meas} = 31^{\circ}5$
iPR ₂	19 10 45	
eS	19 14 48	
iSR ₁	19 16 26	

Little Rock,

eP	19h09m51s	$\Delta_{P-H} = 33^{\circ}3$
eS	19 15 20	$\Delta_{meas} = 33^{\circ}1$

Buffalo, (By telegram, courtesy Science Service)

iP	19h10m18s	$\Delta_{S-P} = 36^{\circ}1$
e(PR ₁)	19 11 35	$\Delta_{meas} = 35^{\circ}9$
e	19 12 28	
eS	19 16 06	
eSR ₂	19 18 40	
eL	19 21 12	

Stations of the United States Coast and Geodetic SurveySitka, (By mail, courtesy U.S.C. and G.S.)

Pn	19h04.3m	$\Delta_{Pn-H} = 4^{\circ}5$
		$\Delta_{meas} = 4^{\circ}6$



EARTHQUAKE OF DECEMBER 21, 1936.

(continued)

Stations of the United States Coast and Geodetic SurveyTucson, (By telegram, courtesy Science Service)

eP	19h08m43s	$\Delta_{P-H} = 25^{\circ}9$
eS	19 13 23	$\Delta_{meas} = 25^{\circ}7$
e(SR ₁)	19 13 34	
e(M)	19 16 45	

Honolulu, (By mail, courtesy U.S.C. and G.S.)

iS	19h16m20s	$\Delta_{S-H} = 37^{\circ}5$
eSR ₂	19 19 00	$\Delta_{meas} = 37^{\circ}8$

Other StationsVictoria, (By telegram, courtesy Science Service)

(P _n)	19h05m00s	$\Delta_{meas} = 7^{\circ}0$
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Bozeman, (By telegram, courtesy Science Service)

iP	19h06m55s	$\Delta_{S-P} = 15^{\circ}4$
iS	19 09 55	$\Delta_{meas} = 15^{\circ}1$
eL	19 11 00	

Pasadena, (By mail, courtesy C.F. Richter)

P	19h07m57s	$\Delta_{P-H} = 21^{\circ}3$
eS	19 11 57	$\Delta_{meas} = 21^{\circ}3$

State College, (By mail, courtesy U.S.C. and G.S.)

eSR ₁	19h18m53s	$\Delta_{SR_1-H} = 38^{\circ}2$
e	19 23 10	$\Delta_{meas} = 37^{\circ}8$

Burlington, (By mail, courtesy U.S.C. and G.S.)

eS	19h16m42s	$\Delta_{SR_1-H} = 38^{\circ}6$
eSR ₁	19 19 00	$\Delta_{meas} = 38^{\circ}4$

Philadelphia, (By mail, courtesy U.S.C. and G.S.)

iPR ₂	19h12m20s	$\Delta_{SR_2-H} = 39^{\circ}4$
i(S)	19 17 03	$\Delta_{meas} = 39^{\circ}1$
eSR ₂	19 19 57	

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