

double

19 JUN 1940

Pasadena Preliminary Report No. 16, Jan.-April, 1940 -Continued

March 17 12:05:06
March 18 03:23:40, 05:51:44, 10:46:51
March 19 ✓ 04:54:09, 08:12:52, 23:56:58 c
March 20 00:39:56, 02:49:41, 13:45:09 c
✓ March 21 P^{*}=14:12:07, SKP=14:15:32. Δ = 133° Sumatra?
March 22 08:32:21, 20:32:12 ✓
March 23 08:26:35
March 24 12:00:05, 20:47:50 c
March 25 17:39:42
March 27 12:39:52 c (S=12:46:44, USCGS: 51°N., 180°, O=12:31.1), 13:59:44,
21:06:52
March 28 08:16:52 c, 16:02:47, 16:18:35, 17:55:15 c, 19:57:52
March 29 21:56:41
March 30 08:17:44 c
✓ March 31 17:03:39
✓ April 1 11:32:55 (SKS=11:43:31. Δ=103°)
April 2 18:13:40
April 3 13:17:43
April 5 16:47:36
April 7 08:42:57
April 8 ✓ 09:01:33, 20:25:18
April 10 20:25:54
April 11 09:14:40
April 12 06:06:00
April 13 20:37:15
April 14 09:44:34 (f=09:45:22. Deep), 15:07:16 ✓
April 16 06:16:45 (S=06:23:59, USCGS: 52°.6 N., 173°.8 E., O=06:07.7),
06:52:07, 07:57:40 (i;08:00:44)
April 17 05:52:36, 16:06:46, 21:47:31
April 18 06:38:51, 10:31:34, 19:56:35
April 19 ✓ 00:15:49 c, 06:44:49, 11:02:08, 11:14:44, 14:50:14, 17:54:30
April 20 10:31:56, 16:00:04, 20:00:09, 20:29:46 c
April 22 00:29:11, 05:22:51, 06:36:34, 17:33:05
April 23 18:30:24
April 24 09:15:18, 10:35:33, 12:01:19
April 25 10:29:53, 18:29:22 c, 22:01:20 c
April 27 02:00:42 (i;02:01:14), 09:47:59 (S=09:58:34), 13:26:11 c, 18:17:21 ✓
(S=18:27:59)
April 29 15:23:04 c

Addenda (Larger shocks only)

May 2 08:36:05 c (Deep)
May 4 07:33:10 (S=07:40:31, USCGS: 53°N., 173° E., O=07:24.1)
May 5 02:13:13 (S=02:20:50)
May 11 14:03:43 (S=14:10:59)
May 18 05:04:22 (S=04:42. Near 34°.0 N., 116°.5 W. Felt widely).
May 19 04:37:24 (Destructive in Imperial Valley. Epicenter near the
international boundary), 15:27:48 (pP=29:43, S=35:52. Δ=69°, h=560 km.)

C.F.Richter

May 21, 1940

Double

18 SEPT. 1940

Pasadena Preliminary Bulletin No. 17, May-June 1940.

Unless otherwise noted, readings refer to P or P', and to the Pasadena station.
(MW = Mt. Wilson.)

- May 1 02:45:16
- May 2 04:38:25, 08:36:05, 21:59:55
- May 4 07:33:10 (S = 07:40:31. USCGS: 53.0°N., 173.0°E., 0 = 07:24.1),
08:15:59, 09:38:49, 16:53:54 (MW), 21:20:53 (MW), 21:31:28 (MW).
- May 5 02:13:13 (S = 02:20:50), 09:00:45
- May 7 22:41:57 (MW)
- May 8 07:49:19
- May 10 01:28:33, 01:47:05, 19:18:45
- May 11 02:48:07, 03:58:11, 07:51:01, 14:03:43 (S = 14:10:59, USCGS: 53.2°N.,
172.0°E., 0 = 13:54:37), 20:07:16
- May 12 03:06:14, 16:32:09 (MW), 20:47:57 (S = 20:51:47)
- May 13 14:57:41
- May 14 15:14:33, 16:57:22
- May 15 17:11:02
- May 16 20:36:40, 22:17:21
- May 17 02:07:42 (S = 02:14:12)
- May 18 05:04:27 (S = 05:04:47. See note at end of bulletin), 11:10:13
- May 19 04:37:23 (Imperial Valley. See note at end), 15:27:48 (pP = 15:28:06,
S = 15:35:52. USCGS: 51°N., 148°E., 0 = 15:17:55, h = 580 km.), 18:36:28
- May 21 19:00:28 (pP = 19:01:48, S = 19:10:07. USCGS: 23°S., 178°W.,
0 = 18:48.9, h = 400 km.)
- May 22 12:10:11
- May 23 06:10:31, 07:53:31
- May 24 16:43:54 (S = 16:52:03. USCGS: 12°S., 78°W., 0 = 16:33:46. Destructive
in Peru), 22:07:51 (S = 22:16:03. Aftershock, USCGS: 12°S., 78°W.,
0 = 21:57:40).
- May 25 05:45:21 (MW), 19:41:39 (MW), 19:54:06
- May 26 00:51:39 (S = 00:52:26)
- May 27 08:03:17, 08:05:18, 11:52:25, 15:54:08
- May 28 09:54:38 (SKS = 10:05:19. USCGS: 2°S., 136°E., 0 = 09:40.4), 14:36:02
- May 29 01:16:17 (MW), 02:04:34 (S = 02:10:02, USCGS: 67.9°N., 138°W.,
0 = 01:57:36), 16:42:05
- May 30 07:30:32
- May 31 00:52:27, 02:43:42, 05:03:45, 05:51:06, 13:06:03
- June 1 09:36:26, 10:49:50
- June 2 07:08:16, 11:46:02, 12:22:54, 19:29:31, 23:50:31
- June 3 18:08:08 (USCGS: 25°N., 110°W. 0 = 18:05.4)
- June 4 00:09:23, 10:35:40 (S = 10:36:05. See note at end.)
- June 5 11:07:59 (S = 11:13:27. USCGS: 68°N., 138°W., 0 = 11:01:00)
- June 7 07:30:43, 10:20:39, 12:16:22
- June 8 03:56:13 (MW), 04:11:30, 11:34:46
- June 10 13:55:29
- June 11 09:00:55, 18:54:33 (MW)
- June 12 05:48:23, 09:16:40 (MW), 14:11:50, 14:23:26, 15:14:51 (MW), 18:00:16 (MW),
18:49:01
- June 13 22:14:42
- June 14 03:34:56, 07:59:41, 17:21:09

Continued

18 SEPT. 1940

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Pasadena Preliminary Bulletin, No. 17, May-June 1940 - Continued

June 15 09:21:09, 14:28:04
 June 17 02:13:37 (MW), 10:33:43 (S = 10:39:44. USCGS: 21.0°N., 155.3°W.,
 O = 10:26.8), 11:45:22 (MW), 18:23:05 (MW), 23:15:08 (MW)
 June 18 14:09:55, 18:48:04 (S = 18:55:21. USCGS: 54°N., 173°E., O = 18:39.0).
 June 19 13:44:20 (MW), 18:31:19
 June 22 11:51:25 (P^t = 11:55:02)
 June 23 07:05:48, 19:08:43, 21:44:05 (USCGS: 25.0°N., 11.0°W., O = 21:41:21)
 June 24 08:02:53
 June 25 03:02:30, 04:57:06 (MW)
 June 26 08:19:21 (iSKP? = 08:22:42), 13:45:45, 19:40:07 (MW)
 June 27 07:04:12, 11:59:28
 June 29 02:50:19
 June 30 13:18:34

July, 1940; larger shocks.

July 2 19:20:28
 July 6 03:49:38 (pP = 03:50:17, S = 03:57:10) (USCGS: 11°N., 61°W. O=03:40:00)
 July 10 06:01:09 (pP = 06:03:17, S = 06:10:27) (USCGS: 45°N., 128°E. O=05:50.5)
 July 13 16:55:22 (S = 17:10:49) (USCGS: 7.1°N., 83°W., O = 16:47:30)
 July 14 06:01:31 (S = 06:08:26) (USCGS: 52°N., 178°E., O = 05:52:48)
 July 27 13:38:47 (pP = 13:39:02, S = 13:43:55)
 Aug. 1 12:51:16 (pP = 12:53:05, S = 13:00:48), 15:20:03 (S=15:29:41)

C. F. Richter

August 6, 1940.

Pasadena Preliminary Bulletin No. 18, July-August, 1940

Readings refer to P or P' unless otherwise noted, and to the Pasadena station.
(MW = Mt. Wilson)

July 1	21:40:38
July 2	01:48:39 (MW), 19:20:28 (S=19:30:05)
July 3	14:48:36, 16:06:08; 18:28:34
July 4	09:11:30 (pP=09:12:31)
July 5	13:27:33, 14:15:24
July 6	03:49:38 (pP=03:50:17, S=03:57:08. USCGS: 11°N.61°W., 0=03:40:00, h=175 km.), 18:00:34, 21:07:55
July 7	18:43:56 (S=18:44:43. 31.7°N. 115.1°W. o=10:43.0)
July 8	10:58:34 (S=10:59:25. Haiwee P=10:58:07, S=10:58:29), 15:28:11
July 10	06:01:09 (pP=06:03:12, S=06:10:27, P'P'=06:30:00. h=600 km. USCGS: 45°N. 128°E., 0=05:50.5)
July 11	07:05:35
July 12	01:31:10
July 13	16:55:22 (ScP=17:01:10, S=17:01:49. USCGS: 7.1°N. 83°W., 0=16:47:30)
July 14	00:00:41 (MW), 06:01:31 (S=06:08:25 USCGS: 52°N. 178°E. 0=05:52:48), 15:43:30
July 16	00:04:49 (pP=05:06), 03:24:28, 22:17:12 (pP=22:17:50)
July 17	12:06:55
July 18	02:22:20, 15:50:05
July 19	03:09:21, 04:56:25 (S=05:03:44. USCGS: 54°N. 173°E. 0=04:47.4), 22:04:06
July 20	02:05:17 (S=02:14:42), 17:54:44
July 21	00:13:30 (pP?=00:13:55), 05:28:26 (pP=05:29:06), 13:57:15, 15:57:07 (PP=15:58:35, SKS, 16:03:51, PS=16:07:28, PKKP=16:07:56. Δ=115°), 18:39:41 (pP=18:41:39), 19:21:17
July 22	05:40:46 (MW), 23:01:30 (S=23:02:21. Tinemaha, P=23:00:47, S=23:00:57. 37°38' N. 113°52' W., 0=23:00:33. Felt in Owens Valley)
July 23	14:14:58
July 24	14:43:50 (MW)
July 26	19:41:46
July 27	13:38:47 (pP=13:39:02, PcP=13:41:42, S=13:43:55, sS=13:44:25. Probably h=80 km. USCGS: 13.6°N 91.6°W., 0=13:32.4), 17:08:42
July 28	19:39:02
July 30	00:30:02, 05:42:28, 15:35:14, 16:13:33, 19:27:29 (S?=19:30:51), 22:03:00
July 31	02:01:42 (MW), 11:52:53, 14:40:31
Aug. 1	12:51:15 (pP=12:53:05, sP=12:53:58, S=13:00:52. Tonga region, h=500 km.) 15:20:03 (pP?=15:20:17, S=15:29:41. Depth 50 km.? USCGS: 44.5°N. 140°E, 0=15:08:21)
Aug. 2	13:08:45 (MW), 14:43:57, 15:41:03
Aug. 3	08:23:11, 20:33:42, 23:04:17
Aug. 4	00:16:39 (MW), 02:37:52, 09:27:55, 16:17:24
Aug. 5	04:39:49, 05:57:15 (MW), 08:28:08 (S=08:34:56), 10:07:57, 14:08:13
Aug. 7	03:07:26 (pP=03:07:54), 08:00:02 (pP=08:00:48), 14:22:33
Aug. 8	13:08:46 (MW), 13:20:10 (MW), 15:10:54 (pP=15:11:23), 22:37:26
Aug. 9	13:53:23
Aug. 10	04:39:19, 05:36:11
Aug. 11	07:18:03, 16:58:08 (S=17:07:28)
Aug. 12	15:55:50, 17:56:37
Aug. 13	08:27:07, 15:49:13 (S?=15:59:44)
Aug. 15	02:59:32, 04:40:09, 04:57:25, 21:35:48 (pP=21:36:24)
Aug. 17	12:16:35
Aug. 18	06:07:14
Aug. 20	06:44:08, 17:43:14, 19:06:16 S=19:12:30)
Aug. 22	03:34:33 (pP?=03:34:45, S=03:40:36, h=60 km? USCGS: 51.9°N. 164.9°W., 0=03:27:18) 06:03:20, 11:11:23, 13:42:40
Aug. 24	07:24:26, 07:59:35, 13:42:30 (S=13:51:51), 13:50:31
Aug. 25	01:10:36 (MW), 10:43:45
Aug. 26	00:36:43, 02:38:06 (pP=02:38:35), 05:08:36 (S=05:14:59)
Aug. 27	07:10:09
Aug. 28	12:40:11 (pP=12:40:58), 13:45:04, 15:28:09
Aug. 29	05:06:04 (MW), 15:00:42
Aug. 30	18:30:30, 21:42:34
Aug. 31	16:34:14, 17:23:08, 19:41:51
Larger shocks of September:	
Sept. 12	13:30:16 (SKS=13:40:49)
Sept. 19	18:32:33 (PP=36:29, S?=43:21, i=47:45)

September 20, 1940

C.F. Richter

Pasadena Preliminary Bulletin No. 20, October-November, 1940

Times refer to P and P' unless otherwise noted or marked simply as e or i.

Readings are at Pasadena unless marked MW=Mount Wilson, R=Riverside or T=Tinemaha.

- Oct. 1 10:54:36 (pP=10:54:52, S=11:04:23. South America), 13:18:46 (MW),
19:25:22, 20:46:34, 21:58:14 (iS=22:08:10)
- Oct. 2 03:23:19 (S=03:29.4), 04:17:43, 10:36:24
- Oct. 3 05:07:29 (pP=05:07:58), 14:13:27, 15:33:37, 23:06:36
- Oct. 4 07:36:46 (MW), 08:06:02 (S=08:15:16. Damage in Chile:USCGS:19°S., 67°W.,
O=07:54:35), 09:44:30
- Oct. 5 04:57:19, 09:41:12, 14:46:20 d (USCGS:(9°N., 84°W., O=14:38:43)
- Oct. 6 15:46:25, 15:49:35 (S=15:58:50. Chile), 16:34:08 (MW)
- Oct. 7 01:38:41, 02:02:50, 06:57:17 (SKS=07:07:42. Δ=107°)
- Oct. 9 03:05:34
- Oct. 10 05:58:43 c
- Oct. 11 05:57:21 d (S-P=6 seconds. 33°47'N., 118°35'W., O=21:57:13. Some damage
at Redondo and Manhattan Beach, near the epicenter. Felt widely in the
Los Angeles metropolitan area.), 07:59:52 d, 18:53:54 c (S=19:04:13.
USCGS: 45°S., 73°W., O=18:41.0)
- Oct. 12 02:54:27 (pP?=02:55:05) (MW), 03:09:40, 05:26:38
- Oct. 13 13:38:11, 23:59:34 (T)
- Oct. 14 02:48:52 c, 03:58:31 (MW), 06:43:18, 08:56:07 d, 16:33:35
- Oct. 15 06:45:14 (pP?=06:45:24), 08:05:06, 18:05:32 (pP?=18:06:05)
- Oct. 16 14:29:51, 23:14:43 d
- Oct. 18 15:13:57 (T)
- Oct. 19 07:29:17, 11:07:50, 15:24:41
- Oct. 20 00:17:49 (T)
- Oct. 21 13:55:05 (pP?=13:55:38), 20:28:35 d (pP?=20:29:07)
- Oct. 22 06:50:07 (pP=06:50:40, SKS=07:00:29. Rumania), 11:02:42 d
- Oct. 23 02:32:20 d (pP=02:32:51)
- Oct. 24 02:31:03, 20:18:55 (pP=20:19:15, S=20:29:01. South America)
- Oct. 25 10:25:43 (MW), 15:06:35
- Oct. 26 01:25:38 (S=01:27:10. 39°N., 112°W.?) (MW), 17:58:28
- Oct. 27 05:43:08 c (S=05:48:52. USCGS:9.9°N., 84.4°W., O=05:35:36), 10:47:35,
19:55:01 (S=19:56:00. Near 30°N., 114°W., O=19:54.5), 22:32:42
- Oct. 28 01:06:48, 01:30:31, 03:35:58, 21:01:21, 21:21:58 (S?=21:23:03)
- Oct. 29 00:56:34, 09:29:13
- Oct. 30 11:59:42 c (pP=12:01:49. Tonga region), 23:10:33 c
- Oct. 31 02:06:26, 02:17:55, 11:02:49
- Nov. 1 01:19:58, 15:56:57 (pP?=15:57:20)
- Nov. 2 04:59:46, 14:55:11, 23:44:07
- Nov. 3 02:20:06, 06:15:38 (R)
- Nov. 4 03:58:55 (pP=03:59:25), 04:16:33
- Nov. 6 01:30:18
- Nov. 7 03:25:31 (MW), 14:09:33 c (pP?=14:11:20, S=14:19:15, SP=14:20:21)
- Nov. 8 10:46:57, 20:13:59, 22:22:06 (S-P=62 seconds. 35°20'N., 124°40'W.,
O=22:20:45)
- Nov. 9 05:58:14 d, 06:09:39 c, 09:28:38, 11:11:39, 15:18:30
- Nov. 10 01:52:15 (pP=01:52:45, SKS=02:02:31. Rumania. USCGS:45.0°N., 26.2°E.,
O=01:39.0, h=100-150 km.), 20:47:24, 21:47:07
- Nov. 12 03:20:14 (pP?=03:21:09), 04:44:34, 04:52:16
- Nov. 13 09:17:23
- Nov. 14 04:36:00, 10:45:54
- Nov. 15 04:58:23, 98:10:28, 08:30:28, 14:00:30
- Nov. 16 02:36:01 c, 07:35:31, 20:02:24 (MW)
- Nov. 17 03:59:46 (S=04:02.3), 07:01:36 (T), 07:05:55, 07:25:03 (S=07:26:40.
Felt in Humboldt County), 16:16:27, 18:35:59 (pP?=18:36:50), 19:55:47
(pP?=19:56:02)
- Nov. 18 02:29:41, 12:59:30 (pP=13:00:07) (R), 22:18:35

Continued

Fracture Frequency Bulletin No. 10, October-November, 1963

Times refer to T and W unless otherwise noted or marked simply as T or W.
See also at bottom of page marked with 'R' for River side or 'L' for Lake side.

Oct. 1	10:54:55 (T-10:54:55, 2-11:04:55, South America), LA:10:54 (10)
Oct. 2	03:53:12 (2-03:53:12, 04:17:43, 10:35:34)
Oct. 3	05:07:22 (T-05:07:22), LA:10:54, 10:35:34, 10:35:34
Oct. 4	07:30:45 (W), 08:00:02 (2-08:00:02, 08:00:02), LA:10:54, 10:35:34, 10:35:34
Oct. 5	01:50:12, 09:41:12, 10:44:30 (USOOS:10:44:30, 0-10:44:30)
Oct. 6	12:40:42, 12:40:42 (2-12:40:42, 0-12:40:42), 12:40:42 (W)
Oct. 7	01:50:41, 02:02:30, 02:57:17 (2-02:57:17, 0-10:44:30)
Oct. 8	03:00:34
Oct. 9	03:00:34
Oct. 10	03:00:34
Oct. 11	03:00:34 (2-03:00:34, 0-10:44:30), 03:00:34 (W), 03:00:34 (T)
Oct. 12	03:00:34 (T), 03:00:34 (T)
Oct. 13	03:00:34 (T), 03:00:34 (T)
Oct. 14	03:00:34 (T), 03:00:34 (T)
Oct. 15	03:00:34 (T), 03:00:34 (T)
Oct. 16	03:00:34 (T), 03:00:34 (T)
Oct. 17	03:00:34 (T), 03:00:34 (T)
Oct. 18	03:00:34 (T), 03:00:34 (T)
Oct. 19	03:00:34 (T), 03:00:34 (T)
Oct. 20	03:00:34 (T), 03:00:34 (T)
Oct. 21	03:00:34 (T), 03:00:34 (T)
Oct. 22	03:00:34 (T), 03:00:34 (T)
Oct. 23	03:00:34 (T), 03:00:34 (T)
Oct. 24	03:00:34 (T), 03:00:34 (T)
Oct. 25	03:00:34 (T), 03:00:34 (T)
Oct. 26	03:00:34 (T), 03:00:34 (T)
Oct. 27	03:00:34 (T), 03:00:34 (T)
Oct. 28	03:00:34 (T), 03:00:34 (T)
Oct. 29	03:00:34 (T), 03:00:34 (T)
Oct. 30	03:00:34 (T), 03:00:34 (T)
Oct. 31	03:00:34 (T), 03:00:34 (T)

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Pasadena Preliminary Bulletin No. 21, October-November, 1940

- Continued -

Nov. 19 15:13:25 (pP=15:13:39, S=15:23:05. Japan), 18:36:32 (S=18:37:56,
Felt strongly in Humboldt County)
Nov. 20 18:18:09 (MW)
Nov. 22 09:13:27, 13:17:50 c (pP=13:19:49. Manchuria?)
Nov. 23 03:56:28 c (S=04:02:41. Central America)
Nov. 24 16:25:25 d
Nov. 26 01:09:03 c (pP=01:11:03. Tonga), eP=01:48:13 (MW)
Nov. 27 14:54:35 (S?=15:05:49)
Nov. 28 14:52:26
Nov. 29 00:51:23, 13:05:27, 13:13:37 (pP=13:14:11)
Nov. 30 02:36:28, 11:11:58, 21:03:24

Dec. 7 22:17:22 (S-P=53 seconds. Felt at San Diego).

C. F. Richter

December 10, 1940

Pasadena Preliminary Bulletin No. 21, December, 1940

Unless otherwise noted, readings refer to P or P', and to the Pasadena station
(MW = Mt. Wilson, R = Riverside, T = Tinemaha)

- Dec. 1 15:59:33, 18:17:39(MW), 19:34:38, 21:18:26 (S=21:24:59), 21:57:14
- Dec. 2 09:45:04(T), 10:12:35, 12:30:59, 14:11:14
- Dec. 3 06:09:08, 07:35:36, 09:58:23(MW), 14:51:50
- Dec. 4 S=00:10:48, 01:19:28, 04:33:11(MW), 07:58:58(MW), 13:20:20, 19:44:40
- Dec. 5 11:02:51
- Dec. 6 02:42:23, 20:40:23
- Dec. 7 08:25:18, 13:27:29, 14:29:37, 22:17:22 (iS=22:18:15. La Jolla, P=22:17:02, S-P=31 sec
Felt at San Diego. 31.7°N., 115.1°W., O=14:16.5)
- Dec. 8 01:36:10(T), 03:31:24(MW), 06:30:09, 18:00:49 (pP?=18:01:30), 23:59:16(T)
- Dec. 9 16:13:27
- Dec. 10 00:23:38(MW), 17:15:22, 19:39:34(MW)
- Dec. 13 05:30:26
- Dec. 14 04:05:04, 08:36:46 (Compression from southwest. pP=08:38:55, sP=08:39:50.
h=600 km. Tonga region), 13:30:06, 23:55:07(MW)
- Dec. 15 23:59:38 (PcP=24:02:20)
- Dec. 16 09:40:40(R), 21:27:10(T)
- Dec. 17 14:56:00
- Dec. 18 03:59:22, 05:08:14 (pP=05:08:50), 05:50:44(MW), 06:18:25(MW), 17:13:58(T)
- Dec. 19 03:23:07, 20:13:20
- Dec. 20 07:34:39 (Felt in New England. USCGS: 44.0°N. 71.1°W., O=07:27:23), 23:42:44
(iS=23:44:20. Tinemaha: P=23:42:18. Felt in Humboldt and Mendocino Counties,
California, region of 40°N. 124°W.)
- Dec. 21 19:36:52
- Dec. 22 12:43:30 (S=12:53:18 USCGS: 17°S. 178°W., O=12:31:35), 19:10:28 (Compression
from southeast. pP=19:11:20, S=19:19:13, h=220 km. Peru or Bolivia), 20:41:02
- Dec. 23 21:53:00±(T) (Felt widely in Montana)
- Dec. 24 L=14:03:25 (New England; aftershock; USCGS, O=13:43:44)
- Dec. 25 03:17:59(R), 12:16:09, 18:27:53
- Dec. 26 03:04:01(R), 06:35:13, 14:19:50(MW), 23:39:27
- Dec. 27 02:23:09, 19:36:30(MW), 22:11:17
- Dec. 28 16:50:11 (Dilatation from northwest. SKS=17:00:24, SKPP'=17:19:55. Deeper
than normal. Region of Marianne Is.), 17:12:36, 23:32:50, 23:50:35(R)
- Dec. 29 07:52:58(R), 16:45:45(MW), 18:13:26(MW)
- Dec. 30 16:00:33(T), 20:44:54(R), 21:03:19
- Dec. 31 07:39:36(R), 07:49:57, 10:02:30(MW), 20:53:38

Important shocks of January, 1941

- Jan. 2 PP=17:08:10, SKP=17:10:07, SKS=17:13:19, PKKP=17:18:21, $\Delta = 114^\circ$?
- Jan. 5 P^m=19:05:39, PP=19:06:22, PS=19:15:58, PKKP=19:16:26. $\Delta = 114^\circ$
- Jan. 6 P= 09:55:38 (Compression from southeast); PcP=09:58:01, ScP=10:01:48
ScS=10:05:56. $\Delta = 36^\circ$
- Jan. 13 P=16:40:48, i=16:41:16, PP=16:44:47, SKS=16:51:11, S=16:51:49. $\Delta = 91^\circ$?

January 13, 1941

C. F. Richter

Pasadena Preliminary Bulletin No. 23, February, 1941.

Unless otherwise noted readings refer to P or P' and to the Pasadena station
 M=Mt. Wilson, R= Riverside, T= Pinomaha, c= compression, d= dilatation.

- Feb. 1 00:06:53 (MW), 05:52:38 (S=05:34:01), 17:30:25 (MW).
- Feb. 2 02:24:57 (MW), 11:56:10, 19:01:11 (Felt at San Francisco), 23:47:05 d
- Feb. 3 07:39:44, 08:15:39
- Feb. 4 12:37:34, 14:16:30 (P'=14:20:38, SKS=14:26:16, PKKP=14:31:58, $\Delta=108^\circ$?)
- Feb. 5 08:11:07, 13:34:04 (S=13:34:56. Gulf of California?)
- Feb. 7 15:23:03, 16:25:56 (MW), 18:34:24
- Feb. 8 14:27:05c (pP?=14:29:02), 19:04:46 (S?=19:15:26)
- Feb. 9 04:27:52, 08:22:20, 09:46:13 (S=09:47:51. Felt at Eureka, Calif. USCGS 40.
 7°N. 125.4°W., O=09:44.7), 15:27:31 (P'=15:30:31), 19:32:36 (S?=19:43:33)
- Feb. 10 13:53:59. 22:46:53 c,
- Feb. 11 00:45:43, 04:52:44 (S=04:54:49. Afterhock of Feb. 9, 09^h), 14:41:28c
 (S=14:46:19. USCGS 14.5°N. 94.0°W. O=14:35.4).
- Feb. 12 08:17:16(T).
- Feb. 13 14:52:36, 16:34:17(T).
- Feb. 14 01:10:31 (S=01:11:30), 04:05:01, 10:18:55 d (pP=10:19:39, sP=10:20:10),
 13:27:48, 19:00:10 (S=19:13:58).
- Feb. 15 03:59:49(T), 09:02:49(T), 23:16:18(MW)
- Feb. 16 10:47:25 c (pP?=10:49:03), 16:58:29 (S=17:08:01)
- Feb. 17 10:10:29
- Feb. 18 03:47:41 (MW), 20:57:22
- Feb. 19 10:13:17 (S=10:14:55. Arizona), 14:12:18, 15:21:41
- Feb. 20 17:00:54 (R), 23:37:09
- Feb. 22 19:26:01 (pP=19:27:49, S=19:35:19. Tonga region).
- Feb. 23 11:37:13 (pP=11:37:35, S=11:41:04. Tacubaya gives 18°04'N. 99°55'W.,
 O=11:32:14), 18:36:42 (S=18:37:02; La Jolla P=18:36:31, S-P=11 seconds.
 Felt at San Diego. 33.5°N. 116.5°W., O=18:36:12), 22:49:51 (R)
- Feb. 24 12:55:33
- Feb. 25 05:56:21 (S?=06:07:18), 06:22:39 (pP?=06:23:08) (MW), 08:17:04
- Feb. 27 03:27:48, 09:58:47 (P'=10:02:40, S?=10:09:11, PKKP=10:14:16), 13:58:19 (R),
 15:15:50
- Feb. 28 03:31:24

C. F. Richter

March 13, 1941

double

Pasadena Preliminary Bulletin No. 24, March, 1941

Unless otherwise noted readings refer to P or P' and to the Pasadena station
MW= Mt. Wilson, R= Riverside, T= Tinehama. c= compression, d= dilatation.

- Mar. 3 07:47:01 (e=07:50:21. Very distant).
- Mar. 4 15:37:34 (T), 21:43:26
- Mar. 7 02:30:00 c
- Mar. 8 20:40:01 (R), 21:54:27, 22:19:55
- Mar. 9 16:58:43 (pP=16:59:30)
- Mar. 10 03:55:47 (T), 04:13:44, 06:39:44, 08:53:11 (pP=08:53:37, sP?=08:53:49)
- Mar. 12 00:04:03, 03:02:57, 10:03:36, 14:28:17
- Mar. 14 03:21:21 c, 14:42:24, 16:26:11
- Mar. 15 05:48:06 (S=05:49:31. La Jolla P=05:47:56, S=05:49:10. Felt at San Diego.
USCGS: 28.1N. 113.6W., 0=05:46.3), 16:47:04 (MW), 19:19:07, 23:40:09
(S=23:41:35)
- Mar. 16 07:12:48, 07:52:39 (S=08:01:01. Japan?), 09:04:08 c, 16:48:34, 23:01:17
- Mar. 17 05:18:10, 08:17:22
- Mar. 18 07:01:19, 10:03:44, 11:53:21
- Mar. 19 02:56:37 c, 21:30:23 (R), 22:29:06.
- Mar. 20 03:48:05
- Mar. 21 08:10:19 d (USCGS 7.3N. 36.6W., 0=07:58.4)
- Mar. 22 14:43:07 c
- Mar. 23 09:07:24
- Mar. 26 05:00:15, 08:24:46, 14:45:34 (R)
- Mar. 27 00:49:29 (MW), 02:51:33.
- Mar. 28 12:33:04, 22:42:54
- Mar. 29 09:04:21 (R)
- Mar. 30 10:17:10 (MW)
- Mar. 31 00:20:58, 01:28:20 (MW), 04:27:05, 07:12:27 (R)

Noteworthy shocks of April

- Apr. 1 10:47:35 (S=10:52:54. Alaska.)
- Apr. 3 15:06:32 (pP=15:07:26, S=15:15:55. Foreshock of next)
15:32:55 (Dilatation from S.E. pP=15:33:57, S=15:42:17. $\Delta=74^\circ$, h=220 km.
Felt in Chile at Taltal, Vallenar and Copiapo)
- Apr. 7 23:36:45 (S=23:42:51. West Indies)
- Apr. 9 17:09:51 (Felt at San Diego)
- Apr. 15 19:14:31 (S=19:18:26. Destructive in Mexico.)

C. F. Richter

April 17, 1941.

Pasadena Preliminary Bulletin No. 25, April, 1941.

Unless otherwise noted reading refer to P or P' and to the Pasadena station
 MW= Mt. Wilson, R= Riverside, T= Tinemaha. c= compression, d= dilatation.

- April 1 02:02:47(MW), 10:47:35 (S=10:52:54; USCGS 56.0°N.153.0°W., 0=10:41.1),
 22:10:33(R)
- April 2 15:59:22 (pP=16:00:24), 18:16:15
- April 3 15:06:32 d (pP=15:07:26, S=15:15:55. Foreshock), 15:32:55 d (pP=15:33:57,
 S=15:42:17 Felt in Chile. USCGS 25°S. 69°W. h=200 km.), 16:16:19,
 21:19:33, 21:43:32(MW)
- April 4 04:07:02, 09:21:04(R), 11:36:43(MW), 21:07:08
- April 6 08:58:21(MW), 23:02:00
- April 7 02:51:55 c (pP=02:53:51. Tonga region), 10:59:48, 20:20:29(South America),
 23:10:21 d, 23:36:45 c (PP=23:38:12, S=23:42:51. USCGS 17.6°N., 78.3°W.,
 0:23:29.3) 23:48:51 (aftershock?)
- April 8 03:54:34, 10:13:56, 22:40:52(MW)
- April 9 17:09:51 (S=17:10:59. La Jolla 17:09:38. Felt at San Diego.)
- April 10 14:35:41 (Mexico?)
- April 14 12:26:55(T), 16:15:22
- April 15 03:56:38, 07:07:56, 16:45:10 c, 19:14:32 c (iL=19:18:26. Destructive in
 Mexico. Tacubaya gives 18°17'N. 103°19'W., 0=19:09:55), 19:50:38,
 21:10:23(MW), 22:41:58, 23:47:42
- April 16 01:43:01, 02:06:02, 02:32:03, 05:32:53, 06:19:22, 12:10:24, 15:42:14.
- April 17 15:59:23(R), 19:33:23
- April 18 06:28:38 d (pP=06:29:05), 13:48:13?
- April 19 08:11:39
- April 20 17:52:44 (P''=17:56:14, SKS=18:03:01. S=18:04:37, PKKP=18:08:04. Pamir.
 USCGS 37°N. 69°E., 0=17:38.3)
- April 21 03:01:31 (S=03:07:27. USCGS 53°N. 166°W., 0=02:54.1), 03:38:04(MW),
 08:13:51, 18:39:37, 22:40:33
- April 22 01:55:59(R), PP=16:26:57, 20:04:13
- April 23 06:59:20 (e=07:01:14, e=07:02:40), 15:18:52(R)
- April 24 01:11:41(R), 10:54:20, 21:10:21 c
- April 25 12:13:42 (L=12:15.1, iS=12:15:19. La Jolla 12:13:20)
- April 26 10:29:00 (Mexico?), 18:00:39
- April 27 05:41:49, PP?=11:42:34, PP?=13:18:56(MW)
- April 28 19:48:17 c (S=19:52:07. Damage in Mexico)
- April 29 01:54:53 (PP=57:35, SKP=58:16. This may be a shock reported in the press
 as strong at Perth, Australia), 04:09:32(MW), 15:54:01
- April 30 09:57:40, 22:57:13

Noteworthy shocks of May

- May 1 07:15:17. Felt at Unalaska
- May 5 15:30:38 c (PP=15:33:32, S=15:41:23. Destructive in Manchuria)
- May 8 10:32:47 (pP?=10:34:47, S=10:41:54. Tonga, h=550 km.?)
- May 13 16:03:55 (S=16:05:39. Felt at Eureka, California)

C. F. Richter

May 15, 1941.

Date: May 19, 1940
Time: 4h 36m 48s, G. C. T.
Epicenter: 32° 50' N. Lat., 115° 30' W. Long.

Tucson

Pasadena

iP 4h 37m 43s
i 4 39 09

eP_h 4h 37m 24s
iP 4 37 35

Date: May 19, 1940
Time: 15h 17m 55s, G. C. T.
Epicenter: 51° N. Lat., 148° E. Long
Depth: About 580 km.

Sitka

College, Alaska

iP 15h 25m 12s
iS 15 30 56

eP 15h 23m 52s
eS 15 28 40

Date: May 21, 1940
Time: 18h 48.9m, G. C. T.
Epicenter: 23° S. Lat., 178° W. Long
Depth: About 400 km.

Manila

Honolulu

P 18h 59m 32s
19 01 32

eP 18h 57m 02s
iS 19 03 28

Date: May 24, 1940
Time: 16h 53m 46s, G. C. T.
Epicenter: 12.0° S. Lat., 78.0° W. Long.
Depth: Probably about 40 or 50 km.

Huancayo

Tacubaya

iP 16h 34m 32s

eP 16h 41m 05s
iS 16 46 57

Date: May 24, 1940
Time: 21h 57.7m, G. C. T.
Epicenter: Near 12.0° S. Lat., 78.0° W. Long.

-2-

Tacubaya
San Juan

 +
 iP 22h 04m 55s
 eS 22 10 48

 +
 iP 22h 04m 14s
 iS 22 09 27

Date: May 28, 1940

Time: 9h 40.4m, G. C. T.

Provisional epicenter: Region of 2° S. Lat., 136° E. Long.

Honolulu
Sitka
~~+~~
 iP 9h 51m 33s
 eS 10 00 21

~~+~~
 eP 9h 53m 40s
 e 10 04 13
 e 10 04 32

Date: May 29, 1940

Time: 1h 58m 36s, G. C. T.

Epicenter: 68° N. Lat., 138° W. Long.

Sitka
Ottawa
Tucson

 +
 iP 2h 00m 13s
 iS 2 02 11

 +
 iP 2h 05m 05s
 eS 2 10 55

 +
 iP 2h 05m 05s
 eS 2 10 58

Date: June 3, 1940

Time: 18h 05.4m, G. C. T.

Epicenter: Region of 25° N. Lat., 110° W. Long

 +
Pasadena
 iP 18h 08m 09s
 i 18 08 52

 +
Tucson
 eP 18h 07m 03s
 e 18 08 32

Date: June 5, 1940

Time: 11h 01.0m, G. C. T.

Epicenter: Near 68° N. Lat., 138° W. Long.

 +
Ottawa
 iP 11h 08m 28s
 iS 11 14 18

 +
Tucson
 iP 11h 08m 28s
 eS 11 14 23

1940

Jan. 1 12:26:14 (pP=12:28:12, e=12:28:53, i= 12:29:18, S=12:
h=550 km.)
2 11:17:46 (S=11:26:09. USCGS: 31°S. 108°W. approx., O=11:07.9)
6 LP 14:16:07 (dilatation from southwest. pP=14:16:30, S=14:26:23)
17 01:27:22 (pP=01:27:40, S=01:37:44) 82.0 9110



From the ISC collection scanned by SISMOS

C.F.Richter,
Pasadena, California,
January 20, 1940

19 JUN. 1940

Pasadena Preliminary Report No.16, Jan.-April, 1940. + *Mai Addenda*

Times refer to P or P' unless otherwise noted or marked simply e or i.

Readings are at Pasadena unless otherwise noted. c = compression, d = dilatation.

Jan. 1 12:26:14 c (pP=12:28:12, S=12:35:22. 18°S., 177°W., O=12:15.2, h=550 km.)
 Jan. 2 11:17:46 c (S=11:26:23. 29°S., 113°W., O=11:07:14)
 Jan. 3 11:26:54 c
 Jan. 4 00:33:31 (R)
 Jan. 6 08:26:41, 14:16:07 d (pP=14:16:30, iS=14:26:46. 21°S., 170°E.,
 O=14:03.3, h=90 km.)
 Jan. 7 03:34:48, 21:44:19
 Jan. 11 14:40:44
 Jan. 14 10:06:53
 Jan. 16 22:06:11
 Jan. 17 01:27:22 d (S=37:44. h=70 km.? USCGS: 17°N., 148°E., O=01:14:53), 04:02:29
 05:34:05, 07:04:47, 09:53:09, 10:32:01, 12:19:10, 13:53:27, 14:19:53,
 14:46:08, 15:38:21, 19:51:36, 22:54:07
 Jan. 19 03:24:15, 03:41:25, 05:36:25, 06:11:03, 09:11:01, 14:04:16, 16:15:58,
 17:31:40
 Jan. 20 10:11:05 (iS=10:22:03)
 Jan. 21 02:58:16, 03:22:00 c (i=03:22:21. Deep), 04:32:01 (pP=04:32:56. Deep),
 07:46:14
 Jan. 24 18:02:40
 Jan. 25 18:59:13
 Jan. 26 04:24:16, 06:54:24 (S=07:05:21), 17:17:21 (S=17:28:06)
 Jan. 28 07:37:53, 08:34:09
 Jan. 30 12:07:10, 12:46:56, 13:58:22
 Feb. 5 06:39:27, 10:49:56 (deep?), 23:00:57
 Feb. 7 17:24:54 c (S=17:32:07. USCGS: 52°N., 174.5°E. O=17:15:56)
 Feb. 8 01:57:03, 08:07:34 (eS=08:09:11. Tinemaha: P=08:06:59, S=08:08:03.
 Strong in northeastern California), 23:21:36 (S?=23:28:33)
 Feb. 9 13:31:40 c, 14:05:24
 Feb. 11 06:19:27, 14:36:03
 Feb. 12 00:13:13 (i=00:13:26, S=00:22:59. JSA: 26°S., 71°W., O=00:01:32),
 05:34:11 c, 08:32:51 d (pP=08:33:52, S=08:42:43. JSA: 22.6°S., 177.5°W.,
 O=08:21:05, h=200 km.), 09:24:50 (S=09:30:28. JSA: 54°N., 160°W.
 O=09:17:57, h=09:17:57, h=100 km.), 15:22:49
 Feb. 13 21:00:14 c, 23:54:03
 Feb. 14 02:16:36 d, 10:37:47; Feb. 17, 13:47:16
 Feb. 19 07:26:13 c
 Feb. 20 02:30:39 c (pP=02:31:28, S=02:40:48. Deep. USCGS: 12°S., 167°E.,
 O=02:18:09), 13:14:43, 13:33:47, 20:47:11, 20:52:04
 Feb. 21 01:34:08, 02:48:20
 Feb. 23 01:09:22 c (pP=01:09:35), 05:11:32, 09:36:35, 16:43:23
 Feb. 24 11:50:24, 12:13:53
 Feb. 27 12:22:39, 19:23:53, 19:26:01
 Feb. 28 13:09:27 d, 17:28:43 (S=17:29:10. Riverside: P=17:28:32, S=17:28:51.
 33°08'N., 116°05'W. Felt widely in southeastern California)
 Feb. 29 12:42:58, 16:25:54
 March 1 10:53:04
 March 3 00:18:27
 March 4 12:56:07, 16:03:16, 20:10:05
 March 5 09:01:53, 23:07:14
 March 6 00:01:35, 05:58:27
 March 7 07:19:38, 19:43:36
 March 8 05:07:43
 March 9 05:11:52, 10:58:43 c (pP=11:00:32, S=11:08:19. $\Delta = 83^\circ$, h=500 km.)
 March 10 18:02:59 (S=18:04:08)
 March 11 11:37:25 c
 March 13 08:13:54, 22:17:45
 March 14 02:38:55, 17:46:04, 18:41:34, 21:27:29, 22:35:37
 March 15 05:40:39, 13:55:58
 March 16 20:15:47, 20:47:22

Continued

Pasadena Preliminary Report No. 16, Jan.-April, 1940 -Continued

March 17	12:05:06
March 18	03:23:40, 05:51:44, 10:46:51
March 19	04:54:09, 08:12:52, 23:56:58 c
March 20	00:39:56, 02:49:41, 13:45:09 c
March 21	P ¹ =14:12:07, SKP=14:15:32, Δ = 133° Sumatra?
March 22	08:32:21, 20:32:12
March 23	08:26:35
March 24	12:00:05, 20:47:50 c
March 25	17:39:42
March 27	12:39:52 c (S=12:46:44, USCGS: 51°N., 180°, 0=12:31.1), 13:59:44, 21:06:52
March 28	08:16:52 c, 16:02:47, 16:18:35, 17:55:15 c, 19:57:52
March 29	21:56:41
March 30	08:17:44 c
March 31	17:03:39
April 1	11:52:55 (SKS=11:43:31. Δ=103°)
April 2	18:15:40
April 3	13:17:43
April 5	16:47:36
April 7	08:42:57
April 8	09:01:33, 20:25:18
April 10	20:25:54
April 11	09:14:40
April 12	06:06:00
April 13	20:37:15
April 14	09:44:34 (f=09:45:22. Deep), 15:07:16
April 16	06:16:45 (S=06:23:59. USCGS: 52°.6 N., 173°.8 E., 0=06:07.7), 06:52:07, 07:57:40 (i;08:00:44)
April 17	05:52:36, 16:06:46, 21:47:31
April 18	06:38:51, 10:31:34, 19:56:35
April 19	00:15:49 c, 06:44:49, 11:02:08, 11:14:44, 14:50:14, 17:54:30
April 20	10:31:56, 16:00:04, 20:00:09, 20:29:46 c
April 22	00:29:11, 05:22:51, 06:36:34, 17:33:05
April 23	18:30:24
April 24	09:15:18, 10:35:33, 12:01:19
April 25	10:29:53, 18:29:22 c, 22:01:20 c
April 27	02:00:42 (i;02:01:14), 09:47:59 (S=09:58:34), 13:26:11 c, 18:17:21 S=18:27:59)
April 29	15:23:04 c

Addenda (Larger shocks only)

May 2	08:36:05 c (Deep)
May 4	07:33:10 (S=07:40:31, USCGS: 53°N., 173° E., 0-07:24.1)
May 5	02:13:13 (S=02:20:50)
May 11	14:03:43 (S=14:10:59)
May 18	05:04:22 (S=04:42. Near 34°.0 N., 116°.5 W. Felt widely).
May 19	04:37:24 (Destructive in Imperial Valley. Epicenter near the international boundary), 15:27:48 (pP=29:43, S=35:52. Δ=69°,h=560 km.)

C.F.Richter

May 21, 1940

May 21, 1940

P	19:00:28
pP	01:48
S	10:06
sS	12:28
P ¹ P ¹	27:22

Δ about 79°
h about 350 km.

Pasadena Preliminary Bulletin No. 17, May-June 1940.

Unless otherwise noted, readings refer to P or P', and to the Pasadena station.
(MW = Mt. Wilson.)

May 1	02:45:16
May 2	04:38:25, 08:36:05, 21:59:55
May 4	07:33:10 (S = 07:40:31. USCGS: 53.0°N., 173.0°E., 0 = 07:24.1), 08:15:59, 09:38:49, 16:53:54 (MW), 21:20:53 (MW), 21:31:28 (MW).
May 5	02:13:13 (S = 02:20:50), 09:00:45
May 7	22:41:57 (MW) <i>down 2e up</i>
May 8	07:49:19
May 10	01:28:33, 01:47:05, 19:18:45
May 11	02:48:07, 03:58:11, 07:51:01, 14:03:43 (S = 14:10:59, USCGS: 53.2°N., 172.0°E., 0 = 13:54:37), 20:07:16
May 12	03:06:14, 16:32:09 (MW), 20:47:57 (S = 20:51:47)
May 13	14:57:41
May 14	15:14:33, 16:57:22
May 15	17:11:02
May 16	20:36:40, 22:17:21
May 17	02:07:42 (S = 02:14:12)
May 18	05:04:27 (S = 05:04:47. See note at end of bulletin), 11:10:13
May 19	04:37:23 (Imperial Valley. See note at end), 15:27:48 (pP = 15:28:06, S = 15:35:52. USCGS: 51°N., 148°E., 0 = 15:17:55, h = 580 km.), 18:36:28 -
May 21	19:00:28 (pP = 19:01:48, S = 19:10:07. USCGS: 23°S., 178°W., 0 = 18:48.9, h = 400 km.)
May 22	12:10:11
May 23	06:10:31, 07:53:31
May 24	16:43:54 (S = 16:52:03. USCGS: 12°S., 78°W., 0 = 16:33:46. Destructive in Peru), 22:07:51 (S = 22:16:03. Aftershock, USCGS: 12°S., 78°W., 0 = 21:57:40).
May 25	05:45:21 (MW), 19:41:39 (MW), 19:54:06
May 26	00:51:39 (S = 00:52:26)
May 27	08:03:17, 08:05:18, 11:52:25, 15:54:08
May 28	09:54:38 (SKS = 10:05:19. USCGS: 2°S., 136°E., 0 = 09:40.4), 14:36:02
May 29	01:16:17 (MW), 02:04:34 (S = 02:10:02, USCGS: 67.9°N., 138°W., 0 = 01:57:36), 16:42:05
May 30	07:30:32
May 31	00:52:27, 02:43:42, 05:03:45, 05:51:06, 13:06:03
June 1	09:36:26, 10:49:50
June 2	07:08:16, 11:46:02, 12:22:54, 19:29:31, 23:50:31
June 3	18:08:08 (USCGS: 25°N., 110°W. 0 = 18:05.4)
June 4	00:09:23, 10:35:40 (S = 10:36:05. See note at end.)
June 5	11:07:59 (S = 11:13:27. USCGS: 68°N., 138°W., 0 = 11:01:00)
June 7	07:30:43, 10:20:39, 12:16:22
June 8	03:56:13 (MW), 04:11:30, 11:34:46
June 10	13:55:29
June 11	09:00:55, 18:54:33 (MW)
June 12	05:48:23, 09:16:40 (MW), 14:11:50, 14:23:26, 15:14:51 (MW), 18:00:16 (MW), 18:49:01
June 13	22:14:42
June 14	03:34:56, 07:59:41, 17:21:09

Continued

Pasadena Preliminary Bulletin, No. 17, May-June 1940 - Continued

June 15 09:21:09, 14:28:04
 June 17 02:13:37 (MW), 10:33:43 (S = 10:39:44. USCGS: 21.0°N., 155.3°W.,
 0 = 10:26.8), 11:45:22 (MW), 18:23:05 (MW), 23:15:08 (MW)
 June 18 14:09:55, 18:48:04 (S = 18:55:21. USCGS: 54°N., 173°E., 0 = 18:39.0).
 June 19 13:44:20 (MW), 18:31:19
 June 22 11:51:25 (P' = 11:55:02)
 June 23 07:05:48, 19:08:43, 21:44:05 (USCGS: 25.0°N., 11.0°W., 0 = 21:41:21)
 June 24 08:02:53
 June 25 03:02:30, 04:57:06 (MW)
 June 26 08:19:21 (iSKP? = 08:22:42), 13:45:45, 19:40:07 (MW)
 June 27 07:04:12, 11:59:28
 June 29 02:50:19
 June 30 13:18:34

July, 1940; larger shocks.

July 2 19:20:28
 July 6 03:49:38 (pP = 03:50:17, S = 03:57:10) (USCGS: 11°N., 61°W. 0=03:40:00)
 July 10 06:01:09 (pP = 06:03:17, S = 06:10:27) (USCGS: 45°N., 128°E. 0=05:50.5)
 July 13 16:55:22 (S = 17:10:49) (USCGS: 7.1°N., 83°W., 0 = 16:47:30)
 July 14 06:01:31 (S = 06:08:26) (USCGS: 52°N., 178°E., 0 = 05:52:48)
 July 27 13:38:47 (pP = 13:39:02, S = 13:43:55)
 Aug. 1 12:51:16 (pP = 12:53:05, S = 13:00:48), 15:20:03 (S=15:29:41)

C. F. Richter

August 6, 1940.

Pasadena Preliminary Bulletin No. 18, July-August, 1940

Readings refer to P or P' unless otherwise noted, and to the Pasadena station.
(MW = Mt. Wilson)

- July 1 21:40:36
- July 2 01:48:39 (MW), 19:20:28 (S=19:30:05)
- July 3 14:48:36, 16:06:08; 18:28:34
- July 4 09:11:30 (pP=09:12:31)
- July 5 13:27:33, 14:15:24
- July 6 03:49:38 (pP=03:50:17, S=03:57:08. USCGS: 11°N. 61°W., 0=03:40:00, h=175 km.),
18:00:34, 21:07:55
- July 7 18:43:56 (S=18:44:43. 31.7°N. 115.1°W. 0=10:43.0)
- July 8 10:58:34 (S=10:59:25. Haiwee P=10:58:07, S=10:58:29), 15:28:11
- July 10 06:01:09 (pP=06:03:12, S=06:10:27, P'P'=06:30:00. h=600 km. USCGS: 45°N.
123°E., 0=05:50.5)
- July 11 07:05:35
- July 12 01:31:10
- July 13 16:55:22 (ScP=17:01:10, S=17:01:49. USCGS: 7.1°N. 83°W., 0=16:47:30)
- July 14 00:00:41 (MW), 06:01:31 (S=03:08:25 USCGS: 52°N. 178°E. 0=05:52:48), 15:43:30
- July 16 00:04:49 (pP=05:06), 03:24:28, 22:17:12 (pP=22:17:50)
- July 17 12:06:55
- July 18 02:22:20, 15:50:05
- July 19 03:09:21, 04:56:25 (S=05:03:44. USCGS: 54°N. 173°E. 0=04:47.4), 22:04:06
- July 20 02:05:17 (S=02:14:42), 17:54:44
- July 21 00:13:30 (pP=00:13:55), 05:28:26 (pP=05:29:06), 13:57:15, 15:57:07 (PP=15:58:35,
SKS, 16:03:51, PS=16:07:28, PKKP=16:07:56, Δ=115°), 18:39:41 (pP=18:41:39),
19:21:17
- July 22 05:40:46 (MW), 23:01:30 (S=23:02:21. Tinemaha, P=23:00:47, S=23:00:57, 37°38' N.
118°52' W., 0=23:00:33. Felt in Owens Valley)
- July 23 14:14:58
- July 24 14:43:50 (MW)
- July 26 19:41:46
- July 27 13:38:47 (pP=13:39:02, PcP=13:41:42, S=13:43:55, sS=13:44:25. Probably h=80 km.
USCGS: 13.6°N 91.6°W., 0=13:32.4), 17:08:42
- July 28 19:39:02
- July 30 00:30:02, 05:42:28, 15:35:14, 16:13:33, 19:27:29 (S?=19:30:51), 22:03:00
- July 31 02:01:42 (MW), 11:52:53, 14:40:31
- Aug. 1 12:51:15 (pP=12:53:05, sP=12:53:58, S=13:00:52. Tonga region, h=500 km.)
15:20:03 (pP?=15:20:17, S=15:29:41. Depth 50 km.? USCGS: 44.5°N. 140°E,
0=15:08:21.)
- Aug. 2 13:08:45 (MW), 14:43:57, 15:41:03
- Aug. 3 08:23:11, 20:33:42, 23:04:17
- Aug. 4 00:16:39 (MW), 02:37:52, 09:27:55, 16:17:24
- Aug. 5 04:39:49, 05:57:15 (MW), 08:28:08 (S=08:34:56), 10:07:57, 14:08:13
- Aug. 7 03:07:26 (pP=03:07:54), 08:00:02 (pP=08:00:48), 14:22:33
- Aug. 8 13:08:46 (MW), 13:20:10 (MW), 15:10:54 (pP=15:11:23), 22:37:26
- Aug. 9 13:53:23
- Aug. 10 04:39:19, 05:36:11
- Aug. 11 07:18:03, 16:58:08 (S=17:07:28)
- Aug. 12 15:55:50, 17:56:37
- Aug. 13 08:27:07, 15:49:13 (S?=15:59:44)
- Aug. 15 02:59:32, 04:40:09, 04:57:25, 21:35:48 (pP=21:36:24)
- Aug. 17 12:16:35
- Aug. 18 06:07:14
- Aug. 20 06:44:08, 17:43:14, 19:06:16 (S=19:12:30)
- Aug. 22 03:34:33 (pP?=03:34:45, S=03:40:36, h=60 km? USCGS: 51.9°N. 164.9°W., 0=03:27:18)
06:03:20, 11:11:23, 13:42:40
- Aug. 24 07:24:26, 07:59:55, 13:42:30 (S=13:51:51), 13:50:31
- Aug. 25 01:10:36 (MW), 10:43:45
- Aug. 26 00:36:43, 02:38:06 (pP=02:38:35), 05:08:36 (S=05:14:59)
- Aug. 27 07:10:09
- Aug. 28 12:40:11 (pP=12:40:58), 13:43:04, 15:28:09
- Aug. 29 05:06:04 (MW), 15:00:42
- Aug. 30 18:30:50, 21:42:34
- Aug. 31 16:34:14, 17:23:08, 19:41:51

Larger shocks of September:

- Sept. 12 13:30:16 (SKS=13:40:49) Sept. 19 18:32:33 (P=18:36:29, S?=43:21, i=47:45)

September 20, 1940

C.F. Richter

September 20, 1940

Prof. E. Rothe,
9, Blvd. de la Pyramide,
Clermont-Ferrand, France.

Dear Professor Rothe:

Your letter of August 16th has just arrived. In order to speed up our reply and to make it more probable that you receive it in time we are mailing it by clipper. On the reverse hereof you will find our preliminary report for July-August, 1940.

Unfortunately, the Carnegie Institution of Washington has discontinued to support us and we may be forced to decrease the number of instruments now operating. The expression "deeply weathered granite" is probably translated best by "granit profondément alteré". I have added the data for H and D. However I could not fill in the data for t as the expression refers to an earthquake at a given time. I have added the information about the time service at the bottom of question 10. This is true for Pasadena as well as all outside stations. I have added also some data on the masses (M). In the interim a new auxiliary station has been added the details of which are as follows:

Palomar.	1 to 4 as the other auxiliary stations.
	5. Granit alteré. (Decomposed granite)
33°21' North	6. In Spring the water level is at a depth of about 20 feet, and
116°52' West	Fall about 150 feet.
Altitude 1700 m	7. The instrument is the same type as given under Benioff ²⁾
approx.	Tableau I, for Pasadena. Only one vertical component as follows:
	C M Tg Ts H Type h D
	Z 50kg 0.25s 2s Up electrom. 1 15 mm per sec
	with the same note as for Pasadena
	8 to 10, as for Pasadena.

We are very glad that you are able to continue with your reports which, in general, are received regularly although with some delay.

With best wishes and best regards, I am

Very truly yours,

B. Gutenberg

Pasadena Preliminary Bulletin No. 19, September 1940.

Unless otherwise noted, readings refer to P or P', and to the Pasadena station (MW = Mt. Wilson, R = Riverside)

- Sept. 1 11:32:02
 Sept. 2 08:12:53, 08:51:31, 23:11:40
 Sept. 3 01:40:40 (pP = 41:08, sP = 41:20), 12:06:18(MW), 14:59:39(MW)
 Sept. 6 03:01:00, 06:24:19, 20:30:23
 Sept. 7 19:42:06 (R)
 Sept. 8 01:18:48, 10:17:33, 10:24:27, 18:23:30
 Sept. 9 04:11:14, 21:47:00, 23:08:32
 Sept. 12 00:35:54 (P" = 00:39:48, i = 00:40:28. Deep? $\Delta = 115^\circ$?), 09:32:45, 13:30:16 (PP = 13:33:56, SKS = 13:40:49, L = 13:54:24)
 Sept. 13 08:00:45, 11:50:58 (S = 11:51:59, 32.1°N. , 114.3°W.), 15:29:23
 Sept. 14 02:37:39, 18:18:45, 23:14:19
 Sept. 15 12:06:47, 14:33:56, 17:27:07
 Sept. 17 08:20:24(R), 09:01:30(MW), 19:55:20
 Sept. 18 15:20:33 (Dil. from southeast. pP = 15:21:02, sP = 15:21:12)
 Sept. 19 11:33:22, 18:32:34 (Dil. from southwest. PP = 18:36:29, eSKS? = 18:43:05, iS? = 18:43:25. USCGS: 23°S. , 171°E. , 0=18:19.8)
 Sept. 20 00:13:27 (P" = 00:15:58. MW), 09:05:01(MW), 18:57:21
 Sept. 21 12:30:36(MW), 14:06:48
 Sept. 22 12:56:02(MW), 22:23:15, 23:05:08 (P" = 23:09:12, SKS = 23:14:49, S = 23:18:10, PKKP = 23:20:25, P'P' = 23:28:24. $\Delta = 110^\circ$. Deep?)
 Sept. 23 07:26:12 (Compression from southeast. pP = 07:28:08, S = 07:35:18, $\Delta = 78^\circ$, h = 570 km.), 10:38:11
 Sept. 24 01:00:56, 10:05:12
 Sept. 25 09:06:38, 14:47:52
 Sept. 26 04:08:53 (Compression from southwest. pP = 04:09:31, PKKP = 04:27:02, P'P' = 04:35:05, $\Delta = 84^\circ$, h = 150 km.), 09:31:51(R), 17:06:13(MW)
 Sept. 27 17:05:29 (S = 17:07:01. Tinemaha P = 17:05:05. Felt at Eureka, Calif.)
 Sept. 29 01:33:33 (Dil. from southeast. pP = 01:33:59), 04:49:23(MW), 06:02:21 (MW)
 Sept. 30 09:48:35(MW), 10:07:46, 11:25:34, 13:37:13, 14:22:56

Larger seismograms of October:

- Oct. 1 10:54:36 (Compression from southeast. pP = 10:54:54, sP = 10:55:07, eS = 11:04.3. $\Delta = 80^\circ$, h = 80km.)
 Oct. 4 08:06:03 (pP? = 08:06:19, S = 08:15:15, P'P' = 08:33:30, $\Delta = 72^\circ$. Slightly deeper than normal. Strong at Iquique, Chile)
 Oct. 6 iP? = 15:49:35, iS? = 15:58:50
 Oct. 11 05:57:20. ($33^\circ47'\text{N.}$, $118^\circ35'\text{W.}$, 0 = 05:57:13. Felt over a wide area in Southern California. Some small damage on the coast near the epicenter.), 07:59:52, 18:53:54 (S = 19:04:31. $\Delta = 86^\circ$)
 Oct. 15 i = 06:45:14, i! = 06:45:23

October 17, 1940

C. F. Richter

Pasadena Preliminary Bulletin No. 20, October-November, 1940

Times refer to P and P' unless otherwise noted or marked simply as e or i.
 Readings are at Pasadena unless marked MW=Mount Wilson, R=Riverside or T=Tinemaha.

- Oct. 1 10:54:36 (pP=10:54:52, S=11:04:23. South America), 13:18:46 (MW),
 19:25:22, 20:46:34, 21:58:14 (iS=22:08:10)
- Oct. 2 03:23:19 (S=03:29.4), 04:17:43, 10:36:24
- Oct. 3 05:07:29 (pP=05:07:58), 14:13:27, 15:33:37, 23:06:36
- Oct. 4 07:36:46 (MW), 08:06:02 (S=08:15:16. Damage in Chile:USCGS:19°S., 67°W.,
 0=07:54:35), 09:44:30
- Oct. 5 04:57:19, 09:41:12, 14:46:20 d (USCGS:(9°N., 84°W., 0=14:38:43)
- Oct. 6 15:46:25, 15:49:35 (S=15:58:50. Chile), 16:34:08 (MW)
- Oct. 7 01:38:41, 02:02:50, 06:57:17 (SKS=07:07:42. Δ=107°)
- Oct. 9 03:05:34
- Oct. 10 05:58:43 c
- Oct. 11 05:57:21 d (S-P=6 seconds. 33°47'N., 118°35'W., 0=21:57:13. Some damage
 at Redondo and Manhattan Beach, near the epicenter. Felt widely in the
 Los Angeles metropolitan area.), 07:59:52 d, 18:53:54 c (S=19:04:13.
 USCGS: 45°S., 73°W., 0=18:41.0)
- Oct. 12 02:54:27 (pP?=02:55:05) (MW), 03:09:40, 05:26:38
- Oct. 13 13:38:11, 23:59:34 (T)
- Oct. 14 02:48:52 c, 03:58:31 (MW), 06:43:18, 08:56:07 d, 16:33:35
- Oct. 15 06:45:14 (pP?=06:45:24), 08:05:06, 18:05:32 (pP?=18:06:05)
- Oct. 16 14:29:51, 23:14:43 d
- Oct. 18 15:13:57 (T)
- Oct. 19 07:29:17, 11:07:50, 15:24:41
- Oct. 20 00:17:49 (T)
- Oct. 21 13:55:05 (pP?=13:55:38), 20:28:35 d (pP?=20:29:07)
- Oct. 22 06:50:07 (pP=06:50:40, SKS=07:00:29. Rumania), 11:02:42 d
- Oct. 23 02:32:20 d (pP=02:32:51)
- Oct. 24 02:31:03, 20:18:55 (pP=20:19:15, S=20:29:01. South America)
- Oct. 25 10:25:43 (MW), 15:06:35
- Oct. 26 01:25:38 (S=01:27:10. 39°N., 112°W.?) (MW), 17:58:28
- Oct. 27 05:43:08 c (S=05:48:52. USCGS:9.9°N., 84.4°W., 0=05:35:36), 10:47:35,
 19:55:01 (S=19:56:00. Near 30°N., 114°W., 0=19:54.5), 22:32:42
- Oct. 28 01:06:48, 01:30:31, 03:35:58, 21:01:21, 21:21:58 (S?=21:23:03)
- Oct. 29 00:56:34, 09:29:13
- Oct. 30 11:59:42 c (pP=12:01:49. Tonga region), 23:10:33 c
- Oct. 31 02:06:26, 02:17:55, 11:02:49
- Nov. 1 01:19:58, 15:56:57 (pP?=15:57:20)
- Nov. 2 04:59:46, 14:55:11, 23:44:07
- Nov. 3 02:20:06, 06:15:38 (R)
- Nov. 4 03:58:55 (pP=03:59:25), 04:16:33
- Nov. 6 01:30:18
- Nov. 7 03:25:31 (MW), 14:09:33 c (pP?=14:11:20, S=14:19:15, SP=14:20:21)
- Nov. 8 10:46:57, 20:13:59, 22:22:06 (S-P=62 seconds. 35°20'N., 124°40'W.,
 0=22:20:45)
- Nov. 9 05:58:14 d, 06:09:39 c, 09:28:38, 11:11:39, 15:18:30
- Nov. 10 01:52:15 (pP=01:52:45, SKS=02:02:31. Rumania. USCGS:45.0°N., 26.2°E.,
 0=01:39.0, h=100-150 km.), 20:47:24, 21:47:07
- Nov. 12 03:20:14 (pP?=03:21:09), 04:44:34, 04:52:16
- Nov. 13 09:17:23
- Nov. 14 04:36:00, 10:45:54
- Nov. 15 04:58:23, 08:10:28, 08:30:28, 14:00:30
- Nov. 16 02:36:01 c, 07:35:31, 20:02:24 (MW)
- Nov. 17 03:59:46 (S=04:02.3), 07:01:36 (T), 07:05:55, 07:25:03 (S=07:26:40.
 Felt in Humboldt County), 16:16:27, 18:35:59 (pP?=18:36:50), 19:55:47
 (pP?=19:56:02)
- Nov. 18 02:29:41, 12:59:30 (pP=13:00:07) (R), 22:18:35

Continued

Pasadena Preliminary Bulletin No. 21, December, 1940

Unless otherwise noted, readings refer to P or P', and to the Pasadena station
 (MW = Mt. Wilson, R = Riverside, T = Tinemaha)

- Dec. 1 15:59:33, 18:17:39(MW), 19:34:38, 21:18:26 (S=21:24:59), 21:57:14
 Dec. 2 09:45:04(T), 10:12:35, 12:30:59, 14:11:14
 Dec. 3 06:09:08, 07:35:36, 09:58:23(MW), 14:51:50
 Dec. 4 S?=00:10:48, 01:19:28, 04:33:11(MW), 07:58:58(MW), 13:20:20, 19:44:40
 Dec. 5 11:02:51
 Dec. 6 02:42:23, 20:40:23
 Dec. 7 08:25:18, 13:27:29, 14:29:37, 22:17:22 (iS=22:18:15. La Jolla, P=22:17:02, S-P=31 sec
 Felt at San Diego, 31.7°N., 115.1°W., O=14:16.5)
 Dec. 8 01:36:10(T), 03:31:24(MW), 06:30:09, 18:00:49 (pP?=18:01:30), 23:59:16(T)
 Dec. 9 16:13:27
 Dec. 10 00:23:38(MW), 17:15:22, 19:39:34(MW)
 Dec. 13 05:30:26
 Dec. 14 04:05:04, 08:36:46 (Compression from southwest. pP=08:38:55, sP=08:39:50.
 h=600 km. Tonga region), 13:30:06, 23:55:07(MW)
 Dec. 15 23:59:38 (PcP=24:02:20)
 Dec. 16 09:40:40(R), 21:27:10(T)
 Dec. 17 14:56:00
 Dec. 18 03:59:22, 05:08:14 (pP=05:08:50), 05:50:44(MW), 06:18:25(MW), 17:13:58(T)
 Dec. 19 03:23:07, 20:13:20
 Dec. 20 07:34:39 (Felt in New England. USCGS: 44.0°N. 71.1°W., O=07:27:23), 23:42:44
 (iS=23:44:20. Tinemaha: P=23:42:18. Felt in Humboldt and Mendocino Counties,
 California, region of 40°N. 124°W.)
 Dec. 21 19:36:52
 Dec. 22 12:43:30 (S=12:53:18 USCGS: 17°S. 178°W., O=12:31:35), 19:10:28 (Compression
 from southeast. pP=19:11:20, S=19:19:13, h=220 km. Peru or Bolivia), 20:41:02
 Dec. 23 21:53:00±(T) (Felt widely in Montana)
 Dec. 24 L?=14:03:25 (New England; aftershock; USCGS, O=13:43:44)
 Dec. 25 03:17:59(R), 12:16:09, 18:27:53
 Dec. 26 03:04:01(R), 06:35:13, 14:19:50(MW), 23:39:27
 Dec. 27 02:23:09, 19:36:30(MW), 22:11:17
 Dec. 28 16:50:11 (Dilatation from northwest. SKS=17:00:24, SKPP'=17:19:55. Deeper
 than normal. Region of Marianne Is.), 17:12:36, 23:32:50, 23:50:35(R)
 Dec. 29 07:52:58(R), 16:45:45(MW), 18:13:26(MW)
 Dec. 30 16:00:33(T), 20:44:54(R), 21:03:19
 Dec. 31 07:39:36(R), 07:49:57, 10:02:30(MW), 20:53:38

Important shocks of January, 1941

- Jan. 2 PP=17:08:10, SKP=17:10:07, SKS=17:13:19, PKKP=17:18:21, $\Delta = 114^\circ?$
 Jan. 5 P'=19:05:39, PP=19:06:22, PS=19:15:58, PKKP=19:16:26, $\Delta = 114^\circ$
 Jan. 6 P= 09:55:38 (Compression from southeast); PcP=09:58:01, ScP=10:01:48
 ScS=10:05:56, $\Delta = 36^\circ$
 Jan. 13 P=16:40:48, i=16:41:16, PP=16:44:47, SKS=16:51:11, S=16:51:49, $\Delta = 91^\circ?$

January 13, 1941

C. F. Richter

Pasadena, California

We wish to acknowledge with thanks receipt of the following bulletins from July 18 to September 18, 1941:

Alger-Bouzareah	April, 1941	No. 4
Apia	April-June, 1941	No. 2
Azores (by JSA)	July, 1941	
Batavia	October-December, 1940	No. 36-45
Boulder City, etc.	July, 1941, August, 1941	
Brisbane	June, 1941	No. 46
Bucarest	May, 1941	No. 20-26
Bureau Central	April, 1941	No. 8-10
Bureau International	March-April, 1941	No. 23-24
Cape Girardeau	November-December, 1940	No. 8-10
Cartuja	March-July, 1941	No. 3-7
	April-June, 1939	No. 4-6
	June-July, 1941	No. 12-16
Coimbra	July, 1941	No. 7
Florissant	January-April, 1941	No. 1-12
Fordham	January-March, 1941	No. 1-6
Fordham (by JSA)	July, 1941	
Helwan	July-December, 1940	No. 1-14
JSA	July-August, 1941	No. 23-30
Manila	May-June, 1941	No. 18-26
Moncalieri	Year 1940	
NESA	July 1-August 15, 1941	No. 73-75
New Zealand	November-December, 1939	No. E92-E93
	June-July, 1941	No. P112-P113
Ottawa	May, 1941	No. 28-32
Perth	May, 1941	
Phu-Lien	June, 1940	
	January-March, 1941	
St. Louis	September-December, 1940	No. 26-36
	January-May, 1941	No. 1-13
Santa Clara	February-March, June-July, 1941	
Santiago, Chile	Year, 1938	
Spokane	January-June, 1941	No. 1-3
Sydney	March-April, 1941	
Toledo	June, 1941	
Tortosa	October-December, 1937	No. 10-12
Upsala	July, 1939-June, 1940	
USCGS	July-August, 1939	No. MSI 71,72
Weston	July-August, 1941	No. 44-45

Pasadena, California

We wish to acknowledge with thanks receipt of the following bulletins from March 25 to May 14, 1941

Adelaide	December, 1940, January-February, 1941	
Batavia	January-June, 1940	No. 1-26
Boulder City	December, 1940, January-April, 1941	
Brisbane	February-March, 1941	No. 42-43
Bucarest	December, 1940	No. 40-41
Bureau Central (France)	January, 1941	No. 1-4
Bureau International	October-November, 1940	No. 33-36
Cartuja	September-December, 1940 and Supplements	No. 65-83, 67*
	January-March, 1939	
	December, 1940	No. 34
Coimbra	January-March, 1941	No. 1-5
Fort-de-France	January-March, 1941	No. 1-2
Hamburg	Year, 1940	No. 1-9
Helgoland	July-December, 1940	No. 7-12
Helwan	July-December, 1940	No. 7-12
J S A	January-June, 1940	No. 1-9, 1-11
København	January-February, 1941	No. 1, 4
	October-December, 1936	No. 40
	January-June, 1937	No. 41, 42
Ksara	December, 1940, January, 1941	
Ivigtut	Years, 1935, 1936	No. 6, 7
Manila	January-February, 1941	No. 1-9
Mexico	Years, 1933, 1934	
NESA	March 1-April 15, 1941	No. 65-67
New Zealand Stations	January-February, 1941	No. P107-108
Ottawa	February-March, 1941	No. 5-16
Palau	September-December, 1940	
Perth	February, 1941	
Phu-Lien	May-July, 1940	
Riverview	October-December, 1940	No. 25-32
San Fernando	September-December, 1940	No. 5-6
Scoresby-Sund	July-December, 1936	No. 15
Spokane	August-December, 1940	No. 4-5
Sydney	November-December, 1941	
Tacubaya	Shock of April 15, 1941	No. 9-10
Toledo	February, 1941	
Tortosa	July-September, 1937	No. 7-9
Trieste	July-August, 1940	
URSS, prelim.	January-February, 1941	No. 1-5, 2
Weston	March, 1941	No. 40
Zurich	November, 1940-February, 1941	No. 126-129
Bureau International	January, 1941	No. 1-5

Pasadena, California

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CALIFORNIA INSTITUTE OF TECHNOLOGY
DIVISION OF THE GEOLOGICAL SCIENCES

SEISMOLOGICAL LABORATORY
PASADENA

April 1, 1940

ADDRESS:
SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVE.
PASADENA, CALIFORNIA

Jesuit Seismological Association,
15 North Grand Blvd.,
St. Louis, Mo.

Gentlemen:

We have to report the following readings from Pasadena:

G.C.T., April 1, 1940:

eP	11 32 55
iPP	37 05
iSKS	43 31
ePS	46 09
eR	12 04.9

$\Delta = 103^\circ$

Yours very truly,

B. Gutenberg.

CALIFORNIA INSTITUTE OF TECHNOLOGY
DIVISION OF THE GEOLOGICAL SCIENCES

SEISMOLOGICAL LABORATORY
PASADENA

April 16, 1940

ADDRESS:
SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVE.
PASADENA, CALIFORNIA

Jesuit Seismological Association,
15 North Grand Boulevard,
St. Louis, Mo.

Gentlemen:

We have to report the following readings from Pasadena:

G.C.T. April 16, 1940,

iP	06 16 45
ePcS	21 55
iSE	23 59
eSS	27 55
iL	29.3

△ 52° Magnitude about 7

iP 06 52 03

iP 07 57 39

Yours very truly,

B. Gutenberg

P.S.

Also, April 14, 1940, G.C.T.

iP	09 44 34
i(pP)	45 22
i(PP)	47 18
No surface waves	

CALIFORNIA INSTITUTE OF TECHNOLOGY
DIVISION OF THE GEOLOGICAL SCIENCES

SEISMOLOGICAL LABORATORY
PASADENA

May 11, 1940

ADDRESS:
SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVE.
PASADENA, CALIFORNIA

Jesuit Seismological Association,
15 N. Grand Boulevard,
St. Louis.

Gentlemen:

We have to report the following readings from Pasadena:

G.C.T. May 11, 1940

eP	14 03 43
eS	10 57
eL	16.4

Δ about 52°

Yours very truly,

B. Gutenberg

CALIFORNIA INSTITUTE OF TECHNOLOGY
 DIVISION OF THE GEOLOGICAL SCIENCES

SEISMOLOGICAL LABORATORY
 PASADENA

20 May, 1940

ADDRESS:
 SEISMOLOGICAL LABORATORY
 220 NORTH SAN RAFAEL AVE.
 PASADENA, CALIFORNIA

Jesuit Seismological Association,
 15 North Grand Boulevard,
 St. Louis, Mo.

Gentlemen:

We have to report the following readings from Pasadena:

G.C.T. May 19,

ePn	04 37 24
iP	35

*8 reported killed, damage in
 Imperial Valley near Mexican
 border. (Region of $32\frac{1}{2}^{\circ}N$ $115\frac{1}{2}^{\circ}W$)*

May 19,

iP	15 27 48
PcP	28 06
pP	29 43
PP	30 36
iS	35 52
esS	39.3
eP'P'	56 11

No surface waves.
 Δ about 69° , depth 560 km.

Yours very truly

B. Gutenberg.

CALIFORNIA INSTITUTE OF TECHNOLOGY
DIVISION OF THE GEOLOGICAL SCIENCES

SEISMOLOGICAL LABORATORY
PASADENA

1940, May 24

ADDRESS:
SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVE.
PASADENA, CALIFORNIA

Jesuit Seismological Association,
15 North Grand Boulevard,
St. Louis, Mo.

Gentlemen:

We have to report the following readings
from Pasadena.

G.C.T., May 24, 1940:

iP	16 43 54	dil. from southeast
i	44 02	
i	08	
i	31	
iS	52 03	
iSS	56 02	
eG	58.8	
eP'P'	17 13 34	

Δ about 60°

Surface waves not larger than S, but still recording after 3 hours.
Intermediate depth.
Magnitude at least 7 1/2.

Yours very truly,

B. Gutenberg.

CALIFORNIA INSTITUTE OF TECHNOLOGY
DIVISION OF THE GEOLOGICAL SCIENCES

SEISMOLOGICAL LABORATORY
PASADENA

May 29, 1940

ADDRESS:
SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVE.
PASADENA, CALIFORNIA

29 JUIN, 1940

Jesuit Seismological Association,
15 North Grand Boulevard,
St. Louis. Mo.

Gentlemen:

We have to report the following readings from Pasadena:

G.C.T. May 29, 1940:

eP	02 04 34
iP	36
i	43
ePP	05 56
e	09 33
eS	10 02
eL	12.4

$\Delta = 36^\circ$, Magnitude 6-3/4

Yours very truly,

B. Gutenberg.

Preliminary epicenter May 19: $32.8^\circ N$ $115.5^\circ E$

SEISMOLOGICAL LABORATORY
 220 NORTH SAN RAFAEL AVENUE
 PASADENA, CALIFORNIA

Pasadena, September 4, 1941

Gentlemen:

We have to report the following readings from Pasadena:

iP	10:34:44	compression from west
i	35:04	
i(PP)	38:17	
i	38:33	
e	43:48	
e(S)	45:12	
e	45:44	
e	46:12	
e(SS)	51:42	
e(SSS)	55.4	period about 1 minute
eL	58.8	
e(P'P')	11:00:17	

13 OCT 1941

13 OCT 1941

Distance about 90° ? Slightly deep ?
 Magnitude about 7, if normal shock. Otherwise higher.

Sincerely yours

Beno Gutenberg

CALIFORNIA INSTITUTE OF TECHNOLOGY

GEOLOGICAL SCIENCES

ADDRESS

SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVE.
PASADENA, CALIFORNIA

September 12, 1940

Jesuit Seismological Association,
13 North Grand Blvd.,
St. Louis, Mo.

Gentlemen:

We have to report the following readings from Pasadena:

G.S.T. Sept. 12, 1940

eP	13 30 16
Max	45
ePP	38.9
e(SMS?)	40 51
e(S?)	41.0
s	42.5
eSS	47.6
eSSS	51.0
eL	54.6

Δ about 90°, Magnitude about 6-1/2
Phases indefinite, increasing gradually with
time.

Yours very truly,

B. Gutenberg

FF

Pasadena

SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVENUE
PASADENA. CALIFORNIA

C O P Y

October 14, 1940

Jesuit Seismological Association
15 North Grand Blvd.,
St. Louis, Mo.

Dear Sirs:

We have to report the following readings
from Pasadena:

October 11, 1940 G. C. T.

eP	18:53:54
eS	19:04:51
eG	16.7

$\Delta = 86^{\circ}$

Surface waves relatively small.

Very truly yours,

Charles F. Richter

SEISMOLOGICAL LABORATORY
 220 NORTH SAN RAFAEL AVENUE
 PASADENA CALIFORNIA

16 DEC. 1940

1940 November 7

Jesuit Seismological Association,
 15 North Grand Boulevard,
 St. Louis, Mo.

Gentlemen:

We have to report the following readings from
 Pasadena:

G.C.T. November 7, 1940

1P	14 09 33
e(pP)	11 20
e(sP)	12 10
e(PF)	58
1S or SKS	19 16
e(SP)	20 21
e(PS)	21 22
aSS	25 07
e(L)	31 56
eSKPP'	38 27

Δ about 83° , h probably between 400-500 km.
 Surface waves very small.

Very truly yours,

B. Gutenberg.

SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVENUE
PASADENA, CALIFORNIA



From the ISC collection scanned by SISMOS

November 11, 1940

Jesuit Seismological Association,
15 North Grand Boulevard,
St. Louis, Mo.

Gentlemen:

We have the following readings to report from Pasadena:

G.C.T. November 10, 1940.

eP	01 52 15	
epP	45	
e	55 06	
ei	52	
ePP	56 06	
i	34	
i	37 02	
ePPP	58 08	
i	59 54	
i	02 00 49	
1SKS	02 31	
eSP	04 14	
ePKKF	09 04	
eSS	09.8	
eP'P'	17 09	
eSKPP'	20 29	
eR	22.9	T=80 sec.

Δ about 96°
h about 150 km.

Yours very truly,

B. Gutenberg.

SEISMOLOGICAL LABORATORY
220 NORTH SAN RAFAEL AVENUE
PASADENA, CALIFORNIA

November 23, 1940

Jesuit Seismological Association,
15 North Grand Boulevard,
St. Louis, Mo.

Gentlemen:

We have to report the following readings
from Pasadena:

iP	03 56 30, Nov. 23, 1940, G.C.T.
e	57 43
eS	04 02 42
eL	07.7

Distant about 42°

Yours very truly

B. Gutenberg