The International Seismological Summary.

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INTERNATIONAL GEODETIC AND GEOPHYSICAL UNION.
ASSOCIATION OF SEISMOLOGY.
FORMERLY THE BULLETIN OF
THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

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The number constitutes the beginning of the tenth volume of the International Seismological Summary in which travel times and Epicentral distances are calculated with reference to "Geocentric" latitudes of epicentres and observing stations. The travel-times used in making determinations are those contained in "Seismological Tables" by H. Jeffreys and K. E. Bullen, Brit. Ass. for Advancement of Science—London, 1950, and residuals derived accordingly.

Distances are calculated from modified direction-cosines defined by :

$$A = \cos\phi' \cos\lambda$$
$$B = \cos\phi' \sin\lambda$$
$$C = \sin\phi'$$

λ being the east longitude from Greenwich and ϕ' the *geocentric* latitude whose relationship to the ordinary *geographic* latitude ϕ is :—

$$\tan\phi' = \cdot 99328 \tan\phi.$$

These formulae are used to determine direction-cosines of both epicentre and station, though the position is in every case referred to normal ϕ and λ.

The notation is that generally accepted. P and S stand for the times of onset of the direct longitudinal and transverse waves. Pg, Sg, P*, S* for short distances are used for times for these waves transmitted through the superficial "Granitic" and "Intermediate" layers respectively. Reflections of the direct waves at the earth's surface are denoted by PP, PS, PPP, SS . . . and at the outer surface of the central core by PcP, PcS . . .

The refracted longitudinal wave through the central core is known as K. Such waves as PKP, SKS, PKS, SKKS, are frequently recorded at great distances from the epicentre. All times are given as Greenwich Civil Time and are referred to the adopted T_0 as zero.

The arrangement of the " Summary " consists of :—

(1) Date and Time at Origin (T_0), calculated from the above-mentioned tables, together with the depth of focus where this is assumed not to be in the surface. The time calculated is that at which the P wave leaves the focus, not that when P arrives at the epicentre.

(2) Epicentre constants :—

$$A=\cos\phi'\cos\lambda \qquad D=\sin\lambda \qquad G=\sin\phi'\cos\lambda$$
$$B=\cos\phi'\sin\lambda \qquad E=-\cos\lambda \qquad H=\sin\phi'\sin\lambda$$
$$C=\sin\phi' \qquad\qquad\qquad K=-\cos\phi'$$

from which distances, Δ, and where necessary Azimuths, of stations with respect to the epicentre may be calculated by means of the formulae :—

$$\cos\ \Delta=aA+bB+cC$$
$$2-2\cos\ \Delta=(a-A)^2+(b-B)^2+(c-C)^2$$
$$2+2\sin\ \Delta\sin Az.=(a-D)^2+(b-E)^2+c^2$$
$$2+2\sin\ \Delta\cos Az.=(a-G)^2+(b-H)^2+(c-K)^2$$

a, b, c being related to the observing station in the same way as A, B, C are to the epicentre.

δ is defined as the nearest integer to $10^5(A^2+B^2+C^2-1)$ and may be used to compare distances calculated by the first two formulae above, whose equivalence depends on the assumption

$$A^2+B^2+C^2=1$$

h is the height, in kilometres, of the epicentre above the sphere of equal volume concentric with the earth and is given by

$$h=-3{\cdot}549+10{\cdot}738\cos 2\phi$$

(3) The tabular matter consisting of the station names arranged in order of epicentral distances, followed by this distance and the Azimuth measured round the epicentre from North through East. Other columns give the P phase and its residual, or PKP, in which the residual is shown in brackets [ ]. The S phase or an associated phase follows with its residual. If SKS is entered here the residual is shown in [ ], and if SKKS in { }. Under " Supp " is placed the time of some other, preferably well recorded phase such as PS, SS, or, in the case of deep focus shocks, pP. The final column, L, records the onset, if known, of Rayleigh waves R, or of the horizontally polarised surface waves Q.

(4) Readings for which space is not available in the tabular part, added at the foot.

The letters E, N, Z after a phase indicate that the reading was taken on an instrument recording East-West, North-South, or Vertical component of motion, though some stations have instruments oriented to record North-East or North-West components. Reflections near

the epicentre take place, and in the case of deep focus earthquakes can be distinguished from the direct phases. These are distinguished as pP, sS, sP, pPP—the small p and s referring to the initial portion of the path towards the surface.

The letters a, k after a P or PKP phase stand for the terms "Anaseismic" and "Kataseismic," and indicate whether the first longitudinal motion was one away from the focus or towards it.

The epicentres for earthquakes with abnormal focal depth are calculated from travel times appropriate to them in the tables cited above. The depth to be assumed can be obtained from these tables when the observational data are plentiful, and the epicentre then determined in the usual way. When the data are scanty an indication of depth can be obtained from the evidence of the readings of certain individual stations.

The first quarter for 1946 contains 106 epicentres, 56 of which are repetitions from previous epicentres.

Cases of abnormal focal depth are noted below :—

Jan.	5d.	1h.	15·1N.	91·2W.	0·025
	6d.	1h.	41·9N.	143·6E.	0·005
	11d.	1h.	44·9N.	130·4E.	0·080
	17d.	9h.	6·2S.	147·7E.	0·010
	17d.	10h.	6·2S.	147·7E.	0·010
	18d.	15h.	Undetermined shock.		Suggested Deep
	20d.	23h.	36·3N.	71·0E.	0·020
	26d.	2h.	29·0N.	142·0E.	0·010
	29d.	18h.	35·5N.	140·4E.	0·005
	31d.	13h.	36·3N.	71·0E.	0·020
Feb.	4d.	3h.	52·3N.	177·3W.	0·015
	7d.	2h.	36·3N.	71·0E.	0·020
	12d.	6h.	39·5S.	175·1E.	0·020
	15d.	3h.	47·3N.	122·9W.	Suggested Deep
	17d.	14h.	33·9N.	139·6E.	0·010
	22d.	17h.	14·9N.	93·6W.	0·015
	26d.	5h.	38·6S.	177·0E.	0·005
	27d.	6h.	22·5S.	66·0W.	0·030
March	4d.	0h.	38·4S.	178·8E.	0·010
	6d.	13h.	45·1N.	148·2E.	0·015
	9d.	9h.	38·1N.	73·2E.	0·020
	12d.	15h.	32·9N.	136·9E.	0·060
	15d.	13h.	9·5S.	70·0W.	0·080
	27d.	11h.	36·8N.	71·4E.	0·015

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KEW OBSERVATORY,
Richmond,
SURREY.

October, 1954.

1946 JANUARY, FEBRUARY, MARCH.

Jan. 1d. Readings at 1h. (Riverview), 7h. (near Samarkand), 9h. (Alicante), 10h. (Tashkent), 13h. (near Leninakan), 17h. (La Paz), 23h. (near Boulder City, Overton, Pierce Ferry, and Tucson).

Jan. 2d. 15h. 11m. 47s. Epicentre 6°·1S. 150°·5E. (as on 1945, Dec. 31d.).

A = −·8655, B = +·4897, C = −·1055; δ = +3; h = +7;
D = +·492, E = +·870; G = +·092, H = −·052, K = −·994.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	21·4	174	e 4 52	+ 1	i 8 43	− 2	—	—	—
	N.	21·4	174	i 4 46	− 5	e 8 49	+ 4	e 5 6	PP	—
Riverview		27·6	178	e 5 53	+ 2	e 10 38	+ 6	i 10 52	sS	e 13·4
Auckland		37·8	147	7 23	+ 3	—	—	—	—	25·8
Wellington		41·2	152	7 40	− 8	17 11	SS	8 48	pP	26·9
Perth		41·3	227	—	—	i 14 16	+12	i 17 31	SS	i 22·0
Christchurch		42·1	156	e 9 31	PP	—	—	16 55	SS	19·4
Irkutsk		70·1	332	—	—	e 20 34	+ 7	—	—	—
Bombay		80·4	290	—	—	e 22 25	+ 4	—	—	—
Andijan		85·0	312	—	—	e 23 7	0	—	—	—
Tashkent		87·4	312	e 12 4	−46	e 23 17	[0]	e 15 46	PP	—
Pasadena		94·5	56	i 13 22	− 1	—	—	—	—	—
Mount Wilson	Z.	94·6	56	i 13 24	0	—	—	—	—	—
Tinemaha	Z.	94·6	54	e 13 23	− 1	—	—	—	—	—
Boulder City		97·3	54	e 13 36	0	—	—	e 17 28	PP	—
Pierce Ferry		98·0	54	e 13 42	+ 3	—	—	e 17 42	PP	—
Tucson		100·6	58	e 13 54	+ 3	—	—	e 17 54	PP	e 49·9
Ksara		113·8	303	e 19 32	PP	e 30 36	PPS	—	—	—
St. Louis		116·5	50	e 19 47	PP	—	—	—	—	e 49·4
Collmberg	Z.	122·8	330	18 59	[+ 1]	—	—	—	—	—
Cheb		123·9	329	—	—	e 30 31?	PS	—	—	e 68·2

Additional readings :—
Auckland P_cP = 7m.53s., PP = 10m.38s., PPP = 12m.13s., P_cS = 12m.27s., S = 17m.19s., SS = 21m.11s., SSS = 23m.37s., phases wrongly identified.
Wellington sP? = 9m.39s., PPZ = 10m.4s., PPP?Z = 11m.42s., SS = 20m.30s., Q = 22.7m.
Perth i = 16m.11s.
Christchurch EN = 11m.45s., EZ = 12m.53s.
Tashkent S_cS = 24m.29s., eSS = 29m.55s.
Collmberg eZ = 19m.10s.
Long waves were also recorded at Arapuni, De Bilt, Paris, and Copenhagen.

Jan. 2d. Readings also at 0h. (Andijan, Samarkand, and near Stalinabad), 4h. (Bombay, New Delhi, Samarkand, Stalinabad, and Tashkent),6h. (near Zürich), 8h. (near Alicante), 9h. (Riverview), 10h. (near Andijan), 13h. (Mizusawa), 14h. (Christchurch, Wellington, and near Florence), 20h. (Harvard, Ksara, and Riverview), 21h. (Riverview and near Fort de France), 22h. (near Santa Lucia), 23h. (La Paz, La Plata, and Tucson).

Jan. 3d. Readings at 4h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Grand Coulee, Boulder City, Overton, Pierce Ferry, Florissant, St. Louis, and Copenhagen), 8h. (Basle, Chur, Neuchatel, Zürich, and Belgrade), 9h. (Mizusawa), 11h. (near Fort de France), 12h. (Riverview and near Santa Lucia), 16h. (Stalinabad), 17h. (Andijan), 19h. and 20h. (near Harvard).

Jan. 4d. 19h. 43m. 53s. Epicentre 10°·1N. 86°·5W.

A = +·0601, B = −·9829, C = +·1742; δ = +5; h = +7;
D = −·988, E = −·061; G = +·011, H = −·174, K = −·985.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		6·9	99	e 2 0	P*	—	—	—	—	—
Tacubaya		15·4	309	e 3 43	+ 3	e 6 51	+19	e 7 24	SS	—
Mobile		20·5	355	4 42	0	8 45	+18	—	—	—
San Juan		21·4	64	e 4 48	− 3	i 9 17	SS	i 5 27	PP	e 10·8
Columbia		24·3	10	e 5 16	− 4	e 9 30	− 7	e 5 46	PP	e 12·8
Huancayo		24·6	154	e 5 21	− 2	i 9 29	−13	e 6 2	PP	e 11·4
Fort de France		25·2	77	e 5 31	+ 2	e 10 18	SS	—	—	—
St. Louis		28·6	356	e 5 55	− 5	i 10 56	+ 8	i 6 6	pP	e 12·1
Florissant		28·8	356	i 5 55	− 7	i 10 54	+ 3	—	—	e 12·8
Bermuda		30·0	39	e 6 14	+ 2	e 11 31	+21	e 7 19	PP	e 12·7
Philadelphia		31·4	17	e 6 28	+ 3	i 11 23	− 9	—	—	e 14·6
Tucson		31·5	318	e 6 23	− 3	—	—	i 9 24	PcP	e 13·6
Chicago		31·6	357	—	—	e 11 41	+ 6	—	—	e 16·8
La Paz	z.	32·1	145	e 6 31	0	—	—	—	—	15·6
Fordham		32·6	17	e 6 35	0	e 11 41	−10	e 7 57	PP	e 17·0
Harvard		34·8	20	e 6 52	− 2	—	—	—	—	e 18·2
Weston		34·8	20	e 6 51	− 3	e 12 37	+12	—	—	—
Pierce Ferry		36·0	321	i 7 3	− 2	—	—	—	—	—
Palomar		36·2	315	i 7 5	− 1	—	—	i 9 37	PcP	—
Boulder City		36·4	319	i 7 8	0	—	—	i 9 37	PcP	—
Ottawa		36·4	12	7 4	− 4	12 57	+ 7	15 13	SS	18·1
Riverside	z.	36·9	315	i 7 13	+ 1	—	—	i 9 38	PcP	—
Mount Wilson	z.	37·6	315	i 7 19	+ 1	—	—	i 9 40	PcP	—
Pasadena		37·6	315	i 7 18	0	—	—	—	—	e 20·0
Tinemaha		39·3	318	i 7 32	0	—	—	i 9 45	PcP	—
Shasta Dam		44·0	320	e 10 4	PcP	—	—	—	—	—

Additional readings :—
Tacubaya eSSN = 7m.27s.
St. Louis iZ = 6m.19s.
Florissant eE = 8m.30s.
Philadelphia e = 10m.59s. and 12m.59s.
Tucson i = 6m.27s., e = 11m.13s.
Fordham e = 5m.58s.
Palomar iZ = 7m.24s. and 7m.32s.
Boulder City i = 8m.29s.
Long waves were also recorded at Bozeman, College, Riverview, and European stations.

Jan. 4d. Readings also at 10h. (Mount Wilson, Riverside, Tinemaha, Tucson, and Ksara), 11h. (Bombay), 15h. (Kew), 16h. (Alicante, Malaga, and Tucson), 18h. (Andijan, Stalinabad, and New Delhi), 19h. (Bombay, Calcutta (2), Hyderabad, New Delhi, Tashkent, Leninakan, Ksara, and Collmberg), 20h. (New Delhi and near Alicante), 22h. (Bogota, La Paz, Hunatu, Shizuoka, Tokyo, and Yokohama).

Jan. 5d. 1h. 15m. 13s. Epicentre 15°·1N. 91°·2W. Depth of focus 0·025.
(as on 1945, Oct. 27d.).

A = −·0202, B = −·9657, C = +·2589; δ = +1; h = +6;
D = −1·000, E = +·021; G = −·005, H = −·259, K = −·966.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz		6·3	312	1 29	− 3	2 28	−15	—	—	2·8
Tacubaya		8·7	300	2 2	− 1	3 30	−10	—	—	3·8
Balboa Heights		12·9	117	e 2 58	+ 1	—	—	—	—	—
Mobile		15·8	10	3 35	+ 2	6 30	+ 7	—	—	—
Port au Prince		18·4	77	e 4 9	+ 6	e 7 30	+12	i 4 23	PP	—
Bogota		19·8	120	i 4 20	+ 3	i 8 6	+21	—	—	—
Columbia		20·9	23	i 4 29	+ 1	i 8 14	+ 9	i 5 5	pP	e 9·0
Cape Girardeau	N.	22·2	3	e 4 40	− 1	i 8 35	+ 7	i 5 19	pP	—
St. Louis		23·5	1	e 4 54	0	e 8 48	− 2	i 5 34	pP	i 11·7
Florissant		23·6	1	i 4 54	− 1	e 8 52	0	i 5 33	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		24·2	78	i 5 2	+ 2	e 9 6	+ 4	i 5 50	pP	i 10·6
Cincinnati		24·7	13	i 5 3	− 2	i 9 5	− 5	i 5 45	pP	—
Tucson		24·7	317	i 5 5	0	e 9 12	+ 2	i 5 45	pP	e 13·6
Lincoln		26·1	350	e 6 1	pP	e 9 23	−10	—	—	e 10·3
Chicago		26·8	5	i 5 22	− 2	i 9 40	− 4	i 6 4	pP	e 11·7
New Kensington		27·3	19	e 5 35	+ 6	e 9 52	0	e 10 57	sS	e 11·5
Philadelphia		28·5	27	i 5 40	0	i 10 12	0	i 6 21	pP	e 11·5
Fort de France		29·0	87	e 5 43	− 1	e 10 58	+38	—	—	—
Pierce Ferry		29·2	320	i 5 45	− 1	e 16 3	S_cS	i 6 29	pP	—
La Jolla		29·5	312	e 5 51	+ 3	—	—	e 6 33	pP	—
Palomar		29·5	313	i 5 49	+ 1	i 10 32	+ 5	i 6 31	pP	—
Bermuda		29·6	50	i 5 52	+ 3	e 9 55	−34	e 6 35	pP	e 12·0
Boulder City		29·6	319	i 5 49	0	e 16 4	S_cS	i 6 33	pP	—
Fordham		29·7	27	i 5 50	0	i 10 32	+ 1	i 6 43	pP	—
Overton		29·7	320	i 5 51	+ 1	—	—	e 6 34	pP	—
Riverside	z.	30·2	313	i 5 54	− 1	e 12 11	S_cP	i 6 37	pP	—
Rapid City		30·6	343	i 5 43	−15	e 11 0	+15	i 6 18	pP	i 13·2
Mount Wilson		30·8	313	i 6 0	0	—	—	i 6 40	pP	—
Pasadena		30·8	313	i 5 59	− 1	e 10 49	+ 1	i 6 41	pP	—
Huancayo		31·2	148	e 6 8	+ 5	e 11 5	+11	e 12 12	sS	e 13·4
Salt Lake City		31·3	329	e 5 48	−16	i 11 13	+17	e 6 31	pP	—
Haiwee		31·8	317	e 6 9	0	—	—	i 6 51	pP	—
Logan		32·0	330	e 5 54	−16	e 11 14	+ 7	i 6 20	pP	e 15·4
Harvard		32·1	28	i 6 11a	0	i 11 8	0	e 6 54	pP	e 13·9
Santa Barbara	z.	32·1	312	e 6 57	pP	—	—	—	—	—
Weston		32·1	28	i 6 11	0	i 11 9	+ 1	e 6 19	pP	—
Tinemaha		32·5	317	i 6 15	0	i 12 21	S_cP	e 6 59	pP	—
Ottawa		32·9	20	6 17	− 1	11 19	− 2	7 3	pP	14·8
Bozeman		34·8	336	e 6 39	+ 5	i 11 52	+ 2	i 13 1	sS	e 14·4
Shawinigan Falls		34·9	23	6 35	0	11 52	+ 1	7 46	PP	15·8
Butte		35·7	335	e 7 25	pP	e 11 57	− 7	e 9 15	P_cP	e 16·4
Seven Falls		36·2	24	6 45	− 1	12 8	− 3	—	—	14·8
Shasta Dam		37·2	320	e 7 6	+12	—	—	e 7 37	pP	—
La Paz	z.	38·8	142	i 7 10k	+ 2	12 53	+ 2	—	—	17·0
Saskatoon		38·9	345	e 9 41	?	i 14 0	sS	—	—	15·8
Grand Coulee		40·0	331	e 7 17	− 1	e 14 17	sS	e 8 0	pP	—
Sitka		53·7	332	e 11 4	PP	i 16 22	+ 1	i 17 44	sS	e 22·3
College		62·5	336	—	—	e 19 36	sS	—	—	e 26·0
Toledo		78·3	52	i 11 41k	+ 1	—	—	—	—	—
Malaga	z.	78·6	54	i 11 43k	+ 1	—	—	—	—	—
Neuchatel		84·5	42	e 12 23	+10	—	—	—	—	—
Basle		84·8	42	e 12 15	+ 1	—	—	—	—	—
Zürich		85·5	42	e 12 17	0	—	—	e 13 11	pP	—
Cheb		87·0	38	—	—	e 22 47?	+ 2	—	—	—
Collmberg	z.	87·0	37	e 12 23	− 2	—	—	e 13 12	pP	—
Helwan		108·8	51	e 15 15	?	—	—	i 18 37	PP	—
Ksara		110·0	45	i 18 44	PP	e 28 22	PS	—	—	—
Riverview	z.	121·1	238	—	—	e 29 50	PS	—	—	—
Bombay		142·7	26	e 22 23	PP	e 33 47?	PS	—	—	—
Hyderabad	N.	146·1	18	19 17	[+ 1]	22 35	PP	—	—	—

Additional readings :—
Bogota i =4m.25s.
Port au Prince e =6m.14s.
Columbia e =5m.31s.
St. Louis iPPZ =5m.42s., isPZ =5m.59s., isSN =9m.53s.
Florissant iPPN =5m.42s., isPN =5m.59s., iSE =8m.59s., isSZ =10m.2s.
San Juan i =7m.45s., iS =9m.10s.
Cincinnati PP =6m.8s., i =9m.28s., isS =10m.30s.
Tucson i =6m.5s., iP_cP =8m.37s., iS =9m.30s., esS =10m.30s., iS_cP =11m.56s.
Chicago e =6m.14s. and 9m.13s., eS =9m.37s., isS =11m.7s.
New Kensington eP_cP? =8m.22s.
Philadelphia eP_cP =8m.47s., e =10m.34s.
Palomar iZ =6m.37s., isPZ =7m.55s., iZ =8m.15s., iP_cP =8m.44s., iS_cPZ =12m.11s.
Riverside iP_cP =8m.50s., epP_cPZ =9m.45s.
Rapid City isS =12m.3s.

Continued on next page.

Pasadena isPZ = 7m.6s., iP$_c$P = 8m.53s., ipP$_c$PZ = 9m.44s., esS?N = 12m.12s., iS$_c$PZ = 12m.15s., iS$_c$SEN = 16m.10s.
Huancayo ePP = 7m.13s., iS$_c$S = 16m.19s.
Salt Lake City e = 6m.11s., i = 12m.16s. and 13m.10s., iS$_c$S? = 15m.12s.
Logan ePP = 7m.24s., eS = 10m.4s.
Harvard iPPP = 7m.32s.
Tinemaha isPZ = 7m.21s., iP$_c$P = 8m.56s., iS$_c$SEN = 16m.19s.
Ottawa PPP = 7m.27s., SS = 12m.29s.
Bozeman eS$_c$S? = 16m.33s.
Butte iS = 13m.20s.
Grand Coulee esP = 8m.22s.
Collmberg eZ = 12m.30s., 13m.15s., 13m.25s., 13m.54s., and 15m.47s.
Helwan e = 19m.39s.

Jan. 5d. 19h. 57m. 19s. Epicentre 15°·5S. 167°·1E.

A = −·9398, B = +·2152, C = −·2656; δ = +8; h = +6;
D = +·223, E = +·975; G = +·259, H = −·059, K = −·964.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	17·7	225	i 4 8	− 2	i 8 30	+64	—	—	e 9·7
Apia		20·5	89	i 4 42	0	e 9 38	+71	—	—	e 13·9
Auckland		22·3	164	6 1	+60	10 23	+81	6 43	PP	11·9
Riverview		23·2	216	i 5 12a	+ 3	i 9 22	+ 4	i 5 29	PP	—
Arapuni		23·7	163	6 41	+87	9 41	+14	10 41	SSS	12·2
New Plymouth		24·3	166	5 23	+ 3	9 42	+ 5	—	—	—
Wellington		26·5	168	5 41	0	10 3	−11	6 46	PPP	13·4
Kaimata		27·2	173	5 48	+ 1	10 26	+ 1	i 9 16	P$_c$P	13·7
Christchurch		28·3	172	5 55	− 2	10 41	− 2	—	—	13·3
Perth		49·3	241	9 11	+18	16 6	+ 7	10 41	PP	23·7
Honolulu		50·2	45	e 9 0	0	e 16 9	− 2	e 11 2	PP	i 20·5
Tokyo		57·1	335	e 9 59	+ 9	—	—	—	—	—
Miyazaki		58·2	325	9 58	0	e 18 1	+ 2	—	—	—
Mizusawa		59·5	338	10 12	+ 5	e 18 17	+ 1	—	—	—
Hukuoka		60·1	326	—	—	22 41	SS	—	—	27·9
Sapporo		62·9	340	e 10 23	− 7	e 19 0	0	e 20 23	S$_c$S	e 26·8
Pehpei		73·2	309	e 11 48	+13	e 21 15	+13	—	—	—
Ukiah		84·6	48	e 12 37	+ 1	e 23 1	− 2	e 15 46	PP	e 35·2
Berkeley		84·8	50	12 36	− 1	23 7	+ 2	12 53	pP	35·6
Santa Clara		84·8	50	i 12 38	+ 1	e 23 3	− 2	—	—	e 38·5
Santa Barbara		85·4	53	e 12 44	+ 4	—	—	—	—	—
Calcutta	N.	85·8	295	e 12 18	−24	i 22 47	−28	23 37	PS	e 40·9
Shasta Dam		85·9	46	i 12 41	− 2	e 22 48	−28	i 13 15	?	—
Pasadena		86·4	54	i 12 44	− 1	i 23 8	[− 2]	e 16 0	PP	e 35·5
Irkutsk		86·5	327	12 46	0	23 6	[− 5]	16 8	PP	—
Mount Wilson	Z.	86·5	54	i 12 44	− 2	—	—	—	—	—
La Jolla		86·7	55	e 12 46	− 1	—	—	—	—	—
Sitka		86·9	28	e 14 15	?	i 23 11	[− 2]	e 24 24	PS	e 35·9
Riverside		87·0	54	i 12 46	− 2	—	—	—	—	—
College		87·1	18	e 12 49	0	e 23 44	+16	e 16 16	PP	e 36·9
Palomar		87·2	55	i 12 49	0	—	—	—	—	—
Haiwee		87·3	52	i 12 48	− 2	—	—	—	—	—
Tinemaha		87·4	51	i 12 49	− 1	e 23 30	0	i 30 44	PKKP	—
Victoria		88·5	39	e 13 11	+15	i 23 20	[− 4]	i 25 3	PPS	40·7
Seattle		88·8	40	—	—	e 23 26?	[0]	e 24 14?	S	e 33·3
Colombo	E.	89·2	277	—	—	23 29	[+ 1]	—	—	—
Boulder City		89·6	53	i 12 59	− 2	e 23 24	[− 6]	e 38 39	P'P'	e 42·7
Pierce Ferry		90·3	53	i 13 2	− 2	e 23 35	[0]	i 16 40	PP	—
Grand Coulee		91·0	40	e 13 5	− 2	e 24 22	+19	i 16 40	PP	—
Tucson		91·6	57	e 13 9	− 1	e 23 37	[− 5]	i 16 50	PP	e 36·8
Kodaikanal	E.	92·3	281	e 14 36	+83	i 25 16	+61	e 18 11	PP	—
Hyderabad	N.	93·3	287	e 13 13	− 5	24 11	{+ 5}	16 37	PP	42·9
Salt Lake City		93·4	49	e 13 19	+ 1	i 23 51	[− 1]	e 16 44	PP	e 38·9
Logan		93·7	48	e 13 18	− 2	e 23 24	[−30]	i 24 56	S	e 42·3
Butte		94·5	43	e 13 52	+29	e 26 7	PS	e 31 13	SS	e 38·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Bozeman		95·4	45	e 13 31	+ 3	i 24 1	[− 2]	e 16 57	PP		e 38·4
New Delhi	N.	97·2	298	e 13 36	0	i 24 6	[− 7]	17 1	PP		43·6
Tacubaya		98·4	72	e 15 31	?	e 24 15	[− 4]	e 17 45	PP		e 47·5
Bombay		98·8	287	e 13 39	− 4	e 24 15	[− 6]	i 35 58	SSS		40·7
Saskatoon		99·8	39	18 0	PP	24 22	[− 4]	27 0	PS		40·7
Rapid City		100·4	47	e 14 21	+31	i 24 29	[0]	e 17 57	PP		e 41·1
Vera Cruz		101·2	73	i 15 11	+77	e 25 35	+ 5	i 17 37	PP		46·0
Frunse		102·2	312	17 43	PP	24 39	[+ 1]	—	—		—
Andijan		103·5	309	e 14 7	+ 3	33 29	SS	18 30	PP		—
Lincoln		104·6	51	e 18 29	PP	e 26 14	+15	e 21 2	PPP		e 52·1
Tchimkent		105·8	311	e 18 46	PP	—	—	—	—		—
Stalinabad		105·9	307	e 18 9	PKP	e 25 55	−15	—	—		—
Tashkent		105·9	310	e 14 13	P	i 24 53	[− 2]	18 0	PKP		—
Florissant		109·2	54	i 18 58	PP	i 25 7	[− 2]	i 28 40	PS		—
St. Louis		109·3	54	e 19 2	PP	e 25 9	[0]	e 19 16	pPP		—
Tananarive		111·4	243	19 28	PP	25 30	[+12]	28 42	PS		54·3
Chicago		111·5	50	e 19 11	PP	e 24 59	[−19]	e 28 56	PS		e 45·5
Sverdlovsk		111·8	326	e 14 41	P	i 25 18	[− 2]	e 19 20	PP		—
Huancayo		112·4	111	e 19 23	PP	e 25 29	[+ 7]	e 21 32	PPP		e 46·0
Cincinnati		113·8	53	i 19 30	PP	—	—	i 29 8	PS		e 53·7
La Plata	E.	114·1	141	19 23	PP	29 4	PS	21 47	PPP		53·0
	N.	114·1	141	18 53	[+12]	29 9	PS	19 29	PP		54·2
Columbia		116·5	59	e 20 5	PP	e 26 19	[+41]	e 29 37	PS		e 47·8
La Paz		116·9	118	e 15 7	P	i 25 7	[−32]	i 19 53	PP		54·7
Bogota		119·0	93	e 18 51	[0]	—	—	—	—		—
Ottawa		119·9	46	18 50	[− 2]	26 23	[+33]	20 23	PP		56·7
Baku		120·5	309	e 19 11	[+17]	e 36 42	SS	e 20 32	PP		—
Philadelphia		121·0	53	e 16 1	?	e 27 49	{+29}	e 19 7	PKP		e 51·1
Shawinigan Falls		121·7	44	e 17 56	[−60]	—	—	—	—		55·7
Fordham		121·9	52	e 18 54	[− 2]	i 25 54	[− 2]	e 20 28	PP		51·1
Seven Falls		122·9	43	19 5	[+ 7]	27 53	{+20}	20 32	PP		59·7
Harvard		123·3	49	e 18 59	[0]	e 30 58	PS	e 20 48	PP		e 59·2
Weston		123·5	49	e 15 41	P	—	—	e 18 59	PKP		—
Moscow		124·4	329	16 18	P	—	—	e 20 57	PP		—
Erevan		124·7	309	e 18 54	[− 8]	—	—	—	—		—
Leninakan		125·1	310	e 19 5	[+ 2]	—	—	—	—		—
Ivigtut		127·8	21	—	—	32 25	PPS	—	—		56·7
Halifax		128·5	45	22 29	SKP	33 17	PPS	38 41?	SS		54·7
San Juan		129·2	79	i 21 20	PP	e 26 3	[−15]	i 22 21	SKP		e 55·4
Bermuda		130·3	61	e 19 13	[0]	i 22 36	SKP	e 21 26	PP		e 52·0
Upsala		130·4	341	—	—	e 22 33	SKP	e 43 41?	SSS		e 56·7
Yalta		131·0	316	e 19 17	[+ 3]	—	—	—	—		—
Ksara		132·5	302	i 19 18	[+ 1]	—	—	21 50	PP		—
Copenhagen		135·4	341	e 19 22	[0]	i 22 55	SKP	40 11	SS		—
Bucharest		136·2	320	e 22 5	PP	e 22 14	SKP	—	—		64·7
Helwan		137·0	298	e 19 31	[+ 6]	29 1	{− 2}	22 14	PP		—
Aberdeen		137·6	352	i 22 12	PP	i 23 3	SKP	i 34 38	PPS		65·5
Budapest	E.	138·6	328	19 30	[+ 2]	—	—	e 22 26	PP		64·7
	N.	138·6	328	19 34	[+ 6]	(e 39 41?)	SS	e 22 29	PP		e 39·7
Collmberg		138·7	336	e 22 26	PP	e 32 5	PS	e 23 3	SKP		e 63·7
Sofia		138·8	319	19 34	[+ 6]	e 40 41	SS	i 22 25	PP		62·7
Prague		139·0	334	e 21 41?	?	e 32 5?	PS	e 22 13	PP		e 59·7
Kalossa	N.	139·2	327	e 19 24	[− 5]	e 23 0	SKP	—	—		—
Belgrade		139·4	323	e 21 23	?	e 26 58	[∓20]	e 21 55	PP		e 59·2
Jena	E.	139·5	336	e 19 53	[+23]	e 22 54	SKP	—	—		—
	Z.	139·5	336	e 19 48	[+18]	e 22 50	SKP	—	—		—
Durham		139·8	350	i 22 30	PP	i 23 10	SKP	i 23 33	?		—
Cheb		139·9	336	e 22 35	PP	e 27 8	[+29]	e 23 33	SKP		e 62·7
De Bilt		140·8	343	i 19 29k	[− 3]	e 40 51	SS	i 22 35	PP		e 62·7
Zagreb		141·3	328	e 19 30	[− 3]	—	—	22 41?	PP		e 103·7
Uccle		142·1	344	e 19 30k	[− 4]	e 23 8	SKP	e 20 0	pPKP		e 60·7
Triest	Z.	142·5	330	i 19 31	[− 4]	—	—	i 19 47	PKP_2		—
Kew		142·7	348	i 19 33	[− 2]	e 23 4	SKP	i 22 43	PP		e 62·7
Strasbourg		142·9	338	e 19 28	[− 8]	e 29 58	{+20}	i 22 37	PP		72·4
Chur		143·6	335	e 19 33	[− 4]	—	—	e 22 53	PP		—
Zürich		143·6	336	e 19 34a	[− 3]	—	—	e 22 51	PP		—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Basle		143·8	337	e 19 34	[− 3]	—	—	e 26 9	PPP	—
Neuchatel		144·5	337	e 19 37	[− 1]	—	—	—	—	—
Paris		144·5	343	i 19 37	[− 1]	e 30 37	{+50}	i 22 49	PP	e 72·7
Besançon		144·7	337	e 19 41	[+ 2]	e 37 41	?	e 23 23	PP	e 37·7
Florence		145·1	330	i 19 41a	[+ 2]	i 29 51	{ 0}	i 23 17	SKP	i 66·0
Rome		145·8	326	i 19 40	[− 1]	i 33 25	PS	i 22 44	PP	e 64·5
Clermont-Ferrand		147·0	340	i 19 46s	[+ 3]	—	—	i 23 13	PP	e 70·7
Barcelona		151·1	337	20 0	[+11]	—	—	23 23	PP	76·4
Tortosa		152·2	338	i 19 59	[+ 8]	31 25	{+55}	20 14	PKP_2	e 72·5
Toledo		154·5	345	i 19 55	[+ 1]	i 26 59	[0]	i 20 22	PKP_2	75·7
Alicante		154·8	338	19 56	[+ 2]	26 44	[−15]	20 18	PKP_2	73·9
Lisbon		156·6	353	19 59k	[+ 2]	30 38	{−17}	20 30	PKP_2	73·7
Granada		156·9	342	i 20 10k	[+13]	26 55	[− 7]	20 56	PKP_2	77·5
Malaga	z.	157·6	343	i 19 57k	[− 1]	i 27 20	[+18]	i 21 46	PKP_2	70·5

Additional readings :—
Auckland PP =6m.27s., sP =7m.15s., pPP =7m.41s., sPP? =8m.26s., P_cP? =8m.59s., S_cS =17m.17s.
Riverview iP_cPN =8m.45s., iE =9m.26s., iNZ =9m.30s., iE =9m.37s., isS?E =9m.49s.
Wellington iZ =6m.1s., sPPZ =8m.6s., sP_cS =10m.31s., S_cP =11m.54s., S_cS? =16m.32s.
Christchurch E =8m.17s., EN =9m.55s.
Perth i =12m.41s., SS =19m.36s., SSS =20m.19s.
Honolulu ePPP =12m.8s., e =14m.56s., iS =16m.16s., e =19m.27s.
Ukiah ePPP? =17m.51s., ePS? =24m.5s., e =28m.13s.
Berkeley P_cP? =13m.15s., S =22m.2s., SKS =22m.53s., SS =27m.10s., SSS =32m.17s.
Calcutta iSSN =28m.5s., iSSSN =31m.58s.
Pasadena eSKSEN =23m.4s., iPSZ =24m.12s., iSSSN =32m.24s.
Irkutsk PPS =24m.26s.?, SS =28m.41s.
College eSKS =23m.6s., ePS =24m.34s., eSS =29m.0s.
Tinemaha ePKP,PKPZ =38m.54s.
Seattle iSS =30m.20s.?
Boulder City i =13m.31s.
Grand Coulee i =13m.13s. and 13m.36s., eSKS =23m.11s.
Tucson i =13m.28s., ePPP =18m.53s., iSKS =23m.47s., i =25m.22s., eSS =30m.1s., ePKKP =30m.29s., eSSS =33m.51s., ePKP,PKP =38m.40s.
Kodaikanal SSE =31m.31s.
Hyderabad PN =13m.20s., SKSN =23m.50s., SSN =30m.19s.
Salt Lake City e =13m.42s., iPS? =25m.54s., e =30m.58s., eSSS =34m.30s.
Logan eSSS =34m.17s.
Bozeman iPS =26m.18s., eSS =30m.41s., eSSS =34m.57s.
New Delhi iN =25m.1s. and 25m.15s., SSN =31m.32s.
Tacubaya ePPN =17m.16s., eN =18m.24s., eE =19m.2s., eN =19m.6s., iPPPE =19m.39s., iPPPN =19m.42s., ePSE =26m.13s., iPSN =26m.24s., eE =26m.39s., iPPSN =26m.57s., eE =27m.41s., eSSE =31m.53s., eSSSE =35m.41s., eSSSN =35m.46s.
Saskatoon SS =32m.49s., SSS =35m.59s.
Rapid City ePPP =20m.19s., eSKS =24m.25s., eS =25m.30s., ePS =27m.0s., eSS =32m.25s., e =35m.47s.
Vera Cruz eE =16m.27s., eS?N =25m.40s., ePSE =26m.35s., ePPSN =27m.8s., eN =28m.3s., eE =31m.3s. and 35m.1s.
Lincoln ePS? =27m.47s., eSS =33m.23s.
Tashkent ePP =18m.39s., eS =25m.43s.
Florissant iE =25m.33s., iSKKSE? =26m.19s.
St. Louis iE =25m.22s., iSKKSE? =26m.23s., ePSE =28m.25s., iE =28m.42s., iZ =30m.8s., iSSE =34m.17s., iE =34m.48s.
Tananarive SS =35m.6s., SSS =38m.45s.
Chicago e =20m.48s., eS? =27m.7s., eSS =34m.27s., eSSS =38m.59s.
Huancayo ePS =29m.4s., eSS =34m.58s., eSSS =39m.4s.
Cincinnati i =19m.51s., iSKP =20m.56s.
La Plata E =30m.29s., SSN =34m.53s., N =40m.5s., E =42m.59s., QN =47·6m.
Columbia eSS =35m.23s., e =43m.1s.
La Paz SKKS =26m.46s., PSZ =29m.45s., PPSZ =30m.55s., SSZ =36m.21s.
Ottawa PS =29m.53s., SS =36m.53s.
Philadelphia ePS =30m.4s., eSS =36m.54s.
Fordham iPS =30m.50s., iSS =37m.4s.
Seven Falls PS =30m.41s., SS =38m.6s.
Harvard ePKS =22m.30s., e =23m.4s., ePPP =23m.47s., ePPS =32m.21s., eSS =37m.39s.
Weston ePP =20m.40s.
San Juan iPPP =24m.3s., ePS =32m.6s., iPPS =33m.17s., e =36m.49s., eSS =38m.50s., i =41m.16s., eSSS =43m.31s.
Bermuda ePPS =33m.11s., eSS? =39m.10s.
Copenhagen 35m.11s.
Helwan e =19m.53s., SKP =23m.1s., PSKS =32m.23s., PPS =34m.38s., SS =40m.23s.

Continued on next page.

Aberdeen iEN =45m.18s., QEN =57m.7s.
Collmberg eE =23m.19s., eN =24m.14s., ePPN =28m.2s., ePKSN =28m.47s., eE = 29m.23s., eSKKSN =34m.31s., ePPSN =40m.2s., eN =42m.41s., eN =52m.7s.; readings wrongly identified.
Sofia iE =23m.6s., iSSEN =46m.17s.?
Prague eSS =40m.23s.?, eSSS =45m.11s.?
Kalossa ePE =19m.28s.
Belgrade e =23m.41s.?
Cheb ePS =34m.20s., eSS =41m.20s.
De Bilt iZ =19m.51s.
Uccle eZ =21m.28s., 22m.29s., and 22m.43s. iPPN =22m.51s., eE =36m.25s., eSSEN = 41m.6s., esSSE =42m.6s., eSSSN =46m.48s.
Triest iPPZ =22m.51s.?, ipPPZ =23m.27s.
Kew eN =19m.48s., iZ =21m.29s., ePS?E =33m.29s.?, eSS?E =41m.41s.?
Strasbourg e =19m.31s., 20m.2s., 20m.58s., and 22m.46s., ePPP =25m.52s., e =28m.56s., 31m.28s., and 36m.38s., iSS =41m.32s.
Paris i =20m.11s., e =20m.41s. and 21m.39s., i =23m.21s., eSKSP? =34m.5s., eSS = 41m.39s., eSSS =47m.2s., eQ =61·7m.
Florence iPPS =35m.14s., iSS =41m.51s., iSSS =46m.47s.
Rome iN=22m.2s., ePSZ =35m.28s.?, ePPSZ =36m.30s., eZ =38m.38s., eSS =42m.51s., eSSSZ =46m.50s.
Tortosa iEN =20m.25s., SKPN =23m.56s., PPN =24m.19s., eSSSE? =53m.16s.
Toledo iZ =21m.38s., PPZ =23m.54s., iPPPN =27m.32s., iSKKSN =30m.45s., SKSP = 34m.17s., PPSN =37m.7s., SSE =43m.40s., SSPN =44m.31s., SSSE =48m.36s., SSSN($\Delta > 180°$) =60m.27s., Q =65·7m.
Alicante SKP =23m.38s., PP =23m.48s., PPP =27m.18s., PKKP =28m.28s., SKKS = 30m.42s., SKKKS =31m.20s. PKKS =32m.14s., PSKS =33m.10s., PPS =37m.6s., SS =44m.1s., SSS =49m.30s., PSSS =50m.4s., Q =63m.30s.
Lisbon Z =20m.45s., SKP? =23m.26s., PPZ =24m.11s., NZ =25m.50s., Z =26m.3s., PPSZ =37m.5s., PPSE =37m.11s., SSE =43m.41s.?, SSPN =45m.6s., SSSN = 50m.9s., SN =63·4m.
Granada PKP_1 =20m.44s., iPP =24m.7s., pPP =24m.26s., PPP =27m.50s., SKKS = 30m.44s., SKSP =34m.25s., SS =43m.59s., SSS =50m.9s., Q =66·4m.
Malaga iPPZ =24m.12s., iPPPZ =28m.0s., P_cP,PKPZ =30m.22s., iPPP ($\Delta > 180°$) = 32m.55s., SKKKSZ =36m.42s., SKS,SKSZ =44m.54s., QZ =57·5m.
Long waves were also recorded at Bergen and Edinburgh.

Jan. 5d. Readings also at 1h. (Tinemaha, Tucson, and Bogota), 3h. (Tucson, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, and Pasadena), 4h. (near Stalinabad, 6h. (La Paz, Santa Lucia, and near Stalinabad), 7h. (Bogota and La Paz), 10h. (Malaga), 12h. (Tinemaha, Pasadena, Mount Wilson, Riverside, Tucson, and near La Paz), 15h. (Riverview, St. Louis, Tucson, Palomar, Pierce Ferry, Boulder City, Riverside, Overton, Mount Wilson, Pasadena, Tinemaha, Grand Coulee, Auckland, Christchurch, and Wellington), 16h. (Riverview, Tucson (2), Pierce Ferry, Boulder City, Palomar, Riverside, Mount Wilson, Pasadena, Haiwee, Tinemaha, Grand Coulee, and Shasta Dam), 17h. (near Andijan and Stalinabad).

Jan. 6d. 1h. 56m. 11s. Epicentre 41°·9N. 143°·6E. Depth of focus 0·005.
(as on 1943, June 21d.).

Intensity V at Sannohe (Aomori Pref.), Attoko (Hokkaido); IV at Hatinohe and Nemuro.
Epicentre 41°·9N. 143°·9E. Depth 50kms. Macroseismic radius 200-300km.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the Year 1946, Tokyo, 1951, p.5, isoseismic chart p.5.

$A = -·6009$, $B = +·4430$, $C = +·6653$; $\delta = -5$; $h = -2$;
$D = +·593$, $E = +·805$; $G = -·536$, $H = +·395$, $K = -·747$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Nemuro		2·0	46	0 16	−16	0 38	−19
Sapporo		2·0	305	0 26	− 6	0 49	− 8
Hatinohe		2·1	229	0 37	+ 3	1 1	+ 2
Mori		2·3	275	0 25	−12	0 54	−10
Miyako		2·6	208	0 38	− 3	1 11	− 1
Morioka		2·9	220	0 45	0	1 20	+ 1
Mizusawa	E.	3·4	216	0 53	+ 1	1 29	− 3
Sendai		4·2	211	1 5	+ 2	1 55	+ 3
Hukusima		4·8	212	0 58	−14	1 55	−12
Mito		6·0	205	1 8	−20	—	—
Tukubasan		6·3	207	1 28	− 4	—	—
Nagano		6·7	221	2 35	+57	—	—
Tokyo		6·8	207	1 39	0	3 1	+ 5
Misima		7·7	210	2 2	+10	3 23	+ 4

Jan. 6d. Three shocks probably with origin in Arabian Sea.

I. 9h.

Bombay ePN =24m.47s., eE =27m.12s.
Stalinabad eP =26m.8s.
Tashkent eP =26m.24s., eS =31m.51s.
New Delhi eSN =27m.8s.
Leninakan eP =27m.47s.
Ksara eP =28m.24s., eS =33m.28s.
Dehra Dun eN =29m.6s.
Hyderabad eSN =29m.8s., SSN =29m.30s., LN =31m.10s.

II. 9h.

Bombay ePEN =59m.35s., eSN =iSE =62m.35s., LEN =64m.9s.
New Delhi ePN =59m.43s., iSN =61m.47s., eE =61m.51s., iE =63m.28s., P_cPE = 66m.7s.
Hyderabad ePN =60m.5s., PPN =60m.13s., eSN =63m.28s., SSN =64m.22s., LN = 65m.31s.
Stalinabad P =60m.35s., iS =65m.45s.
Tashkent P =60m.46s.
Kodaikanal ePE =61m.30s., eSE =65m.10s., LE =67m.10s.
Leninakan eP =62m.25s.
Ksara eP =63m.2s., eS =68m.6s.
Dehra Dun eN =63m.30s. and 65m.41s.
Collmberg eZ =65m.45s., 65m.48s., 65m.55s., 66m.28s., 66m.39s., 66m.51s., and 67m.12s.
Long waves also recorded at European stations.

III. 10h.

Hyderabad PN =18m.54s., SN =22m.5s., SSN =23m.29s.
Bombay ePEN =19m.5s., eSN =iSE =22m.5s., LN =23m.33s.
New Delhi eE =19m.21s., iSN =21m.12s., eSE =21m.17s., P_cPN =25m.34s.
Stalinabad eP =20m.16s., iS =24m.16s.
Tashkent eP =20m.27s.
Andijan eP =20m.33s.
Kodaikanal ePE =20m.45s., eSE =24m.35s., LE =26m.35s.
Dehra Dun eN =22m.17s. and 24m.48s.
Ksara e =23m. and 27m.38s.
Collmberg eZ =25m.16s., 25m.19s., 25m.25s., 25m.59s., 26m.11s., and 26m.22s.
Kew eP? =32m.48s.?, ePPP?EN =35m.46s.?, eSZ =39m.28s.?, eL =48m.
Long waves were also recorded at Paris, Upsala, Rome, Uccle, De Bilt, Bergen, Tucson, and La Paz.

Jan. 6d. Readings also at 6h. (Bogota), 8h. (Riverview) 9h. (Cheb), 10h. (near Alicante), 12h. (Ksara), 13h. (Riverview and Wellington), 15h. (Auckland, Arapuni, Christchurch, Wellington, and Riverview), 16h. (Riverview and Wellington), 17h. (Arapuni, Ksara, and near Granada), 20h. (Santa Lucia), 22h. (Arapuni, Auckland, Christchurch, Wellington, Brisbane, and Riverview), 23h. (Pasadena and Tucson).

Jan. 7d. 6h. 13m. 58s. Epicentre 1°·2N. 121°·8E. (as on 1943, Sept. 12d.).

$A = -\cdot5268$, $B = +\cdot8497$, $C = +\cdot0208$; $\delta = -6$; $h = +7$;
$D = +\cdot850$, $E = +\cdot527$; $G = -\cdot011$, $H = +\cdot018$, $K = -1\cdot000$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		33·5	189	6 42	− 1	12 45	+20	7 55	PP	17·4
Brisbane	N.	41·4	136	e 7 51	+ 1	e 14 7	+ 2	i 17 11	SS	—
Colombo	E.	42·2	279	7 50	− 6	14 3	−14	—	—	23·2
Riverview		44·5	145	i 8 21k	+ 6	i 14 57	+ 6	i 10 7	PP	e 21·7
Kodaikanal	E.	45·0	286	i 8 25	+ 6	i 14 55	− 3	10 5	PP	—
Hyderabad	N.	45·6	294	8 21	− 3	14 56	−10	18 13	SS	21·8
Bombay		51·1	294	e 8 58	− 8	i 16 11	−13	—	—	26·4
Irkutsk		53·0	347	9 21	0	16 44	− 6	—	—	—
Frunse		59·1	321	e 10 13	+ 9	—	—	—		—
Andijan		59·5	318	e 10 10	+ 3	e 18 11	− 5	—	—	—
Tashkent		61·8	318	e 10 21	− 2	i 18 34	−12	—	—	—
Auckland		62·0	134	—	—	19 8	+20	—	—	33·8
Samarkand		62·7	314	10 20	− 9	—	—	—	—	—
Arapuni		63·1	135	—	—	—	—	27 2?	Q	33·4
Christchurch		63·6	141	10 15	−20	19 15	+ 7	12 54	PP	31·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Wellington		63·9	138	10 36	− 1	19 24	+12	14 42	PPP	33·5
Sverdlovsk		73·6	330	i 11 0	−37	i 20 14	−53	—	—	—
Baku		75·5	312	11 53	+ 5	i 21 19	− 9	—	—	—
Tananarive		75·5	251	i 11 43	− 5	21 16	−12	e 29 43	SSS	39·7
Erevan		79·5	310	e 12 15	+ 5	e 22 4	− 7	—	—	—
Leninakan		80·1	311	e 12 0	−13	—	—	—	—	—
Ksara		85·9	303	i 12 43	· 0	23 16	0	16 2	PP	—
College		89·1	26	—	—	e 23 25	[− 2]	e 23 50	S	e 37·0
Copenhagen		99·8	327	—	—	24 26	[0]	32 30	SS	46·0
Rome		103·5	314	e 18 24	PKP	—	—	—	—	e 60·3
De Bilt		105·1	326	—	—	e 29 2?	PPS	—	—	e 54·0
Uccle	E.	106·0	325	—	—	e 24 55	[0]	e 33 43?	SS	e 51·0
Tinemaha		112·7	49	e 18 42	[+ 3]	—	—	e 29 26	PKKP	—
Pasadena	Z.	113·8	52	—	—	—	—	i 29 22	PKKP	e 52·6
Mount Wilson	Z.	113·9	52	e 18 45	[+ 4]	—	—	—	—	—
Alicante		114·0	314	e 19 18	[+37]	—	—	38 50	SSS	e 64·6
Riverside	Z.	114·5	52	e 19 21	[+39]	—	—	e 29 19	PKKP	—
Boulder City		115·7	49	e 18 48	[+ 4]	—	—	e 20 0	PP	—
Toledo		115·9	316	e 19 57	PP	—	—	—	—	81·0
Pierce Ferry		116·3	48	e 18 51	[+ 5]	—	—	—	—	—
Granada		116·7	314	18 11	[−35]	26 41	{−11}	35 35	SS	e 79·5
Malaga		117·5	314	i 20 0	PP	—	—	—	—	—
Lisbon	Z.	120·0	317	14 32	?	—	—	—	—	—
Tucson		120·2	51	e 18 56	[+ 3]	e 28 27	{+72}	e 30 5	PS	e 56·2
Chicago		129·6	28	e 22 33	PKS	e 33 29	PPS	e 41 9	SSS	e 53·6
Florissant		130·4	33	i 22 37	PKS	e 28 23	{+ 1}	—	—	—
St. Louis		130·6	33	e 22 32	PKS	e 28 24	{ 0}	e 31 51	PS	—
Ottawa		131·1	16	e 19 14	[0]	—	—	e 22 32	PKS	39·0
Harvard		134·9	13	e 19 32	[+11]	e 22 49	PKS	e 22 8	PP	e 73·0
Weston		135·0	13	e 19 33	[+12]	—	—	e 22 1	PP	—
Bermuda		146·0	10	e 19 43	[+ 2]	e 43 25	SSP	e 22 24	PP	e 64·3
La Plata	N.	146·5	181	(19 33)	[− 9]	—	—	—	—	19·6
San Juan		159·0	21	e 20 32	[+32]	e 34 52	PS	e 24 34	PP	e 59·5
Huancayo		159·9	123	e 20 10	[+ 9]	e 32 16	?	e 25 24	PP	e 68·2
La Paz	Z.	161·9	148	i 20 6a	[+ 3]	26 52	[−14]	24 38	PP	80·0
Bogota		163·1	70	e 20 9	[+ 5]	—	—	—	—	—

Additional readings :—
Perth PPP =8m.20s., SS =14m.27s.
Riverview iZ =8m.54s., eEN =10m.37s., iPSE =15m.8s., iQE =18m.21s., iQZ =18m.37s.
Kodaikanal SSE =18m.35s.
Christchurch iEZ =10m.39s., EZ =11m.13s., PPPE =14m.34s., Z =15m.11s., S_eSEN = 20m.18s., N =22m.8s., SSE =23m.38s., SSSEN =26m.15s., SSSZ =26m.51s.
Wellington iZ =11m.19s., 11m.41s., and 12m.7s., SSZ =23m.8s., SSS =26m.54s.
Tananarive e =17m.19s.
Ksara SS =29m.8s.
College e =29m.12s.
Uccle ePPSE =28m.50s., eSSSE =37m.31s.
Granada PPS =29m.50s.
Tucson e =20m.17s.
Chicago e =47m.41s.
Florissant eN =22m.50s.
St. Louis iE =22m.49s., eSSN =38m.52s., eSSSN =41m.20s.
Bermuda i =23m.12s., e =30m.9s., 38m.17s., and 40m.20s.
La Plata LE =19m.44s. =PKPE.
San Juan e =45m.18s.
Huancayo eSS =45m.6s., eSSS? =50m.49s.
La Paz iZ =20m.50s., iSKPZ =23m.38s.
Long waves were also recorded at Ukiah, Salt Lake City, Philadelphia, Kew, Prague, and Upsala.

Jan. 7d. Readings also at 0h. (Collmberg and near Andijan), 3h. (near Bogota), 6h. (Lisbon), 9h. (near Frunse), 14h. (Auckland (2), Christchurch (2), Wellington (2), Brisbane, Riverview, and Ksara), 15h. (Zagreb, Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Santa Clara, Tucson, Pierce Ferry, Salt Lake City, Bozeman, Butte, St. Louis, Columbia, and near Shasta Dam), 16h. (Zagreb and near Stalinabad), 20h. (Tucson and near Mizusawa), 22h. (Riverview).

Jan. 8d. 18h. 54m. 19s. Epicentre 33°·1N. 116°·1W. (as on 1945, Aug. 15d.).

Intensity V at Dulzura, Imperial, Lakeside, Palm Springs, and San Diego. Felt less strongly in many other districts.
Epicentre 33°00′N. 115°50′W. Macroseismic area 12,000 square miles.

R. R. Bodle and L. M. Murphy.
United States Earthquakes, 1946, Serial No. 714, Washington, 1948, p.8.

$A = -\cdot3693$, $B = -\cdot7538$, $C = +\cdot5435$; $\delta = -1$; $h = +1$;
$D = -\cdot898$, $E = +\cdot440$; $G = -\cdot239$, $H = -\cdot488$, $K = -\cdot839$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla	1·0	256	i 0 21	0	i 0 34	− 2	—	—	—
Riverside	1·4	277	i 0 26	− 1	i 0 46	0	—	—	—
Mount Wilson	2·0	305	i 0 35	0	i 1 4	+ 2	—	—	—
Pasadena	2·0	301	i 0 35	0	i 1 5	+ 3	—	—	—
Boulder City	3·0	19	i 0 50	0	i 1 34	+ 7	i 0 59	P_g	—
Santa Barbara	3·2	294	i 0 56	+ 4	i 1 47	S_g	—	—	—
Haiwee	3·4	333	e 0 58	+ 3	i 1 47	S*	—	—	—
Pierce Ferry	3·5	30	i 0 56	− 1	i 2 5	S_g	—	—	—
Tinemaha	4·4	336	e 1 10	0	i 2 23	S_g	—	—	—
Tucson	4·5	100	e 1 9	− 2	i 2 11	+ 6	1 1 28	P_g	e 4·3
Santa Clara	6·4	313	—	—	i 3 35	S_g	—	—	—
Salt Lake City	8·4	23	—	—	e 3 0	?	—	—	e 4·5
Shasta Dam	9·1	328	e 2 47	P*	e 4 38	S*	—	—	—
Logan	9·3	21	e 3 46	?	i 4 2	− 3	—	—	e 4·9
Rapid City	14·9	39	e 4 1	?	—	—	—	—	e 7·8
Grand Coulee	15·0	352	e 4 11	+36	—	—	—	—	e 8·0
Florissant	21·6	69	—	—	e 9 4	+15	—	—	e 11·5
St. Louis	21·7	69	e 4 55	0	e 9 8	+17	—	—	e 11·4

Additional readings :—
Boulder City i = 1m.39s.
Tucson eS? = 1m.51s., iS = 1m.56s.
Shasta Dam i = 3m.17s., iS = 4m.43s.
Long waves were also recorded at Ukiah, Bozeman, Chicago, Weston, and Philadelphia.

Jan. 8d. Readings also at 0h. (Ksara), 3h. (Riverview), 7h. (Santa Lucia), 8h. and 9h. (Riverview), 14h. (Riverview and Wellington), 17h. (Frunse and near Andijan), 18h. (Bombay, Calcutta, and New Delhi).

Jan. 9d. Readings at 4h. (near Granada, Toledo, Almeria, and Malaga), 6h. (Riverview), 7h. (Tucson), 11h. (Helwan and near Frunse), 14h. (Riverview), 15h. (Auckland, Riverview, Pasadena, Palomar, Riverside, and Tucson), 18h. (near Balboa Heights), 20h. (La Paz), 21h. (Riverview, Palomar, Tucson, and near Santa Lucia), 23h. (Calcutta).

Jan. 10d. 23h. 37m. 38s. Epicentre 23°·7N. 99°·4E. (as on 1941, May 16d.).

Near the position suggested by U.S.S.R. It is doubtful whether the American observations should be included.

$A = -\cdot1497$, $B = +\cdot9044$, $C = +\cdot3996$; $\delta = +3$; $h = +4$;
$D = +\cdot987$, $E = +\cdot163$; $G = -\cdot065$, $H = +\cdot394$, $K = -\cdot917$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	10·2	266	e 3 3	+32	i 3 59	−28	—	—	—
New Delhi	N.	20·5	289	e 4 42	0	i 7 7	?	—	—	—
Hyderabad	N.	20·6	256	4 45	+ 2	8 3	−26	5 7	PP	—
Bombay	E.	25·2	264	e 5 32	+ 3	i 9 34	−18	i 6 4	PP	—
Almata		26·9	322	e 5 52	+ 7	—	—	—	—	—
Andijan		28·3	313	e 5 59	+ 2	10 49	+ 6	—	—	—
Stalinabad		29·9	307	i 6 2	−10	i 11 0	− 9	—	—	—
Tashkent		30·7	313	e 6 17	− 2	—	—	—	—	—
Tananarive		66·0	234	—	—	e 25 1	SS	e 28 41	SSS	29·6
Grand Coulee		100·8	25	e 15 5	P	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam		105·1	31	i 15 6	P	—	—	—	—	—
Tinemaha		109·9	31	e 15 26	P	—	—	—	—	—
Haiwee		110·8	31	e 15 25	P	—	—	—	—	—
Santa Barbara	z.	111·3	34	e 15 23	P	—	—	—	—	—
Mount Wilson		112·3	33	i 15 27	P	—	—	—	—	—
Pasadena		112·3	33	i 15 24	P	—	—	—	—	—
Boulder City		112·4	30	i 15 36	P	—	—	—	—	—
Pierce Ferry		112·7	29	i 15 40	P	—	—	—	—	—
Riverside	z.	112·8	33	e 15 29	P	—	—	—	—	—
Palomar	z.	113·6	32	e 15 31	P	—	—	—	—	—
Tucson		117·3	29	e 15 56	P	—	—	—	—	—
Bogota		151·1	346	i 20 26	[+37]	—	—	—	—	—

Additional readings :—
Calcutta $iS^*N = 4m.29s.$, $iS_gN = 4m.49s.$
Grand Coulee iP = 15m.10s.
Boulder City i = 15m.56s. and 16m.46s.
Bogota e = 20m.47s.

Jan. 10d. Readings also at 3h. (La Paz), 5h. (near Balboa Heights), 7h. (Bogota and La Paz), 13h. (near Andijan, Almata, and Tashkent), 14h. (Riverview), 15h. (Riverview), 19h. (Calcutta and Mizusawa), 20h. (Port au Prince), 21h. (near Tananarive), 22h. (Tucson).

Jan. 11d. 1h. 33m. 28s. Epicentre 44°·9N. 130°·4E. Depth of focus 0·080.
(as on 1940, July 10d.).

Intensity II-III at Hatinohe, Kashiwara, Tokyo, and Shizuoka. Felt in Manchuria.
Epicentre 45°·0N. 131°·0E. Depth 600km.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1946, Tokyo, 1951, pp. 5-6.

Macroseismic radius greater 300km. (Tokyo), 44°N., 129°·5E., depth 550km. (Pasadena); 45°·3N. 129°·7E. (Strasbourg).
Annales de l'Institut de Physique du Globe de Strasbourg pour l'année, 1946, 2ème partie, Séismologie, Nouvelle série, Tome XI, p. 43.

$A = -·4606$, $B = +·5412$, $C = +·7035$; $\delta = -4$; $h = -3$;
$D = +·762$, $E = +·648$; $G = -·456$, $H = +·536$, $K = -·711$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mori		7·9	107	2 2k	+ 5	3 44	+13	13 42	S_cS	—
Sapporo		8·0	99	2 3k	+ 5	3 39	+ 7	13 41	S_cS	—
Wazima		9·0	144	2 8k	0	3 50	− 1	13 33	S_cS	—
Hatinohe		9·3	114	2 19	+ 8	3 58	+ 2	13 46	S_cS	—
Morioka		9·5	119	2 16k	+ 2	4 4	+ 4	—	—	—
Toyama		9·7	145	2 18	+ 2	4 4	0	13 45	S_cS	—
Mizusawa	E.	9·8	122	i 2 19	+ 2	i 4 1	− 5	—	—	—
Toyooka		10·0	158	2 32k	+13	—	—	—	—	—
Hamada		10·1	172	2 18	− 2	4 14	+ 3	—	—	—
Miyako		10·1	118	2 20k	0	4 8	− 3	13 44	S_cS	—
Nagano		10·1	142	2 23k	+ 3	4 3	− 8	—	—	—
Sendai		10·3	126	2 22k	0	4 14	− 1	13 44	S_cS	—
Hukusima		10·4	130	2 23k	0	4 16	− 1	13 42	S_cS	—
Kyoto		10·7	156	2 27k	+ 1	4 24	+ 2	14 4	S_cS	—
Kobe		10·9	158	2 28	0	4 26	0	13 45	S_cS	—
Utunomiya		11·0	136	2 32k	+ 3	4 23	− 5	13 49	S_cS	—
Sumoto		11·1	160	2 31	+ 1	4 31	+ 1	—	—	—
Onahama		11·2	131	2 35	+ 4	4 32	0	—	—	—
Hukuoka		11·3	180	2 33k	+ 1	4 35	+ 1	—	—	—
Hunatu		11·4	143	2 10	−23	3 36	−60	—	—	—
Tukubasan		11·4	136	2 24k	− 9	4 21	−15	13 38	S_cS	—
Kôti		11·6	167	2 35	0	4 38	− 1	13 46	S_cS	—
Tokyo		11·6	139	2 35	0	4 38	− 1	13 48	S_cS	—
Owase		11·7	155	2 36k	0	4 40	− 1	13 48	S_cS	—
Shizuoka		11·7	145	2 36	0	4 39	− 2	13 49	S_cS	—

Continued on next page.

		Δ	Az.	P	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Misima		11·8	143	2 36	− 1	4 41	− 2	—	—	—
Yokohama		11·8	140	2 39	+ 2	4 38	− 5	13 48	ScS	—
Kumamoto		12·1	179	2 41	+ 1	—	—	13 47	ScS	—
Miyazaki		13·0	176	2 48	− 1	4 52	−13	—	—	—
Zi-ka-wei	N.	15·4	210	3 14	+ 1	5 50	+ 1	—	—	—
Pehpei		24·1	239	i 4 30	− 5	i 8 7	− 8	—	—	—
Almata		37·9	288	i 6 31	− 1	—	—	—	—	—
Frunse		39·6	288	i 6 45	− 1	e 12 7	− 4	—	—	—
Calcutta	N.	40·9	251	i 9 3	pP	i 14 28	sS	—	—	—
Andijan		42·0	286	i 7 5	0	i 12 47	+ 1	—	—	—
Tchimkent		43·2	289	i 7 15	0	e 13 2	− 1	—	—	—
Dehra Dun	N.	43·2	269	e 7 9	− 6	e 11 58	−65	—	—	e 15·9
Sverdlovsk		43·7	312	i 7 20	+ 2	i 13 7	− 3	i 9 2	pP	—
Tashkent		43·8	289	i 7 18	− 1	13 8	− 3	—	—	—
New Delhi	N.	44·8	267	i 7 25	− 2	i 13 20	− 5	i 9 23	pP	—
Stalinabad		45·5	285	i 7 30	− 2	—	—	9 14	pP	—
Samarkand		46·1	287	i 7 33	− 4	i 13 36	− 7	—	—	—
College		47·2	36	i 7 48	+ 2	i 14 0	+ 1	e 8 44	PcP	e 18·7
Hyderabad	N.	51·2	256	8 13	− 2	14 46	− 7	10 0	pP	—
Bombay		54·0	261	1 8 35	0	i 15 25	− 5	i 10 43	pP	—
Sitka		55·7	42	i 8 49	+ 2	i 15 56	+ 4	i 17 38	ScS	e 23·0
Moscow		56·0	317	8 47	− 2	15 49	− 7	10 37	pP	—
Kodaikanal	E.	56·9	250	i 8 34	−21	i 15 52	−16	e 10 19	pP	—
Baku		57·1	297	i 8 57	0	—	—	10 46	pP	—
Colombo	E.	57·8	245	8 55	− 6	16 7	−12	—	—	—
Upsala		62·1	329	i 9 26	− 4	i 17 6	− 7	i 18 16	ScS	—
Honolulu		62·5	87	i 9 33	+ 1	e 17 10	− 8	i 11 30	pP	e 26·9
Bergen	N.	65·9	334	—	—	—	—	e 13 32?	?	—
Victoria		66·8	45	—	—	i 18 8	− 1	—	—	—
Copenhagen		67·0	328	i 9 59	− 2	18 4	− 8	22 50	SS	—
Seattle		67·9	45	i 15 38	?	e 19 6	+44	—	—	e 29·1
Bucharest		68·6	312	i 10 9k	− 1	i 18 26	− 4	i 19 10	?	38·5
Campulung		68·6	313	e 10 0	−10	e 18 17	−13	—	—	—
Grand Coulee		69·4	42	i 10 15	0	e 18 33	− 6	i 12 17	pP	—
Ksara		69·9	298	i 10 17	− 1	19 9	+24	i 12 15	pP	—
Budapest		70·0	317	i 10 18	− 1	i 18 45	− 1	—	—	26·5
Collmberg		70·0	324	i 10 16	− 3	i 18 39	− 7	e 12 47	PP	e 26·5
Prague		70·3	323	i 10 18k	− 2	i 18 44	− 6	e 12 4	pP	e 25·5
Kalossa		70·7	316	i 10 23	0	e 19 33	+39	e 13 12	PP	—
Jena		70·9	324	i 10 48	+24	i 19 16	+20	i 12 45	pP	—
Belgrade		71·2	315	e 10 24k	− 2	e 18 40	−20	e 22 13	SS	25·7
Cheb		71·2	323	e 10 26	0	i 18 57	− 3	e 12 29	pP	e 39·5
Sofia		71·2	312	i 10 26k	0	i 18 57	− 3	i 12 25	pP	e 27·5
Saskatoon		71·6	34	10 30	+ 2	19 3	− 1	i 22 37	SS	—
De Bilt		72·5	328	i 10 32k	− 1	i 19 11	− 3	i 12 32	pP	—
Zagreb		72·7	318	e 10 29	− 5	i 19 42	+26	12 34	pP	e 27·8
Shasta Dam		72·7	49	i 10 36	+ 2	i 19 17	+ 1	i 12 36	pP	—
Ukiah		73·4	51	e 10 40	+ 2	i 19 24	0	e 22 58	sS	e 31·0
Butte		73·8	40	i 10 43	+ 2	i 19 29	+ 1	i 13 39	PP	—
Uccle		73·8	329	i 10 39k	− 2	i 19 23	− 5	i 12 40	pP	e 27·5
Triest		73·9	320	i 10 34	− 7	i 19 16	−13	i 12 34	pP	—
Strasbourg		74·2	324	i 10 41	− 2	i 19 27	− 6	i 12 39	pP	39·5
Ivigtut		74·3	359	—	—	i 19 29	− 5	—	—	—
Bozeman		74·7	40	e 10 47	+ 1	i 19 39	+ 1	e 13 43	PP	e 31·4
Berkeley		74·8	53	10 48	+ 2	19 40	+ 1	12 48	pP	—
Chur		74·8	323	i 10 46k	0	i 19 34	− 5	i 12 46	pP	—
Zürich		74·9	324	i 10 46k	− 1	e 19 36	− 4	i 12 43	pP	—
Brisbane		74·9	159	i 10 44	− 3	i 19 36	− 4	e 20 32	SKS	—
Kew		75·0	331	i 10 46	− 1	i 19 36	− 5	i 12 45	pP	e 28·5
Basle		75·1	324	i 10 47	− 1	e 20 3	+21	i 12 46	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		75·4	297	e 10 50	0	19 38	− 8	12 47	pP	—
Neuchatel		75·8	324	i 10 50	− 2	e 19 46	− 4	—	—	—
Paris		76·2	328	i 10 38	−16	e 19 32?	−22	i 12 38	pP	e 41·5
Florence		76·5	319	i 10 55k	− 1	i 19 57	0	i 12 59	pP	i 28·5
Rome		77·3	318	i 11 0k	0	i 20 2	− 4	i 13 59	PP	—
Logan		77·4	42	i 11 4	+ 4	i 20 8	+ 1	i 13 13	pP	e 31·9
Tinemaha		77·5	50	i 11 4a	+ 3	i 20 10	+ 2	i 40 13	pP'P'	—
Salt Lake City		78·1	44	i 11 7	+ 3	i 20 16	+ 2	e 14 10	PP	e 28·1
Clermont-Ferrand		78·4	325	i 11 5k	− 1	e 21 2	+45	i 13 7	pP	—
Haiwee		78·4	50	i 11 8a	+ 2	i 20 19	+ 2	i 13 11	pP	—
Santa Barbara		78·7	53	i 11 7	0	i 20 21	+ 1	i 13 15	pP	—
Rapid City		79·4	36	i 11 14	+ 3	i 20 26	− 2	i 13 22	pP	e 33·6
Mount Wilson		79·8	52	i 11 15a	+ 2	i 20 31	− 1	i 13 16	pP	—
Pasadena		79·8	52	i 11 13a	0	i 20 30	− 2	i 13 17	pP	e 32·3
Overton		80·0	48	i 11 17	+ 3	i 20 36	+ 2	—	—	—
Boulder City		80·2	48	i 11 17	+ 2	i 21 2	+26	e 13 20	pP	—
Riverside		80·3	52	i 11 17a	+ 1	i 20 35	− 2	i 13 19	pP	—
Pierce Ferry		80·5	47	i 11 19	+ 2	i 20 41	+ 2	—	—	—
Riverview		80·6	163	i 11 16a	− 1	i 20 36	− 4	i 13 21	pP	—
Palomar		81·1	52	i 11 21a	+ 1	i 20 46	+ 1	i 13 29	pP	—
La Jolla		81·2	52	i 11 22a	+ 2	i 20 46	0	i 13 29	pP	—
Barcelona		82·4	323	11 25	− 1	i 20 48	[− 5]	21 22	SP	33·2
Tortosa		83·6	323	i 11 30	− 2	i 20 51	[−10]	13 36	pP	—
Lincoln		84·8	34	—	—	i 21 6	[− 4]	e 25 0	sS	—
Tucson		85·2	49	i 11 42	+ 2	i 21 12	[0]	i 13 45	pP	—
Alicante		86·0	323	i 11 43	− 1	i 21 7	[−10]	i 13 49	pP	39·5
Toledo		86·2	327	i 11 44	− 1	i 21 12	[− 6]	i 13 50	pP	—
Seven Falls		86·5	15	11 46	0	21 15	[− 5]	i 21 33	S	41·5
Shawinigan Falls		86·7	16	11 46	− 1	21 16	[− 5]	—	—	—
Chicago		87·2	29	e 11 50	0	i 21 39	− 4	i 25 22	sS	e 34·5
Ottawa		87·2	19	11 49	− 1	21 17	[− 8]	i 21 37	S	34·5
Granada		88·3	325	i 12 15a	+20	i 21 22	[−10]	i 14 1	pP	32·8
Florissant		88·9	31	i 11 59	+ 1	i 21 56	− 2	i 14 6	pP	—
St. Louis		89·1	31	i 11 59	0	i 21 56	− 4	i 14 7	pP	—
Malaga	z.	89·1	325	i 11 58a	− 1	i 21 27	[− 9]	i 14 2	pP	32·3
Lisbon		89·2	329	11 51	− 8	21 51	−10	13 53	pP	35·2
Cape Girardeau	E.	90·6	31	—	—	i 22 10	− 3	i 21 38	SKS	—
Auckland		90·7	146	12 17	+11	22 17	+ 3	14 14	pP	—
Harvard		90·8	16	i 12 6k	0	i 22 11	− 4	i 14 13	pP	—
Weston		91·0	16	i 12 8	+ 1	i 22 13	− 4	e 14 13	pP	—
Fordham		91·9	18	i 12 14	+ 3	i 22 21	− 4	e 14 22	pP	—
Philadelphia		92·5	19	—	—	i 21 49	[− 6]	e 32 9	SSS	—
Arapuni		92·8	146	—	—	(21 32?)	[−24]	—	—	21·5
Wellington		94·6	148	12 18	− 6	22 51	+ 3	14 24	pP	—
Christchurch		95·7	151	12 28	− 1	22 5	[−10]	14 38	pP	32·5
Columbia		96·4	26	—	—	i 22 11	[− 6]	e 22 57	S	e 40·2
Tananarive		98·2	252	16 48	PP	23 11	− 7	22 17	SKS	—
Bermuda		102·0	12	—	—	e 22 37	[− 7]	i 23 47	S	—
San Juan		115·3	17	e 22 3	?	i 24 49	SKKS	i 25 37	S	e 50·0
Fort de France		119·7	12	e 16 38	PP	—	—	e 22 42	?	—
Bogota		126·0	30	i 18 1	[+ 1]	e 24 7	[− 7]	i 20 4	pPKP	—
Huancayo		140·5	42	e 18 25	[− 4]	e 31 34	SP	i 21 14	PP	—
La Paz	Z.	147·7	34	i 18 42	[+ 1]	25 30	[+34]	i 21 0	pPKP	75·5
La Plata	N.	168·2	34	29 55	SKKS	—	—	—	—	38·2

Additional readings :—
Mizusawa eSN =4m.7s.
Zi-ka-wei iN =3m.22s., 5m.52s., 6m.2s., and 13m.52s.
Calcutta iN =10m.50s. and 12m.7s.
Sverdlovsk isS =16m.10s.
New Delhi iN =7m.36s., 7m.47s., and 10m.13s., sSN =15m.45s., SSN =16m.10s., iN = 16m.49s., SSSN =17m.11s.
Stalinabad isS =16m.28s.
College e =10m.42s., eS_cS =16m.35s., esS =17m.7s.
Hyderabad pP?N =9m.22s., PPN =11m.9s., PN =12m.18s., ?N =13m.2s., SN = 16m.58s., ?N =19m.41s. : the readings are given as for three superimposed shocks.

Continued on next page.

Bombay isSEN =17m.21s., iE =19m.6s., iN =19m.19s., eE =23m.13s.
Sitka isS =19m.16s., e =21m.32s.
Moscow sS =19m.14s.
Kodaikanal SS?E =17m.32s., iE =21m.37s. and 28m.7s.
Upsala eN =11m.51s., eE =24m.32s.
Honolulu isP =12m.28s., epPP =13m.43s., eSS =20m.42s., i =21m.58s.
Victoria i =19m.8s.
Copenhagen 18m.56s. and 26m.9s.
Seattle e =20m.24s.
Grand Coulee i =11m.0s., iS =18m.38s., i =19m.54s., iPKP,PKP =38m.4s., epPKP,PKP =40m.28s., iSKP,PKP =40m.48s.
Ksara isP =13m.3s.
Collmberg e =10m.25s., ePcP =10m.54s., eE =11m.4s., eZ =11m.7s., 11m.18s., 11m.35s., 12m.11s., 12m.18s., and 12m.52s., e =13m.3s., eZ =13m.21s., 13m.34s., 13m.51s., 15m.19s., and 16m.6s., iZ =19m.1s., iNZ =19m.18s., eZ =19m.44s.
Prague ePP =13m.2s., ePPP =14m.32s., eSS =22m.18s., eSSS =23m.20s.
Kalossa e =11m.14s.
Jena i =19m.51s.
Belgrade e =10m.49s. and 11m.59s., eSSS =23m.32s.?
Cheb e =13m.15s., ePPP =15m.17s., eSS =22m.23s., e =27m.2s.
Sofia iEN =19m.32s.
Saskatoon SSS =26m.32s.?
De Bilt eSSS =26m.32s.?
Shasta Dam ePPP =15m.39s., i =19m.47s., iSKP,PKP =40m.32s.
Ukiah e =19m.56s. and 23m.14s.
Butte i =11m.6s., iScS =19m.47s., iSP =20m.31s., esS =22m.50s., i =23m.0s.
Uccle iE =11m.33s., iZ =12m.31s., ipPEN =12m.44s., iPPEZ =13m.36s., eSPEN =19m.48s., esSN =22m.49s.
Triest iPPZ =13m.20s., ipPPZ =15m.12s., esS? =22m.59s.
Strasbourg iPcP =10m.59s., i =11m.15s. and 11m.41s., e =12m.5s., isP =13m.39s., i =14m.3s., epPP =15m.22s., i =19m.52s., isS =22m.59s., eSS =24m.9s.
Bozeman iScS =19m.57s., esS =23m.9s., eSS =24m.46s., eSSS =28m.47s.
Berkeley sS =23m.12s.
Zürich ePP =13m.35s.
Kew ipP?NZ =10m.52s., isP?N =11m.6s., iN =13m.25s., iPS?Z =19m.42s., iPPS?N =20m.2s., iScS?EN =20m.59s., iE =21m.24s., eEN =21m.50s.?, eSS?EN =22m.46s.
Helwan PP =13m.50s., sS =23m.14s.
Paris iPP =13m.36s.
Florence iPPP =15m.5s., iPS =20m.32s.
Rome eSSE =24m.22s.
Logan i =11m.22s., iPP =14m.12s., i =22m.17s., esS =23m.48s.
Tinemaha iSKP,PKPEZ =40m.37s.
Salt Lake City i =20m.37s., isS =23m.57s., i =24m.30s., eSS =25m.20s.
Clermont-Ferrand iPP =14m.6s.
Haiwee iNZ =11m.40s., eSKP,PKPZ =40m.34s.
Rapid City iPP =14m.33s., iScS =20m.35s., i =23m.28s., isS =24m.5s., i =24m.37s., eSS =26m.2s., eSSS =30m.4s.
Mount Wilson iNZ =11m.38s., isPNZ =14m.28s., iNZ =21m.16s., ePKKPZ =29m.52s., ePKP,PKPZ =37m.52s., epPKP,PKPZ =39m.57s., eSKP,PKPZ =40m.21s., ePKP,PKP,PKPZ =60m.29s.
Pasadena isPZ =14m.27s., esSE =24m.8s., eSSE =26m.3s., ePKP,PKPZ =37m.57s., epPKP,PKPZ =39m.57s., eSKP,PKPZ =40m.21s., ePKP,PKP,PKPZ =60m.19s.
Boulder City i =11m.45s. and 12m.41s., iPP =14m.27s., iPKKP =29m.51s., iPKP,PKP =37m.51s., epPKP,PKP =39m.50s., ePKP,PKP,PKP =57m.49s., epPKP,PKP,PKP =59m.45s.
Riverside iZ =11m.33s., isPZ =14m.30s., iPKKPZ =29m.51s., ePKP,PKPZ =37m.55s., eSKP,PKPZ =40m.25s.
Pierce Ferry i =36m.29s., eSKP,PKP =39m.45s., e =40m.23s.
Riverview iPcPNZ =11m.23s., iPPZ =14m.23s., iSKSEN =20m.44s., iScSN =21m.4s., isSE =24m.16s., iE =24m.46s.
Palomar iZ =11m.41s., isPZ =14m.35s., ePKKPZ =29m.49s., ePKP,PKPZ =37m.40s., epPKP,PKPZ =39m.44s., iSKP,PKPZ =40m.16s.
La Jolla esPZ =14m.42s.
Tortosa iPcPE =11m.40s., sPN? =14m.26s., PPN =14m.47s., PPPN =16m.38s., iScSEN =20m.56s., eSSS?N =33m.44s.
Lincoln i =21m.17s., eSS =27m.4s., e =33m.38s.
Tucson i =11m.58s., isP =14m.47s., iPP =15m.9s., ipPP =17m.4s., ePPP =17m.28s., esPP =18m.2s., esS =25m.1s., iSS =27m.18s., esSS =30m.48s., eSSS =31m.23s., ePKP,PKP =37m.35s., iSKP,PKP =40m.7s., ePKP,PKP,PKP =60m.57s.
Alicante PcP =11m.49s., sP =14m.43s., PP =15m.15s., PPP =16m.45s., PS =21m.23s., PPS =22m.11s., sS =24m.53s., SS =26m.17s., Q =32m.35s.
Toledo iPPZ =15m.15s., iScSN =21m.24s., iScS?E =21m.30s., esS =25m.14s.
Seven Falls e =25m.16s.
Chicago iSKS =21m.18s., e =23m.32s., eSS =27m.45s.
Ottawa e =25m.22s. and 27m.42s.
Granada PcP =12m.27s., PP =15m.10s., sP =15m.33s., pPP =16m.23s., sPP =18m.13s., ScS =22m.2s., PS =23m.26s., sS =24m.26s., eSS =27m.55s.

Continued on next page.

Florissant iPPZ =15m.41s., iSKSE =21m.31s., isSKSE =25m.42s., iE =27m.30s., 28m.34s., and 31m.32s.?
St. Louis iPPZ =15m.41s., iZ =16m.10s., iSKSE =21m.31s., isSKSE =25m.44s., iE = 26m.44s., 27m.8s., and 28m.6s., iN =28m.47s., eE =31m.17s., iN =31m.34s. and 34m.12s.
Malaga iPPZ =15m.31s., PPP =17m.23s.
Lisbon ipPZ =13m.58s., iPPZ =15m.30s., iSKS =21m.22s., E =24m.15s., sSE = 25m.22s. and 25m.29s.
Auckland i =12m.27s., 14m.43s., and 16m.38s., PPP =18m.32s., SKS =21m.39s., 23m.27s., 25m.8s., and 26m.22s.
Harvard iSKS =21m.40s., isS =25m.59s.
Fordham i =21m.51s., isS =26m.9s., i =29m.1s.
Philadelphia i =22m.23s., e =25m.53s.
Wellington iZ =12m.42s., PP?Z =16m.7s., pPP =17m.32s., pPPPZ =19m.27s., iZ = 19m.53s., SKS =21m.55s., pSZ =24m.39s., PSZ =24m.57s., SP? =25m.26s., sPS = 26m.34s.
Christchurch Z =15m.36s., eNZ =19m.23s., iEN =22m.57s., EN =24m.9s. and 25m.22s., iN =26m.46s.
Columbia eSP =24m.23s., esS =26m.55s., e =27m.57s., eSS =29m.57s., esSS =33m.41s.
Tananarive SP =25m.12s., SS =30m.12s.
Bermuda isS =27m.41s., eSS =31m.7s., e =35m.54s. and 39m.47s.
San Juan e =28m.38s., eSS =33m.43s., esSS =37m.13s.
Huancayo i =27m.33s. and 37m.17s., e =39m.21s., eSS =42m.52s., e =53m.17s.
La Paz iSKPZ =22m.2s., PPPZ =26m.52s., SSZ =41m.56s.
La Plata P_cPN =31m.44s., N =33m.56s., E =34m.26s.

Jan. 11d. 18h. 41m. 29s. Epicentre 17°·0N. 93°·9W.

Felt at Coatzacoalcoo (Vera Cruz) according to Tacubaya.

$A = -·0651$, $B = -·9547$, $C = +·2906$; $\delta = +14$; $h = +5$;
$D = -·998$, $E = +·068$; $G = -·020$, $H = -·290$, $K = -·957$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Vera Cruz	3·1	316	0 48	− 3	1 11	−18	—
Puebla	4·6	298	1 12	0	(2 1)	− 6	2·0
Tacubaya	5·6	296	1 28	+ 1	(2 32)	− 1	2·5
Merida	5·6	45	1 29	+ 2	2 30	− 3	—
Cape Girardeau	20·6	10	e 4 42	− 1	e 7 58	−31	—
Tucson	21·6	318	i 4 52	− 2	—	—	e 11·8
St. Louis	21·8	7	i 4 56	0	i 8 55	+ 3	—
Florissant	21·9	7	e 4 57	0	e 8 34	−20	—
Pierce Ferry	26·1	321	i 5 37	0	—	—	—
La Jolla	26·3	311	i 5 38	− 1	—	—	—
Palomar	26·3	312	i 5 40	+ 1	—	—	—
Boulder City	26·5	319	i 5 42	+ 1	—	—	e 14·6
Overton	26·6	321	i 5 43	+ 1	—	—	—
Riverside	27·0	313	i 5 47	+ 2	—	—	—
Mount Wilson	27·6	313	i 5 52	+ 1	—	—	—
Pasadena	27·6	313	i 5 53	+ 2	—	—	—
Grand Coulee	37·1	332	e 7 13	− 1	—	—	—

Additional readings :—
Merida SN =2m.27s.
Tucson e =5m.46s.
Florissant eN =8m.37s.
Palomar iEZ =5m.53s.
Grand Coulee i =7m.44s.
Long waves were also recorded at Salt Lake City and San Juan.

Jan. 11d. Readings also at 1h. (Ksara), 2h. (Collmberg (2), Tortosa, Toledo, and Tucson), 12h. (near Andijan), 16h. (Collmberg), 17h. (Apia, Arapuni, Auckland, Christchurch, Wellington, Riverview, Ksara, and Tucson), 20h. (near Tacubaya (3)), 23h. (Tchimkent, near Andijan, and Stalinabad).

Jan. 12d. 20h. 25m. 33s. Epicentre 59°·2N. 149°·1W.

Felt at Anchorage and Cordova.

R. R. Bodle and L. M. Murphy.
United States Earthquakes, 1946, Serial No. 714, Washington, 1948, p.22.
Suggested epicentre :—
59°·25N. 147°·25W. (Pasadena).
59°·4 N. 148°·2W. (Jesuit Seismological Association).

$A = -·4416$, $B = -·2643$, $C = +·8574$; $\delta = 0$; $h = -9$;
$D = -·514$, $E = +·858$; $G = -·736$, $H = -·440$, $K = -·515$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		5·7	5	i 1 29	+ 1	i 2 24	−11	i 2 1	P_g	i 3·1
Sitka		7·4	96	i 1 55	+ 3	i 3 12	− 6	—	—	i 3·9
Victoria		18·4	115	4 20	+ 2	7 55	+14	—	—	9·4
Seattle		19·6	115	e 4 29	− 3	e 8 15	+ 7	—	—	e 8·6
Grand Coulee		20·9	110	i 4 46	0	e 8 23	−12	i 5 0	PP	e 8·9
Saskatoon		24·6	89	5 24	+ 1	9 59	+17	—	—	13·4
Shasta Dam		25·0	126	i 5 25	− 2	e 10 1	+12	—	—	—
Butte		25·4	105	i 5 32	+ 1	e 9 48	− 8	i 5 57	PP	i 10·6
Ukiah		26·0	129	e 5 36	0	e 9 45	−21	e 6 6	PP	e 10·2
Bozeman		26·4	104	i 5 41	+ 1	i 9 51	−21	i 6 14	PP	e 10·6
Berkeley		27·4	129	e 5 47	− 2	10 39	+11	—	—	13·4
Santa Clara		28·0	129	i 5 54	− 1	i 10 44	+ 6	—	—	—
Logan		28·9	110	i 6 4	+ 1	e 10 52	− 1	i 6 53	PP	e 13·2
Salt Lake City		29·7	112	i 6 10	0	e 11 18	+12	i 7 3	PP	e 13·5
Tinemaha		29·8	125	e 6 10	− 1	—	—	—	—	—
Haiwee		30·7	125	e 6 18	− 1	—	—	e 7 28	PP	—
Santa Barbara		31·4	129	i 6 23	− 2	—	—	—	—	—
Rapid City		31·5	98	i 6 28	+ 2	i 11 39	+ 5	e 7 24	PP	e 13·0
Overton		31·9	120	i 6 31	+ 2	—	—	—	—	—
Boulder City		32·2	121	i 6 30	− 2	e 11 46	+ 1	i 7 44	PP	e 14·4
Mount Wilson		32·3	127	i 6 28	− 5	e 11 53	+ 7	i 7 46	PP	—
Pasadena		32·3	127	i 6 30a	− 3	i 11 48	+ 2	i 7 47	PP	e 13·8
Pierce Ferry		32·4	120	i 6 31	− 3	—	—	—	—	—
Riverside	Z.	33·0	127	e 6 45	+ 6	—	—	—	—	—
Palomar		33·5	126	i 6 41a	− 2	i 12 10	+ 5	i 7 56	PP	—
La Jolla		33·8	127	i 6 44	− 2	—	—	—	—	—
Tucson		37·1	120	e 7 11	− 3	i 13 1	0	i 8 37	PP	e 15·1
Lincoln		37·2	95	i 7 15	0	i 13 3	+ 1	i 8 44	PP	e 16·6
Honolulu		38·4	194	i 7 30	+ 5	i 13 17	− 3	i 8 46	PP	e 15·8
Chicago		41·2	87	i 7 46	− 2	i 13 59	− 3	i 9 22	PP	i 16·8
Florissant		41·9	93	i 7 54	0	i 14 12	− 1	i 9 31	PP	—
St. Louis		42·1	93	i 8 2	+ 7	i 14 14	− 2	i 9 36	PP	—
Cape Girardeau	E.	43·5	93	e 8 5	− 2	—	—	e 9 46	PP	e 17·6
Sapporo		44·3	282	e 8 11	− 2	14 50	+ 2	—	—	e 21·4
Ottawa		44·6	74	8 12	− 4	14 51	− 1	10 1	PP	21·4
Cincinnati		44·7	87	i 8 16	0	—	—	i 10 2	PP	i 24·2
Shawinigan Falls		45·2	71	8 17	− 3	15 19	+18	10 5	PP	21·4
Ivigtut		45·3	43	8 21	0	i 15 1	− 1	10 23	PP	20·4
Mori	N.	45·4	282	8 29	+ 7	i 15 7	+ 3	—	—	—
Seven Falls		45·8	69	8 22	− 3	15 9	0	10 12	PP	22·4
Mizusawa		47·5	278	e 8 35	− 3	15 19	−15	—	—	—
Georgetown		48·7	81	i 8 46	− 2	i 15 49	− 1	i 10 42	PP	—
Fordham		48·8	77	i 8 50	+ 1	i 15 54	+ 2	i 10 45	PP	—
Harvard		48·8	74	i 8 47a	− 2	i 15 50	− 2	i 10 43	PP	e 25·4
Philadelphia		48·9	79	i 8 49	− 1	i 15 43	−10	i 10 46	PP	i 19·8
Weston		49·0	74	i 8 47	− 3	e 15 33	−22	e 9 1	pP	—
Mobile		49·4	98	8 56	+ 3	16 4	+ 4	11 38	PPP	—
Columbia		50·4	89	e 8 59	− 2	i 16 7	− 7	e 10 58	PP	e 20·0
Tokyo		50·7	277	e 9 3	0	—	—	—	—	—
Halifax		51·0	67	9 5	− 1	16 23	+ 1	11 17	PP	25·4

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Yokohama	N.	51·0	276	e 9 8	+ 2	—	—	—	—	—
Tacubaya		53·4	116	e 9 19	− 5	e 17 0	+ 5	i 12 3	PP	25·0
Irkutsk		54·1	314	e 9 20	− 9	i 16 56	− 9	—	—	—
Hukuoka		57·1	282	9 51	+ 1	e 17 53	+ 8	—	—	e 26·9
Bergen		59·1	15	i 10 5	+ 1	18 9	− 2	i 10 17	pP	e 27·0
Bermuda		60·0	76	i 10 9	− 2	e 18 21	− 2	e 12 27	PP	e 23·5
Upsala		60·8	8	10 14	− 2	e 18 26	− 7	18 44	PS	e 30·4
Aberdeen		61·1	21	i 10 31	+13	i 18 32	− 5	i 14 7	PPP	27·6
Sverdlovsk		61·9	343	i 10 22	− 2	i 18 42	− 5	—	—	—
Edinburgh	E.	62·0	22	—	—	18 48	0	22 42	SS	—
Durham		63·4	21	i 10 51	+17	i 19 6	0	—	—	—
Copenhagen		64·5	12	i 10 37	− 4	e 19 8	−11	23 33	SS	—
Moscow		65·3	357	10 45	− 1	19 26	− 3	—	—	—
Kew		66·8	21	i 10 59	+ 3	e 19 36	−12	e 13 31	PP	e 30·4
De Bilt		67·1	17	i 11 13	+16	i 19 52	+ 1	i 13 42	PP	e 32·4
Uccle		68·3	19	e 11 4k	− 1	i 20 2	− 4	i 11 20	pP	e 30·4
Collmberg		68·9	13	e 11 3	− 6	e 20 9	− 4	e 13 38	PP	e 35·4
Jena		69·1	14	e 11 29	+19	e 20 31	+16	e 14 19	PP	—
Paris		69·9	20	11 14	− 1	i 20 22	− 2	11 30	pP	e 34·5
Cheb		70·0	14	e 11 17	+ 2	e 20 26?	0	—	—	e 37·4
Prague		70·3	12	e 11 22	+ 5	20 27?	− 2	e 13 51	PP	e 34·4
San Juan		70·8	86	i 11 20	0	i 20 30	− 5	e 13 39	PP	e 29·0
Strasbourg		70·9	16	e 11 17	− 4	i 20 35	− 1	i 11 34	pP	e 33·4
Besançon		72·0	18	e 11 31	+ 3	e 20 48	− 1	e 14 6	PP	e 38·4
Frunse		72·1	329	e 11 37	+ 9	e 21 4	+14	—	—	—
Zürich		72·2	16	e 11 28k	− 1	e 20 46	− 5	e 14 22	PP	—
Neuchatel		72·8	17	e 11 28	− 4	e 20 54	− 4	—	—	—
Chur		72·9	15	e 11 28	− 5	e 20 56	− 3	—	—	—
Clermont Ferrand		72·9	21	e 11 30	− 3	e 21 7	+ 8	i 11 47a	pP	e 36·4
Budapest	N.	73·2	8	11 34	− 1	i 21 4	+ 2	13 24	PP	37·4
Tchimkent		73·9	332	i 11 36	− 3	i 21 1	− 9	—	—	—
Kalossa	E.	74·2	8	e 11 42	+ 2	21 22	+ 8	—	—	—
Triest		74·6	13	e 11 42	− 1	i 21 14	− 4	i 11 55	pP	—
Zagreb		74·6	11	e 11 41a	− 2	e 21 35	+17	e 21 19	S_cS	—
Andijan		74·7	329	e 11 38	− 5	—	—	—	—	—
Tashkent		74·9	332	e 14 47	PP	e 21 28	+ 6	e 26 27	SS	—
Belgrade		76·0	8	i 11 51	0	i 22 7	PS	e 14 55	PP	33·4
Florence		76·1	15	i 11 52	+ 1	i 21 34	− 1	i 22 7	PS	i 37·4
Fort de France		76·4	84	e 11 53	0	—	—	—	—	—
Bucharest		76·7	3	e 11 56	+ 1	e 21 35	− 6	—	—	33·4
Lisbon		76·9	31	i 11 55k	− 1	21 42	− 1	15 1	PP	36·6
Barcelona		77·0	23	—	—	i 21 44	− 1	22 20	PS	35·0
Samarkand		77·0	333	e 11 49	− 7	e 21 57	+12	—	—	—
Toledo		77·1	28	i 11 55	− 2	i 21 47	+ 1	i 12 15	pP	i 33·4
Tortosa	N.	77·3	24	i 12 3	+ 5	21 49	+ 1	15 2	PP	e 35·1
Stalinabad		77·7	331	i 11 53	− 7	i 22 19	PS	i 15 29	PP	—
Rome		78·1	14	e 12 1	− 1	i 22 9	+13	e 15 15	PP	e 38·3
Sofia		78·3	6	e 12 3	0	i 21 56	− 3	i 14 58	PP	40·4
Bogota		78·4	101	e 12 1	− 3	—	—	e 15 2	PP	—
Alicante		79·4	25	12 10	+ 1	i 22 7	− 3	15 11	PP	38·7
Baku		79·5	346	12 21	+11	—	—	e 15 35	PP	—
Leninakan		79·8	352	e 12 14	+ 2	e 22 34	+20	—	—	—
Granada		79·8	28	i 12 17a	+ 5	i 22 20	+ 6	12 38	pP	44·0
Malaga		80·0	29	i 12 12k	− 1	i 22 17	0	i 12 25	pP	43·6
Erevan		80·3	350	e 12 18	+ 4	i 22 39	+19	—	—	—
Dehra Dun	N.	82·6	321	e 11 27	−59	e 21 23	−80	—	—	—
Ksara		87·2	357	i 12 49	0	23 35	+ 7	16 13	PP	—
Helwan		91·3	0	i 13 6k	− 3	24 9	+ 3	16 42	PP	—
Huancayo		92·1	110	i 13 11	− 1	e 23 42	[− 3]	i 16 42	PP	e 37·1
Hyderabad	N.	94·4	315	13 34	+11	24 54	+21	17 15	PP	46·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		95·0	321	i 13 34	+ 8	i 24 49	+11	e 30 57	SS	43·6
La Paz		99·5	106	i 13 41	− 5	i 24 45	{− 5}	i 17 39	PP	49·4
Auckland		100·3	210	16 51	PP	24 18	[−10]	18 27	sPP	47·3
Arapuni		101·2	209	—	—	27 27	PS	e 33 15	SS	44·2
Kodaikanal	E.	101·4	314	e 22 48	PKS	e 25 13	{+ 9}	e 31 18	SS	—
Colombo	E.	103·5	310	18 20	PP	e 26 8	+18	—	—	52·0
Wellington		104·5	209	13 49	−19	24 22	[−26]	18 48	sPP	50·1
Riverview		105·0	229	e 14 19	+ 8	i 24 43	[− 7]	i 25 45	SKKS	e 48·6
Christchurch		107·1	209	e 17 53	?	24 50	[−10]	e 21 17	PPP	50·4
La Plata		119·8	109	25 33	SKS	(25 33)	[−16]	27 9	SKKS	61·8
Tananarive		138·0	337	e 22 55	PKS	e 29 19	{+10}	40 13	SS	e 63·0

Additional readings :—
College eS =2m.19s., i =2m.46s.
Seattle i =5m.23s.
Butte iS_cS =8m.31s.
Bozeman e =7m.59s., iS_cS =8m.58s.
Berkeley iP =5m.50s.
Logan e =7m.32s.
Salt Lake City i =7m.18s. and 11m.51s.
Rapid City ePPP =7m.39s.
Boulder City i =12m.59s., e =16m.4s., eS_cS? =17m.51s., e =19m.31s., ePKP,PKP = 41m.6s.
Pasadena eEN =8m.25s., eZ =12m.41s., iZ =12m.56s.
Tucson e =8m.11s., iP_cP =9m.17s., e =13m.30s.
Lincoln i =13m.26s.
Honolulu iP_cP =9m.43s.
Chicago i =8m.13s., e =8m.49s.
Florissant iSSSE =17m.21s.
St. Louis iPPPE =10m.9s., iSSSE =17m.24s.
Ottawa SS =17m.47s., i =19m.57s.
Cincinnati iPPP? =11m.3s., iSS? =18m.7s., i =18m.26s., iSSS? =19m.29s.
Shawinigan Falls SS =18m.15s.
Ivigtut 8m.33s., eZ =15m.21s., SS =18m.21s.
Seven Falls SS =18m.27s.
Fordham iSS =19m.46s.
Harvard i =9m.4s. and 12m.33s., eP_cS =14m.7s., iS_cS =18m.38s., i =19m.2s. and 19m.37s., eSSS =20m.25s., eQ =23·4m.
Philadelphia i =15m.53s., iS_cS =18m.35s., eSS =19m.22s.
Columbia eP_cP =9m.58s., ePPP =12m.6s., i =16m.37s.
Halifax SS =20m.15s., e =24m.15s.
Yokohama PZ =9m.12s.
Tacubaya ePSE =17m.21s., ePSN =17m.24s., iE =19m.11s., eSS? =20m.6s., eSS?N = 20m.9s., eSSSN =21m.58s., eSSSE =22m.2s., eE =23m.26s., eN =23m.35s.
Bergen PPZ =12m.52s., PPPNZ =13m.58s., SZ =18m.17s., SSE =22m.22s.
Bermuda iPPP? =13m.54s., iS_cS =19m.59s., iSS? =22m.26s.
Upsala eE =20m.4s., e =20m.21s., eSS?N =22m.39s., eSSS =25m.21s.
Aberdeen iN =22m.38s., iEN =25m.40s.
Copenhagen 13m.0s. and 14m.33s.
Kew iP_cP?NZ =11m.13s.k, ePPPN =15m.5s., iPS =19m.46s., eEN =21m.56s., eSS = 23m.50s., eSSSNZ =27m.33s.
De Bilt iSS =24m.27s., eSSS =27m.37s.
Uccle eZ =11m.9s., iPPNZ =13m.47s., iE =20m.43s., iSSEN =24m.14s., iSSSE =28m.3s.
Collmberg iPZ =11m.6s., eE =11m.17s., iZ =11m.22s., eN =11m.33s., eZ =11m.51s., iZ =11m.57s., eE =12m.5s., eZ =12m.11s., iZ =12m.30s., eN =13m.56s., eZ = 15m.42s., eE = 20m.29s., iEN =21m.3s., iN =21m.23s., eE =21m.36s.and 26m.38s., ePKP,PKPZ =39m.13s., $ePKP_2$,PKP_2Z =39m.29s.
Jena e =20m.53s. and 21m.0s.
Paris iPP =14m.1s., i =14m.51s., 15m.54s., and 20m.27s., iPS =20m.47s., e =21m.12s. and 24m.27s., eSS =24m.49s., e =25m.53s., eQ =30·4m.
Cheb e =11m.33s., 12m.39s., and 15m.35s.
Prague ePPP =15m.45s.
San Juan ePPP =15m.30s., i =20m.57s., iS_cS =21m.38s., iSS =25m.7s.
Strasbourg i =11m.57s., 12m.18s., and 12m.44s., ePP =13m.59s., iPS? =21m.2s., i = 21m.33s., e =24m.23s., eSS =25m.25s., esSS? =26m.6s.
Zürich i =11m.42s.
Chur e =11m.32s.
Clermont-Ferrand iPP =14m.26s., ePPP =16m.15s.
Budapest eN =21m.44s.
Kalossa ePN =11m.46s.
Triest iPPZ =14m.32s., iSSS =28m.38s.
Zagreb eSKS =21m.55s.
Belgrade ePPP =16m.43s., e =25m.57s.
Florence iSSS =30m.31s.
Bucharest eE =12m.7s., iE =21m.57s., iN =22m.2s., iE =22m.41s.

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Lisbon PE =11m.59s., PNZ =12m.9s., PPZ =15m.5s., iNZ =18m.6s., iSN =21m.45s., SSN =26m.22s.
Barcelona SS =26m.54s.
Rome ePPPZ =16m.49s., eZ =18m.17s., iSSE =27m.9s., eZ =32m.43s.
Toledo sPNZ =12m.23s., iN =18m.15s., SKSN =22m.5s., S_cSN =22m.14s., isSEN = 22m.27s.?, iPS =22m.41s., PPSN =22m.54s., SSN =26m.47s., SSS =30m.25s.
Tortosa P_cPN =12m.14s., PPPN =18m.6s., PSN =22m.42s., SSSN =29m.47s.
Stalinabad i =12m.10s.
Sofia iN =15m.6s.?, and 22m.16s.
Alicante P_cP =12m.25s., PPP =16m.55s., SKS =22m.27s., PS =22m.55s., SS =27m.7s., SSS =30m.27s., Q =32m.23s.
Granada PP =15m.25s., PS =22m.37s., PPS =23m.10s., SSS =32m.41s.
Malaga iZ =13m.33s., PPZ =15m.29s., ePPPZ =17m.18s., sSZ =22m.37s., eSS = 27m.33s., QZ =35·4m,, ePKP,PKPZ =38m.59s.
Helwan i =13m.17s., SKS =23m.27s., SKKS =23m.54s., PS =25m.6s., PPS =25m.27s., SS =30m.19s.
Huancayo ePPP =19m.6s., iS =23m.47s., iPS =25m.42s., eSS =30m.36s.
Hyderabad SKSN =23m.49s., SKKSN =24m.30s., PSN =26m.3s., SSN =31m.1s.
Bombay SKSEN =24m.31s., eSN =24m.52s., iSSE =31m.12s.
La Paz iPPP =19m.56s., iPSZ =27m.23s., iSS =32m.3s., iSSS =35m.48s.
Auckland i =26m.39s., sS? =29m.16s., SS? =35m.27s.
Wellington S?Z =25m.42s., S_cSP =27m.26s., SS =33m.21s., sSS =38m.13s.
Riverview iSKSE =24m.46s., iSKKKS?N =26m.4s., iS?E =26m.26s., eNZ =27m.33s., iSSN =33m.32s., iE =34m.35s., eN =37m.14s., iSSSE =37m.30s., eQE =43·2m.
Christchurch eZ =23m.7s. and 26m.13s.
La Plata PPPN =31m.27s., E =34m.51s., PSE =36m.45s.
Tananarive e =23m.14s., PPS? =35m.30s.

Jan. 12d. Readings also at 0h. (near Mizusawa), 3h. (Manzanillo, Tacubaya, Vera Cruz, St. Louis, Florissant, Rapid City, Bozeman, Weston, Lincoln, Salt Lake City, Tucson, Pasadena, and Palomar), 4h. (Auckland, Riverview, and Tucson), 6h. (Tacubaya, Vera Cruz, Lincoln, Rapid City, St. Louis, Salt Lake City, Tucson, and Pasadena), 16h. (Andijan and near Stalinabad), 20h. (near Apia), 21h. (Auckland and Collmberg), 22h. (La Paz), 23h. (Kew).

Jan. 13d. 16h. 31m. 5s. Epicentre 38°·2N. 118°·2W. (as on 1945, Dec. 8d.).

Intensity VI at Owens River Gorge. Accompanied by landslides.
Epicentre 37°19′N., 118°39′W.

R. R. Bodle and L. M. Murphy.
United States Earthquakes, 1946, Serial No. 714, Washington, 1948, p.9.

A = −·3723, B = −·6943, C = +·6159 ; δ = −1 ; h = −1 ;
D = −·881, E = +·473 ; G = −·291, H = −·543, K = −·788.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		1·1	182	i 0 19k	− 3	i 0 26	−13	—	—	—
Haiwee		2·1	175	i 0 35k	− 2	i 0 55	− 9	—	—	—
Santa Clara	z.	3·1	254	e 0 53	+ 2	—	—	—	—	—
Boulder City		3·5	128	e 1 3	P*	i 1 53	S_e	i 1 10	P_e	—
Santa Barbara		3·9	198	e 1 1	− 1	i 1 39	−11	—	—	—
Pierce Ferry		4·0	120	i 1 10	+ 6	i 1 57	+ 5	i 1 15	P*	—
Mount Wilson		4·0	178	i 1 1	− 3	e 1 49	− 3	—	—	—
Pasadena		4·1	180	i 1 2	− 3	i 1 54	− 1	—	—	—
Shasta Dam		4·1	309	e 1 18	P_e	i 2 24	S_e	—	—	—
Riverside		4·3	170	i 1 6	− 2	i 2 6	+ 6	—	—	—
Palomar		5·0	167	i 1 16	− 2	—	—	—	—	—
La Jolla		5·4	171	e 1 33	P*	—	—	—	—	—
Logan		6·0	52	—	—	e 3 41	S_e	—	—	e 4·6
Tucson		8·5	132	e 2 10	+ 3	e 3 51	+ 6	e 2 42	P_e	e 4·6

Additional readings :—
Shasta Dam iP =1m.21s., i =1m.27s.
Logan i =3m.56s. and 4m.22s.
Long waves were also recorded at Bozeman and Salt Lake City.

Jan. 13d. Readings also at 2h. (Santa Lucia), 6h. (Bombay), 7h. (Bogota), 8h. (New Delhi), 10h. (Auckland and Wellington), 11h. (Arapuni, Christchurch, Riverview, Bombay, Hyderabad, and Ksara (2)), 14h. (near Balboa Heights and near Bogota), 16h. (near Stalinabad), 17h. (near Boulder City, Overton, Pierce Ferry, and Pasadena), 19h. (Riverview, San Juan, and St. Louis), 21h. (Ksara and Riverview), 23h. (Riverview).

Jan. 14d. Readings at 0h. (New Delhi), 5h. (Riverview), 6h. (near Mizusawa (2), and near Stalinabad), 7h. (Haiwee, Pasadena, Palomar, Riverside, Tucson, and Shasta Dam), 10h. (Arapuni), 11h. (Auckland and Wellington), 12h. (Christchurch, Riverview, and Ksara), 13h. (Collmberg), 14h. (Ksara), 17h. (Fort de France and Port au Prince).

Jan. 15d. 22h. 32m. 1s. Epicentre 40°·6N. 126°·4W. (as on 1945, May 19d.).

$A = -\cdot4519$, $B = -\cdot6129$, $C = +\cdot6482$; $\delta = +2$; $h = -2$;
$D = -\cdot805$, $E = +\cdot593$; $G = -\cdot385$, $H = -\cdot522$, $K = -\cdot761$;

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Shasta Dam		3·0	88	i 0 50	0	i 1 29	+ 2
Tinemaha		7·3	117	i 1 53	+ 3	i 3 19	+ 4
Haiwee		8·0	122	e 1 59	− 1	e 3 39	+ 6
Santa Barbara		8·1	137	e 2 3	+ 1	e 3 31	− 4
Grand Coulee		9·0	33	e 2 13	0	—	—
Mount Wilson	z.	9·2	132	e 2 13	− 3	e 4 0	− 3
Pasadena		9·2	132	e 2 12	− 4	e 3 54	− 9
Riverside	z.	9·7	130	e 2 20	− 2	i 4 8	− 7
Boulder City		10·2	114	e 2 32	+ 1	—	—
Overton		10·2	110	e 2 42	+11	—	—
Palomar		10·5	131	e 2 33	− 2	i 4 30	− 5
Pierce Ferry		10·7	111	i 2 40	+ 2	—	—
Tucson		15·0	119	i 3 42	+ 7	—	—

Jan. 15d. Readings also at 3h. (Baku, Ksara, near Erevan, Leninakan, and near Mizusawa), 5h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson. Grand Coulee, Boulder City, Overton, Pierce Ferry, Shasta Dam, and St. Louis), 6h. (Pierce Ferry), 11h. (Santa Lucia), 13h. (near Samarkand), 17h. (St. Louis), 23h. (Fort de France).

Jan. 16d. Readings at 1h. (near La Paz), 5h. (Mount Wilson, Pasadena, Palomar, and Riverside), 6h. (Tucson), 7h. (Haiwee, Mount Wilson (2), Pasadena (2), Palomar (2), Riverside, Tinemaha, Tucson (2), Boulder City, Overton, Pierce Ferry, San Juan, Montezuma, near La Paz, Andijan, and near Stalinabad), 9h. (La Paz), 11h. (near Boulder City, Overton, and Pierce Ferry), 13h. (Riverview, Andijan, and near Stalinabad), 15h. (Mount Wilson and Tucson), 16h. (Mount Wilson, Riverside, and Tucson), 19h. (Riverside, Mount Wilson, and Riverview), 20h. (near Ottawa), 22h. (near Mizusawa).

Jan. 17d. 9h. 39m. 36s. Epicentre 6°·2S. 147°·7E. Depth of focus 0·010.
(as on 1943, April 5d.).

Felt at Lae. Pasadena suggests depth 100km.

Annales de L'Institut de Physique du Globe de Strasbourg, 2e partie, Séismologie, Nouvelle Série, Tome XI, p. 43.

Suggested epicentres: 7°·5S. 147°·5E. (Pasadena); 6°·5S. 147°·5E. (Strasbourg).

$A = -\cdot8404$, $B = +\cdot5313$, $C = -\cdot1073$; $\delta = +7$; $h = +7$;
$D = +\cdot534$, $E = +\cdot845$; $G = +\cdot091$, $H = -\cdot057$, $K = -\cdot994$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Brisbane	N.	21·8	165	i 4 39	− 6	i 8 35	0	—	—	—
Riverview		27·7	173	i 5 40a	− 1	i 10 24	+10	i 6 9	pP	e 13·3
Perth		39·2	224	7 20	0	13 9	− 4	8 24	PP	18·2
Auckland		39·3	145	7 21?	0	13 22	+ 8	7 54	pP	—
New Plymouth		40·5	147	7 36	+ 5	13 40	+ 8	—	—	18·3
Arapuni		40·6	146	—	—	13 36	+ 2	—	—	17·1
Miyazaki		41·0	339	7 36	+ 1	13 40	0	—	—	—
Kaimata		41·8	153	8 29	+48	13 59	+ 7	—	—	—
Yokohama		42·1	350	e 7 42	− 2	13 57	+ 1	—	—	—
Tokyo		42·3	352	e 7 59	+13	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Wellington		42·5	149	7 48	+ 1	13 51	−11	8 4	pP	17·4
Hukuoka		42·8	340	7 49	− 1	14 0	− 6	14 42	SS	18·0
Christchurch		43·2	153	7 55	+ 2	14 18	+ 6	8 21	pP	19·4
Mizusawa		45·5	353	e 8 14	+ 3	14 48	+ 3	—	—	—
Sapporo		49·4	355	e 8 43	+ 1	15 42	+ 2	—	—	—
Pehpei		53·4	315	e 8 15	−57	—	—	e 10 26	PP	—
Honolulu		60·0	60	i 10 38	+39	e 18 46	+44	i 12 23	PP	e 24·9
Colombo	E.	68·9	279	10 56	0	(19 45)	− 7	—	—	19·8
Irkutsk		68·9	334	10 55	− 1	i 19 54	+ 2	—	—	—
Hyderabad	N.	72·3	290	11 19	+ 2	20 30	− 1	14 19	PP	34·3
New Delhi	N.	76·1	302	e 11 31	− 8	21 8	− 5	21 47	SP	—
Bombay		77·8	291	i 11 48	0	i 21 27	− 4	i 22 14	PS	34·8
Almata		80·4	316	—	—	e 21 59	0	—	—	—
Frunse		82·0	315	e 12 10	− 1	e 22 8	− 7	—	—	—
Andijan		83·0	312	12 15	− 1	i 22 19	− 6	—	—	—
College		85·1	22	e 15 47	PP	e 22 49	+ 3	e 18 1	PPP	e 35·7
Stalinabad		85·2	310	i 12 28	+ 1	i 22 40	− 7	i 12 56	pP	—
Tashkent		85·4	313	e 12 28	0	e 22 46	− 3	12 56	pP	—
Tchimkent		85·4	314	i 12 28	0	22 48	− 1	—	—	—
Sitka		88·3	32	e 12 8	−34	e 23 24	+ 7	i 24 8	SP	e 37·4
Ukiah		93·2	50	—	—	e 24 44	SP	e 30 30	SS	e 37·6
Sverdlovsk		93·5	326	i 13 4	− 2	i 24 3	0	24 43	sS	—
Berkeley		93·8	52	13 13	+ 6	24 23	+17	17 16	PP	47·1
Shasta Dam		93·9	49	e 13 12	+ 4	e 23 38	[+ 8]	e 16 41	PP	—
Victoria		93·9	42	—	—	e 26 6	PPS	e 39 6	Q	45·4
Santa Clara	N.	94·0	52	e 14 5	+57	—	—	—	—	e 38·8
Santa Barbara		95·6	56	e 13 24	+ 8	—	—	—	—	—
Grand Coulee		96·8	42	e 13 24	+ 3	—	—	—	—	—
Tinemaha		96·9	53	i 13 24	+ 3	—	—	e 14 4	pP	—
Pasadena		96·9	56	i 13 27	+ 6	i 23 56	[+ 8]	i 14 3	pP	e 40·7
Mount Wilson		97·0	56	i 13 28 a	+ 6	—	—	i 14 0	pP	—
Haiwee	Z.	97·1	54	e 13 32	+10	—	—	—	—	—
Riverside		97·5	56	i 13 30	+ 6	—	—	i 14 0	pP	—
Tananarive		97·5	250	14 42	?	24 43	+ 6	31 17	SS	e 39·4
La Jolla		97·6	57	e 13 31	+ 6	—	—	—	—	—
Palomar		97·9	57	i 13 31	+ 5	—	—	e 14 0	pP	—
Boulder City		99·6	54	e 13 39	+ 5	e 24 4	[+ 2]	e 14 15	pP	—
Pierce Ferry		100·3	54	e 13 44	+ 7	e 24 20	[+15]	—	—	—
Butte		101·2	43	—	—	e 25 52	+44	e 32 48	SS	e 41·8
Salt Lake City		101·9	49	—	—	e 25 7	− 7	e 32 1	SS	e 42·3
Bozeman		102·3	43	—	—	e 25 7	−10	e 32 29	SS	e 42·6
Grozny		102·9	313	14 19	pP	e 25 20	− 2	—	—	—
Tucson		103·0	57	e 13 56	+ 7	e 24 30	[+12]	e 18 36	PP	e 42·8
Saskatoon		104·5	37	—	—	e 27 56	PS	—	—	44·4
Leninakan		104·6	311	e 14 26	pP	—	—	e 17 57	PP	—
Rapid City		108·0	45	e 19 24	?	e 26 16	?	e 28 37	PS	e 46·2
Ksara		111·5	303	e 14 35	P	28 37	PS	19 9	PP	—
Upsala		114·6	335	—	—	e 35 0	SS	—	—	e 56·4
Helwan		115·9	300	e 19 6	[+34]	31 27	SPP	19 36	pPKP	—
St. Louis		118·7	49	e 18 40	[+ 3]	i 27 35	?	e 19 6	pPKP	e 49·9
Copenhagen		119·2	333	i 18 41	[+ 3]	30 6	PS	22 41	PKS	—
Chicago		119·6	44	—	—	e 36 58	SS	e 40 50	SSS	e 50·0
Belgrade		120·4	319	—	—	e 26 44	SKKS	e 35 35	SS	51·4
Prague		121·4	327	—	—	e 31 36	PPS	e 37 24?	SS	e 52·4
Collmberg		121·5	328	e 18 44	[+ 1]	e 29 22	PS	e 39 56	SSS	—
Cheb		122·5	328	e 20 24?	PP	—	—	—	—	e 58·4
Zagreb		122·6	322	e 19 24?	[+39]	—	—	—	—	—
De Bilt		124·8	333	—	—	e 30 24?	PS	—	—	e 61·4
Ottawa		125·8	35	18 53	[+ 2]	38 0	SS	32 54	PPS	51·4
Strasbourg		125·8	328	e 19 37	[+46]	—	—	e 20 44	PP	e 51·5
Uccle		126·1	333	—	—	e 31 6	PS	e 38 30	SS	e 54·4
Rome		126·7	319	e 21 33	PP	e 31 37	PS	e 38 4	SS	e 61·8
Columbia		127·2	50	e 22 53	PKS	e 27 27	SKKS	e 31 25	PPS	e 54·7
Seven Falls		127·6	31	—	—	e 37 36	SS	—	—	52·4
Paris		128·3	331	e 21 24?	PP	33 24?	PPS	—	—	e 64·4

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fordham		129·4	40	e 19 4	[+ 6]	e 23 14	PKS	e 21 43	PP	57·0
Harvard		129·9	36	e 19 3	[+ 4]	e 23 0	PKS	e 22 14	PKS	e 71·4
Weston		130·1	36	e 19 3	[+ 4]	—	—	i 22 18	PKS	—
La Plata		132·5	151	19 23	[+19]	22 22	PKS	21 18	PP	30·5
Huancayo		133·5	113	e 19 12	[+ 6]	e 39 37	SS	e 19 39	pPKP	e 56·6
Alicante		136·9	323	19 26	[+14]	22 42	PKS	21 24	PP	59·8
Toledo		137·9	327	e 19 21	[+ 7]	26 26	[+13]	22 38	PKS	60·4
La Paz	z.	138·0	123	i 19 20k	[+ 6]	22 36	PKS	i 19 46	pPKP	66·9
Bogota		138·4	90	i 19 12	[− 3]	—	—	e 22 48	PKS	—
Granada		139·6	324	19 31k	[+14]	22 50	PKS	21 32	PP	—
Bermuda		140·1	45	e 22 43	PKS	e 28 27	SKKS	e 23 5	pPKS	e 59·5
Malaga		140·3	324	e 19 20	[+ 2]	41 0	SS	i 19 55	pPKP	73·3
Lisbon		141·4	331	19 50?	[+30]	23 48?	PKS	22 41?	PP	70·1
San Juan		144·9	66	e 19 32	[+ 6]	e 27 6	[+42]	e 41 40	SS	e 60·9
Fort de France		150·4	71	e 19 39	[+ 4]	—	—	—	—	—

Additional readings :—
Riverview iPPNZ =6m.35s., iN =10m.36s., isSN =11m.8s., iE =11m.25s., iN =11m.46s., iE =13m.7s.
Perth PPP =8m.46s., SS =15m.27s., SSS =16m.1s.
Auckland PP =8m.55s., S_cP? =12m.24s., sS =14m.19s., SS =15m.58s., S_cS =17m.6s.
Arapuni i =14m.42s.
Wellington PPZ =8m.59s., PPPZ =9m.34s., P_cPZ =10m.49s., i =14m.12s. and 14m.30s., SS =15m.29s.
Christchurch PPEZ =9m.25s., sS =14m.57s., SS =17m.30s., EZ =19m.18s.
Pehpei e =8m.18s.
Honolulu e =21m.18s.
Hyderabad PSN =21m.4s., SSN =24m.41s.
New Delhi SSN =26m.1s., iN =26m.34s.
Bombay iE =22m.40s.
College esS =23m.31s., e =24m.12s., eSS =28m.37s.
Tashkent sS =23m.34s.
Sitka e =24m.59s.
Ukiah e =26m.14s.
Berkeley i =13m.54s., SS =31m.1s., e =38m.17s. and 42m.39s.
Shasta Dam ePP =18m.42s., e =24m.17s.
Tinemaha iZ =14m.19s.
Pasadena iEN =17m.52s.
Boulder City eS =24m.50s.
Salt Lake City ePS =27m.47s., e =38m.15s.
Bozeman eSP =27m.44s.
Tucson e =17m.5s., eSP =27m.31s., eSS =32m.50s., e =37m.34s.
Rapid City eSS =33m.36s., eSSS =37m.52s.
Upsala eN =39m.24s.? and 46m.42s.?
Helwan PP =20m.27s., pPP =20m.57s., PPP =23m.16s., pPPP =23m.36s.
St. Louis epPPZ? =20m.40s., eZ =28m.55s. and 29m.24s., iPSE? =30m.19s., eSSE =36m.51s., eSSSE =41m.1s.
Copenhagen SS =36m.24s.?
Belgrade e =40m.35s.
Collmberg ePKPE =22m.3s., ePPZ =23m.47s., ePPPN =26m.31s., eSZ =31m.37s., ePSE =33m.53s., ePPSZ =35m.1s., eSSZ =39m.56s., eSSSZ =44m.43s., phases being wrongly identified. Also recorded many other readings not attributed to phase.
Strasbourg e =20m.29s. and 21m.33s., ePPS? =32m.56s.
Rome eS? =32m.38s.
Harvard PKS (pPKP) =19m.25s.
La Plata PE =19m.30s., E =22m.54s., N =22m.58s., Z =23m.5s.
Huancayo ePP =21m.40s., e =23m.22s., ePPP? =25m.11s., e =27m.27s., i =29m.18s., ePS =32m.37s., i =40m.28s.
Alicante PPP =24m.2s., eS =29m.18s., PPS =32m.26s., SS =37m.38s., SSS =43m.52s., Q =53m.51s.
Toledo S_cS,PKPE =34m.29s., SSSN =43m.24s.?
La Paz iZ =23m.34s., PPPZ =25m.44s., iPSZ =32m.58s.
Bogota i =19m.22s.
Granada SS =39m.19s.
Bermuda i =23m.29s., ePPP =26m.1s., e =29m.52s., eSP =32m.59s., e =35m.34s., 41m.39s., and 50m.20s.
Malaga iPPZ =22m.20s.?, PPPZ =25m.36s., PKKPZ =28m.34s., PPPN(△ >180°) =34m.24s., PPS =35m.24s., QZ =69·7m.
Lisbon PPE =22m.52s.?
San Juan iPKP =19m.35s., e =35m.4s., i =48m.10s.
Long waves were also recorded at Aberdeen, Bergen, Besançon, and Florence.

Jan. 17d. 10h. 45m. 32s. Epicentre 6°·2S. 147°·7E. Depth of focus 0·010. (as at 9h.).

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Brisbane	N.	21·8	165	i 4 48	+ 3	—	—
Tinemaha		96·9	53	i 13 21	0	—	—
Pasadena		96·9	56	i 13 21	0	e 13 40	pP
Mount Wilson		97·0	56	i 13 21	− 1	e 13 39	pP
Riverside	Z.	97·5	56	i 13 24	0	i 13 43	pP
La Jolla	Z.	97·6	57	e 13 25	0	—	—
Palomar		97·9	57	i 13 26	0	—	—
Tucson		103·0	57	e 13 50	+ 1	—	—

Long waves were recorded at Riverview.

Jan. 17d. Readings also at 2h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Santa Barbara, Tucson, Boulder City, Pierce Ferry, St. Louis, and Collmberg), 5h. (Tananarive, Tchimkent, near Andijan, Samarkand, and Stalinabad), 6h. (New Delhi), 8h. (Harvard, Ottawa, Seven Falls, and Shawinigan Falls), 9h. and 10h. (Santa Lucia), 12h. (near Pierce Ferry and Boulder City), 17h. (Andijan and near Stalinabad), 22h. (near Stalinabad (2)).

Jan. 18d. 15h. Deep focus earthquake attributed to the region of Samoa. Recorded at all stations in California and Honolulu. Pasadena suggests depth of focus 300kms.

Honolulu eP =40m.33s., i =41m.11s., eS? =46m.52s., L =50m.23s.
Riverview eEZ =41m.30s., eE =42m.54s., eEN =45m.0s., eLEN =49m.54s.
Santa Barbara ePZ =44m.20s.
Pasadena iP =44m.24s., ipP =45m.36s., iZ =47m.10s., eSE =53m.29s.
Mount Wilson iPNZ =44m.25s., ipPZ =45m.37s., iNZ =45m.43s., iZ =47m.3s. and 47m.11s., eZ =48m.13s., iZ =48m.20s.
Riverside ePEZ =44m.25s., epPZ =45m.38s., iZ =47m.18s.
La Jolla eP =44m.26s.
Palomar iP =44m.28s.k, ipPEZ =45m.38s., iSE =53m.38s.
Shasta Dam iP =44m.29s., ipP =45m.40s., eS? =53m.43s., e =54m.9s.
Haiwee iPNZ =44m.32s., epPNZ =45m.43s.
Tinemaha iPEZ =44m.32s., ipPE =45m.45s., eZ =47m.24s.
Boulder City iP =44m.44s., ipP =45m.56s., iPP =47m.39s., eS =54m.4s., eSKS = 54m.39s.
Pierce Ferry iP =44m.47s., ipP =45m.59s., eS =54m.13s.
Overton iP =44m.48s.
Tucson iP =44m.50s., ipP =46m.2s., i =46m.14s., eS =54m.25s.
Grand Coulee iP =45m.2s., ipP =45m.42s.
Brisbane eN =45m.52s., 46m.44s., and 58m.10s.
Collmberg eZ =52m.18s. and 55m.32s.
Long waves were recorded at Auckland.

Jan. 18d. Readings also at 0h. (near Boulder City, Overton, and Pierce Ferry), 1h. (near Stalinabad), 4h. (Mount Wilson, Palomar, Riverside, and Tucson), 5h. (Wellington), 7h. (La Paz and Tucson), 9h. (La Plata), 13h. (near Santa Lucia), 14h. (Samarkand and near Andijan), 16h. (Brisbane, Riverview, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Tucson), 20h. (near Ottawa), 22h. (La Paz).

Jan. 19d. Readings at 1h. (Santa Lucia), 7h. (Cheb), 8h. (near Mizusawa), 10h. (Tucson, Leninakan, near Erevan, and near Stalinabad), 12h. (Mount Wilson and Tucson), 13h. (Arapuni, Auckland, Christchurch, Wellington, Riverview, Mount Wilson, Pasadena, Palomar, Riverside, and Tucson (2)), 14h. (Calcutta), 15h. (Brisbane), 16h. (Haiwee, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Ottawa, and near Apia), 20h. (Tucson), 21h. (Bucharest and Sofia), 22h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Frunse, near Andijan, and Stalinabad).

Jan. 20d. 16h. 54m. 21s. Epicentre 16°·4S. 167°·5E.

$A = -\cdot9371$, $B = +\cdot2077$, $C = -\cdot2806$; $\delta = +3$; $h = +5$;
$D = +\cdot216$, $E = +\cdot976$; $G = +\cdot274$, $H = -\cdot061$, $K = -\cdot960$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	17·4	228	i 4 2	− 4	i 7 39	+20	—	—	i 8·8
Apia		20·2	86	4 39?	0	—	—	—	—	—
Auckland		21·4	165	4 53	+ 2	9 0	+15	5 28	PPP	11·2
Arapuni		22·8	165	4 51	−14	9 39	+28	—	—	10·7
Riverview		22·8	217	i 5 8a	+ 3	i 9 25	+14	i 5 58	PPP	e 11·4
New Plymouth		23·3	167	5 15	+ 5	—	—	—	—	11·6
Wellington		25·6	169	5 30	− 2	10 10	+11	5 39	pP	14·1
Christchurch		27·4	173	5 51	+ 2	10 29	+ 1	6 37	PP	13·6
Perth		49·2	242	—	—	i 16 14	+16	—	—	i 23·0
Honolulu		50·6	43	e 9 12	+10	e 16 12	− 5	e 10 20	PP	e 21·3
Mizusawa		60·5	337	e 10 14	0	18 23	− 6	—	—	—
Berkeley		85·1	49	12 39	0	i 24 33	PS	—	—	i 39·9
Shasta Dam		86·2	46	e 12 43	− 1	e 23 37	+18	e 16 3	PP	—
Calcutta	N.	86·6	295	(e 12 38)	− 8	(i 23 18)	− 5	(e 16 24)	PP	—
Pasadena		86·7	53	e 12 47	0	e 25 0	PPS	i 16 2	PP	e 35·2
Mount Wilson		86·8	53	e 12 45	− 2	—	—	i 16 12	PP	—
Riverside		87·2	53	e 12 47	− 2	—	—	i 13 3	pP	—
Palomar	Z.	87·4	54	i 12 52	+ 2	—	—	i 15 51	PP	—
Tinemaha		87·7	50	i 12 55	+ 3	—	—	—	—	—
College		87·8	17	—	—	e 23 58	+24	e 33 4	SSS	e 38·6
Colombo	E.	89·7	277	12 44	−17	23 37	[+ 6]	—	—	—
Boulder City		89·9	52	e 13 2	0	—	—	e 16 25	PP	—
Overton		90·4	52	e 13 6	+ 2	—	—	—	—	—
Pierce Ferry		90·6	53	i 12 45	−20	—	—	i 13 1	P	—
Grand Coulee		91·4	40	e 13 7	− 2	—	—	—	—	—
Tucson		91·8	57	e 13 11	0	e 24 1	−10	e 16 27	PP	e 38·4
Kodaikanal	E.	92·9	280	e 16 49	PP	—	—	—	—	—
Hyderabad	N.	93·9	287	e 13 42	+21	24 34	+ 5	17 10	PP	44·8
New Delhi	N.	97·9	298	—	—	e 23 55	[−21]	26 23	PS	—
Bombay		99·5	287	e 16 39	PP	i 20 2	PPP	—	—	—
Rapid City		100·7	47	e 17 57	PP	—	—	—	—	e 54·3
Andijan		104·3	309	e 17 12	PP	—	—	—	—	—
Tashkent		106·7	310	e 14 9	− 9	24 58	[0]	18 27	PP	—
Stalinabad		106·8	307	e 17 40	PP	—	—	—	—	—
Florissant	E.	109·4	54	—	—	e 28 31	PS	—	—	—
St. Louis		109·5	54	e 19 5	PP	i 28 29	PS	e 33 51	SS	—
Huancayo		111·7	110	e 19 26	PP	e 26 3	{−14}	e 28 59	PS	e 48·4
Sverdlovsk		112·8	326	e 18 41	[+ 2]	i 29 0	PS	30 14	PPS	—
La Paz		116·1	118	e 19 35	PP	25 27	[− 9]	27 19	SKKS	55·2
Columbia		116·6	59	e 19 51	PP	e 27 4	{+13}	e 29 46	PS	e 51·8
Grozny		124·1	313	19 0	[− 1]	—	—	—	—	—
Moscow		125·4	329	19 0	[− 3]	—	—	—	—	—
San Juan		128·9	79	e 21 27	PP	e 28 24	{+12}	e 23 12	PKS	e 55·0
Bermuda		130·4	61	e 22 29	PP	e 31 26	PS	i 23 49	PPP	e 55·2
Upsala		131·4	341	e 22 29	PP	e 31 9	PS	e 53 9	Q	e 60·6
Ksara		133·3	302	i 19 21	[+ 3]	26 19	[− 9]	21 49	PP	—
Copenhagen		136·4	341	e 19 31	[+ 7]	28 17	{−42}	22 3	PP	59·6
Helwan		137·2	297	19 29	[+ 4]	22 51	SKP	20 0	pPKP	—
Collmberg		139·7	336	e 19 25	[− 5]	e 26 41	[+ 2]	e 22 16	PP	e 65·6
Prague		140·0	334	—	—	e 41 9	SS	—	—	e 66·6
Belgrade		140·4	323	i 19 39	[+ 8]	e 23 17	PKS	i 22 9	PP	65·6
Cheb		140·9	336	e 22 0	PP	e 44 39	SSS	e 25 11	PPP	e 63·6
De Bilt		141·7	343	—	—	e 40 39?	SS	e 57 39?	Q	e 69·6
Uccle		143·1	344	e 19 43	[+ 7]	e 41 49	SS	e 22 34	PP	e 60·6
Strasbourg		143·9	338	e 19 51	pPKP	e 35 25	PPS	e 22 5	PP	e 63·6
Zürich		144·5	336	e 19 36	[− 2]	—	—	e 22 53	PP	—
Chur		144·6	335	e 19 36	[− 2]	—	—	—	—	—
Paris		145·4	343	i 19 41	[+ 1]	—	—	e 23 0	PP	e 71·6
Neuchatel		145·5	337	e 19 39	[− 1]	—	—	—	—	—
Besançon		145·6	338	e 19 42	[+ 2]	—	—	—	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Florence	146·1	329	i 19 58	[+17]	i 30 26	{+29}	—	—	—
Rome	146·7	326	i 19 43	[+ 1]	e 26 29	[−20]	i 23 13	PKS	—
Clermont-Ferrand	148·0	340	e 19 49	[+ 5]	—	—	e 23 5	PKS	e 65·6
Toledo	155·5	345	e 20 1	[+ 6]	27 3	[+ 3]	23 29	PKS	—
Alicante	155·7	338	e 20 14	[+19]	27 9	[+ 9]	23 27	PKS	68·6
Granada	157·8	343	20 17a	[+19]	—	—	24 21	PP	82·4
Malaga	158·5	344	e 20 9	[+10]	31 11	{+ 6}	23 29	PKS	65·6

Additional readings and notes :—
Auckland pPP? =6m.34s., i =7m.25s., P_cP =8m.34s.
Riverview iE =9m.29s. and 9m.48s., iN =9m.52s., iSSZ =10m.11s., iE =10m.27s.
Wellington sP =6m.1s., PPZ =6m.43s., sPP? =7m.3s., P_cPZ =8m.29s., i =8m.44s. and 9m.39s., sS =11m.28s., P_cS =12m.7s., i =12m.39s. and 31m.39s., S_cS? =16m.10s.
Christchurch iZ =7m.12s., P_cP =8m.37s., iEN =10m.37s., QN =11m.49s., P_cSEN = 12m.21s.
Perth i =20m.16s.
Honolulu eSS =19m.6s.
Berkeley e =19m.25s., i =35m.3s., e =39m.4s.
Shasta Dam e =24m.17s. and 24m.45s.
Calcutta readings have been increased by 2m.
Overton i =13m.42s.
Grand Coulee e =14m.52s.
Hyderabad SKSN =24m.3s., PSN =25m.43s., SSN =30m.40s.
New Delhi iSKKSN =24m.18s., SSN =31m.48s.
Tashkent PPP =20m.39s., S =25m.35s., PS =26m.58s.
St. Louis iE =28m.46s., ePKKPZ =29m.50s., iPPPSE =30m.29s.
Huancayo eSS =35m.26s.
La Paz iZ =20m.27s., PPS =30m.11s., iZ =36m.59s.
San Juan e =25m.11s., ePPS =32m.53s., eSS =39m.9s.
Bermuda eSS? =39m.59s.
Upsala eN =22m.37s.
Ksara PPS =33m.56s., SS =39m.43s.
Copenhagen 23m.5s.
Helwan PP =22m.16s.
Collmberg eZ =19m.29s., 19m.35s., 19m.39s., 22m.27s., and 22m.36s., eN =23m.12s., ePPN =25m.18s., ePKSN =26m.3s., eSKSN =29m.15s., eN =37m.47s., and 40m.20s.
Uccle eSSSEN =46m.39s.?
Strasbourg e =19m.58s., 20m.45s., 21m.2s., and 22m.24s., eSS =41m.35s.
Zürich e =20m.32s. and 23m.39s.
Paris e =20m.27s. and 21m.35s.
Rome iZ? =19m.50s., iEZ =21m.13s., PP =24m.7s., ePPPZ? =27m.51s., eSKKSN? = 30m.51s.
Toledo $iPKP_2Z$ =20m.22s., PPZ =23m.52s., P_cP,PKPN =30m.56s., PPSN =36m.39s.?, SSN =43m.10s., SSPN =43m.59s.
Alicante PP =23m.29s., PPP =27m.3s., SKKS =30m.19s., PSKS =34m.7s., PPS = 37m.11s., SS =42m.15s., Q =60m.47s.
Malaga PKSZ =24m.27s., PPPZ =26m.51s., SKKSZ =30m.13s., PPSZ =36m.37s., SSPZ =42m.53s.
Long waves were also recorded at Weston, Sitka, Ukiah, Salt Lake City, and Chicago.

Jan. 20d. 23h. 34m. 25s. Epicentre 36°·3N. 71°·0E. Depth of focus 0·020.
(as on 1944, Nov. 14d.).
A = +·2630, B = +·7638, C = +·5894 ; δ = −5 ; h =0 ;
D = +·946, E = −·326 ; G = +·192, H = +·557, K = −·808.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Stalinabad		2·9	322	i 0 47	0	i 1 20	− 3	—	—
Andijan		4·6	14	i 1 9	0	i 2 0	− 2	—	—
Samarkand		4·6	319	i 0 59?	−10	—	—	—	—
Tashkent		5·2	347	i 1 16	− 1	2 13	− 4	—	—
Tchimkent		6·1	351	i 1 27	− 2	—	—	—	—
Frunse		7·1	22	e 1 37	− 5	e 2 59	− 3	—	—
Almata		8·3	32	1 59	+ 1	—	—	—	—
New Delhi		9·3	144	i 2 13	+ 1	i 3 52	− 2	—	—
Bombay		17·4	174	i 3 57	+ 3	i 7 10	+ 9	i 4 47	sP
Hyderabad	N.	19·9	159	5 21	+60	8 5	+14	—	—
Grozny		20·6	299	e 4 54	+26	i 8 33	+29	—	—
Sverdlovsk		21·7	345	e 4 37	− 2	e 8 22	− 2	—	—
Collmberg	z.	43·2	310	e 7 43	− 4	—	—	—	—

Additional readings :—
New Delhi S^*N =4m.17s., S_eN =4m.44s.
Collmberg eZ =8m.21s., 8m.49s., and 9m.9s.

Jan. 20d. Readings also at 2h. (Samarkand and near Andijan), 3h. (near Collmberg), 6h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, and Bogota), 11h. (Bergen), 12h. (near Mizusawa), 14h. (near Almata), 19h. (Riverview, Christchurch, Pasadena, Riverside, and Tucson), 20h. (Riverview), 22h. (Tucson).

Jan. 21d. 11h. 25m. 22s. Epicentre 40°·8N. 33°·4E. (as on 1944, Oct. 18d.).

Approximate. U.S.S.R. gives epicentre 41°·5N. 31°·5E., this is too far west.

$A = +\cdot6338$, $B = +\cdot4179$, $C = +\cdot6509$; $\delta = +1$; $h = -2$;
$D = +\cdot550$, $E = -\cdot835$: $G = +\cdot543$, $H = +\cdot358$, $K = -\cdot759$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Yalta		3·7	9	i 0 55	− 5	i 1 42	− 3	—	—	—
Bucharest	E.	6·5	306	e 1 42	+ 3	i 2 42	−13	i 2 7	P_g	—
Ksara		7·2	164	i 1 52	+ 3	e 3 26	+13	—	—	—
Sofia		7·8	288	e 2 14	P•	i 3 33	+ 5	—	—	—
Erevan		8·5	90	e 2 16	+ 9	—	—	—	—	—
Grozny		9·5	71	2 25	+ 5	e 4 25	+15	—	—	—
Belgrade		10·3	297	i 3 22	+50	e 6 43	?	—	—	10·6
Helwan		11·0	188	2 45	+ 3	5 30	+43	3 2	PPP	—
Budapest		12·3	308	3 14	+15	e 7 23	?	—	—	9·1
Zagreb		13·6	297	e 3 38?	+21	—	—	—	—	e 8·6
Triest		15·1	295	e 3 43a	+ 7	e 6 54	+29	i 3 51	PP	—
Moscow		15·2	9	i 3 27	−11	i 6 16	−12	—	—	—
Rome		15·7	281	e 3 54	+10	i 7 6	+27	—	—	e 9·7
Prague		16·2	311	e 3 50	0	e 7 38?	+47	—	—	e 10·6
Florence		16·6	288	i 4 9	+13	i 7 35	+35	—	—	—
Cheb		17·4	310	e 4 10	+ 4	e 7 55	+36	—	—	e 11·6
Collmberg		17·6	313	e 4 6	− 2	e 7 41	+18	e 4 24	PP	—
Chur		18·2	298	e 4 18	+ 2	—	—	—	—	—
Jena		18·2	314	e 4 31	+15.	e 8 8	+31	—	—	—
Zürich		19·0	300	e 4 25a	− 1	e 7 58	+ 3	—	—	—
Strasbourg		19·8	304	e 4 35	0	e 8 26	+13	e 4 38	PP	—
Neuchatel		20·0	299	e 4 36	− 1	—	—	—	—	—
Copenhagen		20·3	326	e 4 35	− 5	e 8 31	+ 8	—	—	—
Besançon		20·7	297	e 4 46	+ 2	—	—	—	—	—
Upsala		21·5	339	e 4 43	− 9	e 8 43	− 4	—	—	12·1
De Bilt		22·3	312	—	—	e 8 38?	−24	—	—	e 11·6
Uccle		22·4	307	e 5 6?	+ 4	e 9 15	+11	—	—	e 13·6
Clermont-Ferrand		22·5	296	e 5 6	+ 4	—	—	—	—	—
Sverdlovsk		23·8	39	i 5 11	− 4	i 9 25	− 3	—	—	—
Samarkand		25·6	82	e 5 39	+ 7	—	—	—	—	—
Tashkent		26·9	77	e 5 28	−17	e 10 14	− 6	—	—	—
Stalinabad		27·2	82	i 5 44	− 3	i 10 34	+ 9	—	—	—
Andijan		29·3	78	i 6 5	− 1	—	—	—	—	—
New Delhi	N.	37·7	95	—	—	e 13 0	−10	—	—	e 17·4
Irkutsk		48·2	51	—	—	15 38	− 5	—	—	—
Tucson		100·2	330	e 13 49	0	—	—	—	—	—

Additional readings:—
Helwan P_cP = 7m.1s.
Bucharest eE = 1m.56s., iP_gE = 2m.23s., iE = 3m.19s.
Belgrade i = 3m.54s. and 5m.20s.
Budapest ePE = 3m.26s.
Rome e = 4m.1s., eZ = 7m.10s.
Collmberg eZ = 4m.9s and 4m.12s., eEZ = 4m.16s., eE = 7m.14s., eZ = 7m.57s., eSSZ = 8m.8s., eSSSZ = 8m.24s.
Strasbourg e = 10m.47s., 11m.11s., and 11m.51s.
Long waves were also recorded at Paris.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

Jan. 21d. 15h. 9m. 37s. Epicentre 22°·5N. 66°·5E.

A = +·3688, B = +·8481, C = +·3805; δ = +7; h = +4;
D = +·917, E = −·399; G = +·152, H = +·349, K = −·925.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay	E.	6·9	120	e 2 33	P_g	—	—	—	—	i 5·7
New Delhi	N.	11·4	56	e 3 33	?	—	—	—	—	i 5·7
Hyderabad	N.	12·3	112	—	—	6 43	S_g	—	—	—
Kodaikanal	E.	16·1	137	i 4 49	+60	—	—	—	—	e 8·3
Stalinabad		16·1	6	i 3 57	+ 8	i 7 6	+17	—	—	—
Samarkand		17·1	0	i 4 1	− 1	—	—	—	—	—
Tashkent		18·9	7	e 4 28	+ 4	e 7 57	+ 4	—	—	—
Calcutta	N.	20·2	85	—	—	e 7 54	−27	—	—	e 9·5
Baku		22·7	325	e 5 2	− 2	e 8 59	−10	—	—	—
Erevan		25·6	318	e 5 33	+ 1	—	—	—	—	—
Grozny		27·0	325	5 51	+ 6	e 10 20	− 2	—	—	—
Ksara		29·1	299	i 6 6	+ 2	11 15	+19	—	—	—
Helwan		32·3	290	e 7 8	+35	—	—	e 7 26	PP	—
Sverdlovsk		34·6	355	—	—	e 12 21	− 1	—	—	—
Irkutsk		41·5	34	—	—	14 23	+16	—	—	—
Collmberg	Z.	50·1	319	e 9 0	+ 1	—	—	e 10 56	PP	—

Collmberg eZ = 9m.45s. and 10m.13s.
Long waves were recorded at Riverview.

Jan. 21d. Readings also at 1h. (near Mizusawa), 15h. (Haiwee, Mount Wilson, Palomar, Riverside, and Tucson), 18h. (Arapuni, Auckland, Christchurch, Wellington, Riverview, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Ksara, Rome, and near Mizusawa), 19h. (Brisbane, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, St. Louis, Bogota, Huancayo, and near La Paz), 23h. (Grand Coulee and Santa Lucia).

Jan. 22d. 3h. Undetermined shock.

Auckland P = 12m.5s., S = 16m.6s., i = 16m.43s., L = 17m.40s.
Brisbane ePN = 14m.12s., eSN = 18m.14s., eLN = 20m.8s.
Palomar ePZ = 18m.59s.
Riverside ePZ = 19m.1s.
Riverview eS?N = 19m.4s., eE = 19m.14s., eLN = 21m.42s.
Shasta Dam eP = 19m.4s.
Tinemaha ePEZ = 19m.4s.
Mount Wilson ePZ = 19m.9s.
Boulder City eP = 19m.14s.
Pierce Ferry eP = 19m.18s.
Tucson eP = 19m.21s.
Overton eP = 19m.24s.
Wellington S = 20m.1s., L = 21m.20s.
Ksara iPKP = 26m.58s.
Helwan e = 27m.17s. and 28m.3s.
Long waves were also recorded at Apia, Arapuni, Christchurch, Honolulu, Sitka, Pasadena, Bozeman, La Paz, and Uccle.

Jan. 22d. Readings also at 1h. (near Mizusawa), 2h. (Ksara), 9h. (Riverside, Palomar, Tucson, and near Mizusawa), 12h. (Riverview, Mount Wilson, Tucson, and Tacubaya), 14h. (near Zagreb), 15h. and 22h. (near Stalinabad).

Jan. 23d. 6h. Undetermined shock. Intensity IV; Huaraz.

E. Sildagos.
Datos sismológicos del Perú, 1946. Instituto geológico del Perú, Boletín 7, Lima, 1947, p. 9.
Epicentre approximately 9·5°S. 77°·5W.·

Huancayo eP? = 23m.10s., i = 23m.27s., iS? = 23m.42s., iL = 23m.54s.
La Paz eP = 25m.25s., P = 25m.50s., SZ = 28m.10s., LZ = 29m.16s.
Bogota eP = 25m.55s., e = 26m.17s., 28m.56s., and 29m.36s.
St. Louis ePZ = 31m.4s.
Tucson iP = 31m.25s., e = 32m.12s.
Mount Wilson iPZ = 32m.6s.
Pasadena ePZ = 32m.6s.

Jan. 23d. Readings also at 1h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, St. Louis, and near Barcelona), 5h. (near Mizusawa), 8h. (near Stalinabad), 13h. (near Santa Lucia), 17h. (near Fort de France), 19h. (Tucson), 20h. (near Erevan, Grozny, and Leninakan), 23h. (Bombay and Pehpei).

Jan. 24d. 6h. 18m. 50s. Epicentre 3°·0N. 122°·0E.

Approximate.

$A = -\cdot5292$, $B = +\cdot8469$, $C = +\cdot0520$; $\delta = 0$; $h = +7$;
$D = +\cdot848$, $E = +\cdot530$; $G = -\cdot028$, $H = +\cdot044$, $K = -\cdot999$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	42·1	277	—	—	14 47	PPS	—	—	34·2
Brisbane	N.	42·6	138	—	—	e 13 50	−33	e 16 40	SS	—
Hyderabad	N.	44·9	292	8 30	+12	15 20	+24	10 20	PP	23·3
Kodaikanal	E.	45·2	283	8 22	+ 2	e 15 17	+16	9 52	PP	22·3
Riverview		45·8	146	i 8 24a	− 1	i 14 58	−11	i 9 42	P_cP	—
New Delhi	N.	49·6	306	e 8 55	0	i 16 9	+ 6	16 18	PS	—
Bombay		50·6	292	e 9 8	+ 6	e 16 40	+23	—	—	—
Irkutsk		51·3	346	e 8 59	− 9	—	—	—	—	—
Andijan		58·3	318	e 10 0	+ 1	18 3	+ 2	—	—	—
Stalinabad		59·9	314	i 10 8	− 2	—	—	—	—	—
Tashkent		60·7	317	e 10 10	− 5	e 18 32	0	—	—	—
Sverdlovsk		72·2	330	11 16	−13	20 34	−17	—	—	—
Grozny		77·9	314	—	—	e 21 58	+ 4	—	—	—
Leninakan		79·1	311	e 12 9	+ 1	—	—	—	—	—
Ksara		85·1	304	e 12 39	0	23 27	+19	24 23	PPS	—
Helwan		89·1	300	e 10 12	?	e 23 52	+ 6	e 16 10	PP	—
Cheb		100·2	322	e 20 29	PPP	e 26 40	PS	e 33 8	SS	e 58·2
Pasadena	Z.	112·5	51	e 18 30	[− 8]	—	—	—	—	e 48·5
Mount Wilson	Z.	112·6	51	e 18 23	[−15]	—	—	—	—	—
Palomar	Z.	113·8	51	e 18 53	[+12]	—	—	—	—	—
Tucson		118·9	50	e 19 50	PP	—	—	—	—	e 53·3
Weston		133·2	13	22 26	PKS	—	—	—	—	e 65·5
San Juan		157·3	19	e 20 13	[+15]	e 34 35	PS	e 24 23	PP	e 82·3
Huancayo		160·6	118	e 29 11	?	e 33 15	?	—	—	e 91·2
La Paz		163·3	144	20 8	[+ 4]	31 50	{+20}	25 22	PP	78·2

Additional readings :—
Hyderabad SSN = 18m.15s.
Kodaikanal SSE = 17m.33s.
Riverview iE = 15m.20s., iSSE = 18m.18s., iN = 18m.52s., iE = 18m.57s. and 19m.41s.
New Delhi S_cSN = 17m.47s., SSN = 20m.13s.
Bombay eN = 9m.17s.
Helwan e = 22m.52s.
Cheb e = 28m.10s. and 37m.8s.
San Juan e = 46m.31s. and 50m.41s.
Long waves were also recorded at Arapuni, Christchurch, Wellington, and other European stations.

Jan. 24d. Readings also at 0h. (near Mizusawa), 2h. (Riverview, Tucson, and near Apia), 4h. (near Andijan), 8h. (Riverview), 9h. (near San Juan), 10h. (Harvard, Weston, and Fordham), 15h. (near Santa Lucia), 16h. (near Mizusawa).

Jan. 25d. 4h. 28m. 27s. Epicentre 10°·7N. 63°·8W. (as on 1939, Oct. 14d.).

$A = +\cdot4339$, $B = -\cdot8818$, $C = +\cdot1845$; $\delta = -12$; $h = +6$;
$D = -\cdot897$, $E = -\cdot442$; $G = +\cdot081$, $H = -\cdot166$, $K = -\cdot983$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France	4·8	32	i 1 1	−14	i 1 43	−29	—	—	—
San Juan	7·9	344	e 2 5	+ 6	i 3 49	+19	—	—	i 4·1
Port au Prince	11·4	314	i 3 7	+20	—	—	—	—	i 5·3
Bogota	11·8	240	e 3 6	+13	—	—	—	—	e 5·5
Bermuda	21·6	358	e 5 21	+27	(e 8 48)	− 1	—	—	e 8·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		25·3	207	e 5 51	+21	e 10 35	SS	—	—	i 13·4
La Paz	z.	27·4	188	5 48	− 1	11 34	+66	—	—	14·6
St. Louis	z.	36·5	324	i 7 7	− 2	—	—	—	—	—
Tucson		48·3	305	i 8 46	+ 1	—	—	e 11 49	PPP	—
Pierce Ferry		51·9	308	i 9 12	0	—	—	—	—	—
Overton		52·3	309	i 9 17	+ 2	—	—	—	—	—
Boulder City		52·5	308	i 9 17	0	e 16 49	+ 6	i 11 24	PP	—
Palomar		53·5	304	i 9 25 a	+ 1	—	—	i 11 30	PP	—
La Jolla	z.	53·7	303	e 9 25	− 1	—	—	—	—	—
Riverside	z.	54·0	305	i 9 27	− 1	—	—	i 11 37	PP	—
Mount Wilson		54·6	305	i 9 32	0	—	—	—	—	—
Pasadena		54·7	305	i 9 33	0	—	—	—	—	—
Haiwee		55·0	307	i 9 36	+ 1	—	—	—	—	—
Tinemaha		55·4	308	i 9 37	− 1	—	—	e 11 47	PP	—
Santa Barbara	z.	56·0	305	i 9 43	0	—	—	—	—	—
Grand Coulee		59·1	321	e 9 58	− 6	—	—	—	—	—
Shasta Dam		59·4	312	i 10 2	− 4	—	—	—	—	—

Additional readings :—
Fort de France P_g = 1m.6s. and 1m.12s., SS_g = 1m.51s.
San Juan iP = 2m.10s.
Bogota e = 3m.30s.
Tucson i = 9m.16s. and 9m.43s.
Pierce Ferry i = 9m.24s.
Boulder City i = 9m.41s.
Palomar iZ = 9m.47s. and 10m.26s.
La Jolla eZ = 10m.27s.
Riverside iZ = 9m.50s. and 10m.26s.
Mount Wilson iZ = 9m.55s., eZ = 10m.21s. and 10m.30s.
Pasadena iZ = 9m.54s. and 10m.16s.
Tinemaha iZ = 9m.45s., iEZ = 9m.56s.
Shasta Dam i = 10m.48s.

Jan. 25d. 17h. 31m. 45s. Epicentre 46°·3N. 7°·5E.

Scale VIII-IX at Siders ; VI-VII in the lower Rhone Valley near Lake of Geneva ; V-VI in Upper Valais. Interruption of traffic due to landslides in the Cantons of Valais, Berne, and Vaud. Much damage in Valais and in the Cantons of Berne and Vaud. Alterations occurred to the courses of tributaries of the Rhone and new sources appeared near St. Leonard. Macroseismic radius 250-300km.

E. Wanner.
Jahresbericht des Erdbebendienstes der Schweiz im Jahre 1946, Zürich, 1947, p. 2, Isoseismal chart, p. 21, fig. 1.

J. P. Rothé.
" Deux récents foyers séismiques alpins." La Météorologie, Paris, 1946, pp. 219-224, 3 fig., with isoseismal chart. Shock felt in France as far as Colmar, Epinal, Dijon, Chalon-sur-Saone, Tarare, and Romans.

N. Oulianoff.
" Séismologie et structure du soubassement des Alpes." International Geological Congress Report, 1948 (issued 1950), Vol. 18, No. 5, pp. 110-118, 2 figures.

" Le tremblement de terre du 25 jan., 1946, dans ses rapports avec la structure des Alpes." Ecologue Géol. Helv., Vol. 39, No. 2, 1946, pp. 263-269.

" Le tremblement de terre du 25 jan., 1946, et la structure profonde des Alpes." Bull. Soc. Vaudoise, Sciences Naturelles, 1947, No. 63, pp. 367-390, 5 figures.

" Au sujet de la remarque de M. J. Goguel sur ma communication intitulée ' Infrastructure des Alpes et tremblements de terre du 25 jan., 1946,' " Compte Rendu. Soc. Géol. française, 24 mai, 1948, No. 10, pp. 188, 189.

" Considérations géologiques sur l'altimetrie de la région Sierre-Montana-Sion après le Séisme du 25 jan., 1946."
Bulletin de la Soc. Vaudoise des Sciences Naturelles, Vol. 64, No. 274, Lausanne, 1949, pp. 275-294, 3 figs.

" Considérations géologiques sur l'altimetrie de la région Sierre-Montana-Sion après le Séisme du jan. 25, 1946."
Bulletin Lab. Géol., Minéral and Géophy. Museum Géologique de l'Univ. de Lausanne, 1949, No. 94, p. 20., 3 figs.

Continued on next page.

J. Mariéton.
" Le tremblement de terre du 25 jan., 1946."
Bull. de la Murithienne, fasc., p. 3 (1945-6), Sion, 1946, pp. 70-87, 6 photographs.
Landslides caused by this shock and that of May 30, 1946, amounted to 4,000,000 cu. m. of rock.

P. L. Mercanton.
" Le Séisme du 25 jan., 1946. Son effet sur les lacs Suisses." Bull. de la Soc. Vaudoise des Sciences Naturelles, Vol. 63, No. 267, Lausanne, 1946, p. 321.

F. Montandon.
" Les trois récents séismes du Valais central." Extract from La Revue pour l'Etude des Calamités, tome IX, fasc 24, Geneva, 1946, pp. 50-63.
Intensity 8½-9. Disturbed area 120-140,000 sq. km. Damage caused to 3485 buildings.

" Les trois récents séismes du Valais central." Actes Soc. Helv. Sciences Naturelles, 1946, No. 126, pp. 207-208.

" Un témoignage sur le séisme du 25 jan., 1946." Revue pour l'Etude des Calamités, Vol. 9, No. 24, Geneva 1946, pp. 64-66.

F. Montandon and W. Staub.
" Sur la Cause des tremblements de terre du Haut-Valais."
Le Globe, t 85, Geneva, 1946, p.63-83. 2 figs.

$A = +\cdot6874$, $B = +\cdot0905$, $C = +\cdot7206$; $\delta = -3$; $h = -4$;
$D = +\cdot131$, $E = -\cdot991$; $G = +\cdot714$, $H = +\cdot094$, $K = -\cdot693$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Neuchâtel		0·8	332	i 0 16k	− 2	—	—	—	—	—
Basle		1·3	3	i 0 24a	− 1	—	—	—	—	—
Zürich		1·3	35	i 0 25	0	i 0 45	+ 1	—	—	—
Chur		1·5	68	i 0 29	+ 1	—	—	—	—	—
Strasbourg		2·3	5	i 0 39	− 1	1 16	+ 7	0 48	P_g	—
Clermont-Ferrand		3·1	260	e 0 51	0	i 1 32	+ 3	i 1 0a	P_g	—
Florence		3·7	133	i 0 39	−22	i 1 51	+ 6	—	—	—
Paris		4·2	308	1 6	− 1	i 1 57	0	e 1 27	P_g	—
Triest		4·4	97	i 1 11	+ 1	i 2 1	− 1	i 1 25	P_g	—
Cheb		5·0	39	e 1 15?	− 3	i 2 49	S_g	e 1 40	P_g	—
Uccle		5·0	336	e 1 15	− 3	i 2 7	−11	e 1 35	P_g	—
Jena		5·3	29	e 1 35	P*	i 2 9	−16	e 1 39	P_g	—
Rome		5·7	139	1 31	+ 3	i 2 39	+ 4	i 2 3	P_g	i 3·4
Zagreb		5·9	92	i 1 32a	+ 1	i 2 43	+ 3	i 1 42	P_g	—
De Bilt		6·0	346	i 1 34	+ 2	i 2 36	− 7	—	—	—
Prague		6·0	48	e 1 31	− 1	e 3 15	S_g	e 1 53	P_g	—
Collmberg		6·2	34	e 1 28	− 7	e 3 15	S_g	e 1 49	P*	—
Barcelona		6·2	220	i 1 39	+ 4	2 58	+10	1 48	PP	—
Kew		7·3	317	i 1 50	0	i 3 11	− 4	—	—	—
Tortosa		7·5	225	1 53	0	3 22	+ 2	2 29	P_g	—
Budapest		8·0	77	1 56	− 4	3 53	S*	i 2 23	P*	4·8
Belgrade		9·2	95	e 2 7	− 9	e 3 33	−30	—	—	—
Alicante		9·9	220	i 2 40	+15	i 4 33	+13	2 54	PP	e 5·5
Copenhagen		9·9	16	i 2 24	− 1	4 24	+ 4	—	—	5·5
Durham		10·3	329	i 2 31	− 1	i 5 42	L	—	—	(i 5·7)
Toledo	z.	10·6	237	i 2 41	+ 5	e 4 40	+ 3	2 49	PP	—
Sofia		11·9	102	e 3 0	+ 6	e 5 8	− 1	i 5 24	SS	e 6·3
Granada		12·3	226	i 3 4k	+ 5	i 6 34	L	—	—	(i 6·6)
Aberdeen		12·4	335	i 2 56	− 5	i 6 15	+54	—	—	7·0
Malaga		13·1	227	i 3 13k	+ 3	e 5 59	+21	3 27	PP	7·4
Bucharest		13·2	92	e 3 16	+ 5	e 4 35	−65	—	—	e 7·2
Bergen		14·2	355	e 3 33	+ 9	6 31	+27	—	—	—
Lisbon		14·4	244	3 31k	+ 4	6 17?	+ 8	3 36	PP	7·0
Upsala		14·9	20	e 3 30	− 4	e 6 34	+14	—	—	e 8·1
Moscow		21·0	52	4 46	− 1	8 40	+ 3	5 5	PP	—
Helwan		24·8	124	i 5 26a	+ 1	9 47	+ 1	6 15	PPP	—
Ksara		24·9	111	i 5 26	0	9 55	+ 8	—	—	—
Leninakan		26·7	88	e 5 43	0	—	—	—	—	—
Erevan		27·5	89	e 5 54	+ 4	—	—	—	—	—
Sverdlovsk		33·8	51	i 6 44	− 2	i 12 4	− 6	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tashkent		43·9	73	e 8 6	− 4	—	?	—	—	—
Stalinabad		44·9	77	i 8 17	− 1	—	—	—	—	—
Andijan		46·2	72	e 8 28	0	—	—	—	—	—
Ottawa		55·3	301	e 9 39	+ 1	—	—	—	—	26·2
New Delhi	N.	56·3	81	e 9 43	− 2	i 17 30	− 4	19 29	S_cS	—
Bombay		59·6	93	e 9 15	−53	—	—	e 13 42	PPP	—
Hyderabad	N.	64·5	90	—	—	19 10	− 9	—	—	—
San Juan		65·7	271	—	—	e 19 39	+ 5	—	—	—
Calcutta	N.	67·9	79	—	—	e 20 20	+19	—	—	—
St. Louis		68·0	303	e 11 6	+ 3	—	—	e 24 55	SS	e 31·2
Rapid City		71·2	314	e 11 27	+ 4	—	—	e 24 47	SS	e 39·9
Grand Coulee		75·2	320	e 11 43	− 3	—	—	—	—	—
Shasta Dam		82·5	323	e 12 51	+25	—	—	—	—	—
Pierce Ferry		82·6	315	i 12 26	0	—	—	—	—	—
Boulder City		83·1	316	e 12 28	− 1	—	—	—	—	—
Tinemaha	E.	83·8	319	e 12 36	+ 4	—	—	—	—	—
Tucson		84·0	311	i 12 34	+ 1	e 22 55	− 2	e 15 55	PP	e 44·6
Riverside	Z.	85·9	317	e 12 46	+ 3	—	—	—	—	—
Mount Wilson	Z.	86·0	317	e 12 44	+ 1	—	—	—	—	—
Pasadena		86·1	317	e 12 48	+ 4	—	—	—	—	e 48·2
Palomar	N.	86·2	315	e 12 53	+ 9	—	—	—	—	—

Additional readings :—
Paris S_g = 2m.20s.
Triest i = 2m.15s.
Cheb e = 1m.21s., iN = 2m.39s., eE = 3m.2s.
Uccle eP*NZ = 1m.27s., iZ = 2m.24s., iS_gE = 2m.37s., i = 2m.52s.
Jena i = 2m.1s. and 3m.15s.
Rome i = 1m.34s., iZ = 2m.7s., i = 2m.20s. and 3m.14s.
Zagreb iZ = 1m.37s. and 2m.13s., iNW = 2m.18s., i = 2m.22s., iP_gS_g = 2m.38s., iE = 2m.49s., iS_g = 3m.6s., iSSE = 3m.10s., iZ = 3m.14s.
Prague e = 2m.36s.
Collmberg eZ = 1m.34s., iP_gSEN = 2m.31s.
Barcelona PPP = 2m.8s., SS = 3m.13s.
Tortosa P_gS_g = 2m.59s., 3m.3s., 3m.46s., 3m.54s., and 4m.9s., S_gE = 4m.17s., S_gEN = 4m.28s.
Budapest eN = 2m.7s., iP_gP_gN = 2m.52s., iN = 3m.0s., iE = 4m.15s.
Belgrade e = 2m.22s. and 3m.25s.
Alicante SS = 4m.48s., SSS = 4m.57s., P_cP = 8m.40s., P_cS = 12m.0s., S_cS = 15m.56s.
Copenhagen S = 4m.44s.
Durham EN = 4m.14s. and 5m.34s.
Toledo PPPZ = 3m.1s., iSE = 4m.43s., SSEZ = 4m.55s., SSSNZ = 5m.5s., P_cPZ = 8m.14s., P_cSE = 11m.42s., S_cSE = 15m.22s.
Granada P = 6m.7s., S = 6m.48s.
Malaga SSZ = 6m.8s., SSSN = 6m.13s., iN = 6m.59s., iP_cPZ = 8m.31s., P_cSZ = 11m.53s.
Bergen PN = 3m.36s., SE = 6m.37s.
Upsala eN = 7m.21s., eE = 7m.30s., eN = 7m.54s.
Helwan i = 7m.15s. and 10m.12s.
St. Louis iZ = 11m.11s.
Grand Coulee e = 12m.48s.
Tucson e = 14m.45s.
Long waves were also recorded at Salt Lake City, Bozeman, Butte, and Ukiah.

Jan. 25d. 21h. 38m. 54s. Epicentre 46°·3N. 7°·5E. (as at 17h.).

Felt in Switzerland and France at Ferrette (Haut-Rhin), Remiremont (Vosges), Belfort, Maiche (Doubs), also le Jura, l'Ain, l'Isere, la Savoie, and la Haute-Savoie.
Annales de L'Institut de Physique du Globe de Strasbourg pour l'Année, 1946, 2e partie, Séismologie, Nouvelle Série, tome XI, p. 44.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg	2·3	5	e 0 36	− 4	e 1 12	+ 3	i 0 45	P_g	—
Clermont-Ferrand	3·1	260	e 0 57	+ 6	—	—	—	—	—
Florence	3·7	133	i 1 4	+ 4	i 2 14	S_g	—	—	—
Paris	4·2	308	e 0 59	− 8	e 1 50	− 7	e 1 18	P*	—
Triest	4·4	97	e 2 0	S	(e 2 0)	− 2	—	—	—
Cheb	5·0	39	e 1 36?	P_g	2 27	+ 9	2 34	S*	—
Uccle	5·0	336	e 1 17?	− 1	i 2 53	S_g	i 1 41	P_g	—
Jena	5·3	29	e 1 54	P_g	e 3 6	S_g	—	—	—
Rome	5·7	139	—	—	e 2 31?	− 4	—	—	e 4·1
Zagreb	5·9	92	e 1 33	+ 2	e 2 34	− 6	e 3 4	S*	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague	z.	6·0	48	(i 1 51)	P_g	(3 20)	S_g	—	—	—
Collmberg		6·2	34	e 1 26	− 9	1 2 40	− 8	e 1 46	P*	—
Kew	z.	7·3	317	—	—	—	—	e 2 20	P_g	—
Alicante		9·9	220	e 2 41	+16	—	—	—	—	—
Toledo	z.	10·6	237	e 2 33	− 3	—	—	—	—	—
Malaga	z.	13·1	227	e 3 24	+14	—	—	—	—	e 12·1

Additional readings :—
Paris eS_g = 2m.10s.
Triest eS = 2m.51s., eS_g = 3m.1s.
Cheb 2m.31s.
Prague readings increased by 1m.
Collmberg eZ = 1m.34s., 1m.40s., and 1m.51s., iZ = 1m.54s., eN = 1m.57s., iZ = 2m.15s., iNZ = 2m.18s., eP_gSZ = 2m.28s., eZ = 2m.31s., iZ = 3m.6s., eS_gE = 3m.12s., eN = 3m.19s., eEN = 3m.22s. and 3m.34s., eN = 3m.56s.

Jan. 25d. Readings also at 2h. (Boulder City, Overton, Pierce Ferry, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Riverview), 7h. (near Mizusawa), 10h. (Ksara), 15h. (Jena), 16h. (Bombay, New Delhi, and Ksara), 17h. (Collmberg, Cheb, Clermont-Ferrand, and near Strasbourg), 18h. (Collmberg, Clermont-Ferrand, and near Strasbourg (3)), 19h. (Tucson, Collmberg, Clermont-Ferrand, and near Strasbourg (2)), 20h. (Almeria, Collmberg (2), Cheb, Uccle, Samarkand, near Stalinabad, near Clermont-Ferrand, and Strasbourg (3)), 21h. (Clermont-Ferrand, Strasbourg, and near Collmberg), 22h. and 23h. (Strasbourg).

Jan. 26d. 2h. 30m. 15s. Epicentre 29°·0N. 142°·0E. Depth of focus 0·010.
(as on 1944, Nov. 17d.).

A = −·6903, B = +·5393, C = +·4823 ; δ = −3 ; h = +2 ;
D = +·616, E = +·788 ; G = −·380, H = +·297, K = −·876.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	10·1	357	2 30	+ 6	4 26	+10	—	—	—
Tashkent		59·1	303	e 9 44	− 8	e 18 32	+42	—	—	—
Stalinabad		60·2	301	i 10 3	+ 3	—	—	—	—	—
Samarkand		61·2	302	10 4	− 3	—	—	—	—	—
Sverdlovsk		61·6	323	i 10 12	+ 2	i 19 35	PPS	—	—	—
Bombay		63·3	278	e 10 15	− 6	i 18 46	+ 2	—	—	—
Grand Coulee		74·7	44	e 11 31	0	—	—	i 11 41	pP	—
Grozny		74·9	312	e 11 30	− 2	—	—	—	—	—
Shasta Dam		75·6	52	e 11 37	+ 1	e 21 16	+ 8	i 11 47	pP	—
Leninakan		77·3	311	e 11 54?	+ 8	—	—	—	—	—
Tinemaha		80·1	54	i 12 3	+ 2	—	—	i 12 12	pP	—
Santa Barbara	z.	80·4	56	i 12 3	+ 1	—	—	—	—	—
Haiwee		80·8	54	e 12 5	+ 1	—	—	i 12 16	pP	—
Pasadena		81·6	56	i 12 7	− 2	—	—	i 12 19	pP	e 38·0
Mount Wilson		81·7	56	i 12 8	− 1	—	—	i 12 20	pP	—
Riverside		82·3	56	i 12 12	0	—	—	i 12 25	pP	—
La Jolla		82·9	57	e 12 16	+ 1	—	—	—	—	—
Palomar	z.	83·0	56	e 12 16	0	e 22 34	+ 9	i 12 29	pP	—
Boulder City		83·1	54	e 12 17	+ 1	—	—	i 12 28	pP	—
Overton		83·1	53	e 12 21	+ 5	—	—	i 12 51	pP	—
Pierce Ferry		83·6	53	i 12 20	+ 1	—	—	—	—	—
Ksara		86·3	306	i 12 32	0	i 25 39	?	—	—	—
Tucson		87·9	54	e 12 41	+ 1	e 24 9	SP	e 12 51	pP	e 40·9
Collmberg	z.	88·3	331	e 12 41	− 1	—	—	e 12 52	pP	—
La Paz		149·6	72	19 43	[+ 9]	—	—	—	—	—

Additional readings :—
Mizusawa ePN = 2m.35s.
Shasta Dam i = 12m.3s.
Tinemaha iZ = 12m.41s.
Mount Wilson eNZ = 12m.53s.
Boulder City i = 12m.47s.
Tucson e = 16m.20s.
Collmberg eZ = 13m.0s.
Long waves were also recorded at Riverview and Christchurch.

Jan. 26d. 3h. 15m. 16s. Epicentre 46°·3N. 7°·5E. (as on 25d.).

Felt throughout Switzerland. Maximum intensity VII-VIII. Macroseismic radius 125km. Epicentre as adopted.

E. Wanner.
" Jahresbericht des Erdbebendienstes der Schweiz im Jahre 1946," Zürich, 1947, p. 2, Isoseismic chart p. 28, fig. 2.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brig		0·3	87	e 0 7	P_g	e 0 12	S_g	—	—	—
Neuchatel		0·8	332	i 0 17	− 1	—	—	—	—	—
Zürich		1·3	35	e 0 28	+ 3	e 0 45	+ 1	—	—	—
Strasbourg		2·3	5	e 0 40	0	i 1 6	− 3	i 0 47	P_g	—
Clermont-Ferrand		3·1	260	e 1 0	P_g	e 1 43	S_g	—	—	—
Florence		3·7	133	i 1 10	P_g	i 1 54	S*	—	—	—
Paris		4·2	308	e 1 7	0	e 1 57	0	e 1 25	P_g	—
Triest		4·4	97	e 1 22	P*	e 2 6	+ 4	—	—	—
Cheb		5·0	39	e 1 41	P_g	e 2 38	S*	e 2 44?	S_g	—
Uccle		5·0	336	e 1 18	0	i 2 32	S*	i 2 49	S_g	—
Jena		5·3	29	e 1 47	P_g	e 2 43	S*	—	—	—
Zagreb		5·9	92	e 1 34	+ 3	e 2 40	0	e 3 8	S_g	—
Prague		6·0	48	(e 1 56)	P_g	(e 3 12)	S_g	—	—	—
Collmberg		6·2	34	e 1 36	+ 1	i 2 53	+ 5	e 1 57	P_g	—
Kew	z.	7·3	317	e 1 43	− 7	—	—	—	—	—
Tortosa		7·5	225	3 30	S	(3 30)	+10	4 12	S_g	—
Alicante		9·9	220	—	—	e 4 25	+ 5	—	—	—
Toledo	z.	10·6	237	e 2 37	+ 1	—	—	—	—	—

Additional readings and note :—
Neuchatel i = 0m.20s.
Strasbourg i = 52s., iS_g = 1m.16s.
Paris eS_g = 2m.18s.
Jena eN = 1m.51s. and 3m.9s.
Prague readings have been increased by 1m.
Collmberg eZ = 1m.49s., eEN = 2m.0s., iZ = 2m.6s., eE = 2m.16s., iZ = 2m.20s., eZ = 2m.25s., iP_gSZ = 2m.40s., eZ = 3m.2s. and 3m.13s., eN = 3m.16s., iS_gZ = 3m.22s., eE = 3m.25s., eEN = 3m.37s.
Tortosa iEN = 3m.45s., P_gS_gN = 4m.47s.

Jan. 26d. 6h. 36m. 56s. Epicentre 24°·0N. 98°·5E.

A = −·1352, B = +·9045, C = +·4045 ; δ = +2 ; h = +4 ;
D = +·989, E = +·148 ; G = −·060, H = +·400, K = −·915.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pehpei		9·1	49	e 2 14	0	i 5 41	?	e 2 40	P*	—
New Delhi		19·6	288	e 4 33	+ 1	i 7 20	−48	7 37	SS	8·4
Hyderabad	N.	19·8	254	4 37	+ 2	8 8	− 5	—	—	10·2
Kodaikanal	E.	24·3	240	e 5 31	+11	i 9 51	+14	6 1	PP	12·0
Bombay	E.	24·4	263	e 5 22	+ 1	i 9 32	− 7	—	—	12·6
	N.	24·4	263	e 5 27	+ 6	e 9 38	− 1	—	—	12·5
Colombo	E.	24·7	229	4 18	−66	10 7	+23	—	—	17·5
Andijan		27·5	313	5 44	− 6	—	—	—	—	—
Irkutsk		28·6	7	—	—	10 49	+ 1	—	—	—
Stalinabad		29·1	308	i 6 3	− 1	i 11 1	+ 5	—	—	—
Tashkent		29·9	312	e 6 4	− 8	e 11 4	− 5	—	—	—
Tchimkent		30·1	314	e 6 18	+ 5	—	—	—	—	—
Samarkand		30·8	307	6 16	− 4	—	—	—	—	—
Sverdlovsk		42·7	330	e 7 47	−13	i 14 14	−10	—	—	—
Leninakan		48·3	304	e 8 54	+ 9	—	—	—	—	—
Ksara		55·0	295	e 9 38	+ 3	e 17 43	+26	—	—	—
Helwan		59·4	291	10 15	+ 9	18 0	−15	11 25	P_cP	—
Strasbourg		72·9	316	—	—	e 18 0	?	—	—	—

Long waves were also recorded at Christchurch, Riverview, Bergen, and Upsala.

Jan. 26d. Readings also at 1h. (La Paz (2) and Riverview), 2h. (Mount Wilson, Pasadena, Palomar, and Tucson), 3h. (Collmberg, Uccle, Clermont-Ferrand, and near Strasbourg), 5h. (Strasbourg (2)), 6h. (Strasbourg and near Bogota), 10h. (Besançon and Strasbourg), 12h. (Collmberg, Paris, Jena, Uccle, Strasbourg, and near Besançon), 15h. (Collmberg, Jena, near Besançon, and Strasbourg), 16h. (La Jolla, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Grand Coulee, St, Louis, and Mizusawa), 17h. (La Paz), 18h. (Haiwee, Mount Wilson, Pasadena. Palomar, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, and St. Louis), 20h. (Tucson).

Jan. 27d. Readings at 0h. (Collmberg), 1h. (Grand Coulee, Shasta Dam, Tinemaha, Santa Barbara, Haiwee, Pasadena, Mount Wilson, Riverside, Boulder City, Overton, Palomar, Pierce Ferry, La Jolla, Tucson, St. Louis, La Paz, Mizusawa, Ksara, near Stalinabad), 2h. (near Sotchi), 4h. (Triest, Zagreb, Belgrade, Bucharest, and near Sofia), 7h. (Tucson and Mount Wilson), 13h. (Bucharest and near Sofia), 15h. (Tinemaha, Haiwee, Mount Wilson, Pasadena, Riverside, Palomar, and Tucson), 18h. (Riverview), 19h. (Riverview and Auckland), 21h. (St. Louis, Tucson, Pierce Ferry, Boulder City, Mount Wilson, Palomar, and Tinemaha).

Jan. 28d. 12h. Undetermined shock.

Tucson iP = 51m.37s., i = 52m.8s. and 52m.42s., iL = 53m.18s.
Palomar iP = 52m.23s., eS?EZ = 55m.23s.
Riverside iPZ = 52m.34s.
Mount Wilson ePZ = 52m.40s.
Pierce Ferry iP = 52m.40s., eL = 56m.7s.
Boulder City eP = 52m.41s., eL = 56m.11s.
Pasadena eP = 52m.41s., eS?N = 56m.47s.
Overton eP = 52m.49s., eL = 56m.35s.
Haiwee ePZ = 53m.0s.
Tinemaha eP = 53m.13s.
Shasta Dam eP = 54m.13s.
St. Louis ePZ = 54m.46s., eSN = 58m.52s., eLN = 61m.0s.
Grand Coulee iP = 55m.7s., e = 56m.30s.
Long waves were also recorded at Weston, Salt Lake City, Rapid City, and Chicago.

Jan. 28d. Readings also at 4h. (Hyderabad, New Delhi, Bombay, Ksara, and Tashkent), 5h. (near Bogota), 6h. (Bogota and Tucson), 10h. (Strasbourg, Besançon, and near La Paz), 13h. (Besançon and Strasbourg), 15h. (Tananarive, St. Louis, Tucson, Palomar, Riverside, Pierce Ferry, Pasadena, Boulder City, Overton, Mount Wilson, Haiwee, Tinemaha, Shasta Dam, Grand Coulee, Weston, and College), 16h. (near Apia), 17h. (Tucson (2), Tinemaha, Haiwee, Palomar, Mount Wilson, and Pasadena), 23h. (Tananarive, St. Louis, Boulder City, Pierce Ferry, and Tucson).

Jan. 29d. 18h. 49m. 42s. Epicentre 35°·5N. 140°·4E. Depth of focus 0·005.

Intensity V at Tomisaki, Yokohama; IV at Tokyo, Misima, Mito; II-III at Kasiwara, Utunomiya. Epicentre as adopted. Depth 40km. Macrosiesmic radius between 200-300 kms.
The Seismological Bulletin of the Central Meteorogical Observatory, Japan, for the Year 1946, Tokyo, 1951, p. 6. Isoseismic chart, p. 6.

$A = -\cdot 6287$, $B = +\cdot 5201$, $C = +\cdot 5781$; $\delta = -3$; $h = 0$;
$D = +\cdot 637$, $E = +\cdot 771$; $G = -\cdot 445$, $H = +\cdot 368$, $K = -\cdot 816$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Tokyo	0·6	289	0 12k	− 2	0 21	− 4	—	—
Yokohama	0·7	264	0 20k	+ 5	0 29	+ 2	—	—
Tukubasan	0·8	341	0 12₁	− 5	0 22	− 7	—	—
Misima	1·2	252	0 21k	− 1	0 34	− 4	—	—
Hunatu	1·3	270	0 28	+ 5	0 55	+15	—	—
Onahama	1·5	16	0 29k	+ 3	0 48	+ 3	—	—
Shizuoka	1·7	252	0 22k	− 6	0 42	− 8	—	—
Nagano	2·2	303	0 30k	− 5	0 54	− 8	—	—
Hukusima	2·3	1	0 34	− 3	1 0	− 4	—	—
Sendai	2·8	8	0 48	+ 4	1 21	+ 4	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Toyama		2·9	294	0 44	− 1	1 35	+16	—	—
Hikone		3·4	269	0 48	− 4	1 31	− 1	—	—
Mizusawa		3·7	8	0 57	+ 1	1 36	− 3	—	—
Owase		3·8	249	0 55	− 3	—	—	—	—
Kyoto		3·9	262	0 50	− 9	—	—	—	—
Morioka		4·2	6	1 3	0	1 48	− 4	—	—
Kobe		4·4	259	1 3	− 3	2 7	+10	—	—
Toyooka		4·6	275	1 4	− 5	1 56	− 6	—	—
Sumoto		4·7	257	0 58	−12	1 56	− 8	—	—
Hatinohe		5·1	10	0 51	−25	1 40	−34	—	—
Grand Coulee		70·9	44	e 11 12	0	—	—	—	—
Shasta Dam		72·7	53	i 11 23	0	—	—	i 11 40	pP
Haiwee	z.	78·1	54	e 11 55	+ 1	—	—	—	—
Mount Wilson		79·1	56	i 12 0	+ 1	—	—	i 12 18	pP
Pasadena	z.	79·1	56	i 12 1	+ 2	—	—	i 12 19	pP
Riverside	z.	79·7	56	i 12 4	+ 2	—	—	e 12 20	pP
Overton		80·2	52	e 12 8	+ 3	—	—	—	—
Boulder City		80·3	53	i 12 6	+ 1	—	—	i 12 24	pP
Palomar	z.	80·5	56	i 12 7	0	—	—	i 12 23	pP
Pierce Ferry		80·7	52	i 12 9	+ 1	—	—	i 12 26	pP
Tucson		85·2	54	i 12 32	+ 1	—	—	i 12 50	pP

Additional readings :—
Mount Wilson eZ = 12m.25s.
Tucson i = 13m.10s.

Jan. 29d. Readings also at 0h. (near Oaxaca), 1h. (Collmberg, Jena, Paris, Strasbourg, and near Besançon), 4h. (near Almata, Andijan, and near Frunse), 5h. (near Andijan), 6h. (Harvard, Weston, Columbia, Chicago, Bozeman, Rapid City, Salt Lake City, St. Louis, Overton, Pasadena, Mount Wilson, Boulder City, Riverside, Palomar, Pierce Ferry, and Tucson), 7h. (near Fort de France), 8h. (Tananarive), 9h. (Bombay and near La Paz), 18h. (Montezuma), 19h. (Mizusawa), 21h. (Tucson), 22h. (near Santa Lucia).

Jan. 30d. Readings at 0h. (Boulder City), 1h. (Bucharest and near Sofia), 2h. (La Paz), 5h. (near Tananarive), 9h. (Cheb, San Juan, Tucson, and near Bogota), 12h. (Riverview), 14h. (Cheb and Tucson), 15h. (Bombay, New Delhi, and Stalinabad), 16h. (Calcutta, Hyderabad, and Ksara), 18h. (Almata, Frunse, Samarkand, near Andijan, Stalinabad, Tashkent, and near Mizusawa), 20h. (Tacubaya), 21h. (Tacubaya and near Andijan), 22h. (Zagreb).

Jan. 31d. 13h. 47m. 27s. Epicentre 36°·3N. 71°·0E. (as on 20d.). Depth of focus 0·020.

Epicentre 36°·3N. 71°·2E. Depth 100km. (U.S.S.R.).

$A = +·2630$, $B = +·7638$, $C = +·5894$; $\delta = -5$; $h = 0$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Stalinabad		2·9	322	i 0 47	0	i 1 22	− 1	—	—
Andijan		4·6	14	i 1 12?	+ 3	i 2 8?	+ 6	—	—
Samarkand		4·6	319	e 1 5	− 4	2 1	− 1	—	—
Tashkent		5·2	347	e 1 13	− 4	—	—	—	—
Frunse		7·1	22	e 1 43	+ 1	e 3 5	+ 3	—	—
Almata		8·3	32	2 2	+ 4	—	—	—	—
New Delhi	N.	9·3	144	i 2 0	−12	—	—	—	—
Grozny		20·6	299	e 4 9	−19	—	—	—	—
Leninakan		21·6	292	e 4 21	−17	—	—	—	—
Collmberg	z.	43·2	310	e 7 24	−23	—	—	e 8 26	pP

Jan. 31d. 23h. Undetermined shock.

Riverview e?N =16m.12s., eN =18m.7s., iN =20m.47s., iE =21m.17s., 24m.17s., and 24m.49s., eLZ =25m.18s.
Bombay iE =eN =16m.31s., eEN =24m.45s.
Irkutsk eP =16m.34s.
Almata eP =17m.22s.
Andijan eP =17m.29s., eS =26m.32s.
Samarkand eP =17m.50s.
Sverdlovsk iP =18m.42s., iS =28m.52s.
Baku eP =19m.4s., e =29m.31s.
Hyderabad SN =23m.23s.
Ksara e =23m.43s. and 33m.23s.
Shasta Dam eP =24m.36s.
Pierce Ferry e =24m.51s. and 25m.42s.
Tucson iP =24m.51s.
Boulder City e =25m.39s.
St. Louis iPZ =28m.33s.
Long waves recorded at Weston.

Jan. 31d. Readings also at 0h. (Andijan, near Stalinabad, and near Sofia), 5h. (Baku, Sotchi, near Erevan, Leninakan, Grozny, and near Stalinabad), 6h. (near Tacubaya), 12h. (near Frunse).

Feb. 1d. 0h. Undetermined shock.

Bogota iP =46m.45s., iP* =46m.48s., iP_g =46m.53s., iS =47m.13s., iS_g =47m.24s.
Balboa Heights e =47m.11s.
Huancayo eP =49m.11s., i =49m.57s., eS =52m.25s., eL =53m.45s.
San Juan i =50m.6s. and 50m.11s., iS =53m.44s., eL =57m.24s.
La Paz iPZ =50m.28s., SZ =55m.14s., LZ =59m.21s.
St. Louis ePZ =52m.50s., eSN? =58m.44s., eLN? =60m.52s.
Tucson eP =53m.35s., ePP =54m.53s., e =55m.36s., eS? =63m.40s., eL =68m.26s.
Pierce Ferry eP =54m.10s.
Palomar iPEZ =54m.13s.
Boulder City eP =54m.14s.
Riverside ePZ =54m.20s.
Mount Wilson iPZ =54m.25s.
Pasadena iP =54m.25s.
Grand Coulee eP =55m.25s.
Bermuda eS =57m.11s., eL =59m.15s.

Feb. 1d. 2h. 20m. 53s. Epicentre 46°·3N. 7°·5E. (as on January 26d.).

A = +·6874, B = +·0905, C = +·7206 ; δ = −3 ; h = −4 ;
D = +·131, H = −·991 ; G = +·714, H = +·094, K = −·693.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Besançon		1·4	312	i 0 24	− 3	i 0 43	− 3	—	—	—
Strasbourg		2·3	5	e 0 40	0	i 1 12	+ 2	e 0 43	P*	—
Clermont-Ferrand		3·1	260	e 0 57?	+ 6	e 1 36	+ 7	—	—	—
Paris		4·2	308	e 1 7	0	e 2 9	S*	—	—	—
Jena		5·3	29	e 1 52	P_g	e 3 5	S_g	—	—	—
Collmberg	z.	6·2	34	e 1 35	0	e 2 54	+ 6	e 1 57	P_g	—

Additional readings :—
Strasbourg i =50s.
Collmberg eZ =2m.4s., 2m.18s., 3m.18s., 3m.35s., 3m.41s., and 3m.48s.

Feb. 1d. 5h. Undetermined shock.

Brisbane iS?EN =15m.42s., iQN =18m.55s., eLN =20m.46s.
Riverview iPZ =16m.45s.a, iSE =20m.56s., iSN =21m.0s., iZ =21m.7s., isSEN =21m.11s., iE =21m.33s., iSSNZ =21m.41s., eREN =22·4m.
Christchurch P?Z =19m.17s., eNZ =19m.29s., S =22m.23s., QN =23m.32s., RE =24m.50s.
Auckland P? =20m.17s., S =24m.48s., SS =27m.19s., R =29m.
Arapuni S? =21m.18s., L =23m.0s.
Shasta Dam iP =24m.7s.
Palomar ePZ =24m.11s.
Mount Wilson iPZ =24m.11s.

Continued on next page.

Pasadena iPZ = 24m.12s., eLZ = 52·4m.
Riverside ePZ = 24m.12s.
Haiwee ePZ = 24m.15s.
Tinemaha iPEZ = 24m.16s., iZ = 24m.28s., iEZ = 24m.42s.
Boulder City eP = 24m.25s., i = 24m.52s.
Pierce Ferry iP = 24m.29s.
Tucson iP = 24m.35s.
Grand Coulee e = 24m.43s.
Long waves were also recorded at Wellington.

Feb. 1d. Readings also at 1h. (Riverview and Tucson), 2h. (Pierce Ferry, Boulder City, and Riverview), 20h. (New Delhi and Riverview), 21h. (New Delhi and Bombay), 23h. (Riverview).

Feb. 2d. Readings at 3h. (Besançon and near Strasbourg), 5h. (Besançon and near Strasbourg), 6h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, St. Louis, La Paz, and La Plata), 7h. (Tucson and Tacubaya), 9h. (Christchurch, Riverview, and Ksara), 10h. (Riverview), 11h. (Tacubaya), 13h. (Tucson and near Tacubaya), 16h. (near Alicante), 18h. (Balboa Heights).

Feb. 3d. Readings at 2h. (Arapuni, Auckland, Christchurch, Wellington, Riverview, Mount Wilson, Pasadena, Palomar, Riverside, and Tucson (2)), 4h. (Tucson and near Tacubaya), 7h. (Kodaikanal, Besançon, near Strasbourg, and near La Paz), 8h. (Hyderabad, Bombay, and Tucson), 10h. (Auckland, Christchurch, Riverview, Collmberg, Pasadena, Palomar (2), Riverside (2), Tinemaha, Tucson (2), and Shasta Dam), 11h. (Santa Lucia, Tucson, and Riverside),13h. (Balboa Heights), 15h. (near Irkutsk), 18h. (Ksara), 19h. (La Paz and Shasta Dam), 20h. (La Paz and New Delhi), 22h. (near New Delhi).

Feb. 4d. 3h. 44m. 47s. Epicentre 52°·3N. 177°·3W. Depth of focus 0·015.
(as on 1937, September 3d.).

$A = -·6134$, $B = -·0289$, $C = +·7892$; $\delta = -7$; $h = -6$;
$D = -·047$, $E = +·999$; $G = -·788$, $H = -·037$, $K = -·614$.

		△	Az.	P.	O−C.'	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		19·6	39	e 4 20?	0	e 7 44?	− 5	e 4 52?	PP	e 10·5
Sitka		24·4	62	e 5 38	+30	i 10 6	+51	i 6 22	PP	e 13·0
Mizusawa	N.	31·4	263	(e 6 14)	+ 3	e 6 14	P	—	—	—
Honolulu		34·5	146	e 6 42	+ 4	e 12 2	+ 6	e 7 58	PP	e 16·3
Grand Coulee		36·8	73	i 6 55	− 2	e 12 19	−12	i 7 27	pP	—
Shasta Dam		38·6	85	i 7 11	− 1	i 12 55	− 3	i 7 44	pP	i 18·2
Ukiah		39·1	87	e 7 48	pP	e 13 1	− 5	—	—	e 16·5
Berkeley		40·5	88	7 26	− 2	13 20	− 7	7 50	pP	17·4
Santa Clara		41·0	88	i 8 5	pP	i 13 31	− 3	—	—	—
Butte		41·5	71	e 8 21	?	—	—	(e 8 59)	PP	e 9·0
Bozeman		42·6	71	—	—	e 14 55	pPS	e 16 51	SS	e 19·4
Tinemaha		43·4	86	i 7 51	0	i 14 9	0	i 8 15	pP	—
Haiwee		44·2	87	i 7 56	− 2	e 14 15	− 6	e 8 30	pP	—
Santa Barbara		44·2	90	i 7 58	0	e 14 18	− 3	i 9 41	P,P	—
Salt Lake City		45·0	77	e 8 32	pP	e 14 22	−10	e 10 ?8	PP	e 18·8
Mount Wilson		45·4	89	i 8 6	− 1	i 14 33	− 5	i 8 41	pP	—
Pasadena		45·4	89	i 8 5	− 2	i 14 33	− 5	i 8 40	pP	—
Irkutsk		45·7	303	8 11	+ 1	—	—	9 9	sP	—
Riverside		46·0	89	i 8 10	− 2	e 14 42	− 4	i 8 44	pP	—
Overton		46·1	84	—	—	i 14 43	− 5	i 15 17	pS	e 21·2
Boulder City		46·2	85	i 8 13	− 1	i 14 44	− 5	i 8 48	pP	—
Pierce Ferry		46·6	84	i 8 16	− 1	i 14 51	− 4	i 8 50	pP	—
Palomar		46·7	89	i 8 17	− 1	i 14 54	− 2	i 8 50	pP	—
La Jolla		46·8	90	i 8 17	− 1	e 14 53	− 5	i 8 50	pP	—
Tucson		51·2	85	i 8 50	− 2	i 15 56	− 3	i 9 25	pP	—
Chicago		58·2	62	e 10 13	pP	e 17 22	−11	—	—	e 28·1
Florissant		58·8	66	e 9 12	−35	i 16 58	−42	e 9 52	pP	—
St. Louis		59·0	66	i 9 44	− 4	i 17 31	−12	e 10 16	pP	e 27·4
Sverdlovsk		59·5	275	i 10 4	+12	e 18 16	+27	i 10 50	pP	—
Ottawa	N.	61·8	52	10 3	− 4	e 19 13	sS	—	—	28·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		65·3	310	10 39	+ 9	—	—	—	—	—
Fordham		66·0	54	i 10 31	− 4	e 19 45	pS	i 11 31	sP	—
Philadelphia		66·1	55	—	—	e 19 58	pS	e 23 49	SS	e 31·0
Weston		66·1	51	i 10 32k	− 4	e 19 53	pS	e 11 13	pP	—
Frunse		66·7	311	e 10 42	+ 3	—	—	—	—	—
Columbia		67·4	63	—	—	e 19 20	− 7	—	—	e 28·5
Upsala		67·6	353	e 11 19?	pP	e 20 36?	sS	—	—	—
Tacubaya		67·7	87	10 48	+ 2	e 19 24	− 7	i 11 21	pP	—
Moscow		68·5	340	i 10 51	+ 1	e 19 41	0	i 11 35	pP	—
Andijan		69·4	311	e 10 59	+ 3	—	—	—	—	—
Tashkent		70·4	313	e 11 1	0	—	—	—	—	—
Copenhagen		72·1	355	i 11 54	pP	e 21 23	sS	—	—	—
Stalinabad		72·9	312	i 11 16	− 1	—	—	—	—	—
Collmberg		76·4	354	i 11 36	− 1	e 16 28	PPP	i 12 21	pP	—
Jena		76·9	355	e 11 51	+11	—	—	e 12 38	sP	—
Uccle	Z.	77·3	0	e 11 43	+ 1	—	—	e 12 18	pP	—
Baku		79·0	326	11 52	+ 1	22 48	sS	i 12 38	pP	—
Paris		79·3	1	i 12 38	pP	—	—	—	—	—
Strasbourg		79·4	357	e 12 38	pP	e 23 4	PPS	i 12 59	sP	—
Zürich		80·6	357	e 11 59	− 1	—	—	e 12 44	pP	—
Bucharest		81·6	344	e 12 6	+ 1	—	—	e 12 53	pP	—
Belgrade		82·1	348	i 12 5	− 3	e 22 1	− 9	i 12 53	pP	—
Clermont-Ferrand		82·3	0	i 12 55	pP	—	—	—	—	—
Hyderabad	N.	84·8	292	12 24	+ 3	23 30	PS	—	—	—
Rome	Z.	85·8	353	i 12 27	+ 1	i 15 54	PP	i 13 14	sP	—
Bombay		86·8	297	i 12 33	+ 2	—	—	—	—	—
Tortosa	N.	87·2	2	12 59	pP	—	—	13 19	sP	—
San Juan		87·9	63	e 12 20	−16	e 22 46	−20	i 24 19	PS	e 38·7
Toledo		88·0	6	e 12 36	− 1	17 54	PPP	i 13 21	pP	—
Ksara		89·5	333	i 12 45	+ 1	i 24 34	PS	i 13 28	pP	—
Alicante		89·7	3	e 13 34	pP	—	—	—	—	e 19·6
Granada		90·7	5	13 39k	pP	—	—	i 20 55	?	—
Bogota		94·4	77	e 13 6	0	—	—	e 13 43	pP	—
Helwan		94·4	335	13 6	0	24 39	+35	16 58	PP	—
La Paz		114·6	85	e 19 59	PP	25 49	SKKS	i 28 46	PS	—

Additional readings :—
College iS = 7m.55s.?, isS = 8m.44s.?
Sitka iP = 5m.41s., i = 10m.58s.
Grand Coulee i = 12m.45s. and 14m.1s.
Shasta Dam e = 8m.29s., iP_cP = 9m.21s., iZ = 12m.52s., iS_cS = 17m.2s.
Bozeman e = 18m.1s.
Tinemaha i = 8m.59s., iP_cP = 9m.38s., iEZ = 11m.4s. and 11m.35s., iS_cPEZ = 13m.12s., iS_cS = 17m.34s.
Haiwee iP_cPNZ = 9m.38s., iNZ = 10m.19s., iS_cPZ = 13m.14s., eS_cSNZ = 17m.37s.
Salt Lake City e = 9m.44s., esS = 15m.40s., eS_cS = 17m.40s.
Mount Wilson iZ = 9m.21s., iP_cPZ = 9m.45s., iS_cPNZ = 13m.18s.
Pasadena iP_cP = 9m.43s., iS_cPZ = 13m.19s., iS_cSEN = 17m.35s.
Riverside iP_cPZ = 9m.46s., iS_cPZ = 13m.20s., eS_cSE = 17m.48s.
Boulder City i = 9m.46s., 13m.23s., and 15m.39s., e = 16m.0s.
Pierce Ferry i = 8m.21s. and 15m.51s., e = 17m.55s.
Palomar iE = 9m.6s., iZ = 10m.9s., iEZ = 10m.15s., iS_cP = 13m.23s., iS_cSE = 17m.55s.
Tucson i = 10m.4s., ePP? = 10m.43s., i = 10m.54s., iS_cP? = 13m.44s., eSSS = 20m.53s.
St. Louis ipPZ = 10m.19s., isSN = 18m.40s., iN = 25m.56s.
Sverdlovsk isS = 19m.20s.
Fordham i = 11m.45s.
Moscow esS = 20m.46s.
Collmberg eZ = 11m.54s., eNZ = 12m.4s., ePPP?Z = 12m.30s., eZ = 13m.35s., 13m.43s., 13m.51s., and 14m.6s., eSSS?Z = 18m.11s.
Uccle esP?Z = 12m.45s.
Strasbourg e = 17m.23s. and 19m.52s.
Belgrade e = 16m.9s. and 23m.29s.
Tortosa iN = 14m.14s., PPN = 15m.13s., pPPN = 16m.16s.
San Juan i = 22m.59s., e = 32m.1s.
Toledo P_cP = 15m.25s., S_cS = 22m.53s.
Ksara PP? = 16m.24s., i = 25m.42s.
Helwan PPP = 19m.4s., PPS = 26m.22s.

Feb. 4d. 4h. 11m. 28s. Epicentre 46°·3N. 7°·5E. (as on 1d.).

Maximum intensity VII-VIII. Macroseismic radius 250km.

Dr. E. Wanner, loc. cit., Jan. 25.

$A = +\cdot6874$, $B = +\cdot0905$, $C = +\cdot7206$; $\delta = -3$; $h = -4$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Brig		0·3	87	e 0 5	P_g	e 0 10	S_g	—	—
Zürich		1·3	35	e 0 21	− 4	e 0 39	− 5	—	—
Besançon		1·4	312	i 0 26	− 1	i 0 43	− 3	—	—
Strasbourg		2·3	5	e 0 38	− 2	1 3	− 6	e 0 44	P_g
Clermont-Ferrand		3·1	260	e 0 59	P_g	e 1 43	S_g	—	—
Florence		3·7	133	i 1 5	P*	i 1 54	S*	—	—
Paris		4·2	308	e 1 2	− 5	e 2 19	S_g	e 1 16	P*
Triest		4·4	97	e 1 18	P*	e 2 2	0	—	—
Uccle		5·0	336	e 1 23	+ 5	e 2 24	+ 6	e 1 38	P_g
Jena		5·3	29	e 1 49	P_g	e 3 0	S_g	—	—
Collmberg		6·2	34	e 1 37	+ 2	e 3 20	S_g	e 1 59	P_g
Tortosa	N.	7·5	225	(1 44)	− 9	—	—	(2 17)	P*
St. Louis	Z.	68·0	303	e 12 19?	+76	—	—	e 12 45	pP

Additional readings :—
Strasbourg S_g = 1m.11s.
Paris e = 2m.11s., i = 2m.14s.
Uccle iZ = 2m.40s., iEN = 2m.54s.
Jena eEN = 1m.52s.
Collmberg eZ = 1m.55s. and 2m.36s., ePSZ = 2m.40s., eZ = 2m.59s. and 3m.15s., eEN = 3m.23s. and 3m.29s., eZ = 3m.32s.
Tortosa P_gN = (2m.23s.), iN = (2m.33s.) and (2m.37s.), P_gS_g = (2m.44s.), (2m.47s.), and (2m.54s.); readings diminished by 2m.

Feb. 4d. 21h. 48m. 2s. Epicentre 36°·4S. 176°·6E. Given by Wellington.

$A = -\cdot8054$, $B = +\cdot0478$, $C = -\cdot5908$; $\delta = 0$; $h = 0$;
$D = +\cdot059$, $E = +\cdot998$; $G = +\cdot590$, $H = -\cdot035$, $K = -\cdot807$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	1·5	252	0 29	+ 1	0 48	− 1	—	—	—
Arapuni	1·8	204	0 40	+ 8	1 10?	+14	—	—	—
Tuai	2·4	170	0 36	− 5	1 5	− 7	—	—	—
New Plymouth	3·3	217	0 52	− 1	1 34	− 1	—	—	—
Wellington	5·1	196	1 13	− 7	2 15	− 5	—	—	—
Kaimata	7·3	212	—	—	2 11	P*	—	—	—
Christchurch	7·7	202	—	—	2 12	P*	—	—	—
Riverview	21·0	270	i 4 53$_s$	+ 6	e 8 51	+14	i 5 3	pP	e 10·3
Ksara	147·9	277	i 19 48	[+ 4]	—	—	23 31	PP	—
Helwan	150·3	267	e 19 54	[+ 6]	—	—	e 20 10	PKP_3	—

Riverview gives also iE = 4m.59s. and 5m.16s., iZ = 5m.45s., eQN = 9·1m.

Feb. 4d. Readings also at 3h. (Bombay and New Delhi), 4h. (Besançon, Collmberg, Jena, and Strasbourg (2)), 5h. (near La Paz), 7h. (New Delhi and near Tacubaya), 9h. (Christchurch and Riverview), 12h. (Andijan and near Stalinabad), 14h. (Tucson and near Mizusawa), 15h. (Collmberg, Jena, near Besançon, and Strasbourg), 16h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, St. Louis, near Huancayo and La Paz), 23h. (Andijan, Tashkent, and near Stalinabad).

Feb. 5d. 12h. Undetermined shock.

San Juan eP = 46m.40s., iS = 46m.52s., i = 46m.58s., iL = 47m.11s.
Fort de France e = 47m.24s.
Fordham eP = 51m.46s., eS = 55m.45s.
Weston eP = 51m.52s., eS = 55m.52s.
St. Louis ePZ? = 53m.8s., eZ? = 59m.16s.
Tucson eP = 54m.14s., i = 54m.31s.
Riverside iPZ = 54m.58s.
Tinemaha iPZ = 55m.23s.

Feb. 5d. 19h. 34m. 47s. Epicentre 19°·5N. 95°·0E.

A = −·0822, B = +·9397, C = +·3318; δ = −12; h = +5;
D = +·996, E = +·087; G = −·029, H = ·331, K = −·943.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hyderabad	N.	15·8	266	3 50	+ 5	6 49	+ 7	—	—	—
New Delhi	N.	18·6	304	4 20	− 1	7 20	−26	—	—	12·5
Colombo	E.	19·3	232	4 31	+ 2	8 4	+ 2	—	—	—
Kodaikanal		19·3	246	4 31	+ 2	8 4	+ 2	4 44	PP	9·7
Bombay		21·0	272	e 4 43	− 4	i 8 35	− 2	—	—	10·6
Almata		28·2	332	5 57	+ 1	—	—	—	—	—
Andijan		28·7	323	e 6 6	+ 5	—	—	—	—	—
Tashkent		30·9	321	e 6 7	−13	e 11 10	−14	—	—	—
Samarkand		31·4	316	e 6 25	0	—	—	—	—	—
Irkutsk		33·5	11	—	—	12 1	− 4	14 13	SS	—
Baku		43·7	310	e 14 30	S	(e 14 30)	− 9	e 18 31	SSS	—
Sverdlovsk		45·2	335	e 8 13	− 7	i 14 45	−16	—	—	—
Grozny		47·5	312	8 35	− 3	15 22	−12	—	—	—
Leninakan		48·3	309	e 8 54?	+ 9	—	—	—	—	—
Ksara		54·1	298	e 9 28	− 1	e 15 58	−67	—	—	—
Helwan		58·1	294	i 9 54	− 4	e 16 40	−78	—	—	—
Collmberg	Z.	70·1	319	e 11 12	− 4	—	—	e 11 35	P_cP	—
Tucson		122·9	26	e 19 1	[+ 3]	—	—	i 19 21	?	—

Additional readings:—
New Delhi SS = 9m.20s., S_cS = 12m.3s.
Kodaikanal SS = 8m.23s.
Collmberg eZ = 11m.45s., 12m.17s., and 13m.52s.

Feb. 5d. Readings also at 0h. (La Paz), 9h. (near Stalinabad), 10h. (near Leninakan), 14h. (near Grand Coulee), 16h. (Boulder City and Pierce Ferry), 18h. (Tucson, Tinemaha, Riverview, Wellington, Arapuni, and Auckland), 20h. (St. Louis, Tucson, and Mount Wilson), 21h. (Santa Lucia), 22h. (near Tashkent, Andijan, and Stalinabad).

Feb. 6d. Readings at 1h. (near Grozny), 5h. (Malaga and Almeria), 7h. (Cheb), 8h. (Cheb and near La Paz), 9h. (Cheb and near Tananarive), 10h. (Boulder City, Overton, Pierce Ferry, Tinemaha, Haiwee, Mount Wilson, Riverside, Palomar, Tucson (2), St. Louis, and Santa Lucia), 14h. (Helwan and Ksara), 15h. (Cheb, Samarkand, Tchimkent, near Andijan and Frunse), 20h. (Santa Clara, near Andijan, and near Mizusawa), 22h. (near Huancayo), 23h. (Riverside, Mount Wilson, Tucson, La Paz, and near Bogota).

Feb. 7d. 2h. 22m. 51s. Epicentre 36°·3N. 71°·0E. Depth of focus 0·020.
(as on Jan. 31d.).

A = +·2630, B = +·7638, C = +·5894; δ = −5; h = 0;
D = +·946, E = −·326; G = +·192, H = +·557, K = −·808.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Stalinabad	2·9	322	i 0 45	− 2	i 1 17	− 6
Samarkand	4·6	319	e 1 9	0	e 2 2	0
Andijan	4·6	14	1 12	+ 3	i 2 3	+ 1
Tashkent	5·2	347	e 1 14	− 3	e 2 11	− 6
Frunse	7·1	22	e 2 19	+37	i 3 3	+ 1
Almata	8·3	32	2 1?	+ 3	—	—
Leninakan	21·6	292	e 5 8	PP	—	—

Feb. 7d. 4h. 39m. 53s. Epicentre 6°·7S. 153°·0E. (as on 1941, May 2d.).

A = −·8850, B = +·4509, C = −·1159; δ = −3; h = +7;
D = +·454, E = +·891; G = +·103, H = −·053, K = −·993.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		27·1	183	e 5 52	+ 6	e 10 38	+14	i 6 27	PP	e 13·6
Arapuni		37·4	151	e 8 7?	+51	—	—	—	—	—
Wellington		39·5	154	7 36	+ 2	14 42	+65	20 47	Q	23·3
Christchurch		40·5	158	7 45	+ 3	14 2	+10	17 30	SSS	21·6
Irkutsk		71·9	330	e 11 24	− 3	e 20 39	− 9	—	—	—
Bombay	E.	82·9	290	i 12 31	+ 3	—	—	—	—	—
Andijan		87·3	311	e 12 49	− 1	e 23 37	+ 8	—	—	—
Tashkent		89·7	311	e 12 55	− 6	e 23 54	+ 2	e 24 56	PS	—
Pasadena	Z.	92·7	56	i 13 49	+34	—	—	—	—	—
Mount Wilson	Z.	92·9	56	e 13 16	0	—	—	—	—	—
Riverside	Z.	93·4	56	e 13 19	+ 1	—	—	—	—	—
Ksara		116·2	304	e 19 56	PP	e 29 46	PS	—	—	—
La Paz	Z.	133·2	118	i 22 51	PKS	—	—	—	—	68·1

Additional readings :—
Riverview iNZ = 10m.58s., iN = 11m.20s., eSSN = 12m.11s.
Wellington P_cPZ = 8m.37s.
Christchurch eEZ = 12m.24s., QEN = 18m.20s.
Long waves were also recorded at Auckland and Tucson.

Feb. 7d. Readings also at 1h. (New Delhi), 15h. (Boulder City, Pierce Ferry, and near Tucson), 18d. (near Samarkand), 22h. (Grozny and near Leninakan).

Feb. 8d. Readings at 1h. (Helwan, Ksara, Calcutta, Kodaikanal, Hyderabad, Bombay, Almata, Tashkent, and Andijan), 4h. (near Samarkand), 5h. (Zürich), 7h. (Andijan, Tchimkent, Tashkent, and near Stalinabad), 10h. (Huancayo, Tucson, and near Tananarive), 11h. (near Mizusawa), 17h. (Wellington, Christchurch, and Auckland), 19h. (Ksara, near Barcelona and Tortosa), 22h. (near Stalinabad), 23h. (Mount Wilson, Tinemaha, and Shasta Dam).

Feb. 9d. 13h. 19m. 2s. Epicentre 42°·8N. 17°·9E. (as on 1945, Nov. 13d.).

Intensity VI at Slano (42°47′N. 17°55′E.), Sipan, Ston, and Sucurac; V at Metkovic, Trebinje and Dubrovnik; IV at Ljubinje, Kotor, and Stolac III at Makarska and Zagreb.

Epicentres suggested: 43°·3N. 17°·7E. (Strasbourg).
42°40′N. 15°30′E. (Belgrade).

R. L. Nedeljkovic
Annuaire macroséismique pour l'année, 1946. Institut Séismologique de Béograd, nouvelle série, No. 6, Belgrade, 1950, pp. 45, 46.

A = +·7004, B = +·2262, C = +·6770; δ = +6; h = −3;
D = +·307, E = −·952; G = +·644, H = +·208, K = −·736.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade	2·8	42	i 0 54	+ 7	i 2 48	?	—	—	—
Zagreb	3·3	336	i 0 55	+ 2	i 1 51	S_g	i 1 5	P_g	—
Kalossa	3·8	12	e 1 13	P_g	1 58	S*	—	—	—
Sofia	4·0	89	e 1 20?	P_g	i 2 17	S_g	—	—	—
Rome	4·1	259	i 1 18	P_g	i 1 54	− 1	—	—	—
Triest	4·1	316	1 8	+ 3	i 1 46	− 9	i 1 16	P*	—
Florence	4·9	283	i 1 36	P_g	i 2 26	S*	—	—	—
Campulung	5·7	62	e 2 10	?	—	—	—	—	4·5
Bucharest	6·2	72	e 2 4	P_g	i 3 1	S*	i 3 32	S_g	3·8
Chur	7·2	307	e 1 44	− 5	e 3 0	−13	—	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague	7·7	344	e 2 28	P_g	e 4 2	S_g	—	—	—
Zürich	8·0	308	e 1 57	− 3	e 3 35	+ 2	—	—	—
Cheb	8·2	335	e 1 10	?	(e 3 28)	−10	—	—	e 3·5
Neuchatel	8·8	302	e 2 4	− 7	—	—	—	—	—
Collmberg	9·1	340	e 2 15	+ 1	e 3 58	− 2	i 5 1	S_g	—
Strasbourg	9·1	313	e 2 33	P*	e 4 2	+ 2	e 2 44	PP	i 4·8
Jena	9·2	334	e 2 21	+ 5	e 3 59	− 4	e 5 5	S_g	—
Besançon	9·5	302	e 4 3	S	(e 4 3)	− 7	—	—	e 5·1
Clermont-Ferrand	11·1	291	e 5 58	?	e 7 40	?	—	—	—
Uccle	12·2	316	—	—	e 4 52	−24	—	—	—
Paris	12·3	304	—	—	e 5 40	+22	—	—	e 7·3
Copenhagen	13·4	347	e 3 35	+21	e 6 11	+26	—	—	7·4
Ksara	16·7	116	e 2 36	?	—	—	—	—	e 7·6
Helwan	16·8	136	e 4 13	+15	e 7 22	+17	e 4 29	PPP	—
Moscow	18·2	38	4 22	+ 6	e 7 42	+ 5	—	—	—
Leninakan	19·4	87	e 4 53	+23	—	—	—	—	—
Grozny	20·3	79	4 47	+ 7	—	—	—	—	—

Additional readings :—
Belgrade iP* =58s., i =1m.6s., 1m.12s., and 2m.32s.
Zagreb eP_g =1m.0s., iE =1m.12s., iZ =1m.15s., eSP =1m.20s., iE =1m.24s. and 1m.46s., iZ =2m.0s.
Kalossa i =2m.23s.
Sofia iP* =1m.31s., iS_gEN =2m.35s.
Triest iS_g =1m.58s.
Bucharest eE =2m.20s. and 2m.36s., eN =2m.39s. and 3m.5s.
Collmberg eZ =2m.19s., 2m.56s., 3m.19s., 3m.34s., and 4m.11s., eEN =4m.15s., eZ = 4m.34s., eE =4m.38s., eEZ =4m.47s., eEN =4m.50s., i =4m.57s.
Strasbourg eSS =4m.21s.
Jena eN =4m.4s., eE =5m.11s.
Paris e =6m.40s.
Long waves were also recorded at Aberdeen, Kew, and De Bilt.

Feb. 9d. Readings also at 1h. (Christchurch, Riverview, Haiwee, Mount Wilson, Pasadena, Riverside, and Tinemaha), 2h. (Bombay, Calcutta, Hyderabad, New Delhi, Almata, Tashkent, and Leninakan), 3h. (Bogota), 5h. (near Boulder City, Overton, and Pierce Ferry), 6h. (near Almata), 9h. (Tucson), 14h. (Bergen and Upsala), 17h. (Tchimkent and near Tashkent), 23h. (near Stalinabad).

Feb. 10d. 0h. 58m. 55s. Epicentre 47°·1N. 9°·7E.

Intensity V in Le Raticon and La Prätigau ; IV-V in the Rhine Valley between Coire and Buchs.
Macroseismic radius 35km.

E. Wanner, loc. cit., Jan. 25 above.

A = +·6734, B = +·1151, C = +·7302 ; δ = −9 ; h = −4 ;
D = +·168, E = −·986 ; G = +·720, H = +·123, K = −·683.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Chur	0·3	204	i 0 6	P_g	i 0 10	S_g
Zürich	0·8	289	e 0 16	− 2	i 0 27	− 4
Basle	1·5	287	e 0 27	− 1	i 0 49	0
Neuchatel	1·9	267	i 0 36	+ 2	i 1 0	+ 1
Strasbourg	2·0	319	e 0 39	+ 4	e 1 11	+ 9
Besançon	2·5	273	—	—	e 1 23	S_g
Collmberg	4·7	26	e 1 31	P_g	e 2 34	S_g

Collmberg gives also eZ =2m.38s., 2m.46s., and 2m.55s.

Feb. 10d. 11h. 1m. 17s. Epicentre 36°·4N. 121°·0W. (as on 1939, June 24d.).

Scale V at San Benito ; IV at Big Sur, Greenfield, San Lucas, and San Miguel. Macroseismic area 2000 square miles.

R. R. Bodle and L. M. Murphy.
United States Earthquakes, 1946. Serial No. 714, Washington, 1948, p. 9. Suggested epicentre 36°10′N. 120°55′W.

$A = -·4155$, $B = -·6916$, $C = +·5908$; $\delta = 0$; $h = 0$;
$D = -·857$, $E = +·515$; $G = -·304$, $H = -·506$, $K = -807$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Clara	1·2	321	e 0 22	− 2	i 0 37	− 4	—	—	—
Shasta Dam	4·4	346	e 1 9	− 1	e 2 11	S*	i 1 20	P*	—
Boulder City	5·0	93	e 1 20	+ 2	i 2 43	S_g	e 1 35	P_g	—
Overton	5·3	87	e 1 16	− 6	e 2 51	S_g	i 1 33	P*	—
Pierce Ferry	5·6	90	i 1 29	+ 2	i 3 1	S_g	i 1 44	P*	—
Tucson	9·4	113	e 2 22	+ 4	e 3 45	−22	(i 5 15)	S_g	i 5·2

Additional readings :—
Shasta Dam iS = 2m.20s.
Tucson i = 4m.22s. and 4m.42s.
Long waves were also recorded at Ukiah and Logan.

Feb. 10d. 13h. 13m. 25s. Epicentre 31°·5N. 58°·5E.

Rough.

$A = +·4463$, $B = +·7283$, $C = +·5199$; $\delta = -10$; $h = +1$;
$D = +·853$, $E = -·522$; $G = +·272$, $H = +·443$, $K = -·854$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		14·3	311	e 3 35	+ 9	—	—	—	—	—
Leninakan		15·0	312	e 3 43	+ 8	—	—	—	—	—
Grozny		15·5	323	e 3 38	− 4	—	—	—	—	—
New Delhi	N.	16·5	95	—	—	e 6 42	−16	—	—	i 9·2
Bombay		18·0	131	e 4 14	+ 1	—	—	—	—	—
Hyderabad	N.	22·9	123	5 5	− 1	9 23	+10	—	—	12·0
Helwan		23·4	273	5 20	+ 9	—	—	—	—	i 13·7
Sverdlovsk		25·4	3	5 20	−11	9 40	−16	—	—	—
Moscow		28·3	335	c 5 58	+ 1	11 1	+18	—	—	—

Helwan gives also e = 5m.59s.
Long waves were also recorded at De Bilt, Strasbourg, Kew, and Copenhagen.

Feb. 10d. Readings also at 0h. (Haiwee, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, and Pierce Ferry), 1h. (Bogota, La Paz, and near Mizusawa), 4h. (near Granada), 5h. (near Ksara), 6h. (near Granada and Malaga), 8h. (Collmberg, Besançon, and near Strasbourg), 10h. (near Granada), 12h. (Bogota, Helwan, and Calcutta), 15h. (La Paz), 16h. (near Alicante), 19h. (Tinemaha, Tucson, Boulder City, Pierce Ferry, St. Louis, and Bogota), 22h. (near Stalinabad).

Feb. 11d. Readings at 0h. (Auckland), 2h. (Edinburgh, near Stalinabad, and near Alicante), 3h. (College and near Samarkand), 4h. (Tucson and Ksara), 5h. (Tucson), 9h. (near Stalinabad), 10h. (near Samarkand), 12h. (New Delhi, Almata, Frunse, near Tashkent, Samarkand, and Stalinabad), 13h. (San Juan), 18h. (Malaga), 23h. (Huancayo).

Feb. 12d. 2h. 43m. 22s. Epicentre 35°·7N. 4°·8E.

Intensity VII-VIII at Pascal VI-VII at Bordj, R'Dir, and Tocqueville.
Epicentre 35°45'N. 4°57'E. (Strasbourg). Macroseismic area about 45,000 square km.

J. P. Rothé.
Les Séismes de Kerrata et la séismicite de l'Algérie. Annales de l'Institut de Physique du Globe de Strasbourg, 3eme part., Géophysique, T. VI, 1950, pp. 33-34, with one isoseismic chart, figure 9.

J. P. Rothé.
Deux recentes foyers séismiques alpins, La Météorologie, Paris, 1946, pp. 219-224, 3 figures.

Lagrula, Jean.
Nouvelles mesures de l'intensité de la pesanteur en Algérie. Mise en evidence d'une corrélation sismo-gravimetrique, Comptes Rendus de l'Academie des Sciences, Vol. 224, Paris, 1947, pp. 636-638.

$A = +·8111$, $B = +·0681$, $C = +·5810$; $\delta = +8$; $h = +7$;
$D = +·084$, $E = -·996$; $G = +·579$, $H = +·049$. $K = -·814$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Alicante		4·9	302	i 1 16	− 1	2 11	− 4	1 25	P*	i 2·7
Almeria		5·9	280	1 31	0	—	—	—	—	—
Barcelona		6·1	341	e 1 34	0	2 53	+ 8	—	—	3·5
Tortosa		6·1	337	1 36	+ 2	2 40	− 5	2 3	P_g	—
Granada		6·9	284	1 47k	+ 2	3 14	+ 9	2 21	P_g	—
Malaga		7·5	278	1 53	0	—	—	—	—	—
Toledo		8·1	303	e 2 4	+ 2	i 4 8	S*	i 2 13	P*	5·0
Rome		8·6	42	i 2 10	+ 1	i 3 51	+ 3	—	—	—
Florence		9·5	30	i 2 29	+ 9	i 4 34	+24	—	—	—
Clermont-Ferrand		10·1	354	i 2 33k	+ 5	i 4 41	+16	—	—	e 6·0
Neuchatel		11·4	7	e 2 46	− 1	e 5 13	+17	—	—	—
Lisbon		11·5	289	e 2 50	+ 2	5 38	+39	i 2 56	PP	7·0
Besançon		11·6	5	e 2 53	+ 3	e 5 20	+19	—	—	e 6·1
Chur		11·7	15	e 2 55k	+ 4	e 7 2	L	—	—	(e 7·0)
Basle		12·0	8	e 2 51	− 4	—	—	—	—	e 6·6
Triest		12·0	31	i 2 58	+ 3	e 5 25	+14	i 7 7	Q	—
Zürich		12·0	13	e 2 56a	+ 1	e 6 20	L	—	—	(e 6·3)
Strasbourg		13·1	9	e 3 9	− 1	e 5 52	+14	—	—	e 6·8
Paris		13·2	353	i 3 14	+ 3	e 5 38	− 2	i 3 27	PP	e 7·6
Zagreb		13·2	36	e 3 4	− 7	e 5 52	+12	e 3 20	PP	e 8·9
Belgrade		15·0	48	i 3 31	− 4	e 6 27	+ 4	e 8 38?	P,P	10·6
Uccle		15·1	359	e 3 36a	0	i 6 30	+ 5	i 3 48	PP	i 8·0
Kalocsa		15·2	40	3 39	+ 1	—	—	e 3 57	PPP	—
Cheb		15·4	19	e 3 41	+ 1	e 6 44	+12	—	—	e 7·6
Jena		16·0	16	e 3 55	+ 7	e 7 7	SS	—	—	e 9·1
Prague		16·0	23	i 3 45a	− 3	e 6 55	+ 9	—	—	e 9·6
Sofia		16·0	58	i 3 48a	0	i 6 57	+11	—	—	e 9·6
Kew		16·2	348	i 3 48a	− 2	e 7 3	+12	i 3 57	PP	e 7·6
De Bilt		16·4	1	i 3 53	0	i 7 8	+12	—	—	e 8·1
Collmberg		16·7	18	i 3 56	− 1	e 7 4	+ 1	e 4 4	PP	e 8·6
Campulung		18·1	52	e 4 14	0	—	—	—	—	—
Bucharest		18·4	55	i 4 19	+ 1	i 7 52	+11	i 4 29	PP	9·8
Durham		19·6	349	i 4 30	− 2	8 14	+ 6	4 46	PP	—
Copenhagen		20·7	12	4 44	0	i 8 38	+ 7	—	—	—
Aberdeen		22·0	350	i 4 56	− 2	i 8 55	− 1	—	—	11·2
Helwan		23·0	97	i 5 11a	+ 4	e 9 14	0	e 9 42	SS	—
Yalta		24·0	60	5 26	+ 9	e 9 36	+ 4	—	—	—
Bergen	z.	24·7	1	5 18	− 6	e 9 46	+ 2	—	—	—
Ksara		25·6	86	i 5 33	+ 1	i 10 3	+ 4	—	—	—
Upsala		25·6	15	e 5 32	0	e 9 58	− 1	—	—	e 14·9
Moscow		30·0	38	6 10	− 2	11 6	− 4	—	—	—
Leninakan		30·8	68	e 6 22	+ 2	11 27	+ 4	—	—	—
Erevan		31·4	70	e 6 25	0	i 11 35	+ 3	—	—	—
Grozny		32·2	63	e 6 43	+11	e 12 0	+15	—	—	—
Baku		35·5	68	—	—	i 12 38	+ 2	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		42·6	42	i 7 56	− 3	i 14 17	− 6	—	—	—
Tchimkent		49·7	62	i 8 46	−10	—	—	—	—	—
Tashkent		49·8	63	e 8 56	0	e 16 1	− 5	—	—	—
Stalinabad		50·2	66	i 9 0	0	i 16 12	+ 1	—	—	—
Andijan		52·1	63	e 9 16	+ 2	—	—	—	—	—
Seven Falls		55·8	307	e 9 41	0	—	—	—	—	26·6
Weston		57·7	302	i 9 55k	0	—	—	—	—	—
Harvard		57·8	302	i 9 56	+ 1	—	—	—	—	—
Ottawa		59·5	307	10 7	0	18 20	+ 4	—	—	27·6
Fordham		60·0	301	i 10 11	0	—	—	—	—	—
New Delhi	N.	60·5	74	—	—	i 18 20	− 9	i 19 59	S_eS	—
Bombay	N.	61·6	86	e 10 14	− 8	e 18 42	− 1	—	—	—
San Juan		64·2	275	e 10 45	+ 6	e 19 18	+ 2	i 20 37	S_eS	e 29·2
Hyderabad	N.	66·9	85	—	—	19 43	− 6	—	—	—
Irkutsk		67·9	41	e 11 0	− 2	e 27 32	SSS	—	—	—
Calcutta	N.	72·2	75	—	—	i 20 45	− 6	—	—	—
Florissant	N.	72·2	305	—	—	e 20 47	− 4	—	—	—
St. Louis		72·2	305	i 11 29	0	i 20 49	− 2	e 11 42	P_eP	e 32·6
Grand Coulee		82·8	326	i 12 28	+ 1	e 22 38	− 7	—	—	—
La Paz		86·3	247	i 12 48	+ 3	23 20	0	16 8	PP	50·6
Pierce Ferry		88·7	315	i 12 58	+ 1	—	—	—	—	—
Boulder City		89·2	315	i 13 2	+ 3	e 23 53	+ 6	i 16 29	PP	—
Tucson		89·4	310	e 13 2	+ 2	—	—	—	—	e 47·1
Shasta Dam		89·8	323	e 13 0	− 2	—	—	—	—	—
Riverside	z.	92·1	316	i 13 8	− 4	—	—	—	—	—
Pasadena	z.	92·5	316	i 13 15	+ 1	—	—	—	—	—

Additional readings :—
Alicante P_g = 1m.33s., S* = 2m.24s., S_g = 2m.33s., and 2m.39s.
Tortosa P_gN = 2m.9s., P_gS_gN? = 2m.26s., P_gS_gN = 2m.32s., P_gS_gEN = 2m.49s., SEN? = 3m.26s., S_gN = 3m.33s. and 3m.40s.
Granada PS = 3m.43s., iS = 4m.15s.
Toledo iE = 4m.52s., iP_cPE = 7m.52s., P_cSE = 11m.35s., iS_cSN = 15m.5s.
Lisbon E = 3m.52s., SN = 6m.14s., SE = 6m.19s.
Paris i = 3m.46s. and 5m.0s., e = 5m.55s., eQ = 6m.38s.
Zagreb e = 3m.50s.
Belgrade i = 4m.57s., e = 5m.48s.
Uccle iPPP = 3m.51s., iE = 6m.41s., iSSE = 7m.6s., iN = 7m.26s.
Sofia iE = 4m.31s. and 4m.45s.
Kew iPP = 4m.18s., iPPPZ = 4m.28s.
Collmberg iPPPZ = 4m.13s., eN = 4m.17s., eE = 4m.56s., eEZ = 5m.30s., eEN = 7m.15s., eSSZ = 7m.18s., eSSSN = 7m.30s.
Bucharest iN = 6m.15s., iSSEN = 8m.9s.
Durham N = 4m.34s., iN = 8m.19s., N = 8m.24s.
Helwan e = 6m.18s.
Upsala eSE = 10m.5s.
San Juan iS = 19m.22s., eSS = 23m.24s.
St. Louis eZ = 12m.7s. and 12m.16s., ePSN? = 21m.38s.
La Paz ePPP = 18m.2s., iZ = 19m.47s., SKKS = 22m.50s., PS = 24m.26s.
Long waves were also recorded at Tananarive.

Feb. 12d. 6h. 16m. 32s. Epicentre 39°·5S. 175°·1E. Depth of focus 0·020.

Intensity VI-VII in the region of the epicentre. Epicentre as adopted. Depth < 40km. (Wellington).

R. C. Hayes.
Earthquakes in New Zealand during the year, 1946, New Zealand Journal of Science and Technology, Vol. 29, No 2, (sect. B), Wellington, 1947, p. 90, isoseismic chart, p. 91.

$A = -\cdot7709$, $B = +\cdot0661$, $C = -\cdot6335$, $\delta = -2$; $h = -1$;
$D = +\cdot085$, $E = +\cdot996$; $G = +\cdot631$, $H = -\cdot054$, $K = -\cdot774$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Bunnythorp	0·8	154	0 28	+ 4	0 44	+ 1	—	—
New Plymputh	0·9	298	0 23	− ?	0 40	− 5	—	—
Arapuni	1·5	16	0 34	+ 3	0 58	+ 4	—	—
Tuai	1·7	66	0 33	0	0 58	0	—	—
Wellington	1·8	188	0 35	+ 1	0 59	− 1	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Auckland		2·7	355	0 28?	−17	—	—	—	—
Kaimata		4·1	222	1 0	− 3	1 45	− 6	—	—
Christchurch		4·4	204	1 5	− 1	1 56	− 2	—	—
Riverview		20·0	280	i 4 22k	0	i 8 5	+12	i 4 40	pP
Brisbane	N.	21·9	297	i 4 40	− 1	i 8 34	+ 7	—	—
Boulder City		99·0	51	e 16 43	?	—	—	i 17 30	PP
Pierce Ferry		99·6	51	e 17 34	PP	—	—	—	—
Ksara		147·0	273	i 19 25	[+ 3]	—	—	e 20 8	pPKP

Additional readings :—
Riverview isPZ =4m.55s., iE =8m.8s., eE =8m.18s., eN =8m.31s., iSSN =8m.42s., iSSSE =9m.5s.
Ksara PP =22m.53s., pPP =23m.29s.

Feb. 12d. 13h. 10m. 26s. Epicentre 25°·0S. 178°·0W.

Rough.

A = −·9068, B = −·0317, C = −·4203 ; δ = −6 ; h = +3 ;
D = −·035, E = +·999 ; G = +·420, H = +·015, K = −·907.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		13·5	207	(3 38)	+23	(6 4)	+17	—	—	6·1
Wellington		17·3	200	(4 8)	+ 4	(7 14)	− 2	7 38	SS	12·0
Christchurch		20·0	200	4 40	+ 3	8 21	+ 4	8 45	Q	10·3
Brisbane	N.	26·1	258	—	—	e 11 0	SS	—	—	e 13·7
Riverview		28·2	244	e 6 0	+ 4	e 10 42	+ 1	e 6 50	PP	e 13·8
Pasadena		81·8	47	e 12 21	− 1	—	—	—	—	e 40·2
Riverside	Z.	82·2	47	e 12 23	− 1	—	—	—	—	—
Shasta Dam		83·9	39	e 12 25	− 8	—	—	—	—	—
Pierce Ferry		85·3	47	e 12 38	− 2	—	—	—	—	—
Tucson		85·7	52	e 12 38	− 4	e 23 15	+ 1	i 12 42	P	e 41·9
Huancayo		96·2	106	—	—	e 24 9	[+ 1]	e 30 53	SS	e 46·7
San Juan		116·9	81	—	—	e 26 16	[+37]	e 30 36	PPS	e 61·4
Ksara		149·3	294	e 19 47	[+ 1]	—	—	23 33	PP	—
Collmberg	Z.	152·4	345	e 19 50	[− 1]	—	—	e 20 11	PKP_2	—
Helwan		153·5	287	e 20 3	[+10]	—	—	23 54	PP	—

Additional readings :—
Auckland P given as S, S given as L.
Wellington P given as S, S given as S_cS, QZ =9·6m.
Riverview eSS?N =11m.47s., eN =13m.1s.
Collmberg eZ =20m.0s. and 20m.15s.
Helwan PKP_2 =20m.20s.
Long waves were also recorded at Arapuni, La Paz, Weston, Harvard, Bucharest, Kew, and Paris.

Feb. 12d. 14h. Undetermined shock.

Sofia ePEN =13m.29s., eEN =13m.40s., iS?EN =14m.11s.
Rome ePN =13m.56s.
Zagreb eP =14m.34s.?, eSE =15m.44s., eL =15m.55s.
Zürich e =14m.55s.
Triest ePN =15m.20s., iSN =16m.24s.
Kalossa ePE =15m.24s., ePN =15m.34s.
Florence iP =16m.34s., iS? =18m.38s.
Collmberg eZ =17m.37s., 18m.7s., 18m.51s., 19m.16s., and 19m.35s.
Strasbourg e =19m.30s., i =19m.45s., e =20m.12s.

Feb. 12d. Readings also at 0h. (Riverview (2)), 6h. (near Sofia), 8h. (Huancayo and Malaga) 12h. (Auckland, Riverview, and near Samarkand), 13h. (Wellington and Collmberg), 14h. (Riverview and Brisbane), 17h. (Zürich and near Zagreb), 19h. (Bombay and Calcutta), 20h. (near Leninakan (2)), 21h. (Santa Lucia).

Feb. 13d. Readings at 0h. (near Sofia), 3h. (Samarkand and near Grozny), 4h. (Tucson, Mount Wilson, and Riverside), 8h. (Cheb), 10h. (near Pierce Ferry and Overton), 11h. (Riverview), 20h. (Tucson, Pierce Ferry, Boulder City, Riverside, Mount Wilson, and La Plata), 21h. (Bogota, La Paz, and Huancayo), 22h. (Tchimkent, Andijan, and near Stalinabad).

Feb. 14d. 2h. Undetermined shock.

Bombay eN = 2m.22s., eEN = 6m.58s.
Stalinabad iP = 4m.9s., eS = 10m.43s.
Andijan eP = 4m.12s., S = 10m.40s.
Sverdlovsk eP = 5m.31s., S = 13m.28s.
Collmberg eZ = 8m.28s., 8m.33s., 8m.51s., 9m.13s., and 9m.56s.
Copenhagen P = 8m.31s.
Mount Wilson ePZ = 14m.57s., iNZ = 18m.14s.
Pasadena ePZ = 15m.1s., eZ = 15m.23s., i = 18m.13s.
Riverside ePZ = 15m.2s., iZ = 18m.16s.k.
Boulder City eP = 15m.4s., iP = 18m.18s., i = 18m.59s.
Tucson eP = 15m.13s., i = 18m.35s. and 19m.17s.
Haiwee ePZ = 15m.23s., iNZ = 18m.11s.
La Jolla eP = 15m.26s., i = 18m.20s.
Tinemaha iEZ = 18m.7s.
Santa Barbara eZ = 18m.11s.
Overton iP = 18m.18s.
Pierce Ferry iP = 18m.19s.
Palomar iE = 18m.20s.
St. Louis iPZ = 18m.41s.

Feb. 14d. 7h. 55m. 42s. Epicentre 36°·8N. 71°·4E. (given by U.S.S.R.).

A = +·2560, B = +·7607, C = +·5964; δ = −11; h = 0;
D = +·948, E = −·319; G = +·190, H = +·565, K = −·803.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Stalinabad	2·7	310	i 0 46	+ 1	i 1 18	− 1
Andijan	4·0	11	i 1 8	+ 4	i 1 59	+ 7
Samarkand	4·5	312	1 15	+ 4	—	—
Tashkent	4·8	341	e 1 14	− 1	—	—
Tchimkent	5·7	347	1 22	− 6	i 2 30	− 5
Frunse	6·5	21	e 1 39	0	e 2 55	0

Feb. 14d. 16h. Undetermined shock.

Huancayo e = 50m.2s. and 54m.3s., eL? = 56m.3s.
Montezuma eP = 50m.37s., iS? = 50m.46s., i = 50m.54s., eL = 51m.3s.
La Paz PZ = 51m.51s., iSZ = 53m.28s., iSN = 53m.32s., LZ = 53m.40s.
Tucson iP = 61m.8s., e = 61m.44s.
St. Louis ePZ? = 61m.13s., iSE = 70m.54s.
Pierce Ferry eP = 61m.36s.
Boulder City iP = 61m.38s., i = 61m.48s.
Riverside iPZ = 61m.39s., eZ = 62m.5s. and 62m.18s.
Mount Wilson iPZ = 61m.43s., iZ = 62m.8s. and 62m.22s.
Pasadena iP = 61m.43s., i = 62m.9s. and 62m.22s.
Haiwee ePZ = 61m.50s.
Palomar eE = 61m.52s.
Tinemaha eP = 61m.53s., eZ = 62m.21s., iZ = 62m.33s.

Feb. 14d. 16h. 52m. 54s. Epicentre 41°·6N. 20°·5E. (as on 1942, Aug. 27d.).

A = +·7025, B = +·2627, C = +·6614; δ = −3; h = −3;
D = +·350, E = −·937; G = +·620, H = +·232, K = −·750.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Sofia		2·4	62	e 0 40?	− 1	i 1 32	+20	—	—	—
Belgrade		3·3	359	e 0 55	+ 2	e 1 40	+ 5	—	—	—
Zagreb		5·3	324	1 19	− 3	e 2 20	− 5	—	—	—
Rome		6·0	276	e 1 26	− 6	e 2 40	− 3	—	—	—
Triest		6·4	312	1 56	P*	e 2 39	−14	—	—	e 3·5
Zürich		10·3	308	e 2 38	+ 6	—	—	—	—	—
Collmberg	z.	11·0	335	e 4 18	?	e 4 34	−13	—	—	e 6·0
Basle		11·0	307	—	—	e 4 47	0	—	—	—
Strasbourg		11·4	312	—	—	e 5 6	+10	e 5 28	SS	i 6·5

Additional readings:—
Belgrade e = 2m.18s.
Zagreb e = 2m.33s.
Collmberg eZ = 4m.55s. and 5m.9s.
Long waves were recorded at Bucharest.

Feb. 14d. Readings also at 6h. (Copenhagen), 7h. (Mount Wilson (2), Pasadena, Riverside (2), Tinemaha (2), Tucson, St. Louis, and Riverview), 10h. (Copenhagen), 11h. (near Johannesburg), 12h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Shasta Dam, Helwan, Ksara, and Strasbourg), 13h. (Stalinabad and Strasbourg).

Feb. 15d. 3h. 17m.48s. Epicentre 47°·3N. 122°·9W.

Scale VII at Olympia, Tacoma, and Seattle (with much damage); VI at Aberdeen, Mount Vernon, Port Angeles, Port Townsend, and Portland; V at Bellingham, Everett, Mineral, Monroe, and Richmond Beach; IV at Chehalis, Spokane, Vancouver, and Yakima. Macroseismic area 70,000 square miles. Depth of focus suggested >25km. Epicentre as adopted.

R. R. Bodle and L. M. Murphy.
United States Earthquakes, 1946, Serial No. 714, Washington, 1948, pp. 17-19, with macroseismic chart.

Julian Barksdale and Howard Coombs.
"The Puget Sound Earthquake of Feb. 14d., 1946." Bull. Seismo. Soc. Amer., Vol. 36, No. 4, Berkeley, 1946, pp. 349-354, with macroseismic chart.
"Pacific North-West Earthquake of Feb. 14, 1946." Bull. Geolog. Soc. of America, Vol. 57, No. 12, part 2. Abstracts and Index p. 1249.
Two shocks separated by 30s.?

$A = -\cdot3697$, $B = -\cdot5715$, $C = +\cdot7326$; $\delta = -1$; $h = -4$;
$D = -\cdot840$, $E = +\cdot543$; $G = -\cdot398$, $H = -\cdot615$, $K = -\cdot681$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seattle	0·5	49	i 0 8	− 6	i 0 16	− 7	—	—	—
Victoria	1·3	344	0 28	+ 3	0 42	− 2	—	—	1·2
Grand Coulee	2·7	77	i 0 41	− 4	i 1 11	− 8	—	—	—
Spokane	3·8	81	0 55	− 6	—	—	—	—	—
Shasta Dam	6·6	177	i 1 39	− 2	e 2 45	−13	i 1 49	P*	e 3·4
Butte	7·2	96	e 1 52	+ 3	e 3 7	− 6	e 2 37	P_g	e 3·5
Ukiah	8·2	182	e 2 24	P*	—	—	e 3 0	P_g	e 3·4
Berkeley	9·4	177	i 2 17	− 1	i 4 4	− 3	—	—	i 5·0
Logan	9·6	121	e 2 25	+ 4	i 4 36	S*	—	—	i 5·2
Santa Clara	10·0	176	e 2 29	+ 2	e 5 2	L	—	—	(e 5·0)
Salt Lake City	10·3	125	e 2 31	− 1	e 4 35	+ 5	e 2 52	pP	e 5·2
Tinemaha	10·8	160	i 2 39	0	i 4 27	−15	—	—	—
Saskatoon	11·6	59	2 52	+ 2	4 59	− 2	—	—	5·9
Haiwee	11·7	160	i 2 53	+ 2	—	—	—	—	—
Overton	12·5	147	e 3 4	+ 2	—	—	i 3 18	pP	e 6·6
Sitka	12·7	328	i 2 59	− 6	i 6 22	L	—	—	i 7·2
Boulder City	12·8	149	e 3 7	+ 1	—	—	—	—	e 6·5
Pierce Ferry	13·0	146	e 3 7	− 2	—	—	—	—	e 7·0
Mount Wilson	13·5	163	e 3 15	0	—	—	—	—	—
Pasadena	13·6	163	i 3 15	− 2	e 6 27	+37	—	—	e 6·9
Riverside	13·9	161	i 3 20	− 1	—	—	—	—	—
Rapid City	14·1	96	e 3 21	− 2	e 5 32	−30	—	—	i 6·8
Palomar	14·7	160	i 3 30	− 1	—	—	—	—	—
La Jolla	15·0	162	i 3 35	0	—	—	—	—	—
Tucson	17·6	145	e 4 5	− 3	e 7 3	−20	e 7 19	pP	i 9·2
Lincoln	19·9	99	e 4 36	0	e 8 27	+12	—	—	e 10·5
College	22·3	331	—	—	e 8 57?	− 5	—	—	e 11·4
Florissant	25·1	98	i 5 30	+ 2	e 10 10	+19	—	—	—
St. Louis	25·3	98	e 5 24	− 6	i 9 59	+ 5	i 6 11	PPP	e 12·5
Chicago	25·6	89	e 5 35	+ 3	—	—	—	—	i 13·5
Ottawa	32·2	75	e 6 32	0	(13 12)	SS	—	—	13·2
Shawinigan Falls	33·8	71	e 7 42	PP	(14 12)	SSS	—	—	14·2
Vermont	34·2	75	—	—	—	—	e 14 13	SS	e 17·3
Seven Falls	34·8	69	e 8 2	PP	—	—	—	—	17·2
Bermuda	46·1	87	—	—	—	—	e 18 33	SS	e 22·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		73·2	34	e 11 39	+ 4	—	—	—	—	e 41·2
Strasbourg		75·3	31	e 11 52	+ 5	—	—	e 12 17	pP	e 41·5
Clermont-Ferrand		75·9	35	e 12 12?	+22	—	—	—	—	e 41·2
Toledo	z.	77·6	43	e 11 54	− 6	—	—	i 12 4	pP	—
Granada		79·9	45	i 12 17a	+ 5	i 22 21	+ 5	12 47	pP	33·6
Alicante		80·4	42	—	—	e 22 23	+ 2	—	—	—
Rome	z.	82·8	32	e 12 36	+ 9	—	—	—	—	—

Additional readings :—
Grand Coulee i =47s. and 1m.18s.
Shasta Dam i =2m.0s.
Berkeley e =2m.25s. and 2m.42s., i =2m.56s., 3m.28s., and 3m.41s., iSE =4m.17s.
Logan e =2m.39s. and 2m.53s., i =3m.25s.
Tinemaha i =2m.44s.
Sitka i =6m.56s.
Boulder City i =3m.36s. and 3m.59s.
Pasadena iNZ =3m.24s.
Riverside iEZ =3m.28s.
Palomar iEZ =3m.36s.
Florissant iSN =10m.13s.
St. Louis ePZ =5m.27s., iPZ =5m.31s., iSE =10m.8s., eSSSE? =11m.30s.
Granada P_gP =12m.28s., sS =23m.48s.
Long waves were also recorded at Ivigtut, La Paz, and other American and European stations.

Feb. 15d. 15h. South America. Deep.

Montezuma iP =50m.26s., e =50m.56s., eL =51m.26s.
La Paz iPZ =51m.10s., iSZ =52m.5s., LZ =52m.19s.
La Plata PE =52m.35s., PZ =52m.38s., SEN =54m.42s., LEN =55·2m.
Huancayo eP =52m.48s., e =53m.40s., eS =55m.12s., eL =55m.42s.
St. Louis iPZ =59m.50s., eSE? =68m.13s.
Tucson iP =60m.16s., ipP =60m.35s.
La Jolla iP =60m.43s.
Palomar iPNZ =60m.44s.
Riverside iPEZ =60m.47s.
Mount Wilson iPNZ =60m.51s., iNZ =61m.2s. and 61m.44s.
Pasadena iP =60m.51s.k, i =61m.4s.
Santa Barbara ePEZ =60m.57s.
Haiwee iPNZ =60m.59s.
Tinemaha iP =61m.2s., i =61m.11s.
Shasta Dam eP =61m.26s.
Toledo iPZ =61m.49s.
Fort de France e =61m.59s. and 65m.14s.
San Juan iS =65m.58s., eL? =87m.

Feb. 15d. 15h. Repetition of earlier shock at 15h.

Montezuma e =59m.6s. and 59m.20s., eS? =60m.38s., eL =60m.48s.
La Paz iPZ =59m.54s., iSZ =60m.48s., LZ =61m.9s.
Fort de France e =65m.14s.
Tucson iP =69m.4s.
Palomar iPEZ =69m.31s.k.
Pierce Ferry iP =69m.32s.
Boulder City iP =69m.34s.
Riverside iPEZ =69m.35s.k.
Overton iP =69m.37s.
Mount Wilson iPNZ =69m.39s.
Pasadena iP =69m.39s., iNZ =69m.54s.
Haiwee iPNZ =69m.46s.
Tinemaha iP =69m.50s.
Shasta Dam iP =70m.14s.
Grand Coulee eP =70m.30s.
Toledo iP =70m.34s.

Feb. 15d. Readings also at 0h. (Shasta Dam), 3h. (near Grand Coulee), 4h. (near Grand Coulee (3)), 10h. (Christchurch, Riverview, Mount Wilson, Pasadena, Palomar, Riverside, and near La Paz), 12h. (near Grand Coulee (2)), 15h. (Fort de France, Andijan, and near Stalinabad), 16h. (Bogota), 17h. (Hyderabad and Santa Lucia), 18h. (Andijan and near Stalinabad), 19h. (Palomar and Tucson), 20h. (near Bogota and near La Paz), 23h. (Bogota).

Feb. 16d. 7h. North Pacific, near 180° Long.
Grand Coulee eP =7m.22s.
Shasta Dam iP =7m.46s., e =8m.26s., ePP =9m.16s., e =14m.10s.
Tinemaha iPEZ =8m.25s., iEZ =8m.32s. and 8m.43s.
College e =8m.35s.?, eL =12m.38s.?.
Pasadena iP =8m.38s., eLZ =26·3m.
Mount Wilson iPZ =8m.40s.
Riverside iPZ =8m.43s.
Boulder City iP =8m.46s.
Overton iP =8m.49s.
Palomar iPEZ =8m.50s.k.
Pierce Ferry iP =8m.50s.
Tucson iP =9m.22s., eL =27m.35s.
Sverdlovsk P =10m.2s., S =18m.40s.
St. Louis ePZ? =10m.20s., eSE? =18m.55s.
Leninakan eP =12m.29s.
Erevan eP =12m.34s.
Bombay ePEN =17m.5s., SEN =20m.40s., LEN =22m.8s.
Ksara e =18m.4s., 25m.18s., and 32m.19s.
Hyderabad ePN =18m.10s., PPN =18m.27s., SN =21m.53s.
New Delhi iS?N =19m.26s.
Tashkent eS =20m.26s.?.
Long waves were also recorded at Kodaikanal, Helwan, Kew, and Uccle.

Feb. 16d. 20h. 4m. 55s. Epicentre 15°·3S. 172°·5W. (as at 1945, Oct. 14d.).
A = −·9567, B = −·1260, C = −·2622; δ = −10; h = +6;
D = −·131, E = +·991; G = +·260, H = +·034, K = −·965.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		1·6	19	i 0 31	+ 1	i 0 48	− 3	—	—	—
Christchurch		30·9	202	—	—	—	—	13 54	Q	18·0
Riverview		37·6	234	e 8 43	PP	e 13 11	+ 3	e 15 51	SS	e 17·9
Pasadena		71·3	46	i 11 24	+ 1	—	—	—	—	e 32·2
Mount Wilson		71·4	46	i 11 23	− 1	—	—	—	—	—
Palomar	z.	71·8	47	e 11 27	+ 1	—	—	—	—	—
Shasta Dam		72·5	38	e 11 30	0	—	—	—	—	—
Boulder City		74·6	46	e 11 33	−10	—	—	—	—	—
Overton		75·2	45	e 11 45	− 1	—	—	—	—	—
Pierce Ferry		75·3	46	i 11 47	0	—	—	—	—	—
Tucson		75·6	50	e 11 48	0	—	—	—	—	e 31·2
Grand Coulee		78·9	34	i 12 7	0	—	—	e 15 2	PP	—
St. Louis		93·5	51	e 13 20	+ 1	—	—	—	—	e 44·1
Paris		146·3	6	e 19 43	[+ 2]	—	—	—	—	e 20·1
Strasbourg		146·8	358	e 19 56	[+14]	—	—	e 20 54	PKP_2	—
Zürich		148·0	359	e 19 46a	[+ 2]	—	—	—	—	—
Ksara		148·4	311	e 19 49	[+ 4]	—	—	e 23 6	PP	—
Belgrade		148·6	341	e 19 52a	[+ 7]	—	—	—	—	—
Granada		156·1	22	20 25a	[+29]	—	—	23 6	PP	76·6

Additional readings :—
Pasadena i =11m.30s.
Mount Wilson iNZ =11m.30s.
Palomar iZ =11m.33s.
Boulder City iP =11m.49s., i =12m.2s.
Overton iP =11m.51s., i =12m.3s.
Pierce Ferry i =12m.1s. and 12m.14s.
Belgrade e =20m.23s.
Long waves were also recorded at Alicante, New Delhi, and Weston.

Feb. 16d. 21h. 24m. 4s. Epicentre 15°·3S. 172°·5W. (as at 20h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		1·6	19	i 0 25	− 5	i 0 45	− 6	—	—	—
Christchurch		30·9	202	8 57	?	—	—	13 44	Q	18·5
Riverview		37·6	234	i 8 44	PP	i 13 7	− 1	e 15 48	SS	e 16·5
Pasadena		71·3	46	i 11 28	+ 5	—	—	—	—	e 31·9
Mount Wilson	z.	71·4	46	e 11 25	+ 1	—	—	—	—	—
Palomar	z.	71·8	47	e 11 29	+ 3	—	—	—	—	—
Shasta Dam		72·5	38	e 11 34	+ 4	—	—	—	—	—
Boulder City		74·6	46	e 11 38	− 5	—	—	—	—	—
Pierce Ferry		75·3	46	e 11 46	− 1	—	—	—	—	—
Tucson		75·6	50	e 11 30	−18	—	—	e 11 54	P	e 34·7

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grand Coulee		78·9	34	e 12 5	− 2	—	—	—	—	—
St. Louis		93·5	51	—	—	i 23 55	[+ 2]	e 24 32	S	e 58·0
Huancayo .		93·6	103	—	—	e 24 4	[+11]	e 24 43	S	e 44·6
Paris		146·3	6	19 40	[− 1]	e 26 56?	PPP	e 41 56?	SS	e 79·9
Strasbourg		146·8	358	e 20 12	[+30]	—	—	—	—	—
Toledo	z.	153·5	20	e 20 12	[+20]	—	—	—	—	—
Alicante		156·0	15	e 20 25	[+29]	—	—	—	—	—
Granada		156·1	22	20 4a	[+ 8]	—	—	20 33	pPKP	—

Additional readings :;
Riverview eZ =15m.57s.
Boulder City eP =11m.8s., e =11m.57s.
Huancayo eSS =32m.7s.
Strasbourg e =20m.17s. and 21m.6s.
Granada PKP_2 =21m.9s., PP =24m.10s., pPP =24m.18s., sPP =24m.34s.
Long waves were also recorded at Auckland, Honolulu, Salt Lake City, Rapid City, Weston, and San Juan.

Feb. 16d. 21h. 56m. 25s. Epicentre 15°·3S. 172°·5W. (as at 21h. 24m. above).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		1·6	19	i 0 27	− 3	i 0 47	− 4	—	—	—
Auckland		24·3	206	5 21	+ 1	10 19	SS	6 14	PP	12·4
Arapuni		25·0	203	3 41	?	9 35	−14	—	—	11·4
Christchurch		30·9	202	—	—	13 3	SS	14 9	Q	16·0
Riverview		37·6	234	i 8 46	PP	e 13 4	− 4	(e 15 35?)	SS	e 15·6
Pasadena		71·3	46	i 11 24	+ 1	—	—	—	—	e 32·5
Mount Wilson	z.	71·4	46	i 11 25	+ 1	—	—	—	—	—
Palomar		71·8	47	i 11 28	+ 2	—	—	—	—	—
Shasta Dam		72·5	38	e 11 31	+ 1	e 21 35	+41	—	—	—
Haiwee	N.	72·6	44	e 11 27	− 4	—	—	—	—	—
Boulder City		74·6	46	e 11 42	− 1	e 22 22	+64	—	—	—
Pierce Ferry		75·3	46	i 11 48	+ 1	e 21 24	− 2	—	—	—
Tucson		75·6	50	i 11 51	+ 3	—	—	—	—	e 33·8
Grand Coulee		78·9	34	e 12 6	+ 1	—	—	—	—	—
College		82·1	10	—	—	e 22 40?	+ 2	—	—	e 37·1
St. Louis		93·5	51	e 13 20	+ 1	i 24 34	+ 9	—	—	—
Huancayo		93·6	103	e 22 41	?	e 24 50	+24	e 30 12	SS	e 43·4
La Paz		99·0	110	e 18 7	PP	—	—	—	—	46·6
Philadelphia		105·2	52	—	—	e 26 48	?	e 43 29	Q	e 54·0
Harvard		108·2	49	—	—	(e 25 35?)	[+30]	—	—	e 25·6
Bermuda		112·9	61	—	—	e 27 13	S	—	—	e 58·6
Collmberg	z.	143·8	355	e 19 35	[− 2]	—	—	—	—	—
Paris		146·3	6	i 19 42	[+ 1]	e 25 35?	?	—	—	e 77·6
Strasbourg		146·8	358	e 19 43	[+ 1]	—	—	—	—	e 78·6
Zürich		148·0	359	e 19 47a	[+ 3]	—	—	—	—	—
Ksara		148·4	311	i 19 49	[+ 4]	36 23	PPS	i 23 19	PP	—
Belgrade		148·6	341	i 19 45a	[0]	e 27 35?	[+43]	i 23 7	PP	—
Zagreb		148·7	348	e 19 43	[− 2]	—	—	—	—	—
Rome	z.	153·1	353	e 20 0	[+ 8]	—	—	e 23 38	PP	—
Helwan		153·7	308	e 19 53	[0]	34 5	PSKS	—	—	—
Alicante		156·0	15	e 23 46	PKS	—	—	—	—	e 79·5
Granada		156·1	22	i 19 57k	[+ 1]	30 46	{− 6}	i 20 25	pPKP	81·4

Additional readings :—
Riverview i =13m.18s.
Pasadena i =11m.40s. and 11m.52s.
Grand Coulee i =13m.7s.
Collmberg eZ =19m.48s.
Strasbourg e =20m.5s., i =20m.18s.
Zagreb e =19m.51s.
Helwan e =20m.8s., i =22m.57s.
Granada PKP_2 =20m.45s., PP =24m.6s., pPP =24m.20s., SKSP =35m.36s., SS = 44m.1s., SSS =50m.10s.
Long waves were also recorded at Wellington, Honolulu, Salt Lake City, Rapid City, Columbia, San Juan, De Bilt, Cheb, and Kew.

Feb. 16d. Readings also at 7h. (Tucson), 9h. (Grand Coulee), 14h. (Ksara and Tchimkent), 19h. (Besançon and Strasbourg), 20h. (St. Louis), 21h. (Apia, Andijan, Erevan, Grozny, near Chur, and Zürich).

Feb. 17d. 14h. Undetermined shock.

Bombay eP?EN =2m.27s., eS?EN =5m.7s., LN =6m.6s.
Andijan eP =2m.59s.
Stalinabad iP =3m.10s., eS =6m.25s.
Tashkent eP =3m.43s., eS =7m.15s.
Kodaikanal eE =8m.6s., 8m.13s., 11m.15s., and 11m.28s., LE =12m.46s.
Hyderabad S?N =8m.14s.
Calcutta eP?N =8m.46s., eS?N =10m.56s., i =11m.19s., e =11m.56s. and 14m.36s.
Ksara e =13m.56s.

Feb. 17d. 14h. 21m. 26s. Epicentre 33°·9N. 139°·6E. Depth of focus 0·010.

Intensity IV at Misima, Utunomiya, and Tokyo ; II-III at Hukusima, Shizuoka, Hunatu, Onahama, and Tomisaki.
Epicentre as adopted. Depth of focus 70km. Macroseismic radius greater than 300kms.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1946, Tokyo, 1951, p. 7. Isoseismic chart, p. 7.

A = −·6334, B = +·5391, C = +·5552 ; δ = +7 ; h = +1 ;
D = +·648, E = +·762 ; G = −·423, H = +·360, K = −·832.

		△	Az.	O.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Mera		1·0	11	0 22	+ 2	0 34	− 2
Misima		1·3	336	0 21a	− 3	0 38	− 4
Shizuoka		1·4	317	0 28a	+ 3	0 46	+ 2
Yokohama		1·5	1	0 26	− 1	0 43	− 4
Hunatu		1·7	336	0 29a	0	0 48	− 3
Tokyo		1·8	4	0 49	+19	1 8	+15
Kumagaya		2·2	355	0 22a	−14	0 50	−12
Tukubasan		2·3	10	0 35	− 2	1 1	− 4
Mito		2·6	16	0 38	− 3	1 0	−12
Utunomiya		2·6	5	0 44	+ 3	1 20	+ 8
Owase		2·8	273	0 49	+ 5	1 22	+ 5
Nagano		3·0	339	0 46a	− 1	1 18	− 4
Hikone		3·1	298	0 49k	+ 1	1 25	+ 1
Onahama		3·2	19	0 52	+ 2	1 16	−11
Toyama		3·4	326	0 53	+ 1	1 30	− 2
Kyoto		3·4	291	0 55	+ 3	1 33	+ 1
Osaka		3·5	284	0 59	+ 5	1 38	+ 4
Kobe		3·7	284	1 0	+ 4	1 42	+ 3
Sumoto		3·9	277	1 3	+ 4	1 47	+ 3
Wazima		4·1	330	1 2	0	1 47	− 2
Sendai		4·5	12	1 6	− 1	1 45	−14
Kôti		5·0	269	0 54	−20	—	—
Mizusawa	E.	5·4	12	1 14	− 6	2 6	−15
Morioka		5·9	11	1 21	− 5	2 21	−12
Miyako		6·0	17	1 19	− 9	2 18	−18
Miyazaki		7·1	257	1 51	+ 8	—	—
Hukuoka		7·6	270	1 57	+ 7	—	—
Mori		8·2	5	1 56	− 2	—	—
Shasta Dam		74·2	52	i 11 26	− 2	—	—
Boulder City		81·7	52	i 12 8	− 1	—	—
Overton		81·7	52	i 12 10	+ 1	—	—
Pierce Ferry		82·2	52	i 12 10	− 2	—	—
De Bilt		85·5	334	e 11 34?	−54	—	—
Tucson		86·6	53	e 12 33	− 1	—	—

Feb. 17d. Readings also at 3h. (near Grand Coulee and near Andijan), 6h. (near Andijan), 8h. (La Paz and Bogota), 9h. (Grand Coulee, Tucson, Overton, Boulder City, Pierce Ferry, Shasta Dam, Palomar, Haiwee, Pasadena, Mount Wilson, Tinemaha, and Riverview), 10h. (near Bogota), 11h. (Bogota, Tucson, and Palomar), 13h. (Collmberg), 16h. (Zürich (2) and near Chur), 17h. (Zürich (2), Pasadena, Mount Wilson, Riverside, Auckland, Christchurch, Perth, Riverview, and near Mizusawa), 18h. (Bogota, Zürich, Hyderabad, Bombay, and near Calcutta), 19h. (Jena, Collmberg, Strasbourg, Besançon, near Florence, Basle (2), Neuchatel (2), Zürich (2), Chur (2), and near Sofia).

Feb. 18d. 0h. 16m. 14s. Epicentre 5°·6S. 163°·8E. (as on 1939, April 30d.).

Doubtful.

$A = -·9558$, $B = +·2777$, $C = -·0969$; $\delta = +6$; $h = +7$;
$D = +·279$, $E = +·969$; $G = +·093$, $H = -·027$, $K = -·995$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		24·0	204	i 5 16	− 1	i 9 18	−14	—	—	e 10·6
Riverview		30·4	201	e 6 17	+ 1	e 11 8	− 8	i 6 57	PP	e 13·9
Auckland		32·7	163	10 34?	?	16 38	L	17 22	S_cS	(16·6)
Arapuni		34·1	163	9 10	P_cP	13 52	S_cS	16 22	Q	17·8
Christchurch		38·6	169	10 13	?	14 35	?	15 49	SS	18·2
Perth		51·9	233	13 24	?	17 31	+56	—	—	22·0
Irkutsk		76·5	327	e 11 49	− 5	20 45	−54	—	—	—
Calcutta	N.	78·8	294	—	—	e 20 31	?	—	—	—
College		78·8	18	—	—	e 23 24?	PPS	—	—	e 32·1
Shasta Dam		81·5	47	e 13 24	+63	—	—	—	—	—
Pasadena		83·3	55	e 13 45	+75	—	—	—	—	—
Mount Wilson	Z.	83·4	55	e 12 34	+ 4	—	—	—	—	—
Tinemaha		83·8	52	e 12 36	+ 4	—	—	—	—	—
Riverside	Z.	83·9	55	e 12 31	− 2	—	—	—	—	—
Palomar	Z.	84·2	56	e 13 54	?	—	—	—	—	—
Grand Coulee		85·6	41	i 12 40	− 1	—	—	—	—	—
Boulder City		86·3	53	e 15 4	PP	—	—	—	—	—
Pierce Ferry		87·0	53	e 13 6	+18	—	—	—	—	—
Hyderabad	N.	87·2	287	—	—	21 43	?	25 43	PPS	32·3
Kodaikanal	E.	87·4	280	e 12 46	− 4	—	—	—	—	—
Tucson		89·0	57	e 15 17	?	e 18 2	PPP	—	—	e 45·4
Bombay		92·7	289	e 13 24	+ 9	—	—	—	—	—
Andijan		94·7	311	e 13 10	−14	—	—	—	—	—
Tashkent		97·0	311	e 13 21	−14	e 23 31	[−41]	e 16 36	PP	—
Stalinabad		97·4	309	e 13 22	−15	—	—	e 18 11	PP	—
St. Louis		105·9	51	e 20 12	PPP	e 26 34	+24	27 50	PS	—
Tananarive		112·7	247	—	—	—	—	e 46 24	Q	53·8
Philadelphia		117·2	47	—	—	—	—	e 41 33	Q	e 53·7
Huancayo		118·6	107	e 23 3	?	—	—	e 40 7	SSS	e 55·5
Harvard		118·9	43	—	—	—	—	e 49 24	Q	e 63·8
La Paz	z.	124·2	114	e 19 58	PP	—	—	23 24	PPP	70·8
Aberdeen		127·4	350	—	—	e 38 56	SSP	e 41 11	SSS	e 63·0
Bermuda		127·6	53	e 29 36	?	—	—	—	—	e 58·1
Cheb		129·6	337	—	—	—	—	e 42 46?	SSS	e 62·8
San Juan		129·7	70	—	—	e 23 39	?	e 37 12	PPS	e 68·0
De Bilt		130·4	343	—	—	—	—	e 38 21	SS	e 51·8
Strasbourg		132·6	338	e 34 28	PPS	—	—	e 43 38	SSS	e 60·8
Paris		134·1	343	e 36 46?	PPS	—	—	—	—	e 64·8
Alicante		144·4	339	e 15 27	P	28 15	{−91}	22 17	PP	e 71·2
Granada		146·5	342	i 15 58k	P	23 59	PKS	41 40	SS	67·4

Additional readings :—
Brisbane iPE =5m.20s.
Riverview iNZ =11m.22s., iE =12m.22s. and 12m.57s., iN =13m.6s., iE =13m.19s. and 13m.45s.
Christchurch QE =15m.59s.
Perth i =14m.31s., SS =19m.44s.
Mount Wilson iZ =13m.44s.
Tinemaha eEZ =13m.44s.
Riverside eZ =13m.44s.
Grand Coulee e =13m.13s.
Pierce Ferry e =13m.58s.
Tashkent S_cS =24m.12s., ePPS =24m.52s., eSS =28m.27s.
St. Louis ePSE =30m.9s., eSSN =36m.4s.
Huancayo e =23m.59s. and 34m.23s.
Bermuda e =35m.4s. and 41m.28s.
San Juan e =44m.14s.
Strasbourg ePP? =37m.47s., e =43m.49s. and 50m.28s.
Alicante P =16m.17s., PP =20m.9s., PPP =24m.53s., SS =40m.53s., Q =53m.1s.
Granada iPP =20m.42s., pPP =21m.41s., iSKKS =25m.57s., SKSP =31m.24s., PPS = 35m.6s., SSS =48m.26s.
Long waves were also recorded at Wellington, Honolulu, Sitka, Chicago, Weston, Columbia, Upsala, Kew, and Toledo.

Feb. 18d. 17h. Off coast of California ?

Shasta Dam e = 34m.32s. and 35m.47s.
Grand Coulee eP = 34m.51s., iP = 34m.59s., eS = 38m.41s., e = 39m.59s.
Tinemaha iP = 35m.38s.
Haiwee ePZ = 35m.44s.
Riverside ePZ = 36m.11s.
Mount Wilson ePZ = 36m.14s.
Pasadena iP = 36m.14s.
Boulder City eP = 36m.14s., e = 36m.38s.
Rapid City eP = 36m.16s., eL = 45m.0s.
Overton eP = 36m.18s.
Pierce Ferry iP = 36m.20s.
Palomar iPEZ = 36m.22s.
Tucson eP = 37m.15s., iP = 37m.27s.
St. Louis eSE? = 44m.47s., eLE? = 48·4m.
Long waves also recorded at Weston, Ukiah, Butte, and Bermuda.

Feb. 18d. Readings also at 0h. (Tucson), 4h. (Riverview), 16h. (Santa Lucia and near Mizusawa), 17h. (Copenhagen), 18h. (Samarkand, Stalinabad, Tchimkent, near Andijan, and near Fort de France), 23h. (near Leninakan).

Feb. 19d. 18h. 55m. 23s. Epicentre 35°·0N. 88°·5E.

A = +·0215, B = +·8207, C = +·5710 ; δ = +5 ; h = 0 ;
D = +1·000, E = −·026 ; G = +·015, H = +·571, K = −·821.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dehra Dun	N.	10·0	245	e 2 29	+ 2	e 5 0	S*	e 3 50	?	—
New Delhi	N.	11·5	240	i 2 45	− 3	—	—	e 3 4	PPP	4·5
Calcutta	N.	12·4	181	i 3 0k	− 1	—	—	—	—	i 7·0
Andijan		14·0	299	e 3 31	+ 9	—	—	—	—	—
Stalinabad		16·2	289	i 3 52	+ 2	—	—	—	—	—
Tashkent		16·4	299	e 3 51	− 2	e 7 11	+15	—	—	—
Tchimkent		16·4	302	i 3 57	+ 4	—	—	—	—	—
Samarkand		17·7	291	e 4 11	+ 1	—	—	—	—	—
Hyderabad	N.	19·7	209	4 28	− 6	8 11	+ 1	4 43	PP	10·5
Irkutsk		20·6	28	i 4 43	0	8 44	+15	—	—	—
Bombay		21·2	225	e 4 49	0	e 8 50	+ 9	—	—	10·3
Kodaikanal	E.	26·6	205	—	—	e 10 21	+ 5	e 10 39	?	e 14·2
Sverdlovsk		28·8	328	6 1	− 1	—	—	—	—	—
Colombo	E.	29·1	198	9 32	PcP	—	—	—	—	—
Baku		30·8	293	—	—	e 11 32	+ 9	—	—	—
Grozny		33·9	298	e 7 5	+18	—	—	—	—	—
Ksara		43·0	284	e 14 38	S	(e 14 38)	+ 9	—	—	(e 21·0)
Helwan		48·0	281	e 13 33	?	e 15 49	+ 8	e 14 10	PcS	—
Strasbourg		59·0	311	e 12 43	PP	—	—	—	—	e 29·6
Paris		62·2	312	—	—	e 25 37?	SSS	—	—	e 33·6
Toledo		70·3	305	e 11 15	− 2	—	—	i 11 55	PcP	—
Granada		71·4	303	(11 39k)	+15	—	—	(i 13 52)	PP	—

Additional readings and notes :—
Ksara gives S as P and L as S.
Helwan e = 19m.43s.
Granada readings increased by 10 minutes.
Long waves were also recorded at Weston, Bermuda, and at other European stations.

Feb. 19d. Readings also at 0h. (Overton), 5h. (Bombay), 6h. (Riverview), 9h. (Wellington, Arapuni, Christchurch, Brisbane, and Riverview), 13h. (Mizusawa and near Andijan), 16h. (Grand Coulee, Christchurch, Riverview, and Brisbane), 17h. (Weston, De Bilt, Strasbourg, and Paris), 20h. (Samarkand, Tchimkent, near Andijan, and Stalinabad), 22h. (Tucson).

Feb. 20d. 3h. 41m. 50s. Epicentre 18°·0N. 122°·0E.

A = −·5043, B = +·8071, C = +·3071 ; δ = +4 ; h = +5 ;
D = +·848, E = +·530 ; G = −·163, H = +·260, K = −·952.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Miyazaki		16·3	30	3 54	+ 2	8 1	+68	—	—	(8·0)
Hukuoka		17·3	25	4 3	− 1	7 23	+ 7	—	—	—
Pehpei		18·5	313	e 3 44	−35	e 9 34	L	—	—	(e 9·6)
Kôti		18·6	32	e 4 24	+ 3	8 10	+24	—	—	—
Kobe		20·4	33	4 41	0	8 44	+19	—	—	—
Hikone		21·4	33	4 51	0	8 40	− 5	—	—	—
Misima		22·8	38	e 5 1	− 4	10 33	L	—	—	(10·6)
Tokyo		23·6	38	e 4 31	−42	9 8	−17	—	—	—
Sendai		26·1	36	4 37	−60	9 3	−64	—	—	—
Mizusawa	E.	26·8	34	e 5 46	+ 2	11 3	+44	—	—	—
Morioka		27·3	33	e 4 46	−62	9 26	−61	—	—	—
Sapporo		29·9	29	e 6 10	− 2	—	—	—	—	—
Calcutta	N.	31·9	284	e 6 23	− 6	i 11 30	−10	e 7 20	PP	e 15·0
Hyderabad	N.	41·4	277	e 7 43	− 7	13 54	−11	9 4	PP	20·7
New Delhi		42·3	293	e 7 55	− 2	i 13 48	−31	i 17 17	SS	—
Colombo	E.	42·5	261	7 59	0	14 20	− 2	—	—	22·7
Kodaikanal	E.	43·8	267	i 8 12	+ 3	i 14 42	+ 2	9 52	PP	21·8
Bombay		46·5	279	e 8 32	+ 1	e 15 20	+ 1	i 10 27	PP	21·4
Frunse		47·0	312	e 8 37	+ 2	—	—	—	—	—
Andijan		48·1	309	e 8 44	+ 1	15 47	+ 5	—	—	—
Stalinabad		50·4	306	i 9 3	+ 2	—	—	—	—	—
Tchimkent		50·4	311	i 9 2	+ 1	—	—	—	—	—
Tashkent		50·5	309	e 8 57	− 5	e 16 6	−10	e 10 57	PP	—
Riverview		58·6	152	e 10 22	+21	e 17 46	−18	—	—	e 25·5
Baku		65·1	307	e 10 46	+ 1	—	—	—	—	—
Grozny		68·0	310	e 11 18	+15	—	—	—	—	—
Moscow		72·2	324	i 11 31	+ 2	i 20 52	+ 1	—	—	—
Christchurch		76·8	145	11 26	−29	21 44	+ 2	14 19	PP	38·0
Ksara		77·1	301	i 11 59	+ 2	22 35	+49	—	—	—
Upsala		81·6	330	e 22 32	S	(e 22 32)	− 1	—	—	e 40·2
Bucharest		81·7	314	—	—	e 22 32	− 2	—	—	44·2
Helwan		81·8	298	12 25	+ 3	22 28	− 7	15 40	PP	—
Belgrade		85·4	315	i 12 40k	0	e 23 37	+26	—	—	36·2
Copenhagen		85·8	328	—	—	e 23 28	+13	—	—	42·2
Prague		87·1	322	—	—	e 23 34	+ 6	—	—	e 45·2
Cheb		88·3	322	16 10?	PP	e 23 32	− 7	—	—	e 48·2
Triest		89·5	319	i 13 4	+ 4	i 23 52	+ 2	i 16 33	PP	e 44·1
Strasbourg		91·7	323	e 13 13	+ 3	e 25 26	PS	—	—	e 48·1
Zürich		91·8	321	e 13 38	+27	e 24 2	− 9	e 16 45	PP	—
Florence		91·9	317	e 13 31	+20	i 24 24	+13	i 23 50	SKS	—
Rome		91·9	315	e 13 18	+ 7	e 24 21	+10	e 16 54	PP	—
Victoria		91·9	37	—	—	e 24 4	− 7	—	—	54·2
Basle		92·3	322	e 13 17	+ 4	—	—	—	—	—
Alicante		102·2	317	18 51	PP	25 3	{− 7}	34 43	SS	e 52·5
Mount Wilson	z.	102·8	47	e 18 14	PKP	—	—	—	—	—
Salt Lake City		103·1	39	—	—	e 25 16	{− 1}	—	—	e 59·3
Riverside	z.	103·4	47	e 17 23	?	—	—	—	—	—
Toledo		103·6	320	i 18 19	PKP	e 28 32	PPS	e 35 2	SS	—
Palomar	z.	104·1	47	e 18 8	PKP	—	—	—	—	—
Granada		104·9	318	i 19 7k	PP	25 21	{− 8}	28 40	PS	54·1
Rapid City		105·7	32	—	—	e 25 36	{+ 1}	e 33 52	SS	e 56·4
Lisbon		107·4	322	20 10?	?	—	—	—	—	56·1
Tucson		108·9	46	e 18 39	[+ 8]	e 29 55	PPS	e 21 16	PPP	—
Seven Falls		114·2	9	—	—	e 26 46	{+12}	—	—	50·2
St. Louis		116·1	28	e 19 59	PP	e 25 41	[+ 5]	i 29 37	PS	e 51·2

Continued on next page

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Columbia	123·8	23	—	—	e 26 11?	[+ 9]	(e 29 45?)	PS	e 29·8
Bermuda	129·5	7	e 21 35	PP	e 31 42	PS	—	—	e 58·2
San Juan	143·0	12	e 22 56	PP	e 34 22	PS	—	—	e 67·9
Fort de France	147·3	4	e 19 47	[+ 4]	—	—	—	—	—
Bogota	152·5	36	e 19 57	[+ 6]	—	—	i 20 2	PKP_2	—
Huancayo	162·2	73	e 22 26	?	e 31 32	{+ 8}	e 24 58	PP	e 52·3
La Paz	170·2	83	i 20 20k	[+11]	27 24	[+12]	25 22	PP	80·7

Additional readings :—
Pehpei eS =9m.45s.
Mizusawa eSN =11m.7s.
Calcutta eP_cPN =9m.22s., iSSN =13m.6s., S_cSN =17m.0s.
Hyderabad PN =7m.50s., S_cSN =17m.33s.
Kodaikanal SSE =17m.44s.
Tashkent ePPP =11m.39s.
Christchurch eZ =16m.46s., SSEZ =26m.29s., SSSNZ =30m.40s., Z =32m.29s., QN = 33m.18s.
Upsala eS?N =33m.11s.?.
Helwan i =13m.25s., sS =23m.16s., SP =23m.21s., i =24m.16s.
Belgrade e =13m.25s. and 14m.50s.
Triest iSKS =23m.30s.
Strasbourg e =28m.25s., 36m.21s., and 43m.10s.
Rome eSKSE =23m.50s., eSSSE =33m.50s.
Alicante PPP =21m.28s., PKS =22m.23s., eS? =27m.19s., PS =28m.13s., SSS = 39m.13s., Q =44m.49s.
Toledo iPS?N =29m.59s.
Granada PP =19m.34s., pPKP =20m.24s., SS? =33m.26s.
Rapid City e =28m.12s.
St. Louis iN =30m.1s., eN =30m.26s., iPPSN =30m.40s., eSSE =35m.48s.
San Juan e =23m.51s. and 28m.18s.
Bogota e =21m.37s.
Huancayo e =34m.0s., eSSS =46m.10s.
La Paz PPP =29m.28s., SKKS =32m.22s.
Long waves were also recorded at Brisbane, Auckland, Arapuni, Wellington, Weston, Harvard, Philadelphia, and other European stations.

Feb. 20d. 13h. 11m. 25s. Epicentre 35°·6N. 140°·0E. (as on 1944, Dec. 29d.).

Intensity V at Tukubasan ; IV at Toyko, Mito, and Kumagaya ; II-III at Misima, Titibu, Mera, and Hukusima. Shallow. Epicentre as adopted. Macroseismic radius 200-300km.

A = −·6243, B = +·5239, C = +·5795 ; δ = +4 ; h = 0 ;
D = +·643, E = +·766 ; G = −·444, H = +·373, K = −·815.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Tokyo		0·2	298	0 13	+ 3	0 23	+ 7
Yokohama		0·3	240	0 14k	+ 3	0 24	+ 6
Tukubasan		0·6	7	0 17	+ 2	0 27	+ 1
Mera		0·7	191	0 22	+ 5	0 32	+ 4
Kumagaya		0·8	318	0 16	− 2	0 28	− 3
Mito		0·9	26	0 17	− 3	—	—
Hunatu		1·0	264	0 21	0	0 35	− 1
Misima		1·0	241	0 16k	− 5	0 30	− 6
Utunomiya		1·0	354	0 15k	− 6	0 28	− 8
Onahama		1·5	29	0 32k	+ 4	0 47	− 2
Shizuoka		1·5	244	0 31k	+ 3	0 48	− 1
Nagano		1·8	306	0 32	0	—	—
Hukusima		2·2	10	0 37	− 1	—	—
Toyama		2·5	296	0 42	− 1	—	—
Sendai		2·8	15	0 48	+ 1	1 14	− 8
Hikone		3·1	264	0 50	− 1	1 40	S_e
Wazima		3·1	306	0 58	+ 7	1 39	S_e
Kyoto		3·5	261	0 57	0	—	—
Owase		3·5	245	0 55	− 2	1 52	S_e
Mizusawa	E.	3·7	14	0 59	− 1	1 38	− 7
Osaka		3·8	257	1 2	+ 1	2 1	S_e
Kobe		4·1	258	1 3k	− 2	2 7	S_e
Morioka		4·2	13	1 4	− 3	1 53	− 4
Sumoto		4·4	255	1 16	+ 6	—	—
Tucson		85·4	53	e 12 32	− 8	—	—

Feb. 20d. Readings also at 0h. (Tucson), 2h. (near Samarkand), 3h. (La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Grand Coulee, Shasta Dam, College, and St. Louis), 4h. (near Samarkand), 5h. (near Andijan), 7h. (near Samarkand), 9h. (Mount Wilson, Palomar, Tucson, and San Juan), 11h. (Tucson), 14h. (near Samarkand), 17h. (Riverside and Tinemaha), 18h. (Mount Wilson, Palomar, and Tucson).

Feb. 21d. 10h.

Scale VI at Tarao (Shiga prefecture); V at Udono and Kimoto; IV at Owase, Kobe, and Hikone: II-III at Sumoto, Tu, Tottori, and Kyoto.

Seis. Bull. Cent. Met. Obs., Japan, for 1946. Tokyo, 1951, p. 9, with macroseismic chart. Epicentre 33°·5N. 135°·7E., with focal depth 50km. is given, but it is not possible to reconcile the readings, even approximately, with any definite determination.

Owase P = 32m.55s.k, S = 33m.4s.
Sumoto P = 33m.0s.a, S = 33m.14s.
Kobe P = 33m.2s.k, S = 33m.18s.
Osaka P = 33m.4s., S = 33m.22s.
Hikone P = 33m.11s., S = 33m.34s.
Toyooka P = 33m.16s., S = 33m.40s.
Kôti P = 33m.18s., S = 33m.34s.
Tu P = 33m.22s., S = 33m.34s.
Kyoto P = 33m.28s.k, S = 33m.49s.
Omaesaki P = 33m.33s., S = 34m.9s.
Misima P = 33m.38s., S = 34m.20s.
Hamada P = 33m.44s., S = 34m.18s.
Shizuoka P = 33m.46s., S = 34m.11s.
Wazima P = 33m.53s., S = 34m.34s.
Tokyo P = 34m.2s., S = 34m.52s.
Hukuoka P = 34m.7s., S = 35m.6s.
Kumamoto P = 34m.8s., S = 35m.11s.
Nagano P = 34m.8s.
Yokohama P = 34m.12s., S = 34m.49s.
Hunatu P = 34m.24s., S = 35m.21s.
Miyazaki P = 34m.30s.
Onahama P = 35m.9s.
Sendai P = 35m.47s.
Mizusawa eSN = 36m.29s., eSE = 36m.32s.

Feb. 21d. 15h. 43m. 4s. Epicentre 38°·3N. 31°·8E.

Felt at Argitan (Konya).
Epicentre 38°17′N. 31°42′E. (Istanbul).
38°·2N. 32°·2E. (Strasbourg).

Annales de l'Institut de Physique du Globe de Strasbourg pour l'Année, 1946, 2ème partie, Séismologie, Nouvelle série, Tome XI, p. 46.

$A = +\cdot6687$, $B = +\cdot4146$, $C = +\cdot6172$; $\delta = -1$; $h = -1$;
$D = +\cdot527$, $E = -\cdot850$; $G = +\cdot525$, $H = +\cdot325$, $K = -\cdot787$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		5·6	142	i 1 28	+ 1	2 52	S*	—	—	—
Bucharest	N.	7·5	326	e 1 56?	+ 3	i 3 17	− 3	i 2 22	P_g	—
Sofia		7·8	307	e 1 58	0	i 3 51	S*	i 2 19	P*	—
Helwan		8·4	182	i 2 5a	− 1	3 41	− 2	—	—	—
Leninakan		9·4	74	2 35	+17	—	—	—	—	—
Erevan		10·0	76	e 2 31	+ 4	e 4 57	S*	—	—	—
Belgrade		10·7	311	e 2 36	− 2	e 4 59	+20	—	—	e 5·8
Grozny		11·7	60	i 2 52	+ 1	5 29	+25	—	—	—
Kalossa		12·5	315	3 5	+ 3	e 6 59	L	—	—	(e 7·0)
Zagreb		13·9	308	e 3 22a	+ 1	i 6 23	+26	—	—	e 7·4
Baku		14·2	75	3 27	+ 3	—	—	—	—	—
Rome		15·2	289	i 3 39	+ 1	i 6 38	+10	—	—	e 8·5
Triest		15·3	305	i 3 39	0	i 6 34	+ 4	—	—	i 9·0
Florence		16·4	296	i 3 56	+ 3	i 7 12	+16	—	—	—
Prague		17·1	319	4 1a	− 1	e 7 23	+11	—	—	e 7·9
Moscow		17·9	11	4 10	− 2	7 27	− 3	—	—	—
Cheb		18·2	317	e 4 17	+ 1	e 8 2	+25	e 8 39	P_cP	e 10·5
Chur		18·4	305	e 4 19	+ 1	e 7 53	+12	—	—	—
Collmberg		18·6	321	i 4 21	0	i 7 59	+13	e 4 44	PPP	e 10·6
Jena		19·1	318	e 4 28	+ 1	e 8 10	+13	e 5 19	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zürich		19·2	306	e 4 26k	− 2	e 8 5	+ 6	—	—	—
Basle		19·9	307	e 4 34	− 2	e 8 23	+ 8	—	—	—
Strasbourg		20·2	309	e 4 38a	− 1	i 8 25	+ 4	—	—	11·5
Besançon		20·9	303	e 4 43	− 3	e 8 41	+ 6	—	—	e 10·9
Copenhagen		21·7	330	e 4 53	− 2	i 8 49	− 2	5 17	PP	11·0
Clermont-Ferrand		22·5	299	i 5 3a	+ 1	i 9 12	+ 7	—	—	—
Algiers		22·8	275	i 5 6	+ 1	e 9 18	+ 7	5 22	PP	10·8
Barcelona		22·9	288	—	—	e 9 22	+ 9	i 12 22	PcS	—
De Bilt		23·1	316	i 5 10a	+ 2	i 9 19	+ 3	—	—	e 14·9
Uccle		23·1	312	e 5 8a	0	e 9 13	− 3	e 5 28	PP	e 12·2
Upsala		23·4	341	5 10	− 1	e 9 24	+ 3	5 50	PP	e 12·2
Paris		23·6	306	i 5 22a	+ 9	i 9 25	0	5 39	PP	e 12·9
Tortosa	N.	24·2	286	—	—	i 9 16	−19	—	—	i 11·6
Alicante		25·3	281	5 17	−13	i 9 49	− 5	6 13	PP	e 15·3
Kew		26·0	312	i 5 36a	0	i 10 18	+12	e 9 31?	PcP	e 13·9
Sverdlovsk		26·6	36	5 39	− 3	10 23	+ 7	—	—	—
Bergen		27·7	332	e 5 24	−28	e 10 23	−10	e 10 35	S	18·4
Toledo		27·8	285	i 5 51	− 2	i 11 0	+25	i 16 13	ScS	14·4
Granada		27·9	280	e 5 57k	+ 3	11 4	+27	6 48	PP	14·5
Aberdeen		29·2	322	—	—	i 10 49	− 9	i 11 25	?	17·5
Andijan		31·2	73	6 24	+ 1	—	—	—	—	—
Lisbon		31·9	285	6 28a	− 1	11 39	− 1	—	—	14·7
New Delhi	N.	38·8	91	e 7 25	− 3	i 13 25	− 1	8 59	PP	—
Bombay	E.	40·5	107	i 7 43	+ 1	i 13 57	+ 5	—	—	—
Hyderabad	N.	45·6	104	8 20	− 4	15 6	0	15 12	PS	22·4
Irkutsk		50·8	50	9 2	− 2	e 16 23	+ 3	—	—	—
Florissant	Z.	86·7	318	i 12 46	− 1	—	—	—	—	—
St. Louis	Z.	86·7	318	i 12 45	− 2	—	—	e 13 7	PcP	—
Tucson		101·7	329	e 13 55	− 1	—	—	e 18 2	PP	—
Mount Wilson	Z.	102·6	335	e 17 28	?	—	—	e 18 9	PP	—

Additional readings :—
Bucharest iN = 2m.46s., iS?N = 3m.29s., iS*N = 4m.2s., iS_eN = 4m.26s.
Sofia iEN = 2m.38s., iE = 3m.3s., iS_e?EN = 4m.35s.
Helwan i = 3m.9s., P_cP = 9m.44s.
Belgrade e = 3m.28s. and 4m.18s.
Collmberg e = 5m.18s.
Jena e = 5m.23s. and 8m.13s.
Algiers iSS = 10m.13s.
Uccle ePPP = 5m.43s., eEN = 6m.33s.
Upsala eN = 9m.57s.?
Alicante PPP = 5m.25s., P_cS = 10m.13s., Q = 12m.25s., S_cS = 14m.29s.
Kew eSSZ = 11m.56s.?, eSSSN = 12m.56s.?
Toledo SS = 12m.28s.
Granada P_cS = 12m.12s.
New Delhi i = 13m.36s., SSS = 16m.22s.
Hyderabad SS = 18m.40s.
Long waves were recorded at Riverview.

Feb. 21d. 22h. 53m. 34s. Epicentre 31°·7N. 113°·3W.

A = −·3372, B = −·7829, C = +·5229 ; δ = +6 ; h = +1 ;
D = −·918, E = +·396 ; G = −·207, H = −·480, K = −·852.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Tucson		2·2	75	e 0 37	− 1	i 1 32	S_e	i 2·3
Palomar		3·4	300	i 0 58	+ 3	i 2 0	S_e	—
La Jolla		3·5	289	e 0 56	− 1	i 1 59	S_e	—
Riverside		4·1	305	i 1 4	− 1	i 2 3	S*	—
Pierce Ferry		4·4	355	e 1 17	P*	—	—	—
Boulder City		4·5	342	e 1 11	0	e 2 38	S_e	i 3·2
Pasadena		4·8	302	e 1 11	− 4	e 2 38	S_e	—
Mount Wilson		4·8	304	i 1 14	− 1	i 2 44	S_e	—
Overton		4·9	349	e 1 21	+ 4	—	—	—
Tinemaha	E.	6·8	324	—	—	e 4 1	S_e	—

Tucson gives also i = 0m.51s. and 1m.49s.

Feb. 21d. Readings also at 8h. (Riverview, Auckland, Tucson, Ksara, near Leninakan, and Grozny), 9h. (near Tananarive), 12h. (Shawinigan Falls and near Ottawa), 15h. (Tucson, Tinemaha, Palomar, Mount Wilson, Riverside, Riverview, Auckland, and Christchurch), 16h. (Tucson), 17h. (Helwan, Bucharest, and near Sofia), 21h. (near Irkutsk).

Feb. 22d. 17h. 24m. 45s. Epicentre 14°·9N. 93°·6W. Depth of focus 0·015.

Felt in Chiapas, according to Tacubaya.

$A = -\cdot0607$, $B = -\cdot9649$, $C = +\cdot2555$; $\delta = 0$; $h = +6$;
$D = -\cdot998$, $E = +\cdot063$; $G = -\cdot016$, $H = -\cdot255$, $K = -\cdot967$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	N.	3·7	305	1 6	+ 9	1 49	+ 9	—	—	—
Vera Cruz	Z.	4·9	331	1 12	− 1	2 1	− 8	—	—	—
Puebla		6·0	314	1 32	+ 4	2 36	0	—	—	—
Tacubaya	E.	6·9	311	1 47	+ 7	3 6	+ 9	—	—	—
Merida		7·1	31	1 37	− 6	2 46	−16	—	—	—
Bogota		21·8	117	i 4 40	− 3	—	—	—	—	—
Tucson		23·3	321	i 4 56	− 1	e 9 1	+ 5	i 5 30	pP	e 10·5
Florissant		24·0	7	e 4 51	−13	e 8 55	−13	e 5 10	pP	—
San Juan		26·5	79	e 5 31	+ 4	(e 10 8)	+18	—	—	e 10·1
Pierce Ferry		27·9	323	i 5 37	− 3	—	—	e 6 14	pP	e 15·3
La Jolla		28·0	314	i 5 40	− 1	—	—	i 6 14	pP	—
Palomar		28·0	316	i 5 40	− 1	—	—	i 6 15	pP	—
Boulder City		28·3	322	i 5 40	− 4	e 14 53	L	e 6 12	pP	e 14·9
Overton		28·4	323	i 5 44	0	—	—	—	—	—
Riverside	Z.	28·7	316	i 5 46k	− 1	—	—	i 6 20	pP	—
Mount Wilson		29·3	316	i 5 52k	0	—	—	i 6 26	pP	—
Pasadena		29·3	316	i 5 52	0	—	—	i 6 23	pP	—
Philadelphia		29·7	30	e 6 40	+44	(e 10 54)	+13	—	—	e 10·9
Rapid City		30·2	347	e 5 51	− 9	e 12 3	+74	—	—	e 15·0
Haiwee	N.	30·3	319	e 6 1	0	—	—	—	—	—
Santa Barbara		30·5	314	e 6 1	− 2	—	—	—	—	—
Tinemaha		31·1	320	i 6 8k	0	—	—	e 6 41	pP	—
Huancayo		32·3	146	e 6 26	+ 7	i 11 35	+13	—	—	e 14·1
Weston		33·4	31	—	—	e 11 20	−17	—	—	—
Ottawa		33·9	23	e 6 21	−12	(11 15?)	−32	—	—	11·2
Shasta Dam		35·9	322	i 6 45	− 4	—	—	i 7 16	pP	—
Shawinigan Falls		36·1	24	e 7 33	+42	—	—	—	—	16·2
Grand Coulee		39·1	333	e 7 10	− 6	e 13 27	+21	i 7 44	pP	—

Additional readings :—
Tacubaya iZ = 2m.51s.
Florissant isPZ = 5m.18s., eZ = 5m.31s., iN = 6m.13s., eE = 9m.32s., isSN = 9m.55s.
La Jolla isP = 6m.30s.
Palomar isPZ = 6m.28s.
Boulder City e = 6m.32s.
Riverside isPZ = 6m.36s.
Mount Wilson isPZ = 6m.39s.
Pasadena isPZ = 6m.37s.
Tinemaha isPZ = 6m.59s.
Huancayo e = 7m.18s.
Shasta Dam e = 8m.5s.
Grand Coulee e = 8m.0s., iPP = 8m.42s., e = 10m.46s.
Long waves were also recorded at Bermuda.

Feb. 22d. Readings also at 0h. (La Plata), 1h. (Helwan, Ksara, Grozny, and Erevan), 2h. (Erevan, Leninakan, and Ksara), 3h. (Bombay, Calcutta, New Delhi, and Ksara), 4h. (Riverview and Santa Lucia), 10h. (near Triest (3)), 12h. (La Plata, Santa Lucia, Mount Wilson, Riverside, Tinemaha, Tucson, and near Triest), 14h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Overton, Pierce Ferry, Grand Coulee, Shasta Dam, Riverview, and near Apia (2)), 15h. (Malaga), 19h. (Samarkand and Riverview), 20h. (near Mizusawa).

Feb. 23d. Readings at 1h. (Besançon and Strasbourg), 8h. (near Grand Coulee), 11h. (near Algiers), 15h. (Alicante), 16h. (Collmberg), 18h. (near Miznsawa), 19h. (near Leninakan).

Feb. 24d. 9h. 28m. 56s. Epicentre 0°·5N. 120°·7E.

$A = -·5105$, $B = +·8599$, $C = +·0087$; $\delta = +11$; $h = +7$;
$D = +·860$, $E = +·511$; $G = -·004$, $H = +·007$, $K = -1·000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	38·3	307	e 9 40	P_cP	i 13 24	+ 5	i 16 24	SSS	e 20·6
Colombo	E.	41·2	280	7 47	− 1	13 56	− 6	—	—	21·0
Brisbane	N.	41·7	135	i 7 51	− 1	i 14 5	− 5	e 17 11	Q	i 23·8
Kodaikanal	E.	44·0	285	i 8 8	− 3	i 14 38	− 5	14 46	PS	21·6
Riverview		44·5	144	i 8 15a	0	e 14 59	+ 8	i 10 8	PP	e 21·8
Hyderabad	N.	44·8	295	e 8 4	−13	14 47	− 8	14 52	PS	23·1
New Delhi	N.	50·1	309	i 9 9	+10	i 16 5	− 5	11 43	PPP	23·1
Bombay		50·4	294	e 9 4	+ 3	i 16 11	− 3	—	—	23·5
Irkutsk		53·4	348	9 16	− 8	16 51	− 4	—	—	—
Andijan		59·3	319	e 10 8	+ 2	—	—	—	—	—
Stalinabad		60·7	316	i 10 11	− 4	—	—	—	—	—
Tashkent		61·6	318	e 10 15	− 7	e 18 35	− 8	—	—	—
Auckland		62·3	133	19 4	S	(19 4)	+12	26 24	SSS	34·1
Christchurch		63·7	141	10 37	+ 1	19 15	+ 5	11 17	P_cP	31·5
Wellington		64·1	138	—	—	(19 13)	− 1	(20 29)	S_cS	35·0
Sverdlovsk		73·6	330	e 11 27	−10	20 51	−16	—	—	—
Tananarive		74·2	250	e 11 40	0	e 21 19	+ 5	e 11 44	P_cP	e 29·7
Baku		75·1	312	e 11 43	− 3	e 21 20?	− 4	—	—	—
Grozny		78·7	315	e 12 1	− 5	e 21 40	−23	—	—	—
Erevan		79·1	311	e 12 16	+ 8	e 22 2	− 5	—	—	—
Ksara		85·4	303	e 12 45	+ 5	e 23 12	+ 1	—	—	—
Moscow		85·7	326	12 43	+ 1	e 23 19	+ 5	e 13 10	pP	—
Helwan		89·2	300	13 1	+ 2	23 46	− 1	13 28	pP	—
College		90·2	25	—	—	e 23 22	[−12]	—	—	e 29·3
Upsala		96·1	330	—	—	e 24 4?	[− 3]	e 31 34	SSP	e 48·1
Sitka		97·1	32	—	—	e 24 42	{+ 8}	—	—	e 47·3
Copenhagen		99·8	327	—	—	24 27	[+ 1]	26 34	PS	—
Strasbourg		104·6	321	—	—	e 26 1	+ 2	e 33 21	SS	e 40·7
De Bilt		105·0	325	—	—	e 28 4?	PS	e 33 4?	SS	—
Paris		107·8	322	—	—	e 28 2	PS	29 52	PPS	e 60·1
Clermont-Ferrand		108·5	319	—	—	e 25 10	[+ 4]	e 28 4?	PS	—
Shasta Dam		109·8	46	e 18 21	[−12]	—	—	e 18 50	PP	—
Alicante		113·7	313	—	—	e 26 36	{+ 5}	—	—	e 66·4
Mount Wilson	z.	115·1	51	i 18 47	[+ 4]	—	—	—	—	—
Pasadena	z.	115·1	51	e 18 47	[+ 4]	—	—	—	—	—
Riverside	z.	115·8	51	e 18 47	[+ 2]	—	—	—	—	—
Granada		116·4	313	21 8k	?	35 36	SS	i 23 31	?	—
Palomar	z.	116·4	52	i 19 18	[+32]	—	—	—	—	—
Boulder City		117·0	49	e 18 49	[+ 2]	—	—	e 19 8	?	—
Overton		117·1	48	e 18 53	[+ 6]	—	—	—	—	—
Pierce Ferry		117·6	48	e 18 46	[− 2]	—	—	—	—	—
Tucson		121·5	51	e 18 53	[− 3]	e 30 19	PS	e 20 51	PP	e 51·5
Florissant	z.	131·6	32	—	—	i 22 37	SKP	—	—	—
St. Louis		131·8	32	e 19 18	[+ 3]	i 26 26	[+ 2]	i 22 33	SKP	—
Harvard		135·3	12	—	—	e 22 51	SKP	—	—	e 72·6
Weston		136·0	12	e 21 32	?	—	—	—	—	e 39·4
Fordham		136·8	16	e 22 55	SKP	e 28 55	{− 7}	e 40 7	SS	—
Philadelphia		137·2	18	e 42 4	?	—	—	—	—	e 63·8
Bermuda		146·9	8	e 19 49	[+ 7]	e 33 44	PS	e 23 17	PP	e 75·6
San Juan		160·1	19	e 19 39	[−22]	e 31 26	{+13}	e 45 11	SSP	e 77·5
Huancayo		160·4	126	e 20 57	[+56]	e 37 56	PPS	e 45 7	SSP	e 50·7
La Paz		161·9	152	i 19 6a	[−57]	26 54	[−12]	23 36	PP	80·1
Bogota		164·4	71	e 20 4	[− 1]	—	—	e 21 1	PKP,	—

Additional readings :—
Calcutta iSSSN = 17m.44s.
Kodaikanal PP = 8m.50s., SS = 17m.39s.
Riverview i = 8m.19s., iZ = 10m.38s., iE = 15m.15s., iSSEN = 18m.16s., iZ = 18m.36s., iEN = 18m.40s.
Hyderabad S_cSN = 18m.6s.

Continued on next page.

New Delhi SSN =18m.41s., S_cSN =19m.51s.
Auckland S_cS =28m.51s., SS? =29m.29s.
Christchurch PPEN =13m.7s., PPP =14m.35s., e =18m.23s., S_cS =20m.9s., SS = 23m.31s., SSS =26m.11s., QEN =26m.27s.
Wellington gives S as P?, S_cS as P_cP, also PP =21m.38s., S =27m.44s.
Moscow SKKS =23m.1s.
Helwan sS =24m.34s., i =25m.44s., SS =29m.44s.
Copenhagen 32m.4s.
St. Louis iZ =22m.47s., iE =22m.50s., iPPPE =24m.25s., iE =26m.45s., iSKKSE = 28m.25s., iE =28m.41s., 28m.51s. and 30m.22s., iPSKSE =31m.46s., iE =34m.38s.
Bermuda e =38m.29s., 42m.16s., and 52m.16s.
San Juan e =35m.10s.
Huancayo e =25m.21s. and 31m.20s.
La Paz PKP_3 =19m.54s., PPP =28m.26s., SSZ =46m.4s., SSS? =51m.36s.
Long waves were also recorded at Kew, Uccle, and Aberdeen.

Feb. 24d. Readings also at 0h. (near St. Louis), 1h. (Tucson), 2h. (Pierce Ferry, Tucson, and near La Paz), 3h. (Alicante, Granada, Helwan, Ksara, Stalinabad, Calcutta, Hyderabad, New Delhi, and Bombay), 5h. (near Strasbourg and Besançon, near Overton, Pierce Ferry, and Boulder City), 6h. (Collmberg, near Pierce Ferry, Overton, and Boulder City), 7h. (Ksara, Calcutta, Hyderabad, New Delhi, and Bombay), 8h. (New Delhi, Stalinabad, and near Mizusawa), 9h. (Mount Wilson, Tucson, Kew, Ksara, New Delhi, Andijan, Stalinabad, Tashkent, and Samarkand), 10h. (near Alicante (2)), 10h. (New Delhi and La Paz), 13h. (Balboa Heights, Tucson, Overton, Pierce Ferry, Boulder City, Shasta Dam, Tinemaha, Palomar, Riverside, Mount Wilson, and Pasadena), 17h. (Ksara and near Tananarive), 23h. (Granada, Riverview, Tucson, Palomar, Riverside, Boulder City, Pierce Ferry, St. Louis, La Paz, Bermuda, San Juan, and Fort de France.).

Feb. 25d. 1h. Undetermined shock in the region 60°S. 20°W.

La Plata PNZ =46m.53s., N =47m.1s., EN =48m.8s., E =48m.59s., N =49m.48s., SE =52m.27s., iSN =52m.31s., N =53m.48s., LN =54·6m.
La Paz PZ =49m.34s., PP =51m.23s., iSZ =57m.24s., SSZ =60m.58s., LZ =68m.0s.
Huancayo eP =50m.28s., e =51m.20s., eS =59m.1s., e =64m.12s., eL =71m.3s.
Fort de France e =52m.7s.
Riverview eP?Z =52m.58s., iS?E =63m.22s., eSS?E =68m.52s., eQE =74m.48s.
San Juan e =53m.12s., 56m.0s., and 58m.35s., eS =63m.20s., eSS =68m.59s., eL =80m.13s.
Alicante eP? =53m.53s., eS =65m.1s., SS =71m.29s., eL =85m.29s.
Granada iP =54m.25s.k, PP =58m.28s., iS =64m.59s.
Cheb e =57m.
Palomar eZ? =58m.38s.
Tucson eP =58m.42s., eL =67m.27s.
Pierce Ferry eP =58m.50s.
Riverside iPZ =58m.51s., iZ =59m.0s., eZ =60m.30s.
Boulder City iP =58m.52s., e =60m.33s.
Mount Wilson ePZ =58m.52s., iZ =60m.34s.
Pasadena iP =58m.53s., iZ =59m.1s., e =60m.37s.
Tinemaha ePZ =58m.58s., eZ =60m.58s.
Shasta Dam iP =59m.6s., e =62m.30s.
Overton eP =59m.11s.
St. Louis ePPZ =59m.23s., iN =64m.38s., iSKKSN? =66m.26s., iPSN =68m.57s., iN =71m.34s.
Ottawa eZ =59m.30s., eN =69m., e =75m.24s., L =97m.
Tananarive e =60m.19s. and 65m.29s., L =66m.22s.
Helwan e =62m.15s., 63m.0s., and 64m.6s.
Bermuda e =66m.20s. and 72m.13s., eL =83m.27s.
Strasbourg ePS =68m.25s., eSS =74m.22s., eL =90m.
Seven Falls e =75m.24s., L =95s.
Copenhagen 76m.6s., L =90m.
Long waves were also recorded at Arapuni, Wellington, Philadelphia, Weston, Harvard, Chicago, Sitka, Ksara, and at other European stations.

Feb. 25d. Readings also at 0h. (near Samarkand and Bogota), 1h. (near Tananarive and near Stalinabad), 3h. (Tacubaya), 6h. (Riverview), 9h. (Tacubaya, Christchurch, Riverview), 12h. (Overton, Pierce Ferry, Boulder City, Riverside, and Tucson (2)), 13h. (Riverside, Palomar, Tucson, and near Tacubaya), 16h. (Jena), 17h. (Palomar, Mount Wilson, Riverside, Overton, Boulder City, Pierce Ferry, and near Tucson), 18h. (St. Louis), 20h. (Collmberg, St. Louis, Tucson, Pierce Ferry, Overton, Boulder City, Riverside, Pasadena, Mount Wilson, Tinemaha, Shasta Dam, and Grand Coulee), 21h. (near Irkutsk), 23h. (near Tacubaya).

Feb. 26d. 5h. 30m. 48s. Epicentre 38°·6S. 177°·0E. Depth of focus 0·005.

Intensity VI near the epicentre. Epicentre as adopted. Focal depth >40km. (Wellington).

R. C. Hayes.
Earthquakes in New Zealand during the Year 1946, New Zealand Journal of Science and Technology, Vol. 29, No. 2 (Section B), Wellington, 1947, p. 90—map with epicentre, p. 91.

$A = -·7824$, $B = +·0410$, $C = -·6213$; $\delta = -16$; $h = -1$;
$D = +·052$, $E = +·999$; $G = +·620$, $H = -·033$, $K = -·784$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tuai		0·2	150	0 15	+ 4	0 24	+ 5	—	—
Bunnythorp		2·0	218	0 35	+ 3	0 57	0	—	—
New Plymouth		2·4	258	0 37	− 1	1 5	− 2	—	—
Auckland		2·5	315	—	—	1 32?	+23	—	—
Wellington		3·2	212	0 47	− 2	1 23	− 4	—	—
Kaimata		5·8	225	—	—	2 26	− 6	—	—
Christchurch		5·9	212	1 23	− 4	2 25	− 9	—	—
Riverview		21·4	275	e 5 6	PP	e 8 40	+ 7	i 9 23	SSS
Palomar		94·3	309	i 13 14	+ 1	—	—	—	—
Riverside	z.	94·4	310	i 13 14	0	—	—	—	—
Tucson		97·3	305	e 13 28	+ 1	—	—	—	—

Feb. 26d. Readings also at 0h. (near Tashkent, Stalinabad, and Andijan), 2h. (near Mizusawa), 3h. (Collmberg, Zürich, Triest, Zagreb, near Samarkand, Tchimkent, Tashkent, Stalinabad, and Andijan, and near Fort de France), 5h. (De Bilt, Copenhagen, Strasbourg, Triest, Helwan, Ksara, Sofia, and near Fort de France), 6h. (Riverview and La Paz), 7h. (near Mizusawa), 9h. (Balboa Heights), 11h. (Cheb), 12h. and 13h. (La Paz), 15h. (near Bogota and Balboa Heights), 19h. (Copenhagen, Balboa Heights, Boulder City, Shasta Dam, and near Mizusawa), 23h. (near Leninakan and Erevan).

Feb. 27d. 6h. 5m. 43s. Epicentre 22°·5S. 66°·0W. Depth of focus 0·030.
(as on 1944, Sept. 3d.).

$A = +·3762$, $B = -·8448$, $C = -·3805$; $\delta = -1$; $h = +4$;
$D = -·914$, $E = -·407$; $G = -·155$, $H = +·348$, $K = -·925$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		2·6	267	e 0 49	+ 2	i 1 26	+ 3	i 0 54	?	e 1·6
La Paz	z.	6·3	341	i 1 36a	+ 4	i 2 39	− 5	—	—	2·8
Santa Lucia		11·7	200	2 40	− 1	4 34	−14	2 44	?	5·3
Huancayo		13·7	318	e 3 12	+ 6	i 5 41	+ 7	—	—	i 6·3
La Plata	E.	14·2	152	i 3 15	+ 3	i 5 49	+ 4	—	—	7·3
•	N.	14·2	152	i 3 13	+ 1	5 43	− 2	—	—	7·3
	z.	14·2	152	3 14	+ 2	5 51	+ 6	—	—	—
Bogota		28·1	343	i 5 33	0	e 10 9	+ 9	—	—	—
Fort de France		37·3	8	i 6 50	− 2	e 11 21	−62	—	—	—
San Juan		40·6	0	—	—	i 13 3	− 9	—	—	i 16·4
Weston		64·7	356	e 10 14	− 2	—	—	—	—	—
Harvard		64·9	357	i 10 16	− 1	—	—	—	—	—
St. Louis	z.	64·9	340	i 10 14	− 3	e 18 34	− 5	i 11 14	pP	—
Tucson		69·3	321	i 10 44	− 1	—	—	—	—	e 38·6
Palomar		73·8	318	i 11 10	− 2	—	—	e 12 15	pP	—
Boulder City		74·3	321	i 11 13	− 1	e 20 29	0	i 12 15	pP	—
Overton		74·4	322	i 11 16	+ 1	e 20 33	+ 3	e 12 14	pP	—
Riverside		74·5	318	i 11 15	− 1	—	—	e 12 18	pP	—
Mount Wilson		75·0	318	i 11 19	+ 1	—	—	e 12 25	pP	—
Pasadena		75·1	318	i 11 18	− 1	—	—	i 12 14	pP	—
Haiwee	N.	76·2	320	e 11 28	+ 3	—	—	—	—	—
Tinemaha		77·0	320	i 11 28	− 2	—	—	i 12 32	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam		81·8	321	i 11 52	− 3	i 21 42	− 6	e 12 56	pP	—
Granada		83·5	46	i 12 3k	− 1	i 21 56	− 9	12 38	pP	—
Toledo	z.	84·7	44	i 12 12	+ 2	—	—	i 13 11	pP	—
Alicante		86·2	46	15 4	?	i 22 14	[− 5]	16 38	pPP	e 41·9
Rome	N.	96·6	48	—	—	e 23 7	[−13]	—	—	—
Helwan		106·9	64	18 20	PP	e 24 8	[0]	—	—	—
Ksara		111·7	62	18 53	PP	28 12	SP	19 51	pPP	—

Additional readings :—
Santa Lucia E = 4m.55s.
Bogota i = 5m.39s., e = 5m.54s.
St. Louis iZ = 18m.43s.
Boulder City e = 21m.0s.
Pasadena i = 11m.29s., iZ = 12m.22s.
Granada P_cP = 12m.22s., sP = 12m.48s., pP_cP = 12m.52s., sP_cP = 12m.59s.
Alicante SS = 28m.2s., Q = 34m.56s.

Feb. 27d. Readings also at 0h. (Riverview and Christchurch), 2h. (Balboa Heights and near Mizusawa), 4h. (Tucson), 5h. (near Tananarive), 6h. (near Leninakan), 7h. (Tucson), 8h. (near Frunse, Samarkand, Stalinabad, Tashkent, and Andijan), 13h. (Collmberg, Tucson, Palomar, Mount Wilson, Tinemaha, near Mizusawa (2), and near Erevan), 15h. (Rome, near Tashkent, Andijan, and Stalinabad), 16h. (Tucson, Overton, Boulder City, Palomar, Tinemaha, Haiwee, Riverside, La Jolla, Mount Wilson, Pasadena, and Shasta Dam), 19h. (Rome), 22h. (near Mizusawa).

Feb. 28d. 2h. 22m. 38s. Epicentre 0°·5N. 120°·7E. (as on 24d.).

A = −5105, B = +·8599, C = +·0087 ; δ = +11 ; h = +7 ;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	38·3	307	e 5 31	?	i 12 20	−59	i 15 24	SS	e 19·5
Colombo	E.	41·2	280	7 46	− 2	13 58	− 4	—	—	23·4
Kodaikanal	E.	44·0	285	e 8 10	− 1	i 14 30	−13	9 45	PP	21·3
Riverview		44·5	144	i 8 20a	+ 5	e 14 59	+ 8	e 10 6	PP	e 22·5
Hyderabad	N.	44·8	295	9 40	PP	14 49	− 6	18 9	SS	21·5
New Delhi	N.	50·1	309	—	—	i 15 59	−11	18 38	S_cS	—
Bombay		50·4	294	e 9 8	+ 7	i 16 7	− 7	(18 55]	S_cS	18·9
Irkutsk		53·4	348	e 9 19	− 5	16 46	− 9	—	—	—
Andijan		59·3	319	e 10 6	0	e 18 11	− 3	—	—	—
Stalinabad		60·7	316	i 10 12	− 3	e 18 29	− 3	—	—	—
Tashkent		61·6	318	e 10 16	− 6	e 18 36	− 7	—	—	—
Auckland		62·3	133	8 4	?	18 56	+ 4	8 28	?	28·9
Arapuni		63·4	134	—	—	18 52	−14	—	—	27·4
Christchurch		63·7	141	10 36	0	19 28	+18	11 15	P_cP	32·1
Wellington		64·1	138	10 33	− 5	19 36	+22	11 17	P_cP	34·4
Sverdlovsk		73·6	330	11 33	− 4	20 53	−14	—	—	—
Tananarive		74·2	250	e 11 43	+ 3	e 21 17	+ 3	e 21 35	PS	e 39·2
Baku		75·1	312	—	—	e 21 22	− 2	—	—	—
Erevan		79·1	311	e 12 15	+ 7	—	—	—	—	—
Leninakan		79·8	312	e 12 12	0	—	—	—	—	—
Ksara		85·4	303	e 12 39	− 1	e 23 13	+ 2	—	—	43·4
Moscow		85·7	326	12 42	0	23 1	[− 4]	13 2	pP	—
College		90·2	25	—	—	e 23 25	[− 9]	e 29 51	SS	e 41·9
Upsala		96·1	330	—	—	e 24 2	[− 5]	e 31 22?	SS	e 45·4
Sitka		97·1	32	—	—	e 27 14	PPS	e 31 55	SS	e 45·8
Copenhagen		99·8	327	e 13 52	+ 5	25 14	− 5	e 17 52	PP	—
Prague		100·0	321	—	—	e 24 23	[− 4]	e 27 40	PPS	e 44·4
Collmberg		100·6	323	e 13 56	+ 5	e 22 32	?	e 17 58	PP	e 30·4
Cheb		101·3	322	—	—	e 24 22?	[−11]	e 27 10	PS	e 57·4
Triest		101·4	317	e 18 8	PP	i 24 27	[− 7]	e 25 6	SKKS	—
Bergen		101·9	333	—	—	e 24 12	[−24]	—	—	32·9
Rome		103·1	314	e 14 2	0	e 24 38	[− 4]	e 18 16	PP	—
Strasbourg		104·6	321	—	—	e 24 47	[− 2]	e 25 56	S	e 50·7
De Bilt		105·0	325	e 18 22?	PP	e 24 47	[− 3]	—	—	e 47·4
Uccle		106·0	324	—	—	(e 24 22?)	[−33]	—	—	e 24·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Aberdeen		106·7	332	—	—	i 24 57	[− 1]	i 28 53	PPS	58·8
Paris		107·8	322	e 19 5?	PP	e 28 2	PS	e 29 22?	PPS	e 57·4
Kew		108·4	326	i 18 59	PP	e 25 3	[− 2]	e 26 34	S	e 58·4
Clermont-Ferrand		108·5	319	—	—	e 25 8?	[+ 2]	e 28 20?	PS	—
Shasta Dam		109·8	46	e 18 40	[+ 7]	—	—	—	—	—
Tinemaha	z.	114·0	49	e 18 45	[+ 4]	—	—	—	—	—
Mount Wilson	z.	115·1	51	e 18 43	[0]	—	—	—	—	—
Pasadena		115·1	51	e 18 43	[0]	e 29 4	PS	—	—	e 52·3
Riverside	z.	115·8	51	e 19 40	PP	—	—	—	—	—
Granada		116·4	313	—	—	i 26 46	{− 4}	i 29 40	PS	—
Palomar	z.	116·4	52	e 19 54	PS	—	—	—	—	—
Boulder City		117·0	49	e 18 47	[0]	—	—	—	—	—
Overton		117·1	48	e 18 54	[+ 7]	—	—	—	—	—
Pierce Ferry		117·6	48	e 18 45	[− 3]	—	—	—	—	—
Tucson		121·5	51	e 18 56	[0]	e 30 15	PS	e 20 32	PP	e 50·7
St. Louis		131·8	32	i 22 43	SKP	i 26 26	[+ 2]	i 24 18	PPP	—
Ottawa		132·0	16	e 22 34	SKP	e 26 22	[− 3]	e 28 28	SKKS	e 59·4
Weston		136·0	12	e 22 55?	SKP	e 41 3	SSP	e 45 4	SS	e 54·7
Bermuda		146·9	8	e 19 44	[+ 2]	e 29 52	{− 9}	e 42 56	SSP	e 76·4
San Juan		160·1	19	e 20 54	[+53]	e 45 9	SSP	e 28 18	PPP	e 78·4
Huancayo		160·4	126	e 20 59	[+58]	e 38 0	PPS	e 45 2	SSP	e 68·3
La Paz		161·9	152	i 20 6	[+ 3]	32 12	{+49}	25 6	PP	80·4
Bogota		164·4	71	e 20 6	[+ 1]	—	—	e 21 6	PKP_2	—

Additional readings :—
Calcutta iSSSN =16m.31s.
Kodaikanal PSE =14m.41s., SSE =17m.26s., S_cSE =17m.37s.
Riverview iPSE =15m.9s., iPPSE =15m.21s., iSSE =18m.16s., iN =18m.23s., iZ = 18m.34s.
New Delhi iN =19m.57s.
Auckland PP =13m.12s., P_cS =15m.38s., SS =23m.11s.
Christchurch PPEZ =13m.29s., PPPEZ =14m.48s., EN =17m.35s., SS =23m.31s., SSSZ =26m.12s., QEN =27m.4s.
Wellington S_cS =19m.56s.
Tananarive e =21m.29s., eSS =26m.1s., eSSS =29m.29s.
Moscow sS =23m.33s.
Upsala eN =24m.22s.? and 33m.22s.?
Copenhagen 19m.57s., iSKS =24m.22s., iPS =26m.38s., SS =32m.7s. and 37m.34s.
Prague e =32m.52s. and 36m.10s.
Collmberg eZ =14m.8s. and 15m.1s., ePPZ =16m.31s., eZ =18m.12s., 18m.19s., 18m.34s., 19m.8s., 19m.36s., 20m.31s., 21m.33s., and 22m.44s., eSSZ =26m.59s.
Cheb e =32m.34s., 35m.22s.?, 39m.28s., and 44m.22s.?
Triest ePPZ? =27m.52s.
Rome ePPSEZ =28m.14s.
Strasbourg ePS =27m.30s., e =30m.25s. and 31m.34s., eSS =33m.23s., eSSS =36m.26s., e =40m.22s.
Aberdeen eN =52m.38s.
Paris eQ =42·4m.
Kew ePPPZ =28m.11s., eSKSZ =28m.44s., eSS?Z =42m.54s.?, eSSSZ =52m.9s., eE = 54m.44s. ; readings wrongly identified.
Ottawa eN =41m.22s.?
Bermuda e =51m.50s.
San Juan e =35m.10s.
Huancayo e =50m.42s. and 51m.58s.
La Paz SS =46m.22s., SSS =52m.4s.
Long waves were also recorded at Alicante.

Feb. 28d. Readings also at 2h. (near Leninakan), 8h. (near Andijan, Tashkent, Stalinabad, and near Mizusawa), 10h. (near Stalinabad), 11h. (near Triest), 18h. (near Granada), 19h. (La Paz), 21h. (near Leninakan, Erevan, and Grozny), 23h. (near Overton and Pierce Ferry).

March 1d. Readings at 1h. (Tucson), 3h. (Almeria and Auckland), 10h. (near Triest), 12h. (Tucson and near Triest), 20h. (Tucson and near Tananarive).

March 2d. 2h. Undetermined shock.

Samarkand P = 38m.21s.
Stalinabad iP = 38m.25s.
Tashkent eP = 38m.53s., eS = 41m.21s.
Tchimkent iP = 39m.6s.
Andijan eP = 39m.16s.
Erevan eP = 39m.52s.
Grozny eP = 40m.0s.
Leninakan eP = 40m.2s.
Almata P = 40m.14s.
Bombay eN = 40m.24s., eEN = 44m.1s.
Ksara iP = 41m.1s., eS = 44m.57s., S_cS = 52m.7s.
Sverdlovsk eP = 41m.40s., eS = 46m.18s.
Helwan eP = 41m.45s., e = 43m.12s. and 45m.33s.
New Delhi iP?N = 42m.53s., iN = 44m.20s., iS?N = 44m.52s.
Collmberg eZ = 43m.45s., 43m.56s., 45m.13s., and 46m.12s.
Hyderabad PN = 45m.15s., PPN = 45m.23s., eSN = 48m.34s., LN = 50m.22s.
Calcutta ePN = 45m.59s., eSN = 50m.2s., SSN = 50m.38s.
Long waves were also recorded at Cheb, Copenhagen, and Upsala.

March 2d. 7h. Undetermined shock.

College eP = 49m.37s., i = 49m.45s. and 50m.11s., iS = 50m.30s., i = 50m.39s., iL? = 50m.51s.
Grand Coulee eP = 53m.53s., eS = 57m.33s., eL = 61m.40s.
Shasta Dam iP = 54m.34s.
Tinemaha eP = 55m.20s., iZ = 55m.47s.
Overton eP = 55m.35s.
Boulder City iP = 55m.36s.
Pasadena ePZ = 55m.37s.
Pierce Ferry iP = 55m.38s.
Mount Wilson iPZ = 55m.39s.
Santa Barbara ePZ = 55m.39s.
Riverside iPZ = 55m.42s.
Palomar iP = 55m.49s.
Tucson iP = 56m.17s., e = 57m.26s. and 58m.13s.
St. Louis ePZ = 56m.48s.
Ottawa eZ = 56m.58s., L = 71m.
Weston iP = 57m.32s.s, eS? = 66m.32s., eL = 73m.36s.
Saskatoon PN = 59m.43s., SE = 63m.5s., SSN = 64m.8s., L = 65m.
Long waves were also recorded at Sitka and at other American stations.

March 2d. 20h. 46m. 58s. Epicentre 35°·3N. 44°·6E. (as given by stations of the U.S.S.R.).

A = +·5824, B = +·5743, C = +·5752; δ = −13; h = 0;
D = +·702, E = −·712; G = +·410, H = +·404, K = −·818.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Erevan	4·9	356	e 1 39	P_g	2 41	S_g
Leninakan	5·5	355	—	—	i 2 49	S*
Baku	6·6	38	e 1 35	− 6	—	—
Ksara	7·4	260	e 2 17	P*	e 3 46	S*
Grozny	8·1	6	e 2 11	+ 9	—	—
Helwan	12·4	248	3 26	PPP	e 5 29	+ 8
Tashkent	20·3	65	4 33	− 7	e 8 15	− 8
Tchimkent	20·7	62	e 4 43	− 1	—	—
Moscow	21·0	350	4 52	+ 5	8 48	+11
Sverdlovsk	24·1	22	e 5 19	+ 1	—	—

Helwan gives also PPP = 4m.8s., S = 7m.38s., P_cP = 8m.8s.

March 2d. Readings also at 2h. (near La Paz), 3h. (near Santa Lucia and near Algiers), 5h. (Triest, Belgrade, and Ksara), 6h. (Tucson), 7h. (Samarkand and near Stalinabad), 12h. (near Mizusawa), 13h. (Weston, St. Louis, Tucson, Palomar, Riverside, Pasadena, Mount Wilson, and Tinemaba), 19h. (Tucson and near Andijan), 22h. (Fort de France), 23h. (Shasta Dam, Tucson, Pierce Ferry, Boulder City, Riverside, Mount Wilson, Pasadena, Tinemaha, Riverview, and Ksara).

March 3d. Readings at 0h. (Tashkent, Samarkand, Stalinabad), 3h. (La Paz), 4h. (Tucson, La Paz, and near Huancayo (2)), 5h. (Tucson (2), and Bogota (2)), 10h. (Tucson, Pierce Ferry, and Boulder City), 11h. (De Bilt, Uccle, Collmberg, Paris, near Clermont-Ferrand, Strasbourg, and Besançon), 15h. (near Bogota), 18h. (Tucson, College, and Jena), 20h. (Prague, Sverdlovsk, Tashkent, Almata, Riverview, and Brisbane), 22h. (near Andijan).

March 4d. 0h. 46m. 59s. Epicentre 38°·4S. 178°·8E. Depth of focus 0·010.

Intensity V near the epicentre.
Epicentre as adopted. Focal depth >40km. (Wellington).

R. C. Hayes.
Earthquakes in New Zealand during the year 1946, New Zealand Journal of Science and Technology, Vol. 29, No. 2 (Sect. B), Wellington, 1947, p. 90, map with epicentre p. 91.

$A = -\cdot7855$, $B = +\cdot0165$, $C = -\cdot6186$; $\delta = -5$; $h = -1$;
$D = +\cdot021$, $E = +1\cdot000$; $G = +\cdot618$, $H = -\cdot013$, $K = -\cdot786$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai		1·3	253	0 25	+ 1	0 44	+ 2	—	—	—
Auckland		3·5	294	—	—	1 15	−19	—	—	—
New Plymouth		3·8	257	0 56	− 2	1 38	− 4	—	—	—
Wellington		4·2	226	1 5	+ 2	1 53	+ 2	—	—	—
Christchurch		6·9	220	—	—	2 55	− 3	—	—	—
Kaimata		6·9	231	—	—	2 57	− 1	—	—	—
Riverview	z.	22·8	274	e 4 57	+ 2	—	—	—	—	e 10·4

March 4d. Readings also at 8h. (Sverdlovsk), 12h. (near Balboa Heights), 18h. (Tchimkent and near Andijan), 21h. (Tucson), 23h. (Mount Wilson and Tucson).

March 5d. 4h. 45m. 11s. Epicentre 40°·6N. 50°·3E.

Epicentre 40°·3N. 49°·1E. (U.S.S.R.):

$A = +\cdot4864$, $B = +\cdot5859$, $C = +\cdot6482$; $\delta = +3$; $h = -2$;
$D = +\cdot769$, $E = -\cdot639$; $G = +\cdot414$, $H = +\cdot499$, $K = -\cdot762$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grozny		4·4	311	e 1 11	+ 1	2 4	+ 2	i 1 25	P_g	—
Erevan		4·4	265	e 1 8	− 2	2 2?	0	—	—	—
Leninakan		4·9	277	e 1 21	+ 4	—	—	i 1 39	P_g	—
Samarkand		12·8	88	3 14	+ 8	—	—	—	—	—
Ksara		13·3	244	e 3 11	− 2	—	—	—	—	e 7·3
Stalinabad		14·4	91	i 3 32	+ 5	—	—	—	—	—
Tashkent		14·4	81	e 3 19	− 8	e 6 8	− 1	—	—	—
Andijan		16·7	83	e 3 55	− 2	i 7 7?	+ 4	—	—	—
Moscow		17·3	336	4 1	− 3	7 15	− 1	—	—	—
Sverdlovsk		17·6	19	i 4 2	− 6	i 7 25	+ 2	—	—	—
Bucharest		18·2	291	4 49?	PPP	—	—	—	—	10·8
Frunse		18·3	76	e 4 14	− 3	—	—	—	—	—
Helwan		18·8	241	e 4 16	− 7	7 46	− 4	4 31	PP	—
Almata		20·0	73	4 42	+ 5	—	—	—	—	—
Sofia		20·2	285	e 3 49	−50	e 8 17	− 4	—	—	—
New Delhi	N.	25·1	106	—	—	i 9 43	− 8	—	—	—
Collmberg	z.	27·8	305	e 5 47	− 6	e 14 34	?	e 6 38	PP	—
Cheb		28·0	303	e 5 49?	− 6	e 11 26	+48	—	—	e 16·8
Upsala		28·0	324	e 6 7	+12	e 10 35	− 3	—	—	e 15·2
Jena		28·6	304	e 7 12	PPP	—	—	e 7 21	?	—
Copenhagen		29·0	315	e 6 13	+ 9	e 11 19	+25	14 19	?	16·8
Chur		29·9	296	e 6 5a	− 7	—	—	—	—	—
Zürich		30·5	297	e 6 22	+ 5	e 16 0	L	—	—	(e 16·0)
Strasbourg		31·0	300	—	—	e 12 13	SS	—	—	—
Basle		31·2	298	e 5 57	−26	—	—	—	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almeria	40·8	283	7 39	− 6	—	—	—	—	—
Toledo	40·9	287	i 7 40	− 6	—	—	i 7 53	?	—
Malaga	42·3	284	8 2	+ 5	—	—	—	—	—
Grand Coulee	91·3	353	e 13 3	− 6	—	—	—	—	—

Additional readings :—
Helwan SS = 8m.16s.
Collmberg eZ = 6m.1s., iP$_c$PZ = 6m.18s., eZ = 6m.29s. and 6m.51s., iZ = 6m.56s. and 6m.59s., eZ = 8m.5s., ePPZ = 8m.15s., eZ = 9m.20s. and 9m.26s., ePPPZ = 9m.43s., eZ = 11m.5s. and 12m.41s., eSSZ = 18m.46s. ; readings wrongly identified.
Upsala eE = 6m.22s. and 11m.8s., eN = 13m.29s. and 14m.24s.
Long waves were also recorded at De Bilt, Uccle, and Bergen.

March 5d. Readings also at 4h. (Tucson, Wellington, and Christchurch), 6h. (near Alicante), 13h. (near Grozny), 14h. (near Pierce Ferry and Overton, and near Shasta Dam), 16h. (La Plata, La Paz, and near Mizusawa).

March 6d. 13h. 11m. 7s. Epicentre 45°·1N. 148°·2E. Depth of focus 0·015.

Intensity V at Attoko (Hokkaido) ; IV at Nemuro.
Epicentre 44°·4N. 147°·5E. Focal depth 100km. Macroseismic radius >300km.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1946, Tokyo, 1951, p. 10, Isoseismic chart, p. 10.

A = − ·6019, B = + ·3732, C = + ·7060 ; δ = 0 ; h = − 4 ;
D = + ·527, E = + ·850 ; G = − ·600, H = + ·372, K = − ·708.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		2·6	227	0 10	− 32	0 40	− 34	—	—	—
Sapporo		5·4	250	1 22	+ 2	2 20	− 1	—	—	—
Hatinohe		6·7	229	1 35	− 2	2 41	− 12	—	—	—
Miyako		7·2	222	1 39	− 5	—	—	—	—	—
Morioka		7·5	226	1 45k	− 3	2 56	− 16	—	—	—
Mizusawa		8·0	224	1 55	0	3 12	− 12	—	—	—
Hukusima		9·4	221	2 17	+ 4	3 41	− 17	—	—	—
Mito		10·5	217	3 33	+ 65	—	—	—	—	—
Tukubasan		10·8	217	4 18	S	(4 18)	− 13	—	—	—
Kumagaya		11·2	220	2 40	+ 3	4 34	− 7	—	—	—
Nagano		11·3	225	2 41	+ 2	—	—	—	—	—
Tokyo		11·4	217	3 44	+ 64	—	—	—	—	—
Yokohama		11·7	217	4 12	?	—	—	—	—	—
Hunatu		12·0	220	3 13	+ 25	4 54	− 6	—	—	—
Mera		12·0	215	4 29	?	—	—	—	—	—
Misima		12·2	218	2 53	+ 2	5 0	− 4	—	—	—
Irkutsk		29·5	300	e 5 52?	− 2	—	—	—	—	—
Almata		49·6	295	8 41	+ 1	—	—	—	—	—
Sverdlovsk		52·7	316	i 9 2	− 1	e 16 19	− 1	—	—	—
Andijan		53·8	293	i 9 14	+ 2	16 39	+ 4	—	—	—
Tchimkent		54·7	297	i 9 10	− 8	—	—	—	—	—
Tashkent		55·5	296	e 9 24	0	e 17 2	+ 5	—	—	—
Stalinabad		57·3	293	i 9 35	− 2	—	—	—	—	—
Samarkand		57·8	295	9 36	− 4	—	—	—	—	—
Grand Coulee		60·1	51	e 9 54	− 2	—	—	i 10 41	sP	—
Shasta Dam		62·3	59	10 11	0	—	—	i 10 41	pP	—
Moscow		63·8	323	i 10 21	0	—	—	—	—	—
Tinemaha	z.	67·1	60	i 10 42	0	—	—	i 11 12	pP	—
Haiwee	N.	67·9	61	e 10 49	+ 2	—	—	e 11 8	pP	—
Grozny		68·2	310	i 10 52	+ 3	—	—	—	—	—
Mount Wilson	z.	69·1	62	i 10 54	0	—	—	e 11 23	pP	—
Pasadena		69·1	62	e 10 51	− 3	—	—	i 11 40	sP	—
Riverside	z.	69·7	62	i 10 52	− 6	—	—	i 11 32	pP	—
Overton		69·8	58	e 11 0	+ 2	—	—	—	—	—
Boulder City		69·9	60	i 11 0	+ 1	—	—	i 11 30	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		70·3	58	i 11 3	+ 2	e 20 6	+ 4	i 11 33	pP	—
Palomar		70·4	62	i 11 2	0	—	—	i 11 36	pP	—
La Jolla		70·5	63	e 11 3	0	—	—	—	—	—
Leninakan		71·0	309	e 11 10	+ 4	—	—	—	—	—
Copenhagen		72·9	336	i 11 17	0	e 20 31	0	21 16	sS	—
Yalta		73·4	318	e 11 20	0	—	—	—	—	—
Tucson		75·0	59	i 11 29	0	—	—	e 11 59	pP	—
Jena		77·2	333	e 11 42	+ 1	—	—	e 12 36	sP	—
Uccle		79·5	338	e 11 54a	0	—	—	—	—	—
Sofia		79·7	322	e 11 57	+ 2	—	—	—	—	—
Zagreb		80·1	328	e 11 59	+ 2	—	—	—	—	—
Strasbourg		80·5	334	e 12 0	+ 1	—	—	e 12 39	pP	—
Zürich		81·3	334	e 12 4a	+ 1	—	—	—	—	—
Basle		81·5	334	e 12 6	+ 2	—	—	—	—	—
Chur		81·5	333	e 12 5a	+ 1	—	—	—	—	—
Paris		81·8	338	i 12 7	+ 1	—	—	—	—	i 49·9
Shawinigan Falls		81·8	27	e 12 7	+ 1	(21 55?)	−12	—	—	21·9
Clermont-Ferrand		84·4	336	i 12 21	+ 2	—	—	e 12 29	?	—
Helwan		85·9	309	i 12 27k	0	e 22 51	+ 4	e 22 39	SKS	—
Weston		86·0	28	i 12 28a	+ 1	e 19 1	?	e 13 0	pP	—
Toledo	z.	91·8	339	i 13 6	+12	—	—	i 14 5	sP	—
Alicante		92·3	336	e 16 44	PP	—	—	—	—	—

Additional readings :—
Sapporo S = 2m.17s.
Mount Wilson iZ = 11m.40s.
Pasadena i = 10m.59s.
Riverside iZ = 11m.4s. and 11m.43s.
Palomar iZ = 11m.8s. and 11m.44s.
Copenhagen 15m.17s.
Tucson e = 13m.41s.

March 6d. Readings also at 1h. (Tucson), 3h. (Helwan), 8h. (near Mizusawa), 12h. (near Irkutsk), 15h. (near Stalinabad), 16h. (Tucson, near Leninakan, and Grozny), 23h. (Tucson, Grand Coulee, Wellington, and Riverview).

March 7d. 16h. 31m. 4s. Epicentre 2°·0S. 68°·0E.

Not an approximate determination.

A = +·3744, B = +·9266, C = −·0347 ; δ = −3 ; h = +7 ;
D = +·927, E = −·375 ; G = −·013, H = −·032, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	14·8	53	3 26	− 6	—	—	—	—	6·9
Kodaikanal	E.	15·4	38	i 3 46	+ 6	c 7 36	+64	—	—	9·7
Bombay		21·3	12	e 4 53	+ 3	c 9 1	+18	—	—	11·0
Hyderabad	N.	21·9	18	4 55	− 2	8 59	+ 5	9 59	SS	11·0
Tananarive		26·1	230	4 28	?	c 10 8	+ 1	—	—	e 12·2
Calcutta	N.	31·4	38	e 6 26	+ 1	i 11 36	+ 4	—	—	—
New Delhi	N.	31·7	15	i 6 25	− 2	i 11 32	− 5	7 28	PP	—
Stalinabad		40·4	1	i 7 42	+ 1	—	—	—	—	—
Tashkent		43·1	2	e 8 6	+ 2	e 14 36	+ 6	—	—	—
Tchimkent		44·1	2	i 8 9	− 3	—	—	—	—	—
Baku		45·3	341	—	—	e 14 54?	− 8	—	—	—
Ksara		46·7	322	e 8 39	+ 7	—	—	e 10 50	PP	—
Helwan		47·2	314	8 37	+ 1	—	—	e 10 45	PP	—
Leninakan		47·9	335	e 8 41	− 1	—	—	—	—	—
Grozny		49·4	338	8 54	+ 1	—	—	—	—	—
Sverdlovsk		58·9	353	i 10 2	− 1	e 18 7	− 1	—	—	—
Irkutsk		62·1	24	e 10 25	0	—	—	—	—	—
Moscow		62·7	341	i 10 29	0	e 18 58	+ 1	—	—	—
Rome	z.	66·5	318	e 10 52	− 2	—	—	e 17 58	?	—
Chur		70·5	321	e 11 17k	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Collmberg	Z.	70·6	327	i 11 19	0	—	—	—	—	—
Zürich		71·3	321	e 11 23a	0	—	—	—	—	—
Basle		72·0	321	e 11 28	0	—	—	—	—	—
Strasbourg		72·3	323	e 11 9	−20	—	—	—	—	—
Copenhagen		73·0	331	e 11 42	+ 9	e 21 6	+ 6	31 56	Q	38·9
Grand Coulee		133·8	6	e 19 14	[− 5]	—	—	—	—	—
Shasta Dam		140·3	12	e 19 34	[+ 3]	—	—	—	—	—
Tinemaha	Z.	144·6	8	i 19 41	[+ 3]	—	—	—	—	—
Halwee	N.	145·6	8	e 19 44	[+ 4]	—	—	—	—	—
Overton		145·6	3	e 19 44	[+ 4]	—	—	—	—	—
Pierce Ferry		146·0	2	i 19 44	[+ 3]	—	—	—	—	—
Boulder City		146·1	3	e 19 44	[+ 3]	—	—	—	—	—
Mount Wilson	Z.	147·4	8	i 19 48	[+ 5]	—	—	—	—	—
Pasadena		147·5	8	i 19 47	[+ 4]	—	—	—	—	—
Riverside	Z.	147·8	8	i 19 48	[+ 4]	—	—	—	—	—
Palomar		148·5	6	i 19 48	[+ 3]	—	—	i 23 22	PKS	—
La Jolla		148·9	7	e 19 54	[+ 8]	—	—	—	—	—
Tucson		149·9	358	e 19 51	[+ 4]	—	—	—	—	—

Additional readings :—
Bombay eSN = 9m.4s.
Helwan e = 9m.16s. and 11m.23s.
Collmberg eZ = 11m.25s., 11m.36s., 11m.44s., 11m.49s., 11m.56s., and 12m.4s.
Boulder City e = 20m.2s.
Tucson iP = 19m.56s.
Long waves were also recorded at Riverview, La Paz, Huancayo, and De Bilt.

March 7d. 21h. 40m. 50s. Epicentre 27°·5N. 96°·4E.

A = −·0990, B = +·8828, C = +·4593 ; δ = +9 ; h = +3 ;
D = +·994, E = +·111 ; G = −·051, H = +·456, K = −·888.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m. s.		
Calcutta	N.	8·8	237	2 8	− 3	i 3 7	−46	—		—
New Delhi	N.	17·0	278	e 4 0	− 1	i 6 35	−35	—		—
Hyderabad	N.	19·3	242	e 4 26	− 3	7 37	−25	8 7		S
Bombay		23·3	253	e 5 17	+ 7	e 9 26	+ 6	—		—
Kodaikanal	E.	24·8	230	e 5 15	−10	—	—	—		—
Stalinabad		25·6	303	i 5 30	− 2	i 10 7	+ 8	—		—
Tashkent		26·1	309	e 5 39	+ 2	e 10 21	+14	—		—
Sverdlovsk		38·7	329	i 7 31	+ 4	13 27	+ 2	—		—
Grozny		43·5	305	e 8 4	− 3	—	—	—		—
Moscow		50·3	321	i 9 1	+ 1	16 10	− 3	—		—
Copenhagen		64·4	322	i 10 41k	+ 1	—	—	—		—
Collmberg	Z.	65·1	316	i 10 43	− 2	—	—	—		—
Zürich		68·9	313	e 11 6	− 3	—	—	—		—
Bogota		146·8	342	e 19 46	[+ 4]	—	—	—		—

Additional readings :—
Calcutta iS*N = 3m.24s., iS$_e$N = 3m.37s.
Collmberg eZ = 10m.47s., 10m.55s., 11m.2s., 11m.8s., 11m.23s., 11m.31s., and 12m.9s.
Bogota e = 20m.8s.

March 7d. Readings also at 3h. (near Santa Lucia), 4h. (Colombo), 5h. (Palomar, Riverside, and San Juan), 9h. (near Bogota), 10h. (near Mizusawa), 11h. (Pierce Ferry, Tucson (2), La Paz, Basle, near Chur, and Zürich), 12h. (Jena), 13h. (Collmberg and Mizusawa), 14h. (Collmberg (2)), 15h. (Christchurch, Wellington, Brisbane, Riverview, and Malaga (3)), 17h. (Tucson), 19h. (Boulder City, Overton, Pierce Ferry, and near Grozny), 20h. (Boulder City, Overton, Pierce Ferry, Tucson, and Riverside).

March 8d. 19h. 19m. 6s. Epicentre 47°·5N. 13°·2E.

Intensity V at Salzburg.

Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, 1946, Neue Folge, Vol. 83, Vienna, 1947, page 5. Epicentre as adopted.

A = +·6602, B = +·1548, C = +·7350; δ = +5; h = −4;
D = +·228, E = −·974; G = +·716, H = +·168, K = −·678.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		1·9	168	i 0 44	P_g	i 1 9	S_g	—	—	—
Chur		2·6	255	e 0 44	0	e 1 14	− 3	—	—	—
Zagreb		2·6	131	e 0 51	P_g	e 1 17	0	e 1 25?	S_g	—
Cheb		2·7	348	e 0 53	P_g	e 1 23	+ 4	e 1 33	S_g	—
Prague		2·7	18	e 0 59	P_g	e 1 35	S_g	1 26	S*	—
Zürich		3·1	268	e 0 49	− 2	e 1 31	+ 2	e 0 58	P_g	—
Jena		3·6	344	e 1 0	+ 2	i 1 54	S*	i 1 14	P_g	—
Basle		3·8	273	0 58	− 3	e 1 51	+ 4	—	—	—
Collmberg		3·8	358	e 1 3	+ 2	e 1 45	− 2	e 1 12	P_g	—
Strasbourg		3·8	288	1 0	− 1	i 1 56	+ 9	i 1 15	P_g	—
Florence		4·0	200	i 1 13	P*	i 2 1	S*	—	—	—
Kalossa	N.	4·1	101	e 1 30	P_g	—	—	—	—	—
Neuchatel		4·3	265	e 1 5	− 3	e 1 54	− 6	—	—	—
Besançon		4·9	270	e 1 16	− 1	e 2 31	S*	—	—	—
Rome		5·6	185	e 2 18	+51	e 3 9	S_g	—	—	e 3·7
Belgrade		5·7	115	e 1 46	P*	e 3 52	?	e 2 4	P_g	—
Uccle		6·7	303	e 2 7	P_g	e 2 57	− 3	i 3 39	S_g	—
De Bilt		6·9	315	i 3 47	S_g	—	—	—	—	—
Clermont-Ferrand		7·2	260	e 2 54?	?	—	—	—	—	i 4·4
Paris		7·3	284	e 2 1	P*	e 3 8	− 7	e 3 54	S_g	—
Copenhagen		8·2	357	e 2 46	P_g	e 4 26	S_g	—	—	—

Additional readings:—
Zagreb e = 56s., 1m.3s., and 1m.6s., i = 1m.34s. and 1m.41s.
Cheb e = 1m.7s., 1m.13s., 1m.27s., and 1m.31s.
Jena i = 1m.57s.
Collmberg eZ = 1m.7s., 1m.10s., and 1m.16s., eN = 1m.19s., cZ = 1m.31s., eNZ = 1m.36s., eS_gEN = 2m.2s., iS_gSZ = 2m.7s., iE = 2m.11s.
Strasbourg i = 1m.31s.
Kalossa eP = 1m.37s.
Uccle e = 3m.17s.
Paris e = 3m.41s.

March 8d. Readings also at 2h. (Weston, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Grand Coulee, College, and near Almata), 5h. (Palomar, Tinemaha, Tucson, and near Tacubaya), 10h. (Rome and Samarkand), 11h. (Christchurch, Wellington, Riverview, Tucson, and Huancayo), 16h. (Alicante, Tashkent, Tchimkent, near Almata, and Andijan (2)), 18h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Fordham, Harvard, Weston, Sverdlovsk, and Riverview), 19h. (Weston and Tananarive), 21h. (Mount Wilson, Riverside, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and Riverview), 22h. (Strasbourg).

March 9d. 9h. 8m. 8s. Epicentre 38°·1N. 73°·2E. Depth of focus 0·020.
(as on 1937, July 23d.).

A = +·2280, B = +·7552, C = +·6145; δ = −8; h = −1;
D = +·957, E = −·289; G = +·178, H = +·588, K = −·789.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Andijan		2·7	346	i 0 44	− 1	i 1 17	− 2
Stalinabad		3·5	279	i 0 58	+ 3	i 1 44	+ 7
Tashkent		4·4	318	e 1 7	+ 1	2 4	+ 6
Frunse		4·9	12	e 1 13	0	e 2 10	0
Samarkand		5·1	290	—	—	2 22	+ 8
Almata		5·9	27	—	—	2 49?	+16
New Delhi	N.	10·1	160	e 3 57	?	i 4 13	0
Sverdlovsk		20·5	341	e 4 29	+ 2	e 8 10	+ 8
Leninakan		22·8	287	e 4 45	− 4	—	—

No additional readings.

March 9d. 16h. 18m. 31s. Epicentre 55°·6N. 162°·0E.

$A = -\cdot5398$, $B = +\cdot1754$, $C = +\cdot8233$; $\delta = -3$; $h = -7$;
$D = +\cdot309$, $E = +\cdot951$: $G = -\cdot783$, $H = +\cdot254$, $K = -\cdot568$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sapporo		18·3	237	e 4 18	+ 1	—	—	—	—	—
Morioka		21·1	229	e 4 47	− 1	8 24	−15	—	—	—
Mizusawa	E.	21·6	229	4 53	− 1	e 8 55	+ 6	—	—	—
Sendai		22·4	228	4 59	− 3	9 4	0	—	—	—
Nagano		24·9	232	e 5 31	+ 5	—	—	—	—	—
Tokyo		25·1	227	e 5 24	− 4	—	—	—	—	—
College		25·9	48	—	—	e 10 7	+ 3	—	—	e 11·6
Osaka		27·8	232	5 53	0	—	—	—	—	—
Irkutsk		33·3	290	—	—	13 1	+59	—	—	—
Grand Coulee		47·0	64	i 8 35	0	—	—	—	—	—
Shasta Dam		50·1	73	i 8 58	− 1	—	—	e 14 9	S_cP	—
Sverdlovsk		51·2	316	9 6	− 1	—	—	—	—	—
Tinemaha		54·9	74	i 9 36	+ 1	—	—	i 39 49	P′P′	—
Haiwee	N.	55·7	74	e 9 42	+ 2	—	—	—	—	—
Mount Wilson		57·1	76	i 9 49	− 1	—	—	—	—	—
Pasadena		57·1	76	i 9 49a	− 1	e 17 42	− 3	i 39 47	P′P′	e 27·1
Andijan		57·4	296	9 55	+ 2	—	—	—	—	—
Overton		57·4	71	i 9 55	+ 2	—	—	—	—	—
Boulder City		57·6	72	i 9 54	0	i 17 52	+ 1	—	—	—
Rapid City		57·6	58	e 9 57	+ 3	i 17 55	+ 4	e 11 53	PP	e 30·0
Tchimkent		57·7	299	9 54	− 1	—	—	—	—	—
Pierce Ferry		57·9	71	i 9 57	+ 1	i 17 57	+ 2	—	—	—
Palomar		58·4	76	i 9 53	− 7	i 17 57	− 5	—	—	—
La Jolla		58·6	77	e 10 0	− 1	—	—	—	—	—
Tashkent		58·6	298	e 9 45	−16	e 18 9	+ 5	—	—	—
Moscow		60·2	328	10 10	− 2	18 33	+ 8	—	—	—
Calcutta	N.	62·5	270	—	—	e 19 27	+33	—	—	—
Tucson		62·6	72	i 10 28	0	—	—	e 39 36	P′P′	e 30·3
New Delhi	N.	64·1	283	—	—	e 19 10	− 4	—	—	—
Copenhagen		66·3	342	i 10 53	+ 1	e 19 44	+ 2	—	—	32·5
Grozny		67·7	314	11 0	− 1	e 20 8	+10	—	—	—
St. Louis		67·9	54	i 11 2	0	i 19 59	− 2	e 24 28	SS	e 32·9
Baku		68·4	310	—	—	e 20 24	+17	—	—	—
Leninakan		70·6	315	e 11 22	+ 3	e 20 54	+21	—	—	—
Erevan		70·8	314	e 11 22	+ 2	—	—	—	—	—
De Bilt		71·0	345	e 11 22	0	i 21 34	PS	e 13 41	PP	e 35·5
Jena		71·0	340	e 11 21	− 1	—	—	—	—	—
Yalta		71·0	323	11 18	− 4	—	—	—	—	—
Uccle		72·4	345	e 11 30a	0	e 20 52	− 1	e 21 34	PS	e 35·5
Weston		72·4	38	e 11 29	− 1	e 21 1	+ 8	—	—	—
Strasbourg		74·0	343	e 11 39	0	e 21 23	+12	e 14 36	PP	e 37·5
Paris		74·6	346	e 11 43	0	—	—	—	—	e 40·5
Basle		75·0	343	e 11 46	+ 1	—	—	e 15 43	?	—
Zürich		75·0	342	e 11 45a	0	—	—	—	—	—
Chur		75·3	341	e 11 48	+ 1	—	—	—	—	—
Neuchatel		75·6	343	e 11 49	+ 1	—	—	—	—	—
Ksara		79·8	317	i 11 12	−60	e 21 44	−30	—	—	—
Toledo		84·1	349	i 12 36	+ 2	e 23 56	PS	12 57	pP	—
Helwan		85·0	319	e 12 39	+ 1	—	—	—	—	—
Riverview		89·6	188	—	—	e 29 5	SS	—	—	e 45·2
San Juan		95·8	45	—	—	e 28 35	?	—	—	e 50·0
La Paz	z.	125·5	64	e 18 59	[− 4]	—	—	—	—	64·2

Additional readings :—
Rapid City $ePcP = 10m.43s.$, $c = 13m.21s.$, $iScS = 19m.43s.$
Palomar $iZ = 10m.1s.$
Tucson $ePP = 12m.47s.$, $ePPP = 14m.3s.$
St. Louis $eE = 20m.22s.$
Jena $e = 11m.35s.$
Uccle $eSSN = 25m.35s.?.$
Strasbourg $eSP = 22m.1s.$, $eSS = 26m.42s.$
Toledo $PP = 16m.29s.?.$
Helwan $e = 12m.59s.$
Long waves were also recorded at Sitka, Bozeman, Philadelphia, Christchurch, and other European stations.

March 9d. 19h. Shock in Belgium.

Suggested Epicentre 50°28′N. 4°3′E. Intensity V at Havre.

Ch. Charlier.
Bulletin Séismique de l' Observatoire Royal de Belgique à Uccle. 1946. Gembloux, 1948, p. 10.

Uccle $eP_gN = 38m.9s.$, $iS_g = 38m.16s.$, $iS = 38m.19s.$, $iE = 38m.26s.$, $i = 38m.33s.$
Paris $eS = 39m.1s.$
Neuchatel $e = 39m.41s.$
Strasbourg $eS = 39m.42s.$, $eS_g = 39m.54s.$
Zürich $e = 39m.56s.$
Basle $e = 40m.1s.$

March 9d. 21h. 51m. 24s. Epicentre 18°·5N. 66°·0W.

Approximate position. Negative residuals at $\Delta > 40°$ may be due to focus deeper than normal, but there is no other evidence for this.

$A = +·3860$, $B = -·8669$, $C = +·3154$; $\delta = -1$; $h = +5$;
$D = -·914$, $E = -·407$; $G = +·128$, $H = -·288$, $K = -·949$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
San Juan		0·2	224	i 0 28	+18	i 0 46	+30	i 1·1
Fort de France		6·0	128	e 1 41	+ 9	—	—	—
Port au Prince		6·0	272	e 1 39	+ 7	i 2 29	−14	i 3·2
Bogota		15·9	211	e 3 51	+ 4	6 55	+11	—
Fordham		23·3	345	e 5 18	+ 8	e 9 6	−14	—
Weston		24·2	351	e 5 30	+11	e 9 26	− 9	—
Harvard		24·4	351	e 5 32	+11	e 9 31	− 8	—
Tucson		42·5	298	e 7 48	−11	—	—	e 21·4
Pierce Ferry		45·6	303	i 8 15	− 9	—	—	—
Boulder City		46·3	303	e 8 19	−10	—	—	—
Palomar	z.	47·6	298	e 8 30	− 9	—	—	—
Riverside	z.	47·9	299	e 8 33	− 9	—	—	—
Mount Wilson		48·7	299	e 8 39	− 9	—	—	—
Pasadena	z.	48·8	299	e 8 51	+ 2	—	—	—
Tinemaha	z.	49·2	303	i 8 56	+ 4	e 17 25	?	i 21·2

Additional readings :—
Pierce Ferry $i = 8m.29s.$
Boulder City $iP = 8m.34s.$
Palomar $e = 8m.44s.$
Tinemaha $eZ = 8m.44s.$
Long waves were also recorded at Bermuda and Philadelphia.

March 9d. Readings also at 3h. (Collmberg, Uccle, Paris, Strasbourg, near Besançon, and Clermont-Ferrand), 6h. (Mount Wilson and Riverside), 12h. (Bucharest, Sofia, and near Andijan), 16h. (near Granada), 20h. (Samarkand), 21h. (Mount Wilson, Palomar, Tinemaha, Tucson, and near Mizusawa).

March 10d. Readings at 3h. (Strasbourg), 4h. (La Paz, near Huancayo, and near Shasta Dam), 5h. (Tucson), 8h. (Tucson, Bogota, and near Balboa Heights), 10h. (Shasta Dam and near La Paz), 14h. (Sverdlovsk, Grozny, Almata, Tchimkent, near Tashkent, Samarkand, and Stalinabad (2)), 15h. (near La Paz and near Andijan (2)), 16h. (Calcutta and New Delhi), 19h. (St. Louis, Tucson, Pierce Ferry, Riverview, and Wellington), 21h. (near Almeria, Granada, and Malaga), 22h. (Tucson and near Tacubaya), 23h. (Almeria, Granada, and Malaga).

March 11d. Readings at 5h. (Philadelphia, Rapid City, Tucson, Palomar, Riverside, Pierce Ferry, Pasadena, Mount Wilson, Overton, Haiwee, Tinemaha, Shasta Dam, Grand Coulee, and near Leninakan), 7h. (near Mizusawa), 9h. (Grand Coulee and Shasta Dam), 10h. (Sofia), 13h. (Tucson), 16h. (near Tacubaya (2)), 18h. (Rome), 20h. (Pehpei), 21h. (De Bilt), 23h. (Bogota and near Tacubaya).

March 12d. 0h. 1m. 57s. Epicentre 35°·3S. 106°·3W.

A = −·2296, B = −·7850, C = −·5753; δ = −9; h = 0;
D = −·960, E = +·281; G = +·161, H = +·552, K = −·818.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Santa Lucia	E.	29·4	97	6 3?	− 4	11 3?	+ 2	13 3?	SSS		15·1
Huancayo		36·4	59	e 7 8	0	i 12 50	0	i 8 36	PP	i	15·7
La Paz		38·8	72	i 7 23a	− 5	i 13 17	− 9	8 57	PP		18·2
La Plata	E.	39·3	104	7 45	+13	13 27	− 7	9 9	PP		16·1
	N.	39·3	104	7 41	+ 9	13 27	− 7	9 45	PcP		16·3
Tacubaya		54·8	8	e 9 36	+ 2	i 17 19	+ 5	—	—	c	23·9
Wellington		60·2	239	10 11	− 1	18 37	+12	10 43	PcP		28·1
Christchurch		60·9	235	10 15	− 2	18 43	+ 9	22 30	SS		27·9
Auckland		62·0	243	—	—	19 53	+65	21 19	ScS		30·4
San Juan		65·6	43	i 10 43	− 5	e 19 23	−10	e 15 9	PPP	e	27·4
Tucson		67·3	357	i 10 58	− 1	e 19 59	+ 5	e 39 34	P'P'	c	27·9
Palomar		69·0	351	i 11 12	+ 3	i 20 19	+ 5	i 11 19	PcP		—
Riverside	Z.	69·7	350	i 11 16	+ 2	—	—	—	—		—
Mount Wilson	Z.	70·0	350	i 11 17	+ 2	—	—	e 11 34	PcP		—
Pasadena		70·0	350	i 11 17	+ 2	—	—	—	—	e	29·6
Boulder City		71·4	354	e 11 23	− 1	e 20 49	+ 7	i 11 27	?		—
Pierce Ferry		71·4	354	e 11 20	− 4	e 20 49	+ 7	i 11 24	?		—
Haiwee	N.	71·9	350	e 11 33	+ 6	—	—	—	—		—
Overton		71·9	354	e 11 30	+ 3	—	—	—	—		—
Columbia		72·9	22	e 11 36	+ 3	e 20 58	− 1	e 25 44	SS	e	31·6
Tinemaha		72·9	350	i 11 32	− 1	—	—	—	—		—
Berkeley		74·3	347	e 11 41	0	21 17	+ 2	26 11	SS		34·0
St. Louis		75·1	13	e 11 43	− 3	e 21 22	− 2	i 21 29	?		—
Florissant	E.	75·2	13	—	—	e 21 25	0	i 22 7	PS		—
Salt Lake City		75·9	356	—	—	e 21 32	0	e 26 57	SS	e	32·9
Shasta Dam		77·1	348	e 11 54	− 3	e 21 52	+ 6	i 11 58	?		—
Bermuda		77·8	36	—	—	e 21 56	+ 3	i 22 33	PS	e	35·1
Rapid City		79·1	3	e 12 13	+ 5	i 22 7	0	e 17 11	PPP	e	33·4
Philadelphia		80·2	24	—	—	e 22 20	+ 1	e 27 11	SS	e	33·7
Riverview		80·2	236	i 12 14k	0	e 22 19	0	i 23 12	PS	e	37·2
Fordham		81·4	24	e 12 12	− 8	e 22 36	+ 5	—	—	e	34·1
Grand Coulee		83·6	352	e 12 31	0	—	—	—	—		—
Harvard		83·7	26	i 12 29	− 3	—	—	—	—	e	39·6
Weston		83·7	26	e 12 28	− 4	e 22 56	+ 2	—	—		—
Victoria		84·8	350	—	—	e 23 15	+10	—	—		36·1
Ottawa		85·0	21	12 36	− 2	23 7	0	28 45	SS		38·1
Seven Falls		88·0	23	—	—	e 23 39	+ 3	—	—		36·1
Lisbon		116·0	59	18 45?	[0]	29 26?	PS	—	—	e	55·5
Granada		119·3	63	20 24a	PP	29 54	PS	21 6	pPP		58·7
Alicante		122·1	63	—	—	e 28 36	?	30 42	PS	e	60·7
Paris		127·3	52	—	—	e 31 11	PS	e 38 3?	SS	e	62·1
Uccle		128·9	50	e 19 31	[+21]	e 31 16	PS	e 38 32	SS	e	61·1
De Bilt		129·6	48	e 21 19	PP	e 22 29	PKS	e 24 11	PPP	e	58·1
Strasbourg		130·7	52	—	—	e 43 56	SSS	—	—	e	61·8
Rome		132·6	62	e 21 33	PP	e 26 10	[−16]	e 22 45	PKS		—
Cheb		133·9	51	e 21 50	PP	e 32 1	PS	e 22 55	PKS	e	64·1
Copenhagen		134·2	43	22 56	PKS	34 2	PPS	39 9	SS		55·1
Triest		134·2	57	e 21 45	PP	e 39 47	SS	e 22 48	PKS	e	63·2
Collmberg	Z.	134·3	49	e 19 19	[− 1]	—	—	—	—		—
Belgrade		138·8	59	e 20 3	[+35]	e 23 21	PKS	e 22 8	PP		—
Helwan		144·1	86	i 19 36k	[− 1]	e 23 40	PKS	22 46	PP		—
Moscow		148·0	38	19 52	[+ 8]	27 8	[+17]	23 11	PP		—
Ksara		148·9	81	19 52	[+ 6]	—	—	e 40 37	?		—
Irkutsk		152·4	317	e 20 18	[+27]	42 58	SS	48 57	SSS		—
Leninakan		156·0	67	19 53	[− 3]	—	—	—	—		—
Sverdlovsk		156·7	18	20 3	[+ 6]	31 2	{+ 7}	43 57	SS		—
Grozny		157·0	61	19 53	[− 4]	—	—	—	—		—
Tashkent		173·1	28	e 20 29	[+18]	31 56	{−22}	e 25 39	PP		—
Andijan		174·5	10	e 20 27	[+16]	—	—	—	—		—
Stalinabad		174·9	49	e 25 42	PP	—	—	—	—		—

For Notes see next page.

NOTES TO MARCH 12d. 0h. 1m. 57s.

Additional readings :—
Huancayo ePcP =9m.15s.
La Plata PPN =8m.27s., PPP?E =9m.43s.
Tacubaya iSE =17m.22s.
Wellington PPZ =12m.55s., ScSZ =20m.6s., SSZ =22m.44s., Q =26m.23s.?.
Christchurch PP =13m.39s., e =18m.6s.
Auckland SS =23m.57s., SSS =26m.48s.
San Juan e =13m.54s. and 23m.29s.
Tucson i =11m.6s., e =23m.30s.
Columbia eScS =22m.12s., e =23m.46s.
Berkeley iP =11m.44s., PP =15m.12s., Q =31m.33s.
Florissant iSE =21m.32s., iE =26m.22s.
Bermuda eSS =27m.8s., e =31m.3s.
Rapid City e =27m.25s.
Philadelphia eSSS =31m.0s.
Riverview iSKSEN =22m.25s., PPSE =23m.30s., iSSE =27m.49s., iE =28m.5s.
Alicante SS =36m.43s., SSS =41m.13s., Q =50m.32s.
Paris eSSS =43m.3s.?.
Uccle eSSSN =43m.5s.
De Bilt ePPS =33m.3s.?, eSS =39m.3s.?.
Rome eSS?E =39m.30s.?.
Triest eSSS =44m.30s.
Collmberg eZ =19m.22s., 19m.29s., 19m.35s., 19m.54s., 19m.57s., and 20m.18s.
Helwan PPP =25m.57s.
Irkutsk ePP =24m.31s., ePPP =28m.2s.
Sverdlovsk SKSP =34m.28s.
Tashkent PPP =29m.43s., SS =46m.49s.
Long waves were also recorded at Honolulu, Bozeman, Chicago, New Delhi, and at other European stations.

March 12d. 2h. 21m. 54s. Epicentre 29°·8N. 51°·8E.

Destruction between Chiraz and the Persian Gulf.
Epicentre : 29°·75N. 51°·5E. (Strasbourg) ; 32°N. 53°E. (J.S.A.).
Annales de l'Institut de Physique du Globe de Strasbourg, pour l'année 1946, 2ème partie, Séismologie, Nouvelle Série, Tome XI, p. 47.

A = +·5375, B = +·6831, C = +·4945 ; δ = +6 ; h = +2 ;
D = +·786, E = −·618 ; G = +·306, H = +·389, K = −·869.

		△	Az.	P.	O−C.	S.	O−C.		Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Baku		10·7	351	2 41	+ 3	e 4 39	0	—	—	—
Erevan		11·9	332	e 3 0	+ 6	—	—	—	—	—
Leninakan		12·6	332	e 2 55	− 8	—	—	—	—	—
Ksara		14·1	290	e 3 27	+ 4	6 17	+15	—	—	—
Grozny		14·3	342	3 28	+ 2	6 8	+ 2	—	—	—
Samarkand		15·9	48	5 18	?	5 47	?	—	—	—
Stalinabad		16·5	54	i 3 56	+ 2	7 4	+ 6	—	—	—
Helwan		17·8	275	4 11	0	7 33	+ 5	4 33	PPP	—
Tashkent		18·2	47	i 4 14	− 2	e 7 47	+10	—	—	—
Tchimkent		19·0	44	i 4 27	+ 1	e 8 14?	+19	—	—	—
Andijan		20·0	52	i 4 38	+ 1	—	—	—	—	—
Yalta		20·2	321	e 4 37	− 2	—	—	—	—	—
Bombay		22·0	116	e 4 57	− 1	i 8 55	− 1	—	—	12·2
New Delhi		22·2	87	e 4 38	−22	i 8 56	− 4	i 4 58	P	11·1
Frunse		22·4	49	5 5	+ 3	—	—	—	—	—
Almata		24·1	49	5 27	+ 9	—	—	—	—	—
Bucharest		25·0	313	e 5 29	+ 2	e 9 53	+ 4	i 10 47	SS	—
Sofia		26·2	337	e 5 39	+ 1	i 10 9	0	i 6 8	PP	e 15·6
Sverdlovsk		27·7	10	i 5 53	+ 1	i 10 35	+ 2	—	—	—
Moscow		27·8	343	5 53	0	10 32	− 3	—	—	—
Belgrade		28·9	310	i 5 59	− 4	e 10 45	− 8	e 16 24	ScS	e 18·1
Kodaikanal		30·9	124	e 5 29	−51	i 11 19	− 5	6 54	PP	—
Zagreb		32·2	310	e 6 29	− 3	e 11 42?	− 3	e 16 58	ScS	e 19·0
Calcutta	N.	33·5	94	e 6 34	− 9	i 11 57	− 8	i 13 41	SS	—
Triest		33·6	309	i 6 43	− 1	i 12 6	0	i 7 58	PP	—
Rome		33·8	303	e 6 47k	+ 1	i 12 9	− 1	i 17 10	ScS	e 17·6
Prague		34·6	317	e 7 1?	+ 8	e 12 17	− 5	e 17 6	ScS	e 19·1
Colombo	E.	34·9	126	6 57	+ 2	12 14	−13	—	—	21·0
Florence		35·0	305	i 7 2	+ 6	i 12 27	− 1	—	—	—
Cheb		35·8	317	e 7 3	0	i 12 39	− 2	e 8 30	PP	e 20·1

Continued on next page.

		△	Fz.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Collmberg	N.	35·9	318	e 7 0	− 4	e 12 37	− 5	e 8 31	PP	e 20·8
Jena		36·6	318	e 7 7	− 3	e 12 46	− 7	e 17 20	S_eS	—
Chur		36·8	310	e 7 7	− 4	e 12 48	− 8	—	—	—
Zürich		37·5	311	e 7 13a	− 4	e 12 58	− 9	—	—	—
Upsala		37·8	333	e 8 43	PP	e 13 4	− 7	e 15 38	SS	e 20·1
Copenhagen		38·0	325	i 7 18	− 3	i 13 9	− 5	—	—	17·1
Basle		38·2	311	e 7 19	− 4	—	—	e 9 58	P_eP	—
Strasbourg		38·3	313	e 7 17	− 7	i 13 17	− 2	e 8 38	PP	18·7
Neuchatel		38·5	310	e 7 22	− 4	e 13 14	− 8	—	—	—
De Bilt		40·8	317	i 7 46	+ 1	e 13 53	− 3	e 9 26	PP	e 19·1
Algiers		41·0	293	e 7 47	+ 1	13 55	− 4	9 6	PP	20·1
Uccle		41·0	315	e 7 45a	− 1	i 14 8	+ 9	i 13 56	P_eS	e 19·8
Barcelona		41·5	301	—	—	e 13 57	−10	17 48	S_eS	—
Paris		41·8	312	e 7 41	−12	e 13 59	−12	17 54	P	e 24·1
Tortosa		42·7	300	i 8 5	+ 5	i 14 22	− 2	17 56	S_eS	20·8
Bergen		43·4	330	8 5	− 1	14 31	− 4	9 27	PP	19·6
Alicante		43·6	297	8 39	+31	i 14 33	− 5	9 55	PP	e 20·6
Kew		44·0	315	i 8 18	+ 7	e 14 38	− 5	i 9 59	PP	e 21·1
Irkutsk		44·3	45	i 8 14	+ 1	14 46	− 2	—	—	—
Durham		45·3	319	e 8 19	− 2	14 59	− 3	i 10 12	PP	—
Aberdeen		46·1	323	—	—	i 15 8	− 6	i 18 16	S_eS	23·3
Granada		46·2	295	i 8 30a	+ 2	i 15 14	− 1	—	—	—
Toledo		46·3	298	e 8 26	− 3	i 15 16	0	10 23	PP	22·4
Tananarive		48·6	186	e 8 47	0	e 15 49	0	10 35	PP	e 23·5
Lisbon		50·3	298	9 1k	+ 1	16 11	− 2	18 44?	S_eS	25·7
College		84·4	8	—	—	e 22 56	− 5	—	—	e 44·2
Seven Falls		87·6	325	—	—	e 23 18	[0]	—	—	50·1
Weston		91·1	322	e 13 10	+ 2	e 24 0	− 4	—	—	—
Ottawa		91·3	326	13 8	− 1	23 36	[− 4]	—	—	47·1
Sitka		92·8	4	—	—	e 22 10	?	—	—	e 55·5
St. Louis		103·2	330	e 18 10	PP	e 25 57	+10	24 34	SKS	e 45·1
San Juan		103·4	301	—	—	e 32 24	SS	—	—	e 55·6
Salt Lake City		108·2	347	—	—	e 28 18	PS	—	—	e 59·8
Overton		112·8	348	e 19 27	PP	—	—	—	—	—
Pierce Ferry		113·1	347	e 18 43	[+ 4]	—	—	—	—	—
Boulder City		113·4	348	e 19 8	[+28]	—	—	e 19 21	PP	—
Tucson		116·1	343	e 18 47	[+ 2]	—	—	e 19 45	PP	e 47·1
La Paz		123·8	269	e 19 6	[+ 6]	27 26	{−14}	20 46	PP	e 63·1

Additional readings :—
Helwan i =5m.2s., 5m.33s., and 5m.56s., SS =7m.57s.
New Delhi i =4m.48s., PPEN =5m.11s., iN =9m.14s., SSN =9m.41s.
Bucharest iE =10m.0s., iS_eSE =16m.16s.
Sofia iE =10m.22s.
Zagreb eE =6m.53s.
Rome iE =16m.38s.
Cheb e =16m.23s. and 19m.4s.
Collmberg eZ =7m.14s. and 8m.0s., ePPPZ =8m.44s., eP_ePZ =9m.14s., eZ =10m.35s. and 12m.44s., eE =12m.48s., eN =12m.51s., eS_eSEN =17m.18s.
Upsala ePN =8m.46s., ePS?E =16m.30s., eN =17m.25s.
Strasbourg iSSS =16m.8s.
De Bilt eSS =16m.46s.
Algiers iSSS =17m.49s.
Uccle eSSN =16m.47s., eSSSN =17m.58s.
Paris i =12m.52s., eSS =17m.1s., e =19m.1s., eQ =23m.6s.
Bergen eZ =10m.41s. and 13m.41s.
Alicante P_eS =14m.43s., SS =17m.59s.
Kew eE =16m.59s., eSSNZ =18m.4s., iQEN =18m.20s.
Durham N =18m.15s.
Aberdeen eE =19m.6s.
Toledo PSEN =15m.33s., iS_eSN =18m.21s., iSSN =18m.36s., QN =19m.51s.
Tananarive SS =18m.36s.
Lisbon Z =9m.38s., SZ =16m.15s.
St. Louis eZ =18m.20s., ePSN =27m.21s., eN =31m.45s., eSSS?N =37m.56s.
Tucson e =22m.14s.
La Paz PS =30m.48s.
Long waves were also recorded at Philadelphia, Rapid City, Bozeman, Pasadena, Huancayo, Riverview, and Christchurch.

March 12d. 15h. 28m. 25s. Epicentre 32°·9N. 136°·9E. Depth of focus 0·060.

Intensity II-III at Onahama.
Seismo. Bull. Cent. Met. Obs., Japan, 1946, Tokyo, 1951, page 10, with isoseismal chart.
Epicentre as adopted, depth of focus 340km. Radius of macroseismic area more than 300km.

$A = -·6143$, $B = +·5748$, $C = +·5406$; $\delta = +1$; $h = +1$;
$D = +·683$, $E = +·730$; $G = -·395$, $H = +·369$, $K = -·841$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Owase		1·3	333	0 57	+ 3	2 35	+59
Omaesaki		2·0	33	0 59	+ 1	1 59	+16
Osaka		2·1	327	1 0	+ 2	1 41	− 3
Sumoto		2·2	311	1 1	+ 2	1 40	− 5
Kobe		2·3	321	0 58	− 2	1 39	− 7
Kyoto		2·3	335	2 22	?	3 4	?
Hîkone		2·4	347	0 59	− 1	1 43	− 5
Shizuoka		2·4	31	0 54k	− 6	1 47	− 1
Misima		2·8	21	1 5	+ 2	1 55	+ 2
Kôti		2·9	283	0 52	−12	2 35	+41
Hunatu		3·0	31	1 7	+ 2	1 57	+ 1
Yokohama		3·4	41	1 12k	+ 4	2 3	+ 1
Tokyo		3·6	40	1 13	+ 3	2 5	0
Kumagaya		3·8	32	1 15	+ 3	2 8	0
Toyama		3·8	4	1 12	0	2 5	− 3
Nagano		3·9	15	1 14	+ 2	2 6	− 4
Tukubasan		4·2	38	1 17k	+ 2	2 9	− 5
Mito		4·5	39	1 21	+ 3	2 17	− 3
Wazima		4·5	0	1 17	− 1	2 11	− 9
Kumamoto		5·2	271	1 17	− 8	2 30	− 2
Onahama		5·2	38	1 17	− 8	2 19	−13
Hukuoka		5·5	279	1 27k	− 1	2 31	− 7
Hukusima		5·6	30	2 14	+44	3 20	+40
Sendai		6·3	29	1 37	0	2 46	− 7
Mizusawa	E.	7·1	28	1 48	+ 2	3 5	− 5
Morioka		7·6	25	1 51	− 1	3 12	− 8
Miyako		7·9	30	1 54	− 1	3 17	− 9
Hatinohe		8·5	25	1 44	−18	2 30	−68
Sapporo		10·7	18	4 16	S	(4 16)	− 8
Nemuro		12·4	31	3 41	+55	—	—

March 12d. Readings also at 1h. (near Andijan), 3h. (Tacubaya (2)), 4h. (Tucson, Pierce Ferry, and near Tacubaya), 5h. (Helwan, Ksara, and Mizusawa), 6h. (Mount Wilson, Tinemaha, Riverview, and Brisbane), 8h. (Overton, Pierce Ferry, Boulder City, Tucson, Shasta Dam, Tinemaha, Palomar, Riverview, Christchurch, and Auckland), 9h. (near Tacubaya), 11h. (La Paz and Huancayo), 17h. (near Tacubaya), 19h. (Rome and Helwan), 23h. (Wellington and near Tananarive).

March 13d. 7h. Undetermined shock.

Santa Lucia PE = 20m.17s., SN = 20m.43s., LE = 20m.49s.
La Plata PE = 22m.42s., SN = 24m.42s., SE = 24m.48s., LN = 25·3m.
La Paz P = 23m.18s., S = 27m.18s.
St. Louis ePZ = 31m.14s., iZ = 31m.24s.
Tucson eP = 31m.25s., e = 31m.36s.
Palomar ePZ = 31m.47s., iNZ = 31m.58s.
Riverside iPZ = 31m.50s., iZ = 32m.1s.
Pierce Ferry eP = 31m.51s.
Mount Wilson iPZ = 31m.54s., iZ = 32m.5s.
Pasadena iZ = 32m.5s.
Haiwee ePZ = 32m.7s.
Tinemaha iPZ = 32m.8s., iZ = 32m.18s. and 32m.27s.
Tananarive 65m.16s., L = 76m.50s.
Kodaikanal eE = 65m.48s.

March 13d. 8h. 40m. 30s. Epicentre 52°·5S. 139°·5E.

$A = -·4648$, $B = +·3970$, $C = -·7914$; $\delta = -4$; $h = -6$;
$D = +·649$, $E = +·760$; $G = +·602$, $H = -·514$, $K = -·611$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		20·5	30	i 4 41a	− 1	i 8 25	− 2	i 4 49	pP	e 9·6
Christchurch		23·7	82	9 22	S	(9 22)	− 5	—	—	(13·7)
Wellington		26·3	79	5 41	+ 2	10 56	+45	8 35	P_cP	11·5
Perth		26·8	311	—	—	10 23	+ 4	—	—	11·9
Brisbane	N.	27·0	28	i 5 45	0	i 10 22	0	i 6 33	PP	—
Auckland		29·2	72	e 7 30	PPP	10 57	− 1	—	—	11·8
Hyderabad	N.	87·3	303	15 18	?	23 22	− 7	—	—	—
Bombay		91·5	299	—	—	e 24 3	− 5	—	—	—
Huancayo		109·1	144	—	—	e 29 46	PPS	—	—	e 50·1
Mount Wilson	Z.	123·5	76	e 19 13	[+13]	—	—	—	—	—
Ksara		123·9	282	e 21 7	PP	31 2?	PS	—	—	57·5
Shasta Dam		125·4	67	e 19 10	[+ 7]	—	—	—	—	—
Tinemaha	Z.	125·4	73	e 19 16	[+13]	—	—	—	—	—
Tucson		126·5	83	e 19 14	[+ 9]	—	—	—	—	e 58·7
Boulder City		126·6	77	e 19 14	[+ 9]	—	—	—	—	—
Overton		127·2	76	e 19 14	[+ 7]	—	—	—	—	—
Pierce Ferry		127·2	77	e 19 15	[+ 8]	—	—	—	—	—
Sitka		129·7	44	e 19 42	[+31]	—	—	—	—	e 55·0
Rome	Z.	143·2	274	e 20 38?	?	—	—	—	—	—
St. Louis		143·3	92	e 19 44	[+ 8]	e 41 35	SS	e 47 12	SSS	e 60·7
Chur		147·7	280	e 19 57	[+13]	e 25 43	[−68]	—	—	—
Zürich		148·5	280	e 19 58	[+13]	—	—	—	—	—
Basle		149·2	280	e 20 7	[+21]	—	—	—	—	—
Strasbourg		149·5	282	—	—	e 27 32	[+39]	(e 29 36)	SKKS	e 29·6
Paris		152·8	278	—	—	(e 28 30)?	[+93]	—	—	e 28·5

Additional readings :—
Riverview iZ = 8m.33s., iN = 8m.42s., iP_cPZ = 8m.47s., iSSSE = 9m.6s.
Christchurch L is given as S, phases are wrongly identified.
Brisbane iSSN = 11m.32s.
Hyderabad PSN = 23m.34s.
Pierce Ferry i = 19m.20s.
Basle e = 21m.36s.
Long waves were also recorded at Arapuni, New Delhi, Weston, Pasadena, De Bilt Uccle, and Kew.

March 13d. Readings also at 0h. (Arapuni, Auckland, Christchurch, Brisbane, Riverview, Mount Wilson, Riverside, Tinemaha, Tucson, Pierce Ferry, Ksara, Rome, Chur, and Zürich), 1h. (Riverview, Tucson, Samarkand, De Bilt, and Uccle), 4h. (Malaga and near Andijan), 15h. (Tucson), 16h. (Frunse, near Andijan, and Stalinabad), 17h. (Weston, Harvard, and Port au Prince), 18h. (Bermuda, Bogota, Weston, Harvard, and near Port au Prince), 19h. (Tinemaha and Tucson), 20h. (Ksara, Erevan, and near Leninakan), 22h. (Frunse, Stalinabad, and near Andijan), 23h. (near Tchimkent).

March 14d. Readings at 0h. (Arapuni, Auckland, Christchurch, Wellington, and Riverview), 2h. (Riverview), 13h. (Granada and near Samarkand), 14h. (near Samarkand), 15h. (Collmberg, Jena, near Strasbourg and Besançon), 18h. (Leninakan), 20h. (near Tacubaya), 21h. (Tucson and Weston).

March 15d. 3h. 3m. 2s. Epicentre 19°·3N. 146°·3E.

$A = -·7858$, $B = +·5241$, $C = +·3285$; $\delta = +7$; $h = +5$;
$D = +·555$, $E = +·832$; $G = -·273$, $H = +·182$, $K = -·944$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shizuoka	17·1	337	4 9	+ 7	7 22	+10	—	—	—
Yokohama	17·1	340	3 59	− 3	9 54	L	—	—	(9·9)
Tokyo	17·3	340	4 5	+ 1	—	—	—	—	—
Osaka	18·0	329	4 44	+31	8 43	+71	—	—	—
Hikone	18·2	334	4 18	+ 2	7 48	+11	—	—	—

Continued on next page.

		△	Az.	P.	P−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kôti		18·2	322	4 4	−12	7 31	− 6	—	—	—
Miyazaki		18·3	315	4 20	+ 3	7 47	+ 8	—	—	—
Toyama		19·1	326	4 25	− 2	8 9	+12	—	—	—
Kumamoto		19·4	316	4 46	+16	9 26	L	—	—	(9·4)
Sendai		19·5	347	4 31	0	7 10	−56	—	—	—
Hukuoka		20·1	318	4 38	0	8 32	+13	—	—	—
Mizusawa	E.	20·3	347	4 47	+ 7	8 26	+ 3	—	—	—
Irkutsk		46·3	325	8 28	− 1	i 15 16	0	—	—	—
Honolulu		52·2	77	—	—	e 16 40	+ 1	—	—	e 24·5
Riverview		53·0	175	i 9 19$_a$	− 2	i 16 55	+ 5	i 9 26	pP	e 24·2
Calcutta	N,	54·0	284	e 9 38	+10	e 17 14	+11	—	—	—
Auckland		62·0	154	—.	—	e 18 58?	+10	—	—	—
College		62·5	26	—	—	e 18 50	− 4	e 23 8	SS	e 26·0
New Delhi	N.	63·1	293	e 10 49	+17	i 19 2	0	—	—	30·5
Arapuni		63·4	154	e 17 28	?	—	—	—	—	—
Hyderabad	N.	64·0	280	e 11 31	+53	20 16	+63	—	—	—
Andijan		65·7	306	e 10 43	− 5	—	—	—	—	—
Wellington		65·8	157	—	—	e 19 28	− 7	—	—	35·2
Kodaikanal	E.	66·8	274	—	—	e 20 0	+12	—	—	—
Christchurch		67·0	160	11 0	+ 3	19 47	− 3	25 39	SS	35·9
Tchimkent		67·6	308	e 10 40	−21	—	—	—	—	—
Tashkent		67·9	307	e 11 3	+ 1	e 20 3	+ 2	—	—	—
Stalinabad		68·7	304	i 11 10	+ 3	—	—	—	—	—
Bombay		68·9	283	e 11 14	+ 5	—	—	—	—	—
Sverdlovsk		71·7	325	i 11 24	− 2	i 20 42	− 3	—	—	—
Victoria		76·0	43	—	—	e 21 23	−11	—	—	36·0
Shasta Dam		78·6	51	e 12 1	− 4	—	—	e 15 1	PP	—
Grand Coulee		79·0	43	i 12 6	− 1	—	—	—	—	—
Berkeley		79·5	53	12 10	0	—	—	—	—	37·5
Baku		82·4	310	22 44	S	(22 44)	+ 3	—	—	—
Tinemaha	Z.	82·8	54	e 12 41	+14	—	—	—	—	—
Haiwee	Z.	83·3	54	e 12 31	+ 1	—	—	—	—	—
Pasadena		83·8	56	e 12 33	+ 1	—	—	—	—	e 40·0
Mount Wilson	Z.	83·9	56	i 12 32	− 1	—	—	—	—	—
Moscow		84·3	327	12 32	− 3	22 55	− 5	—	—	—
Grozny		84·4	313	e 12 38	+ 2	e 23 2	+ 1	—	—	—
Riverside	Z.	84·5	56	i 12 34	− 2	—	—	e 15 45	PP	—
Palomar		85·1	57	i 12 39	0	—	—	—	—	—
Boulder City		85·8	54	e 12 39	− 3	—	—	—	—	—
Logan		85·8	47	i 12 45	+ 3	e 23 10	− 5	—	—	e 41·3
Overton		85·9	52	e 12 47	+ 4	—	—	—	—	—
Salt Lake City		86·2	48	e 12 45	+ 1	e 23 5	−14	e 29 12	SS	e 41·7
Pierce Ferry		86·3	53	e 12 42	− 3	—	—	—	—	—
Erevan		86·4	311	e 12 48	+ 3	e 23 24	+ 3	—	—	—
Leninakan		86·6	312	e 12 47	+ 1	e 23 25	+ 2	—	—	—
Tucson		90·2	56	e 13 4	0	e 30 28	SS	e 16 36	PP	e 41·1
Rapid City		90·6	43	e 13 6	+ 1	e 23 32	[− 4]	e 30 6	SS	—
Upsala		90·8	337	—	—	e 23 34	[− 4]	e 23 58?	S	e 43·0
Ksara		95·3	308	e 13 28	+ 1	26 11	PS	17 22	PP	—
Copenhagen		95·7	336	e 17 28	PP	24 37	− 7	e 26 10	PS	47·0
Collmberg		98·7	333	e 17 41	PP	—	—	—	—	e 49·0
Cheb		99·8	332	e 17 55	PP	e 26 55	PS	e 20 21	PPP	e 49·0
Helwan		100·6	307	e 14 25	+34	e 25 22	− 3	17 58	PP	—
Florissant	E.	101·6	42	—	—	e 24 29	[− 6]	—	—	—
St. Louis		101·7	42	e 18 0	PP	e 24 27	[− 8]	—	—	—
Chur		103·5	331	e 18 19	PP	—	—	—	—	—
Rome	Z.	105·6	327	—	—	e 28 32	PPS	—	—	—
Weston		109·5	29	—	—	e 29 10	PPS	—	—	e 50·1
Alicante		114·7	332	19 17	PP	—	—	61 21	Q	e 69·4
Granada		117·1	334	15 3$_a$	P	i 36 15	SS	19 57	PP	69·2
San Juan		130·9	42	e 22 48	PKS	e 33 6	PPS	e 39 30	SS	e 64·3
Bogota		133·7	63	e 19 21	[+ 2]	—	—	e 21 48	PP	—
La Paz		147·1	90	i 19 48$_a$	[+ 5]	23 16	PKS	—	—	73·0

For Notes see next page.

NOTES TO MARCH 15d. 3h. 3m. 2s.

Additional readings :—
Riverview ePSE =17m.7s., iScS?E =19m.18s.
Christchurch eZ =30m.7s.
Shasta Dam iP =12m.6s.
Grand Coulee i =12m.23s.
Berkeley i =19m.54s.
Haiwee eN =12m.48s.
Riverside iZ =12m.50s.
Palomar iZ =12m.53s., iEN =13m.3s.
Boulder City e =12m.43s.
Logan e =13m.26s.
Pierce Ferry e =12m.46s.
Tucson e =17m.36s. and 23m.8s.
Rapid City e =18m.30s., eS =23m.54s.
Copenhagen 27m.49s., iSS =31m.8s.
Colimberg eE =17m.49s., eN =18m.44s.
Cheb e =32m.19s.
Helwan PPP =20m.3s.
Granada SKS =21m.43s., SS =40m.15s., Q =61·0m.
Long waves were also recorded at Huancayo and other American and European stations.

March 15d. 4h. P only recorded at numerous American stations.

Grand Coulee iP? =49m.6s.
Shasta Dam iP =49m.27s., e =49m.58s. and 56m.58s.
Tinemaha iPZ =50m.10s.
Haiwee iPN =50m.14s.
Mount Wilson iPZ =50m.16s.
Pasadena iPZ =50m.16s.
Riverside iPZ =50m.19s.
Boulder City iP =50m.20s.
Overton iP =50m.20s.
Pierce Ferry iP =50m.24s.
Palomar iPNZ =50m.25s.
Tucson iP =50m.54s.
St. Louis iPZ =51m.27s.
Weston e =51m.56s.

March 15d. 7h. 45m. 46s. Epicentre 14°·3S. 167°·3E. (as on 1945, Aug. 29d.).

$A = -\cdot9457$, $B = +\cdot2131$, $C = -\cdot2454$; $\delta = -2$; $h = +6$;
$D = +\cdot220$, $E = +\cdot976$; $G = +\cdot239$, $H = -\cdot054$, $K = -\cdot969$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	18·7	224	i 4 16	− 6	i 7 54	+ 6	i 4 33	PP	—
Auckland	23·5	166	5 8	− 4	9 41	+18	5 59	PP	11·7
Riverview	24·3	215	i 5 23$_s$	+ 3	i 9 40	+ 3	i 5 33	pP	e 11·6
Arapuni	24·8	166	—	—	9 20	−26	—	—	11·4
Wellington	27·7	170	5 58	+ 6	11 4	+31	6 40	PP	15·7
Christchurch	29·5	173	6 11	+ 3	11 2	0	6 22	pP	—
Honolulu	49·2	45	—	—	e 16 11	+13	—	—	e 20·6
Perth	50·0	241	i 14 11	PcS	i 16 12	+ 3	i 18 52	SS	23·9
Tokyo	56·1	333	8 44	−59	—	—	—	—	—
Osaka	57·3	329	9 54	+ 2	—	—	—	—	—
Nagano	57·6	333	9 51	− 3	—	—	—	—	—
Toyama	58·1	332	11 30	PP	18 8	+10	—	—	—
Hukuoka	59·2	325	10 0	− 5	18 3	− 9	—	—	—
Ukiah	83·7	47	—	—	e 23 54	+60	—	—	e 38·2
Berkeley	83·9	49	12 34	+ 1	22 54	− 2	e 24 16	PPS	38·3
Santa Clara	83·9	49	e 12 32	− 1	—	—	—	—	e 38·7
Shasta Dam	84·9	46	i 12 38	0	—	—	—	—	—
Irkutsk	85·6	327	12 37	− 4	i 22 58	[− 7]	—	—	—
Pasadena	85·6	54	i 12 50	+ 9	e 24 24	PS	—	—	e 25·9
Mount Wilson	85·7	54	i 12 42	0	—	—	—	—	—
Sitka	85·7	28	—	—	e 23 20	+ 6	—	—	e 40·4
College	85·9	17	e 13 20	+37	e 23 0	[− 7]	e 27 56	SS	e 35·8
Palomar	86·3	55	i 12 47	+ 2	—	—	—	—	—
Tinemaha	86·5	51	i 12 46	0	—	—	i 30 13	?	—
Victoria	87·4	39	—	—	e 23 38	+ 8	—	—	40·2

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City	88·7	53	e 12 26	−31	—	—	—	—	—
Colombo	89·2	277	e 10 44	?	e 23 48	+ 1	—	—	45·2
Overton	89·2	52	e 13 0	+ 1	—	—	—	—	—
Pierce Ferry	89·4	53	e 12 59	− 1	—	—	—	—	—
Grand Coulee	90·1	40	e 12 59	− 4	—	—	—	—	—
Tucson	90·8	57	i 13 6	0	e 23 36	[− 2]	e 16 35	PP	e 37·3
Kodaikanal	92·3	280	i 12 15	−58	e 23 32	[−14]	—	—	40·5
Salt Lake City	92·4	49	e 25 41	PS	e 31 11	SS	e 34 9	SSS	e 37·8
Logan	92·7	48	e 17 54	PP	e 25 48	PS	—	—	e 42·8
Hyderabad	93·1	287	e 13 28	+11	24 25	+ 3	23 45	SKS	—
Bozeman	94·4	44	—	—	e 23 45	[−13]	e 26 7	PS	e 39·8
Tacubaya	97·9	72	e 17 29	PP	e 26 30	PS	—	—	e 49·6
Bombay	98·7	287	e 13 39	− 3	e 24 17	[− 4]	—	—	—
Rapid City	99·4	47	—	—	e 24 22	[− 2]	e 27 2	PS	e 46·7
Andijan	102·9	309	17 31	PP	—	—	26 34	PS	—
Tchimkent	105·1	311	17 49	PP	—	—	—	—	—
Tashkent	105·3	310	e 14 6	P	e 25 57	− 8	e 18 21	PP	—
Stalinabad	105·4	307	17 48	PP	—	—	i 18 38	PP	—
Florissant	108·4	54	—	—	e 28 17	PS	e 34 39	SS	—
St. Louis	108·4	54	e 18 58	PP	e 25 8	[+ 3]	e 28 18	PS	e 45·0
Chicago	110·6	50	—	—	e 28 40	PS	e 35 3	SS	e 47·7
Sverdlovsk	111·0	326	e 14 29	P	e 18 56	PP	e 34 20	SS	—
Huancayo	112·6	110	e 19 38	PP	e 28 26	PS	e 35 6	SS	e 51·2
Columbia	115·7	58	—	—	e 26 28	{−17}	e 29 28	PS	e 52·4
La Paz	117·3	117	i 20 24	PP	30 6	PS	31 6	PPS	56·2
Ottawa	119·0	45	i 18 51	[0]	e 30 14?	PS	—	—	49·2
Philadelphia	120·1	52	(e 20 28)	PP	(e 27 47)	{+32}	(e 36 26)	SS	(e 50·0)
Seven Falls	121·9	42	—	—	e 28 32	PKKP	e 37 56	SS	59·2
Weston	122·6	48	e 20 24	PP	—	—	e 37 32	SS	e 51·6
Moscow	123·5	329	i 20 35	PP	—	—	—	—	—
Leninakan	124·5	310	19 6	[+ 5]	—	—	—	—	—
San Juan	128·7	77	e 17 6	?	e 31 38	PS	e 21 51	PP	e 58·6
Upsala	129·4	341	e 22 26	PKS	e 28 14?	{− 2}	e 55 14?	Q	e 61·2
Bermuda	129·5	59	e 21 54	PP	e 31 49	PS	e 39 19	SS	e 62·6
Bergen	132·1	348	e 21 10	PP	e 22 42	PKS	e 44 44	SSS	—
Ksara	132·1	302	i 19 15	[− 1]	29 32?	{+59}	i 21 38	PP	—
Copenhagen	134·4	341	e 19 20	[0]	i 22 50	PKS	39 14	SS	62·2
Bucharest	135·4	320	21 14?	PP	33 14?	PPS	—	—	—
Helwan	136·6	298	19 23	[− 1]	22 52	PKS	22 5	PP	—
Cheb	138·9	336	e 22 20	PP	e 31 49	PS	—	—	—
De Bilt	139·7	343	i 19 28	[− 2]	—	—	i 22 24	PP	e 72·2
Uccle	141·1	343	i 19 32	[0]	—	—	e 22 29	PP	—
Strasbourg	141·9	337	e 18 41	[−53]	e 41 0	SS	e 22 35	PP	e 70·2
Chur	142·6	335	e 19 27	[− 8]	—	—	e 22 40	PP	—
Zürich	142·6	336	e 19 32	[− 3]	—	—	—	—	—
Basle	142·8	337	e 19 37	[+ 2]	—	—	—	—	—
Paris	143·4	343	i 19 32	[− 4]	e 23 26	PKS	i 22 40	PP	69·2
Rome	144·9	327	i 19 36	[− 3]	e 23 34	PKS	e 22 52	PP	—
Clermont-Ferrand	145·9	340	i 19 36	[− 5]	—	—	e 22 50	PP	e 74·2
Tortosa	151·2	338	19 51	[+ 2]	29 57	{−28}	23 48	PP	—
Toledo	153·4	345	e 19 52	[0]	35 10	PS	—	—	—
Alicante	153·7	339	e 19 55	[+ 2]	31 25	{+46}	24 19	PP	e 77·2
Lisbon	155·5	353	20 14?	[+19]	26 22	[−38]	24 13?	PP	76·8
Granada	155·8	342	i 20 0k	[+ 4]	27 42	[+41]	i 24 11	PP	83·5

Additional readings :—
Auckland S_eS =16m.21s.
Riverview iPPZ =5m.57s., iPPP?Z =6m.14s., iP_ePEZ =9m.4s., iEZ =9m.43s., isSZ = 9m.55s., iEN =10m.7s., iZ =10m.11s., iN =10m.23s., iSSEZ =10m.36s.
Wellington P_ePZ =8m.31s., P_eS =11m.50s., SS =12m.38s.
Christchurch PP =7m.26s., P_ePE =8m.55s., sS =11m.26s., sSS =11m.44s., P_eS =13m.3s.
Berkeley i =34m.48s.
Shasta Dam e =13m.11s.
Mount Wilson iZ =13m.9s.
Palomar iZ =13m.23s.
Grand Coulee e =13m.10s., i =13m.44s.

Continued on next page.

Tucson e =13m.42s., ePPP =19m.13s., ePS =25m.29s., ePKKP =30m.32s., eSSS = 33m.42s., ePKP,PKP? =38m.40s.
Kodaikanal eE =15m.30s., iSKS?E =22m.42s., eE =28m.2s.
Tacubaya eE =26m.41s.
Rapid City eSS =32m.4s.
Tashkent ePKP =17m.43s., ePPP =20m.44s., SKS =24m.20s.?, ePS =27m.34s., eSS = 32m.44s.
Stalinabad ePPP =20m.54s.
Florissant iPPS?E =28m.48s.
St. Louis iPPS?N =28m.39s., iSS?N =34m.6s., iN =34m.43s., eSSSN =38m.7s.
Huancayo e =29m.42s., eSSS =39m.34s.
Columbia e =31m.38s. and 39m.34s.
Philadelphia readings diminished by 10m.
San Juan i =22m.29s., e =43m.46s.
Bermuda e =22m.42s., ePPS =33m.34s.
Bergen eZ =22m.0s.
Copenhagen 21m.52s. and 34m.44s.
Uccle eN =22m.42s.
Strasbourg e =32m.9s.
Paris e =19m.59s. and 20m.58s., i =23m.1s., e =27m.14s.?, eSSS =47m.34s.?.
Rome eN =21m.13s.
Tortosa PKP_3E =20m.0s., iEN =21m.58s., PPPE =26m.40s., SKSPN =33m.30s.
Toledo SS? =41m.1s.
Alicante PKP_3 =21m.9s., SKP =23m.43s., PKKP =28m.27s., PSKS =34m.29s., Q = 67m.37s.
Lisbon PKP =20m.21s.?, iPKP_3Z =21m.2s.k, QE =69·1m.
Granada pPKP =20m.47s., pPP =25m.10s., sPP =25m.58s., PPP =29m.49s., pPPP = 30m.39s., sSS =45m.25s.
Long waves were also recorded at Harvard, Vera Cruz, Prague, Aberdeen, Collmberg, and Tananarive.

March 15d. 13h. 21m. 0s. Epicentre 35°·7N. 118°·0W.

(Foreshock of Walker Pass Earthquake at 13h. 49m.).

$A = -·3821$, $B = -·7187$, $C = +·5810$; $\delta = +9$; $h = 0$;
$D = -·883$, $E = +·469$; $G = -·273$, $H = -·513$, $K = -·814$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		0·4	4	i 0 9k	− 4	—	—	—	—	—
Tinemaha		1·4	352	i 0 26k	− 1	—	—	—	—	—
Mount Wilson	z.	1·5	182	i 0 28k	0	—	—	—	—	—
Pasadena		1·6	185	i 0 30k	0	i 0 50	− 1	—	—	—
Riverside		1·8	163	i 0 33.	+ 1	i 0 54	− 2	—	—	—
Palomar		2·5	158	i 0 43k	0	—	—	—	—	—
Boulder City		2·6	84	i 0 43	− 1	—	—	—	—	—
La Jolla		2·9	168	i 0 48	0	—	—	—	—	—
Overton		3·0	74	i 0 50	0	—	—	—	—	—
Pierce Ferry		3·3	83	i 0 52	− 1	—	—	—	—	—
Santa Clara		3·6	298	e 0 58	0	i 1 44	+ 2	—	—	—
Ukiah		5·4	311	e 1 20	− 4	e 2 26	− 2	i 1 44	P_g	i 3·1
Shasta Dam		6·1	326	i 1 32	− 2	i 2 48	+ 3	i 2 9	P_g	—
Tucson		6·9	118	i 1 42	− 3	i 2 57	− 8	i 2 24	P_g	i 3·1
Salt Lake City		7·0	42	e 1 51	+ 5	i 3 13	+ 5	i 2 19	P_g	i 3·6
Logan		7·7	36	i 2 0	P*	i 3 50	S*	—	—	i 4·1
Butte		11·1	20	e 2 43	0	i 5 9	+20	—	—	i 5·8
Bozeman		11·3	26	e 2 49	+ 3	e 5 21	+27	—	—	i 5·9
Grand Coulee		12·2	357	i 3 0	+ 2	—	—	—	—	—
Seattle		12·4	346	e 5 11	S	(e 5 11)	−10	—	—	e 7·6
Victoria		13·4	344	3 18	+ 4	6 12	+27	—	—	7·0
Rapid City		14·1	49	i 3 24	+ 1	i 6 12	+10	i 3 46	PP	i 7·0
Lincoln		17·5	67	i 4 12	+ 5	i 7 46	+25	—	—	i 9·1
Saskatoon		18·3	23	4 22	+ 5	7 54	+15	—	—	9·0
Florissant	E.	22·2	74	e 4 59	− 1	e 9 18	+18	—	—	—
St. Louis	E.	22·3	74	e 5 0	− 1	e 9 19	+17	—	—	e 11·7
Cape Giraudeau	E.	23·0	78	e 5 5	− 2	e 9 19	+ 5	—	—	e 12·0
Tacubaya		23·2	130	e 5 16	+ 7	e 9 20	+ 2	i 5 40	PP	e 11·4
Chicago		24·4	66	e 5 23	+ 2	e 9 51	+12	e 5 51	PP	e 12·2
Sitka		24·7	338	e 5 16	− 8	e 10 4	+20	—	—	e 12·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz	N.	25·3	125	e 6 4	+34	e 10 40	+46	—	—	e 13·1
Columbia		30·3	82	—	—	—	—	e 13 42	SSS	e 15·5
Ottawa		33·2	60	e 9 22	?	—	—	—	—	e 16·0
Philadelphia		33·8	71	i 6 51	+ 5	e 12 17	+ 7	e 14 20	SS	e 16·0
Fordham		34·7	69	e 6 53	− 1	—	—	—	—	18·2
Shawinigan Falls		35·3	58	e 7 7	+ 8	—	—	—	—	18·0
Harvard		36·3	65	i 7 8	+ 1	—	—	i 8 32	PP	e 19·0
Weston		36·5	65	e 7 8	− 1	e 12 50	− 1	—	—	—
Seven Falls		36·7	57	e 7 6	− 4	—	—	—	—	18·0
Aberdeen		72·9	32	—	—	e 21 13	+14	—	—	—
Collmberg	Z.	83·3	30	i 12 30	0	—	—	—	—	—
Cheb		84·0	30	e 9 0?	?	—	—	—	—	e 39·0
Zürich		84·5	34	e 12 40	+ 4	—	—	—	—	—
Alicante		86·4	45	—	—	e 18 38	PPP	—	—	e 39·8
Moscow		86·6	14	i 12 47	+ 1	e 23 26	+ 3	—	—	—
Sverdlovsk		87·8	1	i 12 52	0	e 23 35	+ 1	—	—	—
Ksara		106·7	23	e 18 48	PP	—	—	—	—	—

Additional readings :—
Boulder City i = 0m.47s.
Ukiah i = 2m.20s. and 2m.38s.
Shasta Dam i = 1m.45s., 1m.48s., 1m.52s., and 2m.38s.
Tucson e = 2m.3s.
Logan i = 2m.3s., 2m.34s., and 2m.58s.
Butte e = 3m.14s.
Bozeman e = 3m.47s.
Grand Coulee i = 3m.14s. and 3m.41s.
Seattle eS = 6m.35s.
St. Louis ePPE = 6m.53s., eE = 11m.27s.
Tacubaya ePN = 5m.20s., iPPPN = 5m.58s., eSZ = 9m.23s., iSSN = 10m.13s.
Fordham iP = 6m.58s.
Weston i = 7m.13s.
Collmberg eZ = 12m.36s.
Long waves were also recorded at College, Honolulu, New Kensington, Guadalajara, Bermuda, San Juan, Ivigtut, and other European stations.

March 15d. 13h. 38m. 38s. Epicentre 9°·5S. 70°·0W. Depth of focus 0·080.
(as on 1945, Aug. 1d.).

A = +·3374, B = −·9270, C = −·1640 ; δ = +6 ; h = +7 ;
D = −·940, E = −·342 ; G = −·056, H = +·154, K = −·986.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		5·8	243	i 1 36	− 1	i 2 34	−20	—	—	i 3·6
La Paz	Z.	7·2	165	i 1 50	0	i 3 12	− 6	—	—	3·5
Bogota		14·6	344	i 3 17	+12	e 5 18	−17	—	—	—
Cape Girardeau	N.	50·0	340	e 8 7	+ 1	e 14 36	− 1	—	—	—
St. Louis	E.	51·5	340	e 8 17	0	e 14 47	−10	—	—	—
Weston		51·6	359	i 8 22k	+ 4	—	—	—	—	—
Florissant		51·7	340	e 8 20	+ 1	e 14 48	−12	—	—	—
Harvard		51·8	359	i 8 24	+ 4	—	—	e 10 16	pP	—
Tucson		56·9	319	i 8 54	− 1	—	—	i 10 50	pP	—
Rapid City		61·2	334	e 9 26	+ 2	—	—	—	—	—
Pierce Ferry		61·4	321	i 9 25	0	—	—	—	—	—
Palomar		61·7	317	i 9 26k	− 1	—	—	—	—	—
Boulder City		61·9	320	i 9 28	− 1	—	—	—	—	—
Overton		62·0	321	i 9 27	− 2	—	—	—	—	—
Riverside	Z.	62·4	317	i 9 30k	− 2	—	—	—	—	—
Mount Wilson	Z.	63·0	317	i 9 34	− 2	—	—	—	—	—
Pasadena	Z.	63·0	317	i 9 34	− 2	—	—	—	—	—
Tinemaha		64·7	319	e 9 48	+ 2	—	—	—	—	—
Shasta Dam		69·4	320	i 10 12	− 3	—	—	—	—	—
Toledo		78·2	47	i 13 17	?	—	—	—	—	—

Additional readings :
Huancayo i = 2m.46s.
Bogota e = 3m.45s. and 9m.25s.
St. Louis eE = 14m.54s.

Continued on next page.

Florissant iE =14m.58s.
Tucson ipP? =9m.41s.
Palomar iNZ =10m.0s.
Riverside iZ =10m.3s.
Mount Wilson iZ =10m.5s.
Pasadena iZ =10m.6s.

March. 15d. 13h. 49m. 35s. Epicentre 35°·7N. 118°·0W. (as at 13h. 21m.).

Intensity VIII at Onyx; VII at Weldon; VI at Bakersfield, Mojake, San Bernardino, and Visalia. At San Canyon much damage was caused by landslide. Macroseismic area 65,000 sq. m.

A. A. Bodle and L. M. Murphy.
United States Earthquakes of 1946, Serial No. 714, Washington, 1948, pp. 9-12, map of epicentral region p. 10.
Epicentre 35°44′N. 118°3′W.

S. K. Chakrabarty and C. F. Richter.
"The Walker Pass Earthquakes and the Structure of Southern Sierra Nevada." Bull. Seismo. Soc. Amer., Vol. 39, No. 2, April, 1949, pp. 93-107. Tables and figure, p. 94.

A = −·3821, B = −·7187, C = +·5810; δ = +9; h = 0;
D = −·883, E = +·469; G = −·273, H = −·513, K = −·814.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee	N.	0·4	4	i 0 10	− 3	—	—	—	—	—
Tinemaha		1·4	352	i 0 27	0	—	—	—	—	—
Mount Wilson	Z.	1·5	182	i 0 28	0	—	—	—	—	—
Pasadena		1·6	185	i 0 29k	− 1	i 0 55	+ 4	—	—	—
Riverside		1·8	163	i 0 32	0	i 0 59	+ 3	—	—	—
Palomar		2·5	158	i 0 43	0	—	—	—	—	—
Boulder City		2·6	84	i 0 43	− 1	—	—	—	—	—
La Jolla		2·9	168	e 0 48	0	—	—	—	—	—
Overton		3·0	74	i 0 47	− 3	—	—	—	—	—
Pierce Ferry		3·3	83	i 0 53	0	—	—	—	—	—
Santa Clara		3·6	298	e 0 58	0	i 1 44	+ 2	—	—	—
Ukiah		5·4	311	e 1 29	+ 5	—	—	—	—	i 2·6
Shasta Dam		6·1	326	i 1 34	0	i 2 45	0	i 1 46	P*	—
Tucson		6·9	118	i 1 42	− 3	i 2 57	− 8	i 2 12	P_g	i 3·5
Salt Lake City		7·0	42	e 1 48	+ 2	—	—	i 2 20	P_g	i 3·3
Logan		7·7	36	i 2 0	+ 4	—	—	i 2 25	P_g	i 4·0
Butte		11·1	20	e 2 46	+ 3	e 4 49	0	—	—	i 5·8
Bozeman		11·3	26	e 2 46	0	e 5 0	+ 6	—	—	i 5·8
Grand Coulee		12·2	357	i 3 1	+ 3	—	—	—	—	e 5·7
Seattle		12·4	346	e 5 0	S	(e 5 0)	−21	—	—	e 6·9
Victoria		13·4	344	3 26	+12	6 5	SS	6 43	SSS	7·4
Rapid City		14·1	49	i 3 24	+ 1	i 5 51	−11	i 3 32	PP	i 6·6
Lincoln		17·5	67	—	—	i 7 43	+22	—	—	i 9·4
Saskatoon		18·3	23	4 22	+ 5	7 51	+12	—	—	9·4
Florissant	E.	22·2	74	e 5 3	+ 3	i 9 16	+16	—	—	e 11·7
St. Louis	E.	22·3	74	e 5 1	0	e 9 17	+15	—	—	e 11·7
Cape Girardeau		23·0	78	e 5 7	0	e 9 24	+10	—	—	e 11·9
Tacubaya		23·2	130	i 5 16	+ 7	e 9 20	+ 2	e 5 51	PPP	i 11·6
Chicago		24·4	66	i 5 22	+ 1	i 9 52	+13	e 5 38	PP	e 12·2
Sitka		24·7	338	—	—	e 9 33	−11	—	—	e 11·1
Vera Cruz		25·3	125	e 6 5	PP	e 10 54	SS	—	—	e 12·0
Ottawa		33·2	60	e 6 39	− 1	—	—	—	—	17·4
Philadelphia		33·8	71	e 6 51	+ 5	e 12 17	+ 7	—	—	i 17·9
Fordham		34·7	69	i 6 59	+ 5	—	—	—	—	i 18·2
Shawinigan Falls		35·3	58	e 7 6	+ 7	—	—	—	—	17·4
Harvard		36·3	65	i 7 8	+ 1	—	—	—	—	e 19·0
Weston		36·5	65	e 7 9	0	—	—	—	—	—
Seven Falls		36·7	57	e 7 9	− 1	—	—	—	—	18·4
Bermuda		43·9	79	—	—	e 14 50	+ 8	—	—	e 18·1
San Juan		48·7	97	—	—	e 15 45	− 5	—	—	e 19·8

Continued on next page.

		Δ	Az.	P.	P−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		50·9	117	e 9 8	+ 3	—	—	—	—	—
Huancayo		62·3	132	—	—	e 18 57	+ 5	e 23 29	SS	e 26·4
La Paz		70·2	129	11 9	− 8	—	—	—	—	35·4
Aberdeen		72·9	32	i 10 36	−57	—	—	i 25 58	SS	34·9
Bergen	N.	73·6	26	—	—	e 19 45	?	—	—	34·4
Durham	N.	74·7	34	e 14 13	PP	—	—	—	—	—
Upsala		78·0	22	—	—	e 21 25?	−30	e 26 25?	SS	e 36·4
Copenhagen		79·6	27	i 12 11	+ 1	i 22 20	+ 8	14 37	PP	36·4
Uccle		80·1	34	e 12 17	+ 4	e 13 25?	PP	e 33 25?	Q	e 41·4
Paris		80·6	36	e 12 26	+10	e 23 58	PPS	e 37 25?	Q	e 39·4
Lisbon		81·0	49	15 31	PP	—	—	—	—	39·5
Clermont-Ferrand		83·1	38	e 12 31	+ 2	—	—	e 18 25?	PPP	e 39·2
Strasbourg		83·2	33	e 12 32	+ 3	e 23 15	PS	e 15 30	PP	e 41·4
Collmberg		83·3	30	i 12 30	0	—	—	—	—	e 40·4
Toledo	Z.	83·3	46	i 12 31	+ 1	—	—	15 13	PP	—
Cheb		84·0	30	e 22 59	S	(e 22 59)	+ 2	e 32 25?	SSS	e 39·4
Zürich		84·5	34	e 12 41	+ 5	—	—	—	—	—
Prague		84·8	29	e 17 25?	PPP	e 23 13	+ 8	—	—	e 38·4
Irkutsk		84·9	336	e 12 43	+ 5	23 7	+ 1	—	—	—
Moscow		86·6	14	e 12 33	−13	e 23 12	[+ 1]	—	—	—
Sverdlovsk		87·8	1	i 12 50	− 2	—	—	—	—	—
Rome	Z.	90·5	35	e 22 16?	PKS?	—	—	—	—	—
Christchurch		101·0	224	18 10	PP	28 11	PPS	36 29	SSS	44·4
Ksara		106·7	23	e 18 53	PP	e 29 3	PPS	—	—	—
Riverview		109·4	242	—	—	e 25 31	[+21]	e 34 49	SS	e 52·6
New Delhi	N.	114·5	345	—	—	e 33 49	?	—	—	e 65·7
Calcutta	N.	116·9	332	—	—	e 31 38	PPS	—	—	—

Additional readings :—
Boulder City i = 47s. and 52s.
Ukiah i = 2m.3s.
Shasta Dam i = 1m.51s., 2m.30s., and 3m.5s.
Tucson i = 1m.52s., 3m.8s., and 3m.15s.
Salt Lake City i = 2m.16s.
Butte i = 3m.16s., 3m.36s., and 5m.9s.
Bozeman i = 3m.54s.
Seattle eS? = 6m.43s.
St. Louis iPE = 5m.5s.
Tacubaya eSN = 9m.25s., iN = 9m.40s. and 9m.51s., eE = 9m.54s.
Chicago i = 5m.56s. and 11m.29s.
Vera Cruz iPPPE = 8m.21s., iN = 10m.29s.
Seven Falls e = 10m.1s.
Huancayo e = 19m.36s.
Aberdeen iEN = 30m.47s.
Upsala eE = 23m.25s.?
Paris e = 13m.25s.? and 18m.25s.?
Lisbon E = 20m.13s.
Strasbourg e = 13m.2s. and 14m.3s.
Collmberg eZ = 12m.40s.
Prague eE = 20m.55s.
Christchurch eEN = 24m.29s., EN = 30m.25s., QEN = 39m.27s.
Riverview eE = 32m.55s.
Long waves were also recorded at College, Columbia, Pennsylvania, Guadalajara, Manzanillo, Honolulu, Ivigtut, Arapuni, Wellington, Santa Lucia, and other European stations.

March 15d. 14h. 0m. 35s. Epicentre 35°·7N. 118°·0W. (as at 13h.).

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Boulder City	2·6	84	i 0 43	− 1	—	—
Overton	3·0	74	i 0 37	−13	—	—
Pierce Ferry	3·3	83	i 0 53	0	—	—
Berkeley	4·1	303	1 5	0	1 55	0
Shasta Dam	6·1	326	e 1 35	+ 1	e 2 45	0
Salt Lake City	7·0	42	e 2 30	P_g	—	—

Additional readings :—
Berkeley i = 1m.52s. and 2m.6s.
Shasta Dam iP = 1m.39s., e = 2m.33s. and 3m.1s., i = 3m.7s.

March 15d. 19h. 18m. 52s. Epicentre 35°·7N. 118°·0W. (as at 14h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee	z.	0·4	4	i 0 11	− 2	—	—	—	—	—
Tinemaha		1·4	352	i 0 28	+ 1	—	—	—	—	—
Mount Wilson		1·5	182	i 0 29k	+ 1	—	—	—	—	—
Pasadena		1·6	185	i 0 30k	0	i 0 50	− 1	—	—	—
Riverside		1·8	163	i 0 33	+ 1	—	—	—	—	—
Santa Barbara		1·9	228	i 0 34	0	—	—	—	—	—
Palomar	z.	2·5	158	i 0 41	− 2	—	—	—	—	—
Boulder City		2·6	84	i 0 44	0	i 1 18	+ 1	—	—	i 1·4
La Jolla		2·9	168	e 0 48	0	—	—	—	—	—
Pierce Ferry		3·3	83	i 0 53	0	—	—	—	—	—
Santa Clara		3·6	298	i 0 58	0	i 1 42	0	—	—	—
Ukiah		5·4	311	e 1 56	P_g	e 2 48	S*	—	—	e 3·4
Shasta Dam		6·1	326	i 1 38	+ 4	i 2 41	− 4	—	—	—
Tucson		6·9	118	i 1 43	− 2	i 2 47	−18	i 2 13	P_g	i 3·2
Salt Lake City		7·0	42	e 2 10	P*	e 3 38	S*	—	—	i 3·8
Logan		7·7	36	e 2 5	P*	e 3 55	S*	e 2 24	P_g	i 4·3
Grand Coulee		12·2	357	e 3 1	+ 3	—	—	e 5 54	?	e 6·7
Rapid City		14·1	49	1 3 30	+ 7	e 6 38	+36	—	—	e 7·4
Florissant		22·2	74	e 5 3	+ 3	e 10 18	?	—	—	e 11·7
St. Louis		22·3	74	e 5 1	0	e 9 15	+13	—	—	i 11·8

Additional readings :—
Boulder City i = 50s.
Shasta Dam i = 1m.53s. and 3m.4s.
Tucson i = 2m.5s.
Logan i = 4m.8s.
Long waves were also recorded at Seattle, Bozeman, Butte, Tacubaya, Vera Cruz, Chicago, Weston, and Philadelphia.

March 15d. 21h. 54m. 32s. Epicentre 35°·7N. 118°·0W. (as at 19h.).

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City	2·6	84	i 0 44	0	—	—	—	—	—
Pierce Ferry	3·3	83	i 0 53	0	—	—	—	—	—
Santa Clara	3·6	298	e 1 0	+ 2	e 1 45	+ 3	—	—	—
Ukiah	5·4	311	—	—	e 2 46	S*	—	—	e 3·3
Shasta Dam	6·1	326	e 1 34	0	e 2 42	− 3	i 1 52	P*	—
Tucson	6·9	118	i 1 43	− 2	i 2 7	P*	—	—	i 2·6
Salt Lake City	7·0	42	e 2 22	P_g	e 3 42	S*	—	—	i 4·1
Logan	7·7	36	e 2 7	P*	e 3 58	S_g	—	—	i 4·2
Grand Coulee	12·2	357	e 2 51	− 7	e 5 50	+34	—	—	—
Rapid City	14·1	49	e 3 28	+ 5	e 6 8	+ 6	—	—	e 7·4
St. Louis	22·3	74	—	—	e 9 16	+14	—	—	e 11·8

Additional readings :—
Boulder City i = 49s. and 1m.20s.
Shasta Dam i = 3m.1s.
Tucson i = 2m.2s. and 2m.18s.
Logan e = 2m.30s.
Long waves were also recorded at Bozeman, Columbia, Tacubaya, and San Juan.

March 15d. Readings also at 2h. (Besançon, Strasbourg, and Collmberg), 5h. (near Overton and Pierce Ferry), 7h. (near Rome), 8h. (near Balboa Heights), 10h. (Weston, Tucson, near Tacubaya, and near Alicante (2)), 13h. (Boulder City (3), Overton (2), Pierce Ferry (3), Shasta Dam (3), Tucson, and near Alicante), 14h. (Tucson (2), near Boulder City and Pierce Ferry (2)), 15h. (Boulder City, Overton, Pierce Ferry, Salt Lake City, and near Besançon), 18h. (near Mizusawa), 19h. (near Boulder City (2), and Pierce Ferry (2)), 21h. (near Granada), 22h. (near Boulder City and Pierce Ferry), 23h. (near Boulder City and Pierce Ferry).

March 16d. 9h. 46m. 17s. Epicentre 35°·7N. 118°·0W. (as at 15d.).

A = −·3821, B = −·7187, C = +·5810; δ = +9; h = 0.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		1·4	352	i 0 27	0	—	—	—	—	—
Mount Wilson		1·5	182	i 0 29k	+ 1	—	—	—	—	—
Pasadena		1·6	185	i 0 30	0	i 0 53	+ 2	—	—	—
Riverside		1·8	163	i 0 32	0	—	—	—	—	—
Santa Barbara	z.	1·9	228	i 0 33	− 1	—	—	—	—	—
Palomar	z.	2·5	158	i 0 43	0	—	—	—	—	—
Boulder City		2·6	84	i 0 44	0	i 1 19	+ 2	i 0 49	P*	—
Pierce Ferry		3·3	83	i 0 53	0	i 1 36	+ 1	—	—	—
Santa Clara		3·6	298	e 1 6	P*	i 1 58	S*	—	—	—
Shasta Dam		6·1	326	e 1 33	− 1	—	—	i 2 4	P_g	—
Tucson		6·9	118	i 1 42	− 3	i 3 0	− 5	i 2 11	P_g	i 3·3
Logan		7·7	36	—	—	e 4 3	S*	—	—	e 4·7
Rapid City		14·1	49	e 3 25	+ 2	—	—	—	—	e 7·9

Additional readings :—
Boulder City iS = 1m.25s.
Shasta Dam e = 1m.37s., i = 1m.56s.
Long waves were also recorded at Salt Lake City.

March 16d. 11h. 31m. 25s. Epicentre 24°·6N. 121°·1E. (as on 1943, November 23d.).

A = −·4702, B = +·7794, C = +·4140; δ = −5; h = +3;
D = +·856, E = +·517; G = −·214, H = +·354, K = −·910.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pehpei		14·1	295	e 3 23	0	—	—	e 3 29	PP	e 7·4
Calcutta	N.	30·1	273	e 9 22	P_cP	—	—	—	—	—
Irkutsk		30·4	339	e 6 17	+ 1	e 11 32	+16	—	—	—
New Delhi	N.	39·3	287	—	—	i 13 40	+ 6	—	—	—
Andijan		43·5	304	e 8 17	+10	e 14 52	+16	—	—	—
Kodaikanal	E.	43·8	260	—	—	e 18 33	SSS	—	—	—
Tchimkent		45·7	306	e 8 32	+ 8	—	—	—	—	—
Tashkent		45·9	305	e 8 26	0	e 15 16	+ 5	—	—	—
Grozny		63·2	308	e 10 45	+13	—	—	—	—	—
Leninakan		65·1	306	e 10 57	+12	—	—	11 18	P_cP	—
Moscow		66·4	323	e 10 51	− 2	—	—	—	—	—
Ksara		73·0	299	e 11 35	+ 2	—	—	—	—	—
Christchurch		82·7	145	e 13 1	+34	e 22 35	− 9	28 6	SS	—
Aberdeen	E.	85·7	333	—	—	e 24 57	PPS	—	—	—
Grand Coulee		89·9	36	e 12 59	− 3	—	—	i 13 8	P_cP	—
Shasta Dam		92·3	43	i 13 10	− 3	—	—	i 13 17	P_cP	—
Tinemaha	z.	97·0	44	e 13 34	− 1	—	—	—	—	—
Mount Wilson	z.	98·9	46	e 13 42	− 1	—	—	—	—	—
Pasadena	z.	98·9	46	e 13 34	− 9	—	—	—	—	—
Tucson		104·8	44	e 14 17	+ 7	—	—	—	—	—
Bogota		147·4	29	e 19 42	[− 1]	—	—	e 19 58	PKP_2	—

Additional readings :—
Christchurch PEZ = 13m.59s., eEN = 15m.15s., SEZ = 23m.18s., SSSE = 31m.36s.
Shasta Dam e = 18m.19s.
Long waves were also recorded at Riverview and at other European stations.

March 16d. 14h. 15m. 8s. Epicentre 26°·4N. 92°·6E.

A = −·0407, B = +·8960, C = +·4422; δ = +1; h = +3;
D = +·999, E = +·045; G = −·020, H = +·442, K = −·897.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	5·5	226	e 0 42	−43	i 2 7	−23	—	—	—
New Delhi	N.	13·8	282	e 3 23	+ 4	i 6 15	+21	—	—	—
Bombay		19·7	251	—	—	e 7 25	−45	e 9 7	PcP	—
Kodaikanal		21·5	225	e 4 51	− 1	i 8 36	−11	5 11	PP	10·6
Andijan		22·0	316	4 52?	− 6	8 45?	−11	—	—	—
Frunse		22·1	324	e 5 7	+ 8	—	—	—	—	—
Colombo	E.	22·9	214	5 6	0	9 11	− 2	—	—	—
Stalinabad		23·4	309	i 5 12	+ 1	—	—	—	—	—
Tashkent		24·3	314	e 5 10	−10	e 9 16	−21	—	—	—
Irkutsk		27·3	16	e 5 53	+ 5	e 10 35	+ 8	—	—	—
Erevan		42·0	302	7 56	+ 2	—	—	—	—	—
Leninakan		42·6	303	8 6	+ 7	—	—	—	—	—
Ksara		49·1	293	e 8 40	−11	—	—	—	—	—
Toledo		78·3	308	i 11 57	− 6	—	—	i 14 6	?	—
Tucson		117·6	22	e 20 17	PP	—	—	—	—	—

Kodaikanal gives also SSE = 9m.3s.
Long waves were also recorded at Copenhagen.

March 16d. Readings also at 0h. (Tacubaya), 1h. (La Paz and near Tananarive), 4h. (Fort de France), 7h. (near Andijan and near Balboa Heights), 10h. (Bergen, Bucharest, and near Pierce Ferry), 11h. (Weston, Tucson, Palomar, Mount Wilson, and Tinemaha), 13h. (near Pierce Ferry and near Boulder City), 17h. (near Pierce Ferry and Boulder City), 18h. (Tucson), 19h. (near Pierce Ferry and Boulder City), 20h. (La Paz, Ksara, Almata, Frunse, Tchimkent, near Tashkent, Andijan, and Stalinabad), 21h. (Zürich, Basle, La Plata, near Pierce Ferry, and Boulder City), 23h. (Weston, Tinemaha, Pasadena, Mount Wilson, Tucson, near Pierce Ferry, Boulder City, and near La Paz).

March 17d. 14h. 45m. 55s. Epicentre 38°·2N. 118°·2W. (as on 1946, Jan. 13d.).

Intensity V at Luning, less strong at Bridgeport and National Park.
Epicentre 38°·3N. 118°·2W. Macroseismic area 12,000 sq. m.

R. R. Bodle and L. M. Murphy.
United States Earthquakes, 1946, Serial No. 714, Washington, 1948, p. 12.

A = −·3723, B = −·6943, C = +·6159; δ = −1; h = −1;
D = −·881, E = +·473; G = −·291, H = −·543, K = −·788.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		1·1	182	i 0 22	0	—	—	—	—	—
Santa Clara		3·1	254	e 0 57	P*	i 1 39	S*	—	—	—
Boulder City		3·5	128	i 0 57	0	e 1 33	− 7	e 1 5	P*	—
Mount Wilson	z.	4·0	178	1 5	+ 1	—	—	—	—	—
Pierce Ferry		4·0	120	i 1 3	− 1	—	—	e 1 10	P*	i 2·5
Pasadena		4·1	180	e 1 5	0	i 2 14	S_g	i 1 17	P*	—
Shasta Dam		4·1	309	i 0 59	− 6	e 2 15	S_g	i 1 8	P	e 2·6
Riverside	z.	4·3	170	i 1 8	0	—	—	—	—	—
Palomar	z.	5·0	167	e 1 18	0	—	—	—	—	—
Salt Lake City		5·5	60	e 1 55	P_g	i 2 49	S*	—	—	i 3·1
Logan		6·0	52	e 1 50	P*	e 2 54	S*	—	—	e 3·1
Tucson		8·5	132	e 2 7	0	i 3 19	−26	i 4 11	S*	i 4·6
Butte		8·9	27	—	—	e 4 50	S_g	—	—	e 5·5
Grand Coulee		9·7	357	e 2 46	PPP	e 4 56	S*	e 5 8	S_g	—
Rapid City		12·7	58	e 3 27	PPP	—	—	—	—	e 7·1

Additional readings:—
Boulder City i = 1m.9s.
Shasta Dam i = 1m.31s.
Tucson i = 2m.47s.
Grand Coulee i = 3m.12s.
Long waves were also recorded at Chicago and College.

March 17d. 20h. 48m. 30s. Epicentre 0°·0 128°·5E. (as on 1940, May 1d.).

Rough.

A = −·6225, B = +·7826, C = ·0000; δ = −3; h = +7;
D = +·783, E = +·623; G = ·000, H = ·000, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		39·8	150	e 10 42	?	e 13 0	−42	—	—	e 15·9
Calcutta	N.	45·0	303	—	—	e 14 2	−56	—	—	—
Colombo	E.	49·0	279	8 49	− 1	16 8	+13	—	—	—
Hyderabad	N.	52·2	293	—	—	e 16 43	+ 4	17 27	PPS	—
Irkutsk		55·9	343	e 9 36	− 6	17 24	− 5	—	—	—
New Delhi	N.	56·6	306	—	—	i 17 37	− 1	—	—	—
Christchurch		58·5	144	8 9	?	e 18 2	− 1	23 47	Q	28·3
Andijan		65·0	316	e 10 49	+ 5	—	—	—	—	—
Stalinabad		66·7	313	i 10 53	− 2	—	—	—	—	—
Tashkent		67·3	316	e 10 52	− 7	e 19 46	− 8	—	—	—
Tchimkent		67·5	317	i 11 20	+20	—	—	—	—	—
Sverdlovsk		78·0	329	e 11 53	− 9	21 45	−10	—	—	—
Baku		81·3	311	—	—	22 2?	−28	—	—	—
Grozny		84·7	314	e 12 37	0	—	—	—	—	—
Erevan		85·4	310	12 53	+13	—	—	—	—	—
Leninakan		86·0	311	12 32	−11	—	—	—	—	—
Pierce Ferry		112·0	52	e 21 10	PPP	—	—	—	—	—

Christchurch gives also SE = 16m.40s.
Long waves were also recorded at Brisbane, Arapuni, Wellington, and Auckland.

March 17d. 21h. 5m. 56s. Epicentre 25°·0N. 63°·5E.

Not approximate.

Felt at Pasni, coast of Mekran according to Bombay.
Epicentre 25°N. 63°E. (Bombay); 25°N. 63°·5E. (Strasbourg).
Annales de l'Institut de Physique du Globe de Strasbourg, pour l'année 1946, 2ème partie, Séismologie, Nouvelle Série, Tome XI, p. 48.

A = +·4049, B = +·8121, C = +·4203; δ = +10; h = +3;
D = +·895, E = −·446; G = +·188, H = +·376, K = −·907.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		10·6	123	e 2 32	− 4	e 4 36	− 1	—	—	6·2
New Delhi	N.	12·7	71	e 3 6	+ 1	i 5 26	− 2	—	—	6·9
Stalinabad		14·2	17	i 3 24	0	e 6 26?	SS	—	—	—
Samarkand		14·9	11	—	—	6 41	SS	—	—	—
Hyderabad	N.	15·8	116	—	—	6 57	SS	—	—	9·7
Andijan		17·4	23	e 4 7	+ 1	—	—	—	—	—
Kodaikanal	E.	19·8	136	i 4 34	− 1	i 8 15	+ 2	4 49	PP	12·1
Frunse		20·0	24	4 37	0	—	—	—	—	—
Almata		21·3	28	4 50	0	8 49	+ 6	—	—	—
Erevan		22·0	319	e 4 58	0	—	—	—	—	—
Leninakan		22·7	320	e 5 7	+ 3	—	—	—	—	—
Calcutta		22·8	91	—	—	i 8 26	−45	—	—	—
Colombo	E.	23·9	138	5 18	+ 2	9 42	+12	—	—	13·1
Ksara		25·5	297	i 5 34	+ 2	i 10 16	+19	—	—	—
Helwan		28·9	287	e 5 10	−53	11 16	+23	7 7	PPP	—
Sverdlovsk		31·9	358	i 6 25	− 4	i 11 46	+ 6	—	—	—
Triest	E.	44·7	312	—	—	e 14 52	− 2	—	—	—
Prague		45·2	318	—	—	e 18 34	S_eS	—	—	e 29·6
Collmberg	Z.	46·4	318	e 8 29	− 1	—	—	—	—	e 30·1
Cheb		46·5	317	e 8 4?	−27	e 15 37	+18	e 11 4?	PPP	e 31·1
Chur		47·8	312	e 8 38k	− 3	—	—	—	—	—
Copenhagen		48·0	324	—	—	i 15 59	+18	—	—	26·1
Zürich		48·5	313	e 7 40	−66	e 9 2	?	—	—	—
Strasbourg		49·2	314	—	—	e 16 7	+ 9	—	—	e 29·1

For Notes see next page.

NOTES TO MARCH 17d. 21h. 5m. 56s.

Additional readings :—
Kodaikanal SSE = 10m.39s.
Helwan P_cP = 7m.16s.
Collmberg eZ = 8m.36s., 8m.46s., 8m.53s., and 9m.14s.
Cheb e = 19m.7s.
Chur e = 8m.46s.
Zürich e = 7m.59s.
Long waves were also recorded at Tananarive, Huancayo, Weston, Philadelphia, and at other European stations.

March 17d. Readings also at 1h. (near Andijan and near Bogota), 2h. (Colombo, and near Leninakan), 4h. (Malaga), 5h. (Ksara), 6h. (Granada, Tucson, Shasta Dam, near Pierce Ferry, and Boulder City), 8h. (Tucson, Shasta Dam, near Pierce Ferry, and Boulder City), 9h. (Shasta Dam, near Pierce Ferry (2), and Boulder City (2), and near Algiers), 10h. (near Basle and Zürich), 11h. (near Bogota), 12h. (Tucson, Ksara, and Helwan), 13h. (Auckland, Arapuni, Wellington, and Christchurch), 17h. (Weston), 18h. (Collmberg and Jena), 20h. (near Pierce Ferry, and near Boulder City), 23h. (Harvard, Tucson, near Almata, and near Algiers).

March 18d. 10h. 5m. 54s. Epicentre 35°·7N. 118°·0W. (as on 16d.).

A = −·3821, B = −·7187, C = +·5810 ; δ = +9 ; h = 0 ;

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City	2·6	84	i 0 44	0	e 1 25	S_g	i 0 48	P*	—
Pierce Ferry	3·3	83	i 0 53	0	i 1 39	+ 4	i 1 2	P*	—
Santa Clara	3·6	298	e 1 5	P*	e 2 1	S_g	—	—	—
Shasta Dam	6·1	326	e 1 35	+ 1	e 2 43	− 2	—	—	—
Tucson	6·9	118	i 1 43	− 2	i 2 52	−13	i 2 16	P_g	i 3·2

Long waves were also recorded at Salt Lake City.

March 18d. I 15h. 49m. 25s. } Epicentre 35°·7N. 118°·0W. (as at 10h.).
II 15h. 50m. 40s. }

Intensity VI at Brown, Los Angeles, Trona, and Weldon.

R. R. Bodle and L. M. Murphy
United States Earthquakes, 1946, Serial No. 714, Washington, 1948, p. 12.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Haiwee	z.	0·4	4	i 0 9k	− 4	—	—	—	—	—
II	z.	0·4	4	i 0 10	− 3	—	—	—	—	—
I Tinamaha		1·4	352	i 0 26	− 1	i 0 44	− 2	—	—	—
II		1·4	352	i 0 26	− 1	i 0 45	− 1	—	—	—
I Pasadena		1·6	185	i 0 30	0	i 0 50	− 1	—	—	—
II		1·6	185	i 0 30	0	i 0 49	− 2	—	—	—
II Riverside		1·8	163	i 0 34	+ 2	i 0 56	0	—	—	—
I Boulder City		2·6	84	i 0 42	− 2	e 1 20	+ 3	i 0 49	P*	—
II		2·6	84	i 0 42	− 2	—	—	—	—	—
I Pierce Ferry		3·3	83	i 0 51	− 2	i 1 26	− 9	i 0 59	P*	—
I Santa Clara		3·6	298	e 1 2	+ 4	—	—	—	—	—
II		3·6	298	(e 1 10)	P_g	—	—	—	—	—
II Ukiah		5·4	311	e 1 54	P_g	e 3 0	S_g	—	—	e 3·3
I Shasta Dam		6·1	326	e 1 36	+ 2	e 2 40	− 5	e 1 43	P*	—
II		6·1	326	e 1 38	+ 4	i 3 5	S*	e 1 49	P*	—
I Tucson		6·9	118	i 1 41	− 4	—	—	—	—	—
II		6·9	118	i 1 42	− 3	i 2 49	−16	i 2 8	P*	i 3·2
II Salt Lake City		7·0	42	e 2 17	P_g	i 3 37	S*	e 2 49	?	i 4·2
II Logan		7·7	36	e 2 5	+ 9	e 4 5	S_g	—	—	i 4·1
II Butte		11·1	20	—	—	5 56	+67	—	—	e 7·0
II Bozeman		11·3	26	—	—	e 5 52	+58	—	—	e 6·4
II Grand Coulee		12·2	357	—	—	i 5 12	− 4	—	—	e 6·6
II Rapid City		14·1	49	i 3 24	+ 1	—	—	—	—	i 7·5
II Florissant	E.	22·2	74	e 5 3	+ 3	e 9 11	+11	—	—	—
II St. Louis		22·3	74	e 5 1	0	e 9 15	+13	—	—	e 11·7

Santa Clara readings are given as PZ and SN.
Shasta Dam II i = 2m.59s.
Long waves were also recorded for II at College and at other American stations.

March 18d. Readings also at 1h., 3h., 5h., 15h., and 16h. (2) (near Pierce Ferry and Boulder City), 20h. (Tucson), 21h. (near Pierce Ferry, Boulder City, and near Mizusawa), 22h. (La Paz).

March 19d. Readings at 2h. (near Zagreb), 4h. (Santa Lucia), 5h. (near La Paz), 8h. (Shasta Dam, near Pierce Ferry (2) and Boulder City (2)), 12h. (Tucson and Palomar), 22h. (near La Paz).

March 20d. 4h. 30m. 9s. Epicentre 20°·5S. 174°·0E.

$A = -\cdot9323$, $B = +\cdot0980$, $C = -\cdot3481$; $\delta = -4$; $h = +5$;
$D = +\cdot105$, $E = +\cdot995$; $G = +\cdot346$, $H = -\cdot036$, $K = -\cdot937$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		16·3	178	3 42	−10	6 58	+ 5	—	—	7·5
Wellington		20·7	180	4 45	+ 1	8 51	+20	4 57	pP	10·7
Christchurch		23·0	183	5 8	+ 1	9 14	0	8 51	PcP	10·7
Riverview		24·2	232	i 5 18a	− 1	i 9 45	+10	i 10 30	SS	e 11·7
Pasadena	z.	84·3	51	i 12 32	− 3	—	—	—	—	—
Mount Wilson	z.	84·4	51	e 12 29	− 7	—	—	—	—	—
Riverside	z.	84·8	51	e 12 33	− 4	—	—	—	—	—
Tinemaha	z.	85·7	48	i 12 44	+ 2	—	—	—	—	—
Tucson		88·9	55	e 12 53	− 5	—	—	—	—	e 41·2
Helwan		145·1	293	e 19 43	[+ 4]	—	—	—	—	—
Collmberg	z.	145·8	339	e 19 41	[0]	—	—	e 19 48	PKP_2	—
Zürich		150·7	340	e 20 0	[+12]	—	—	—	—	62·4
Chur		150·8	338	e 19 54	[+ 5]	—	—	—	—	62·4

Additional readings :—
Wellington PP?Z = 5m.35s., iZ = 5m.47s., eZ = 6m.40s., iZ = 10m.10s.
Christchurch NZ = 6m.20s., 8m.23s., iN = 10m.2s.
Riverview iE = 5m.22s., iN = 9m.50s., iSSN = 10m.56s.
Helwan e = 20m.14s. and 21m.12s.
Collmberg eZ = 21m.5s.
Long waves were also recorded at Bozeman, Salt Lake City, and Kew.

March 20d. 5h. 14m. 21s. Epicentre 18°·9N. 107°·0W. (as on 1942, Aug. 14d.).

$A = -\cdot2768$, $B = -\cdot9054$, $C = +\cdot3220$; $\delta = +5$; $h = +5$;
$D = -\cdot956$, $E = +\cdot292$; $G = -\cdot094$, $H = -\cdot308$, $K = -\cdot947$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya		7·4	85	1 56	+ 4	3 23	+ 5	e 2 8	P•	3·7
Tucson		13·7	346	i 3 18	0	—	—	i 3 31	PP	e 6·9
Riverside	z.	17·7	331	i 4 8	− 2	—	—	—	—	—
Mount Wilson	z.	18·2	331	i 4 14	− 2	—	—	—	—	—
Pasadena	z.	18·2	331	i 4 29	PP	—	—	—	—	e 9·4
Tinemaha	z.	20·6	334	e 4 46	+ 3	—	—	—	—	—
St. Louis		24·5	33	e 5 21	− 1	e 9 46	+ 6	e 5 52	PP	i 13·3
Columbia		27·6	51	—	—	e 10 31	− 1	—	—	e 16·1
Weston		38·2	40	e 8 24	+61	—	—	—	—	—
San Juan		38·7	83	—	—	e 13 20	− 5	—	—	e 15·9

Additional readings :—
Tucson i = 4m.56s.
St. Louis eZ = 5m.26s., iE = 10m.50s.
Long waves were also recorded at Vera Cruz, and at other American stations.

March 20d. Readings also at 2h. (Samarkand), 5h. (Mount Wilson, Pasadena, Riverside, Palomar, Tinemaha, Tucson, Collmberg, Uccle, Chur, Zürich, Copenhagen, De Bilt, Paris, Strasbourg, Alicante, and Granada), 11h. (Riverview), 15h. (New Delhi), 16h. (Weston, Riverview, Auckland, and Christchurch).

March 21d. Readings at 2h. (near Balboa Heights), 3h. (Tchimkent, Andijan, Tashkent, near Samarkand and Stalinabad), 6h. (Tucson and Riverview), 10h. (Sofia and near Pierce Ferry), 13h. (near Pierce Ferry, Boulder City, and near Andijan), 14h. (Sofia and Bucharest), 18h. (Ksara), 19h. (Tucson), 20h. (Wellington and Arapuni).

March 22d. 12h. Undetermined shock.

Brisbane iPN = 41m.22s., iSN = 44m.46s., eLN = 47m.0s.
Auckland P = 42m.0s., S = 45m.4s., L = 45m.55s.
Wellington PZ = 43m.3s., pPZ = 43m.31s., sPZ = 43m.57s., iZ = 45m.2s., S = 46m.51s., L = 49m.
Riverview iPZ = 43m.18s.a, iSN = 47m.9s., iP$_c$P?E = 47m.16s., iE = 47m.24s., eQ?E = 47·7m., eRN = 48·3m.
Christchurch P = 43m.25s., e = 43m.36s., S = 47m.22s., iN = 47m.40s., EN = 48m.4s., Z = 49m.25s.
Riverside ePZ = 51m.27s.
Tinemaha ePZ = 51m.31s.
Mount Wilson eP?Z = 51m.41s.
Tucson eP = 51m.42s., e = 51m.49s., and 52m.6s.
Ksara e = 58m.10s.
Collmberg e = 58m.12s., 58m.16s., 58m.22s., 58m.35s., 58m.40s., and 58m.43s.
Jena eN = 58m.14s., eE = 58m.17s., eN = 58m.26s.
Basle e = 58m.27s.
Weston eSS = 96m.0s.
Long waves were also recorded at Arapuni.

March 22d. Readings also at 0h. (Mizusawa), 3h. (San Juan and near La Paz), 4h. (near Pierce Ferry and Boulder City), 6h. (near Balboa Heights), 10h. (near Pierce Ferry and Boulder City), 12h. (near Pierce Ferry, Boulder City, and near Frunse), 14h. (Alicante), 19h. (Strasbourg), 20h. (Frunse and near Andijan), 22h. (Brisbane and near Granada), 23h. (near Granada).

March 23d. Readings at 3h. (near Oaxaca and near Balboa Heights), 8h. (near Santa Lucia), 10h. (Ksara), 12h. (Malaga (2) and Granada), 13h. (Ksara), 16h. (Pasadena, Mount Wilson, Riverside, and Tinemaha), 22h. (Almata, Tchimkent, and near Andijan).

March 24d. 15h. 32m. 53s. Epicentre 22°·0S. 171°·7E. (as on 1944, Oct. 5d.).

$A = -·9184$, $B = +·1340$, $C = -·3724$; $\delta = +10$; $h = +4$;
$D = +·144$, $E = +·990$; $G = +·368$, $H = -·054$, $K = -·928$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		15·1	170	3 36	0	6 22	− 3	—	—	7·0
Arapuni		16·4	169	e 3 1	−52	—	—	—	—	7·0
New Plymouth		17·1	175	4 8	+ 6	—	—	—	—	—
Wellington		19·4	174	4 24	− 6	8 7	+ 3	i 4 59	PP	9·4
Kaimata		20·5	181	4 39	− 3	8 33	+ 6	—	—	—
Christchurch		21·5	179	4 46	− 6	8 48	+ 1	5 3	pP	—
Riverview		21·6	232	i 4 53a	− 1	i 8 44	− 5	i 9 9	SS	e 10·1
Pasadena		86·9	51	e 12 51	+ 3	—	—	—	—	e 40·5
Mount Wilson	z.	87·1	51	e 12 52	+ 3	—	—	—	—	—
Riverside	z.	87·4	51	i 12 53	+ 3	—	—	—	—	—
Shasta Dam		87·4	43	e 12 52	+ 2	—	—	—	—	—
Palomar		87·5	53	e 12 54	+ 3	—	—	—	—	—
Haiwee	N.	88·0	49	e 13 4	+11	—	—	—	—	—
Tinemaha	z.	88·3	49	i 12 57	+ 2	—	—	—	—	—
Boulder City		90·2	51	i 13 6	+ 2	—	—	—	—	—
Pierce Ferry		90·9	51	i 13 9	+ 2	—	—	—	—	—
Tucson		91·6	56	e 13 13	+ 3	e 22 15	PKS	e 16 52	PP	e 42·5
Ksara		139·5	296	e 19 21	[− 9]	—	—	23 3	PKS	—
Copenhagen		143·0	340	e 19 35	[− 1]	—	—	—	—	69·1
Helwan		143·7	291	19 34	[− 3]	—	—	23 13	PKS	—
Collmberg		146·4	335	e 19 43	[+ 1]	—	—	—	—	—
Jena		147·2	335	e 19 42	[− 1]	—	—	—	—	—
De Bilt		148·2	344	e 19 51	[+ 6]	—	—	—	—	e 72·1
Uccle		149·6	345	e 19 51	[+ 4]	—	—	—	—	e 72·1
Strasbourg		150·5	337	e 19 52	[+ 4]	—	—	e 20 22	PKP_2	73·6
Chur		151·3	335	e 19 59a	[+10]	—	—	—	—	—
Zürich		151·3	336	e 19 55a	[+ 6]	—	—	—	—	—
Basle		151·5	337	e 19 49	[− 1]	—	—	—	—	—
Paris		151·9	344	e 19 56	[+ 6]	—	—	—	—	e 79·1
Clermont-Ferrand		154·6	342	(e 19 7?)	[−47]	—	—	—	—	e 19·1
Toledo		161·8	349	30 12	SKKS	33 26	?	—	—	81·1
Alicante		162·4	340	e 27 48	SKS	(e 27 48)	[+41]	(e 28 18)	PPP	e 28·3

For Notes see next page.

NOTES TO MARCH 24d. 15h. 32m. 53s.

Additional readings :—
Wellington iZ = 5m.37s.
Kaimata i = 4m.45s.
Christchurch eNZ = 7m.51s., SN = 8m.39s., 9m.43s.
Riverview iSE = 8m.48s., iP_cPZ = 8m.54s.
Mount Wilson iZ = 13m.6s.
Palomar eEN = 13m.8s.
Boulder City i = 13m.17s.
Pierce Ferry i = 13m.22s.
Tucson e = 26m.20s.
Helwan PKP = 19m.45s., e = 22m.18s.
Collmberg e = 19m.48s., 19m.55s., 20m.3s., and 20m.37s.
Jena e = 19m.47s.
Strasbourg e = 56m.34s.
Basle e = 19m.56s.
Toledo i = 30m.40s.
Long waves were also recorded at Honolulu, Huancayo, College, and other American and European stations.

March 24d. 21h. 17m. 27s. Epicentre 0°·4N. 80°·4W. (as on 1943, March 16d.).

A = +·1668, B = −·9860, C = +·0070 ; δ = +7 ; h = +7 ;
D = −·986, E = −·167 ; G = +·001, H = −·007, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		7·6	56	e 1 55	0	e 3 2	−21	i 2 6	pP	—
Balboa Heights		8·5	5	i 2 7	0	i 3 44	− 1	—	—	—
Huancayo		13·3	158	e 3 9	− 4	e 5 33	− 9	—	—	e 6·2
La Paz	z.	20·7	146	4 41s	− 3	i 8 41	+10	—	—	14·1
San Juan		22·7	37	i 5 7	+ 3	i 9 27	+18	i 5 41	PP	e 10·8
St. Louis		39·1	348	e 7 31	0	e 16 39	SS	—	—	—
Weston		42·6	11	e 8 2	+ 3	—	—	—	—	—
Tucson		42·7	322	i 8 4	+ 4	—	—	e 9 36	PP	e 23·2
Pierce Ferry		47·3	323	e 8 41	+ 4	—	—	—	—	—
Boulder City		47·7	322	e 8 43	+ 3	—	—	—	—	—
Riverside		48·1	318	e 8 46	+ 3	—	—	—	—	—
Mount Wilson		48·7	318	e 8 49	+ 1	—	—	—	—	—
Pasadena	z.	48·7	318	i 8 55	+ 7	—	—	—	—	—
Shasta Dam		55·3	323	e 9 37	− 1	—	—	—	—	—

Additional readings :—
Bogota i = 2m.13s., 3m.9s., 3m.36s., and 4m.14s.
Huancayo e = 3m.41s. and 3m.55s.
La Paz iPZ = 4m.48s.
San Juan i = 9m.45s.
Riverside iZ = 8m.53s.
Mount Wilson iZ = 8m.58s.

March 24d. Readings also at 0h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, and St. Louis), 1h. (Ksara), 2h. (near Boulder City and Pierce Ferry), 5h. (Mount Wilson, Pasadena, Tinemaha, Tucson, Boulder City, Pierce Ferry, and St. Louis), 11h. (near Bogota), 14h. (2) and 15h. (2) (near Mizusawa), 20h. (Shasta Dam, near Boulder City and Pierce Ferry), 22h. (near Bogotà).

March 25d. 8h. 47m. 39s. Epicentre 19°·7N. 74°·7W.

Intensity IV at Port au Prince, Pétionville, Anse à Veau.
Epicentre 19°N. 74°·7W. (J.S.A.).
Liste des Séismes ressentis dans la République de Haïti au courant de l'année 1946.

A = +·2486, B = −·9088, C = +·3351 ; δ = +1 ; h = +5 ;
D = −·965, E = −·264 ; G = +·088, H = −·323, K = −·942.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince	2·5	116	i 0 43	0	i 1 3	−11	—	—	i 1·4
San Juan	8·2	97	e 2 29	P*	i 3 41	+ 3	—	—	i 4·3
Balboa Heights	11·7	205	e 2 44	− 7	i 4 50	−14	—	—	—
Bogota	15·0	177	i 3 37	+ 2	e 6 28	+ 5	i 3 56	PPP	—
Columbia	15·3	340	e 6 45	S	(e 6 45)	+15	e 8 45	P_cP	e 10·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Philadelphia		20·2	1	e 4 39	0	e 8 14	− 7	—	—	e 10·7
Weston		22·8	8	e 5 3	− 2	e 8 59	−12	—	—	—
Harvard		22·9	8	i 5 5	− 1	i 9 2	−11	—	—	e 11·7
Tacubaya	E.	23·1	274	e 5 17	+ 9	—	—	—	—	—
St. Louis		23·2	329	e 5 9	0	e 9 26	+ 8	i 5 25	PP	i 12·0
Florissant	E.	23·4	329	—	—	e 9 30	+ 9	—	—	i 12·1
Ottawa		25·6	359	e 5 31	− 1	—	—	—	—	10·4
Huancayo		31·5	181	e 7 37	PP	e 13 25	SS	e 9 21	P_cP	e 16·9
Rapid City		34·0	323	—	—	e 14 45	SSS	e 16 57	S_cS	e 17·8
Tucson		34·6	300	i 6 54	+ 1	—	—	i 8 5	PP	—
La Paz		36·5	169	i 7 10k	+ 1	i 12 52	+ 1	—	—	22·4
Pierce Ferry		38·1	305	i 7 23	+ 1	—	—	—	—	—
Boulder City		38·7	304	i 7 29	+ 2	—	—	—	—	—
Bozeman		39·6	321	—	—	e 18 14	S_cS	—	—	e 19·4
Riverside	Z.	40·4	301	i 7 42	+ 1	—	—	i 9 44	P_cP	—
Mount Wilson	Z.	41·0	301	i 7 48	+ 2	—	—	i 9 46	P_cP	—
Pasadena		41·0	301	i 7 48	+ 2	—	—	i 9 46	P_cP	e 24·0
Tinemaha		41·7	304	i 7 54	+ 2	—	—	—	—	—
Grand Coulee		45·4	320	i 8 21	− 1	—	—	—	—	—
Shasta Dam		45·6	306	i 8 21	− 3	—	—	i 10 0	P_cP	—
Granada		63·6	58	(i 10 42k)	+ 7	—	—	(13 46)	PP	(35·2)

Additional readings :—
Bogota iPPP =4m.4s., i =4m.16s., iSS =6m.42s., eP_cP? =8m.53s.
Tucson i =9m.26s.
Granada readings increased by 3 minutes.
Long waves were also recorded at Bermuda, Sitka, College, Alicante, De Bilt, Paris, Strasbourg, and at other American stations.

March 25d. 22h. 16m. 33s. Epicentre 14°·5N. 92°·3W. (as on 1938, April 10d.).

A = −·0389, B = −·9678, C = +·2488 ; δ = +5 ; h = +6 ;
D = −·999, E = +·040 ; G = −·010, H = −·249, K = −·969.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		4·9	300	e 1 20	+ 3	2 6	− 9	—	—	2·1
Vera Cruz		5·9	323	1 44	P*	2 49	+ 9	—	—	2·9
Merida		6·9	20	i 2 28	P_g	i 3 37	S*	i 4 9	S_g	i 4·5
Puebla		7·2	309	e 2 7	P*	3 6	− 7	—	—	—
Tacubaya	E.	8·2	307	2 9	+ 6	(3 49)	+11	—	—	3·8
Balboa Heights		13·6	112	e 3 14	− 3	—	—	—	—	—
Bogota		20·5	117	i 4 44	+ 2	e 8 44	+17	i 4 58	PP	—
Columbia		21·9	25	e 4 59	+ 2	e 9 5	+11	—	—	e 13·9
Cape Girardeau		22·9	7	e 5 5	− 1	e 9 25	+12	e 5 18	?	—
St. Louis		24·1	4	e 5 18	0	e 9 40	+ 6	i 5 40	pP	—
Florissant	N.	24·3	4	e 5 20	0	e 9 26	−11	e 5 40	pP	—
Tucson		24·5	320	i 5 22	0	e 9 55	+15	i 11 7	SSS	e 12·9
San Juan		25·4	77	e 5 33	+ 2	e 10 38	SS	e 6 45	PPP	e 12·6
Pierce Ferry		29·0	322	i 6 2	− 2	e 15 54	L	e 6 12	?	(e 15·9)
Palomar		29·1	315	i 6 4	0	—	—	—	—	—
Boulder City		29·4	321	i 6 7	0	e 15 53	L	e 9 8	P_cP	(e 15·9)
Philadelphia		29·5	29	e 4 20	?	(e 11 41)	+39	e 7 36	PPP	e 11·7
Riverside	Z.	29·8	315	e 6 9	− 2	—	—	—	—	—
Mount Wilson	Z.	30·4	315	i 6 16	0	—	—	—	—	—
Pasadena		30·5	315	i 6 16	− 1	—	—	—	—	e 14·3
Rapid City		30·9	345	e 6 27	+ 7	—	—	(e 9 31)	P_cP	e 9·5
Salt Lake City		31·2	331	e 6 25	+ 2	—	—	—	—	e 19·0
Huancayo		31·3	147	e 6 27	+ 3	e 11 31	0	(e 13 37)	SSS	e 13·6
Tinemaha	Z.	32·2	319	i 6 24	− 8	—	—	—	—	—
Weston		33·2	29	e 6 52	+11	e 11 56	− 6	—	—	—
Ottawa		33·8	21	e 6 44	− 2	(12 27?)	+17	—	—	12·5
Shasta Dam		37·0	321	e 7 3	−10	—	—	e 7 8	?	—
La Paz	Z.	39·0	141	i 7 24	− 6	13 29	0	—	—	19·5
Grand Coulee		40·0	332	i 7 37	− 1	—	—	i 9 13	PP	—

For Notes see next page.

NOTES TO MARCH 25d. 22h. 16m. 33s.

Additional readings :—
Bogota i = 5m.8s., $ePcP$? = 9m.45s.
St. Louis eZ = 5m.31s., iSN = 9m.55s., isSE = 10m.17s.
Florissant eN = 5m.32s., iSN = 9m.59s.
Tucson e = 7m.3s., iS = 9m.58s.
Grand Coulee i = 8m.9s.
Long waves were also recorded at Bermuda, at other American, and European stations.

March 25d. Readings also at 3h. (Tucson, near Vera Cruz, Tacubaya, and Oaxaca), 4h. (Ksara and Helwan), 7h. (Balboa Heights and near Mizusawa), 11h. (Samarkand, near Almata, Andijan, Stalinabad, Tchimkent, Tashkent, Frunse, near Pierce Ferry and Boulder City), 16h. (Malaga), 17h. (Berkeley), 18h. (Tinemaha, Mount Wilson, Pasadena, Tucson, Santa Lucia, Frunse, Andijan, Samarkand, and near Stalinabad), 21h. (Santa Lucia and Malaga), 23h. (Tucson, near Shasta Dam, Pierce Ferry, and Boulder City).

March 26d. 17h. 9m. 3s. Epicentre 3°·5S. 102°·3E. (as on 1943, June 7d.).

A = −·2126, B = +·9753, C = −·0606 ; δ = +8 ; h = +7 :
D = +·977, E = +·213 ; G = +·013, H = −·059, K = −·998.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	24·6	294	5 20	− 3	9 50	+ 8	—	—	—
Calcutta	N.	29·2	333	i 6 22a	+17	i 11 20	+22	i 7 28	PPP	e 14·8
Perth		31·0	157	i 6 35	+14	(11 22)	− 4	—	—	11·4
Hyderabad	N.	31·4	312	6 28	+ 3	11 30	− 2	7 22	PP	15·8
Pehpei		33·4	7	e 6 46	+ 4	e 12 39	+36	—	—	—
Bombay		36·6	308	e 7 12	+ 2	i 12 55	+ 2	—	—	17·1
New Delhi		40·0	325	i 7 38	0	i 13 40	− 4	9 13	PP	18·9
Dehra Dun	N.	40·8	328	e 8 15	+30	e 14 32	+36	e 17 39	SS	e 22·3
Almata		51·9	348	9 16	+ 4	16 39	+ 4	—	—	—
Andijan		51·9	331	9 13	+ 1	16 40	+ 5	—	—	—
Frunse		52·5	335	9 17	0	16 47	+ 4	—	—	—
Tashkent		53·8	330	e 9 23	− 3	e 17 0	− 1	—	—	—
Brisbane	N.	53·9	122	i 9 24	− 3	i 17 2	0	i 10 3	?	e 27·9
Riverview		54·5	130	e 9 38	+ 6	i 17 7	− 3	11 37	PP	e 25·1
Mizusawa	E.	55·5	37	9 45	+ 6	e 17 35	+11	—	—	—
Irkutsk		55·6	2	i 9 47	+ 7	i 17 51	PS	—	—	—
Tananarive		55·6	250	e 17 0?	?	e 17 10	−15	18 1	PPS	25·4
Baku		64·8	318	10 49	+ 6	19 26	+ 3	—	—	—
Erevan		68·4	316	e 11 9	+ 3	20 8	+ 1	—	—	—
Grozny		68·9	320	11 12	+ 3	i 20 16	+ 3	—	—	—
Sverdlovsk		68·9	338	i 11 7	− 2	i 20 11	− 2	—	—	—
Leninakan		69·1	317	e 11 16	+ 6	20 19	+ 4	—	—	—
Ksara		72·6	307	i 11 30	− 1	i 21 0	+ 4	—	—	—
Christchurch		73·4	135	11 41	+ 5	20 26	−39	13 30	PP	35·4
Auckland		73·9	128	—	—	21 13	+ 3	25 57	SS	32·6
Wellington		74·6	132	10 57	−46	21 7	−11	14 10	PP	38·0
Arapuni		74·8	129	e 13 15	?	21 39	+19	e 25 51	SS	39·2
Helwan		75·4	302	11 45	− 2	21 24	− 3	22 3	PPS	—
Yalta		77·1	317	11 47	−10	—	—	—	—	—
Moscow		79·0	329	e 12 2	− 5	22 2	− 4	—	—	—
Bucharest		82·6	315	e 12 24	− 2	e 22 43	0	—	—	39·0
Sofia		84·3	313	e 12 33	− 2	i 22 56	− 4	e 15 22	PP	—
Belgrade		86·7	315	12 46	− 1	e 23 19	− 5	18 7	PPP	e 52·0
Kalocsa	E.	87·9	317	e 12 47	− 6	—	—	—	—	—
Zagreb		89·9	316	e 12 57	− 5	e 24 10	+16	e 23 34	SKS	—
Upsala		90·3	330	—	—	23 33	[− 1]	i 24 0	SKKS	e 44·0
Prague		91·3	320	e 13 11	+ 2	e 23 40	[0]	e 16 57	PP	e 44·0
Triest	E.	91·5	315	e 13 14	+ 4	e 24 14	+ 6	i 16 44	PP	—
Rome		92·2	311	e 13 7	− 6	i 24 9	− 5	e 25 37	PS	e 44·5
Collmberg		92·3	321	e 13 12	− 1	e 24 28	+13	e 16 43	PP	e 41·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb		92·6	320	e 13 15	0	e 23 53	[+ 6]	e 16 49	PP	e 57·0
Copenhagen		92·8	325	13 12	− 4	i 24 17	− 2	19 9	PPP	—
Florence		93·1	314	i 13 27	+10	i 24 25	+ 3	—	—	—
Jena		93·1	320	e 13 16	− 1	e 24 21	− 1	e 16 39	PP	—
Chur		94·4	316	e 13 19	− 4	e 24 18	{+ 4}	—	—	e 56·6
Zürich		95·1	317	e 13 51	+25	e 24 26	−13	—	—	—
Strasbourg		95·6	319	e 18 10	PP	e 24 42	− 1	e 26 10	PS	e 48·0
Basle		95·7	318	e 13 27	− 2	e 23 40	[−25]	e 18 58	PPP	—
Neuchatel		96·2	317	—	—	—	—	e 27 15	PPS	—
Bergen		96·5	331	13 39	+ 7	24 13	[+ 4]	16 35	PP	e 44·0
De Bilt		97·1	322	13 38	+ 3	i 25 1	+ 5	e 17 38	PP	e 43·0
Uccle		97·7	320	e 17 42	PP	e 24 3	[−12]	e 25 1	S	e 47·0
Clermont-Ferrand		98·9	316	e 13 41	− 2	e 26 51	PS	e 17 51	PP	e 51·0
Algiers		99·5	306	e 17 57?	PP	e 25 18	+ 2	e 19 57	PPP	e 49·0
Barcelona		99·9	312	—	—	e 25 16	− 4	e 26 52	PS	e 56·6
Aberdeen		100·7	328	—	—	i 24 22	[− 8]	i 26 58	PS	48·9
Durham	N.	100·8	325	—	—	25 40	+13	32 54	SS	—
Tortosa		101·2	310	—	—	25 22	− 8	27 4	PS	e 60·6
College		101·5	24	e 18 17	PP	e 24 41	[+ 7]	e 27 31	PS	e 41·9
Edinburgh		101·5	326	—	—	e 24 27	[− 7]	—	—	—
Alicante		102·2	309	18 59	PP	25 39	0	e 26 45	PS	e 50·8
Granada		104·8	307	13 56k	−14	24 47	[− 3]	18 44	PP	54·8
Toledo		104·8	310	e 17 31	?	i 25 58	− 2	i 27 35	PS	54·0
Lisbon		108·9	310	18 58	PP	26 36	S	28 32	PS	50·6
Ivigtut		118·3	344	—	—	—	—	52 57?	Q	60·0
Victoria		120·6	33	—	—	e 37 21	SS	—	—	64·0
Grand Coulee		123·3	32	i 18 59	[0]	—	—	i 19 46	PP	—
Shasta Dam		125·4	40	e 19 1	[− 2]	—	—	e 20 52	PP	—
Ukiah		125·6	43	e 23 31	PPP	e 38 9	SS	e 43 23	SSS	e 60·7
Bozeman		128·9	29	e 21 30	PP	e 34 33	?	—	—	e 48·0
Tinemaha		130·0	42	e 19 13	[+ 1]	—	—	i 22 33	PKS	—
Santa Barbara	Z.	130·3	46	i 19 15	[+ 2]	—	—	i 22 38	PKS	—
Logan		131·2	33	e 19 16	[+ 2]	—	—	e 22 40	PKS	e 66·3
Mount Wilson		131·6	46	e 19 14	[− 1]	—	—	i 22 41	PKS	—
Pasadena		131·6	45	i 19 14	[− 1]	e 32 8	PS	i 22 40	PKS	e 59·0
Salt Lake City		131·8	34	i 22 53	PKS	—	—	—	—	e 56·0
Boulder City		132·9	41	e 19 5	[−13]	i 22 44	PKS	e 21 38	PP	—
La Jolla	Z.	132·9	46	e 19 20	[+ 2]	—	—	i 22 46	PKS	—
Palomar		133·0	46	e 19 19	[+ 1]	i 22 46	PKS	e 21 43	PP	—
Pierce Ferry		133·4	41	e 19 13	[− 5]	—	—	e 21 48	PP	—
Rapid City		133·7	25	e 19 25	[+ 6]	e 26 40	[+12]	e 22 48	PKS	e 70·3
Seven Falls		136·2	352	19 26	[+ 2]	40 25	SS	23 3	PKS	56·0
Shawinigan Falls		136·9	354	19 30	[+ 5]	—	—	22 10	PP	83·0
La Plata	N.	137·5	205	14 57	?	29 33	{+27}	23 9	PKS	64·0
Tucson		137·8	43	e 19 17	[− 9]	i 23 2	PKS	e 22 15	PP	e 56·3
Ottawa		138·3	357	19 28	[+ 1]	29 15	{+ 4}	22 18	PP	60·0
Lincoln		139·1	22	e 22 44	PP	—	—	—	—	e 77·3
Harvard		140·8	351	e 19 29	[− 3]	e 25 46	PPP	e 22 38	PP	e 77·0
Weston		140·9	351	e 19 10	[−22]	—	—	e 22 32	PP	—
Chicago		140·9	12	e 22 39	PP	e 29 31	{+ 5}	e 40 55	SS	e 57·2
St. Louis		143·2	16	e 19 31	[− 5]	i 41 46	SS	i 22 48	PP	—
Philadelphia		143·6	355	e 19 34	[− 3]	e 23 20	PKS	e 22 51	PP	e 56·2
Bermuda		148·8	338	e 20 7	[+22]	e 42 37	SS	e 22 32	PP	e 61·0
Columbia		149·5	5	e 33 46	PS	—	—	—	—	e 68·8
La Paz		158·0	206	i 20 7a	[+ 8]	31 13	{+11}	23 49	PKS	75·4
San Juan		161·4	323	e 20 3	[+ 1]	e 26 34	[−32]	e 24 37	PP	e 67·7
Port au Prince		164·1	341	e 33 24	?	—	—	—	—	—
Huancayo		164·4	189	e 20 59	PKP_3	e 32 37	{+62}	e 25 13	PP	e 64·0
Bogota		176·2	287	e 20 11	[− 1]	e 29 6	PPP	e 22 1	PKP_3	—

Additional readings :—
Perth i =10m.17s.
Hyderabad SSN =12m.49s.
Pehpei eS =12m.48s.
New Delhi PPE =9m.17s., iSE =13m.46s., SSN =16m.47s.

Continued on next page.

Brisbane iN =19m.14s.
Riverview ePE =10m.44s., iE =17m.14s., iPPSE =17m.27s., iS_cSN =19m.13s., iS_cSE = 19m.21s., eSSE =20m.50s., eSSN =20m.56s., iE =21m.58s., eQE =22·3m.
Mizusawa SN =17m.39s.
Tananarive e =22m.18s.
Christchurch PNZ =9m.44s., NZ =16m.37s., S_cSEN =20m.57s., PPS =21m.58s., 23m.48s., SSEN =25m.49s., SSS =29m.24s., QEN =31m.16s.
Auckland SKS? =20m.20s., SSS? =30m.47s.
Wellington PPP? =15m.47s., SS =27m.49s., SSS =31m.48s.
Arapuni SSS? =30m.51s.
Helwan e =17m.51s.
Sofia ePN =12m.29s.?.
Belgrade eSS =30m.17s.
Kalossa ePN =13m.7s.
Zagreb eE =13m.28s., e =23m.55s.
Upsala eN =23m.55s., iSKKSE? =24m.3s., eN =28m.9s., eE=28m.57s.?, eN=32m.57s.?, and 40m.57s.?.
Prague eSS =29m.45s.
Triest ePPPE =18m.52s., eSKSE =23m.37s., iPSE =25m.16s., iPPSE =25m.52s., iSSE =30m.16s., eSSSE =34m.34s.
Rome eSSN =29m.47s. —
Collmberg eZ =13m.26s., eSKSE =23m.47s., eN =24m.10s., and 24m.33s., ePSE = 25m.37s., eSSN =30m.38s.
Cheb e =25m.40s.
Copenhagen i =13m.19s., 25m.22s., and 30m.40s.
Jena eN =13m.20s., eE =24m.25s.
Strasbourg e =18m.18s., eSS? =30m.34s., e =41m.20s.
Bergen PSN =25m.17s., SSEN =31m.32s., QE =39·0m.
De Bilt iSKS =24m.17s., ePS =26m.27s.
Uccle ePSE =26m.37s.
Algiers e =20m.40s.
Aberdeen iN =32m.13s. and 40m.10s., iE =47m.25s.
Durham N (no phase) =31m.38s. and 31m.57s.
Tortosa SSE =32m.42s.
College eSS? =31m.53s., e =37m.35s.
Alicante e =47m.33s.
Granada PKP =17m.28s., PS =28m.37s., SS =34m.31s.
Toledo $PKKP_2E$ =28m.10s., PSN =28m.45s., iSSN =35m.15s., QN =49·0m.
Lisbon PP?Z =19m.3s., N =24m.25s.?, PS?E =27m.47s., SS?EN =34m.18s., Q?N = 44m.45s.?
Logan i =23m.7s.
Pasadena iZ =20m.2s. and 23m.3s., eZ =33m.45s.
Boulder City e =19m.15s.
Palomar iZ =23m.27s.
Pierce Ferry e =19m.20s.
Seven Falls SSS =45m.33s.
La Plata N (no phase) =32m.3s., 40m.3s., and 44m.51s.
Tucson i =19m.36s., eSKKS =27m.38s., eS? =29m.11s., ePPS =32m.45s., i =36m.2s., e =40m.25s.
Ottawa PPPN =24m.57s., PS =34m.39s., SSS =40m.39s.
Harvard PKKS =32m.25s., eSS =41m.22s.
Weston e =19m.40s.
St. Louis $iPKP_2Z$ =19m.34s., iZ =19m.55s., and 20m.5s., eZ =20m.17s., iZ =20m.30s., ePPPPP?E =30m.34s.,ePSKSE =32m.42s., eE =33m.19s., iPPP?($\Delta > 180°$)N = 35m.1s., iN =43m.40s., eN =44m.38s., iN =45m.35s., eSSSN =47m.51s.
Philadelphia e =29m.44s., ePS =33m.2s., e =35m.33s., eSS =40m.19s., e =51m.19s.
Bermuda ePPP? =25m.32s., e =33m.47s., ePPS =35m.57s.
Columbia e =34m.44s., eSS =39m.40s.
La Paz PPZ =24m.49s., PPP =28m.37s., PSKS =35m.33s., SS =45m.29s.
San Juan eSKS =32m.51s., ePPS =39m.37s., iSS =44m.46s., eSSS =51m.17s.
Port au Prince i =33m.43s.
Huancayo e =30m.11s., ePPS =39m.37s., eSS =45m.9s., e =57m.9s.
Long waves were also recorded at Besançon, Honolulu, Punta Arenas, Santa Lucia, Seattle, and Sitka.

March 26d. Readings also at 0h. (Balboa Heights), 13h. (New Delhi), 14h. (Ksara and near Basle), 16h. (St. Louis, New Delhi, and near Samarkand), 17h. (near Alicante), 21h. (Tucson), 22h. (St. Louis, near Boulder City and Pierce Ferry).

March 27d. 5h. Undetermined shock in the region 60°S. 10°E.

La Paz iPZ =55m.57s., S?Z =65m.14s., LZ =79m.30s.
Helwan P =57m.38s., PP =62m.9s., PPP =62m.54s., S =68m.18s.
Bogota e =57m.39s.
Ksara eP =58m.2s.
St. Louis eP?Z =63m.52s.
Tucson iP =64m.8s., e =65m.6s., 67m.22s., 68m.9s.
Boulder City e =64m.15s.
Mount Wilson ePZ =64m.15s.
Pierce Ferry e =64m.16s.
Palomar ePZ =64m.17s.
Pasadena ePZ =64m.18s.
Tinemaha ePZ =64m.22s.
Grand Coulee iP =64m.33s., i =65m.3s., e =66m.23s. and 66m.58s.
Hyderabad SN =68m.47s.
New Delhi eN =77m.42s.
Long waves were also recorded at Huancayo, Kodaikanal, Wellington, Auckland, and at some European stations.

March 27d. 11h. 24m. 57s. Epicentre 36°·8N. 71°·4E. Depth of focus 0·015.
(as on 1946, Feb. 14d.).

Epicentre 36°·6N. 71°·8E. Focal depth 100kms. (U.S.S.R.).

A = +·2560, B = +·7607, C = +·5964 ; δ = −11 ; h = 0 ;
D = +·948, E = −·319 ; G = +·190, H = +·565, K = −·803.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Stalinabad	2·7	310	i 0 43	− 1	i 1 19	+ 2
Andijan	4·0	11	1 5	+ 4	i 1 57	+10
Samarkand	4·5	312	1 5?	− 3	—	—
Tashkent	4·8	341	e 1 12?	0	e 2 8?	+ 1
Tchimkent	5·7	347	1 22	− 2	—	—
Frunse	6·5	21	e 1 35	0	e 2 51	+ 3
Almata	7·8	32	1 51	− 1	—	—

March 27d. 23h. 30m. 31s. Epicentre 25°·4N. 64°·7E.

A = +·3865, B = +·8177, C = +·4265 ; δ = −8 ; h = +3 ;
D = +·904, E = −·427 : G = +·182, H = +·386, K = −·904.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		9·9	129	e 2 27	+ 2	i 4 42	+22	—	—	6·5
New Delhi	N.	11·6	71	e 2 45	− 5	i 4 48	−13	e 3 11	PPP	—
Stalinabad		13·6	14	i 3 13	− 4	e 5 50	0	—	—	—
Samarkand		14·4	8	3 29	+ 2	—	—	—	—	—
Hyderabad	N.	15·1	120	3 35	− 1	6 26	+ 1	—	—	7·8
Tashkent		16·3	12	e 3 49	− 3	e 7 5?	+12	—	—	—
Andijan		16·6	21	e 3 59	+ 3	—	—	—	—	—
Tchimkent		17·3	12	i 4 3	− 1	i 7 37	+21	—	—	—
Frunse		19·3	22	e 4 30	+ 1	e 8 2	0	—	—	—
Kodaikanal	E.	19·3	140	i 4 22	− 7	i 8 7	+ 5	4 39	PP	10·0
Almata		20·5	25	4 42	0	—	—	—	—	—
Calcutta	N.	21·8	92	e 6 7	+71	i 10 2	+70	i 11 3	SSS	e 11·8
Erevan		22·4	316	e 5 4	+ 2	e 9 14	+10	—	—	—
Leninakan		23·1	316	e 5 12	+ 4	—	—	—	—	—
Colombo	E.	23·4	141	5 16	+ 5	—	—	—	—	13·1
Grozny		23·7	323	i 5 16	+ 2	i 9 34	+ 7	—	—	—
Ksara		26·4	295	i 5 41	+ 1	i 10 39	+27	—	—	—
Helwan		29·8	285	e 6 9	− 2	11 5	− 2	7 14	PPP	—
Sverdlovsk		31·5	356	i 6 25	− 1	i 11 36	+ 2	—	—	—
Moscow		36·2	334	i 7 4	− 2	e 12 50	+ 3	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		37·9	307	e 7 22	+ 2	—	—	e 7 29	?	—
Irkutsk		40·1	37	7 40	+ 1	e 13 51	+ 5	—	—	—
Belgrade		40·5	310	i 7 39	− 3	e 14 31	+39	e 10 18	PPP	—
Triest	z.	45·3	310	i 8 18	− 3	—	—	—	—	—
Prague		45·7	316	—	—	e 15 15	+ 7	e 18 57	SSS	e 24·5
Rome		45·8	305	i 8 23a	− 2	e 15 5	− 4	e 10 1?	PP	e 23·5
Collmberg		46·9	317	i 8 33	− 1	—	—	e 10 36	PP	e 30·5
Cheb		47·0	316	e 8 29?	− 6	e 15 34	+ 8	e 10 29?	PP	e 31·5
Upsala		47·2	330	—	—	e 19 5	SS	e 19 11	?	e 23·8
Jena		47·6	316	e 8 39	0	—	—	—	—	—
Chur		48·3	311	e 8 43	− 2	—	—	—	—	—
Copenhagen		48·3	323	i 8 44	− 1	e 15 50	+ 5	i 10 40	PP	23·5
Zürich		49·0	312	e 8 48a	− 2	e 15 53	− 2	—	—	—
Basle		49·7	312	e 8 54a	− 2	e 15 48	−16	—	—	—
Strasbourg		49·7	313	e 8 56	0	e 15 55	− 9	e 10 50	PP	—
De Bilt		51·8	318	i 9 10	− 2	e 16 34	+ 1	e 11 19	PP	e 29·5
Uccle		52·2	316	e 9 14	− 1	e 16 37	− 2	e 20 29?	SS	e 27·5
Clermont-Ferrand		52·7	309	e 9 17	− 1	e 17 7	PPS	e 10 32	PcP	e 32·5
Tortosa		54·8	303	i 9 37	+ 3	—	—	10 47	PcP	—
Alicante		55·8	300	i 9 47	+ 6	e 17 21	− 7	11 31	PP	e 26·0
Aberdeen		56·5	323	—	—	e 21 52	SS	—	—	e 35·2
Granada		58·4	299	i 9 59a	− 1	i 17 58	− 4	10 21	pP	27·3
Toledo		58·4	302	i 9 58	− 2	i 18 2	0	12 2	PP	—
Lisbon		62·5	302	10 26k	− 2	20 30?	ScS	—	—	39·5
Riverview	N.	100·9	123	e 18 29	PP	—	—	—	—	—
St. Louis	N.	112·1	338	—	—	e 25 19	[− 2]	e 28 54	PS	—
Tucson		122·5	355	e 19 1	[+ 3]	—	—	e 20 40	PP	e 73·1

Additional readings :—
Kodaikanal SSE =8m.29s.
Rome ePPPN =10m.28s., eSS?N =17m.45s.?, eSSSN =18m.39s.?.
Collmberg eE =8m.40s., iZ =8m.43s., eZ =8m.52s., eE =12m.0s.
Cheb e =19m.4s.
Copenhagen 19m.39s.
Strasbourg e =9m.12s. and 9m.15s., eSS? =20m.5s.
De Bilt eSS =20m.29s.?
Tortosa PPPE =12m.48s.
Alicante PPP =12m.35s., PcS =15m.19s., SS =21m.15s., Q =22m.59s.
Granada PcP =10m.43s., PP =12m.6s., PPP =13m.29s., pPPP =13m.37s., PcS =14m.40s., SS =22m.31s., SSS =24m.0s.
Toledo i =10m.4s., PSN =18m.16s.
Lisbon PZ =10m.33s., E =10m.41s.?
St. Louis eSSSN =39m.29s.?
Long waves were also recorded at Dehra Dun, Edinburgh, Bucharest, Bergen, Weston, and La Paz.

March 27d. Readings also at 0h. (Shasta Dam and near Bogota), 2h. (Tucson, Tinemaha, Almata, Samarkand, Tchimkent, and near Stalinabad), 3h. (Granada, Jena, near Strasbourg, and Besançon), 8h. (La Paz), 9h. (Tucson), 11h. (near Pierce Ferry and Boulder City), 14h. (near Mizusawa), 18h. (Jena, La Paz (2), Tucson, near Bogota (2), and near Besançon), 19h. (La Paz, Tinemaha, Riverside, Tucson, San Juan, near Tchimkent, Tashkent, Frunse, and Andijan), 21h. (St. Louis).

March 28d. Readings at 3h. (near Grozny), 4h. (near Mizusawa), 7h. (near Alicante), 17h. (Strasbourg, Besançon, Weston, St. Louis, Tucson, Riverside, Pasadena, Mount Wilson, Ksara, Hyderabad, Christchurch, and Riverview).

March 29d. 7h. 17m. 28s. Epicentre 2°·3N. 76°·3W.

Felt at Papayan, Coconucos, and Purace. Epicentre as adopted.
Mapa sísmico y tectónico de Colombia (Banco de la República, Bol. gráfico 7, febrero de 1947).
Annales de l'Institut de Physique du Globe de Strasbourg, 2ème partie Séismologie, Nouvelle série, Tome XI, Strasbourg, 1951, p. 48.

A = +·2366, B = −·9708, C = +·0398 ; δ = +2 ; h = +7 ;
D = −·971, E = −·237 ; G = +·009, H = −·039, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		3·2	44	e 0 49?	− 3	i 1 33?	+ 1	i 0 58?	P*	—
Huancayo		14·3	176	e 3 23	− 3	i 5 58	− 8	—	—	i 7·0
San Juan		18·8	32	i 4 26	+ 3	i 8 6	+16	e 5 4	PPP	e 8·8
Fort de France		19·4	52	e 4 30	0	—	—	—	—	—
La Paz	z.	20·3	157	4 44	+ 4	—	—	—	—	—
Tacubaya		28·1	309	e 13 19	PcS	—	—	—	—	e 13·5
Fordham		38·4	4	e 7 23	− 2	—	—	—	—	—
St. Louis		38·4	343	e 7 25	0	e 13 15	− 5	e 8 57	PP	—
Weston		40·2	7	e 7 41	+ 1	—	—	i 7 45	?	—
Harvard		40·3	7	e 7 38	− 2	—	—	—	—	—
Tucson		44·1	317	i 8 12	0	—	—	e 9 57	PP	—
Pierce Ferry		48·4	319	i 8 46	0	—	—	—	—	—
Boulder City		48·9	319	i 8 50	0	—	—	—	—	—
Palomar	z.	48·9	314	i 8 50	0	—	—	—	—	—
La Jolla	z.	49·0	313	e 8 52	+ 2	—	—	—	—	—
Riverside	z.	49·6	314	i 8 55	0	—	—	—	—	—
Mount Wilson	z.	50·2	314	i 9 0	0	—	—	—	—	—
Pasadena	z.	50·3	314	i 9 2	+ 2	—	—	—	—	—
Granada		74·9	52	i 12 4k	PcP	21 25	+ 3	—	—	—
Rome		87·6	48	e 12 51	0	—	—	—	—	—
Belgrade		93·2	46	e 20 48	?	—	—	—	—	—
Kodaikanal	E.	151·1	63	e 23 29	PP	e 30 37	{+12}	—	—	39·2

Additional readings :—
Bogota iP_e = 1m.14s.?, iS* = 1m.42s.?.
Kodaikanal eE = 25m.19s. and 34m.2s.

March 29d. 7h. 26m. 4s. Epicentre 1°·7S. 80°·9W.

Felt at Guayaquil, Equador.

A = +·1581, B = −·9870, C = −·0295 ; δ = +3 ; h = +7 ;
D = −·987, E = −·158 ; G = −·005, H = +·029, K = −·1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		9·3	47	(i 2 10?)	− 7	(i 4 27?)	+22	(i 4 40)	S*	(i 5·9)
Balboa Heights		10·7	6	i 2 33	− 5	—	—	—	—	e 5.9
Huancayo		11·7	152	i 2 54	+ 3	i 5 11	+ 7	i 5 36	SSS	i 6·0
La Paz	z.	19·3	139	i 4 28	− 1	i 8 8	+ 6	—	—	12·5
Merida		24·1	340	i 5 7	−11	i 9 23	−11	—	—	—
San Juan		24·7	36	i 5 22	− 2	i 9 58	+14	i 5 54	PP	i 11·8
Fort de France		25·5	51	i 5 29	− 3	i 10 14	+17	6 9	PP	e 13·2
Tacubaya	N.	27·6	321	—	—	e 10 23	− 9	e 12 56	PcS	—
Santa Lucia	N.	33·0	164	6 43	+ 4	11 20	−37	10 22	?	15·3
Columbia		35·5	0	e 6 58	− 2	e 12 36	0	e 8 20	PP	e 15·8
Bermuda		37·2	23	e 7 16	+ 1	e 13 11	+ 9	e 8 41	PP	i 15·3
La Plata	E.	39·4	150	6 26	−67	13 25	−10	16 50	SSS	22·1
	N.	39·4	150	7 26	− 7	13 32	− 3	9 2	PP	21·1
Cape Girardeau	E.	39·6	350	e 7 31	− 4	e 13 32	− 6	—	—	—
St. Louis		41·1	349	e 7 44	− 3	i 14 3	+ 2	i 8 1	pP	—
Philadelphia		41·8	8	e 7 54	+ 1	i 14 10	− 1	i 9 11	PP	e 18·6
Fordham		42·8	9	e 8 1	0	i 14 28	+ 2	i 17 56	SSS	—
Chicago		43·7	353	e 8 17	+ 9	e 14 31	− 8	e 9 57	PP	e 19·2
Tucson		44·1	323	i 8 11	− 1	e 14 42	− 3	i 8 28	pP	e 17·9
Lincoln		44·3	344	e 8 30	+17	i 14 54	+ 6	e 9 34	PP	e 18·5

Continued on next page.

		Δ	Fz.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Weston		44·7	11	i 8 16a	0	e 14 55	+ 1	e 8 28	?	—
Harvard		44·8	11	i 8 16	− 1	e 14 52	− 3	i 8 29	pP	e 20·9
Ottawa		47·1	6	8 33	− 2	15 27	− 1	10 34	PP	22·9
La Jolla		48·6	319	e 8 48	+ 1	—	—	—	—	—
Palomar		48·6	320	i 8 47	0	i 15 54	+ 5	i 9 6	?	—
Pierce Ferry		48·6	325	i 8 48	+ 1	—	—	i 9 7	?	—
Shawinigan Falls		48·6	9	8 45	− 2	—	—	—	—	26·9
Boulder City		49·0	324	e 8 51	+ 1	e 15 58	+ 3	—	—	—
Riverside	z.	49·4	320	i 8 51	− 2	—	—	—	—	—
Seven Falls		49·4	10	8 53	0	15 58	− 2	19 44	SS	25·9
Rapid City		49·8	339	e 9 0	+ 4	e 16 10	+ 4	e 10 50	PP	e 21·1
Mount Wilson	z.	49·9	320	i 8 57	0	—	—	—	—	—
Pasadena		50·0	320	i 8 56	− 2	e 16 10	+ 1	i 9 14	?	e 20·9
Salt Lake City		50·8	331	e 9 22	+18	i 16 22	+ 2	e 11 21	PP	e 20·3
Tinemaha	z.	51·9	322	i 9 13	+ 1	—	—	—	—	—
Berkeley		54·9	321	9 25	−10	17 17	+ 1	9 47	pP	22·9
Butte		55·1	335	e 10 5	+29	e 17 21	+ 3	e 21 29	SS	e 31·2
Ukiah		56·2	322	—	—	e 17 38	+ 5	e 22 0	SS	e 24·6
Shasta Dam		56·6	324	e 9 43	− 4	—	—	—	—	—
Saskatoon		57·9	342	9 38	−18	i 17 32	−23	20 56	SS	23·9
Grand Coulee		59·5	332	e 10 9	+ 2	—	—	e 14 32	PeS	—
Victoria		62·1	330	10 20	− 5	18 42	− 7	—	—	27·9
Ivigtut		67·6	17	—	—	19 57	0	—	—	28·9
Sitka		73·2	333	—	—	i 21 4	+ 2	i 25 42	SS	e 30·4
Lisbon		76·9	50	11 54	− 2	21 49	+ 6'	15 17	PP	36·9
Honolulu		78·4	293	—	—	e 22 15	+15	—	—	e 36·0
Granada		80·9	52	i 12 18k	+ 1	i 22 34	+ 8	12 27	PcP	i 38·2
Toledo		81·0	50	i 12 17	− 1	i 22 33	+ 6	13 5	pP	37·9
College		81·9	337	e 12 34	+11	e 22 34	− 2	e 15 48	PP	e 34·0
Alicante		83·5	51	12 22	− 9	22 56	+ 4	15 32	PP	40·2
Edinburgh		84·5	34	—	—	e 22 58	− 4	—	—	—
Tortosa		84·6	49	i 12 39	+ 3	e 23 2	− 1	24 25	PPS	44·8
Durham	E.	85·2	35	e 12 40	+ 1	i 23 8	− 1	23 15	ScS	—
Aberdeen		85·3	32	i 12 43	+ 3	i 23 7	− 3	i 34 52	?	41·5
Barcelona		85·9	48	—	—	e 23 6	−10	—	—	37·8
Algiers		86·1	53	e 12 56?	+12	23 15	− 3	23 56	PS	40·9
Paris		86·9	41	i 12 47	− 1	i 23 25	− 1	e 16 9	PP	e 39·9
Clermont-Ferrand		87·0	44	e 12 56?	+ 8	e 23 22	− 5	—	—	e 41·4
Uccle		88·3	39	e 12 53a	− 2	i 23 41	+ 2	e 24 50	PS	e 36·9
De Bilt		88·9	38	i 12 57	− 1	e 23 34	−10	e 23 56	ScS	e 40·9
Basle		90·2	42	e 13 3	− 1	e 23 22	[−12]	—	—	—
Strasbourg		90·4	41	e 13 22	+18	i 23 57	− 1	e 18 20	PPP	e 45·9
Zürich		90·9	42	e 13 4	− 3	—	—	e 21 44	?	—
Copenhagen		92·3	34	e 13 22	+ 9	i 24 32	+17	25 41	PS	44·9
Florence		92·7	46	i 13 25	+10	i 24 22	+ 4	i 25 20	PS	—
Rome		93·7	48	e 13 16	− 4	e 24 36	+ 9	e 17 8	PP	e 42·8
Collmberg		93·8	39	e 13 19	− 1	e 24 31	+ 3	e 25 45	PS	e 42·9
Triest	E.	94·5	44	e 13 24	+ 1	i 24 36	+ 2	e 17 11	PP	—
Prague		94·7	40	e 17 50	PP	e 25 7	+31	e 26 38?	PPS	e 46·9
Upsala		95·8	30	—	—	e 24 4	[− 1]	e 25 56?	PS	e 44·9
Zagreb		96·0	45	—	—	e 24 11	[+ 4]	—	—	—
Belgrade		99·3	46	—	—	e 24 8	[−16]	e 26 9	PS	49·9
Wellington		99·6	228	42 33	?	48 54	?	51 32	Q	52·6
Christchurch		100·7	225	—	—	38 6	?	45 16	Q	49·9
Sofia	E.	101·6	47	e 18 14	PP	24 49	[+14]	—	—	39·9
Helwan		110·1	59	e 18 28	[− 5]	28 56	PS	19 5	PP	—
Leninakan		116·8	44	20 12	PP	—	—	—	—	—
Sverdlovsk		117·1	22	19 45	PP	25 45	[+ 5]	29 43	PS	—
Riverview		119·7	229	—	—	e 25 56	[+ 7]	e 27 13	SKKS	e 55·7
Baku		121·2	42	e 20 32	PP	—	—	e 30 29	PS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		129·4	356	e 21 3?	PP	e 28 56	{+40}	22 39	PKS	—
Samarkand		132·2	34	e 19 19	[+ 3]	—	—	—	—	—
Tashkent		132·3	30	e 19 18	[+ 2]	22 41	PKS	e 21 43	PP	—
Frunse		133·5	25	—	—	22 47	PKS	—	—	—
Stalinabad		134·0	33	19 20	[0]	—	—	—	—	—
Andijan		134·2	29	19 26	[+ 6]	22 54	PKS	—	—	—
Bombay		149·1	54	e 19 54	[+ 8]	—	—	—	—	—
Hyderabad	N.	154·4	51	20 8	PKP_2	30 42	{ 0}	24 7	PP	—

Additional readings :—
Bogota i =(2m.28s.?) and (2m.42s.), iP_cP =(6m.30s.?), readings increased by 10m.
Fort de France PPP =6m.24s., SS =11m.17s., SSS =11m.22s.
La Plata N =15m.56s., E =19m.2s., N =19m.32s.
St. Louis iZ =8m.12s., iSE =13m.58s., isS?E =14m.39s., iE =16m.54s.
Philadelphia ePP =9m.59s.
Chicago e =10m.43s. and 13m.57s., eS_cS =18m.15s.
Tucson isP? =8m.44s., iPP =9m.40s., iPPP =10m.32s., i =11m.5s. and 15m.57s.
Harvard e =8m.44s. and 9m.38s., ePP =10m.6s., iS_cS =18m.12s., eSS =18m.34s., e =18m.48s.
Ottawa SS =18m.29s.
Rapid City eP_cP =9m.58s., e =12m.8s., eS_cS? =18m.6s., eSS =20m.8s.
Berkeley S =16m.25s., SSS =20m.55s.
Lisbon QN =33m.44s.
Toledo PP =15m.12s., S_cSEN =22m.46s., PSN =23m.25s., iPPSN =23m.44s., SSN =27m.44s., Q =34m.0s.
College e =17m.50s. and 24m.10s., eSS =28m.2s., eSSS =31m.24s.
Alicante PS =23m.44s., Q =34m.38s.
Tortosa eSEN =23m.7s., S_cSE? =23m.24s.
Paris iS =23m.43s., ePS =24m.37s., eSS =29m.51s.
Uccle eSSN =29m.8s.
De Bilt eSS =28m.56s.?
Strasbourg e =26m.11s. and 29m.31s.
Copenhagen 23m.50s., SS =30m.50s.
Rome ePPP?N =18m.56s., eSKSE =23m.53s., eS?Z =23m.58s., eSSN =30m.31s., eSSS?N =33m.29s.
Collmberg eSKS?E =24m.0s.
Triest iSKSE =24m.0s.?, ePSE =25m.51s., eSSE =30m.27s.
Prague eSS? =31m.56s.
Upsala eE =26m.6s., eN =30m.56s.?
Belgrade e =28m.20s.
Christchurch SSSEN =42m.19s.
Helwan PPP? =21m.5s.
Sverdlovsk S =27m.47s., PPS =31m.1s., SS =36m.2s., SSS =40m.32s.
Riverview iPSE =30m.6s., iZ =30m.13s., iPPSE =30m.25s., eSSE =36m.43s.
Irkutsk ePS =31m.43s.?
Hyderabad SKSP =34m.23s., SS =43m.50s.
Long waves were also recorded at Bozeman, Seattle, Besançon, Bucharest, Arapuni, Auckland, and Tananarive.

March 29d. 20h. 7m. 1s. Epicentre 2°·3N. 76°·3W. (as at 7h. 17m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		3·2	44	i 0 59?	P*	i 1 52	S_g	i 1 8?	P_g	—
Balboa Heights		7·4	334	e 1 52	0	i 3 16	− 2	—	—	—
Huancayo		14·3	176	e 3 21	− 5	e 6 2	− 4	—	—	e 6·5
Fort de France		19·4	52	e 4 32	+ 2	—	—	—	—	—
La Paz		20·3	157	4 39	− 1	8 49	SS	—	—	12·2
St. Louis		38·4	343	e 7 24	− 1	e 12 58	−22	—	—	—
Tucson		44·1	317	i 8 12	0	—	—	i 8 18	?	—
Riverside	z.	49·6	314	e 8 58	+ 3	—	—	—	—	—
Tinemaha	z.	51·8	317	e 9 10	− 2	—	—	e 9 23	?	—

St. Louis gives also iPZ =7m.28s., eS?E =12m.38s.

March 29d. Readings also at 0h. (near Pierce Ferry and Boulder City), 5h. (Rome, Zürich, Basle, Strasbourg, Besançon, Tucson, Pierce Ferry, Boulder City, Palomar, Riverside, Mount Wilson, and Pasadena), 7h. (La Paz), 8h. (Tacubaya), 9h. (near Bogota), 10h. (near Frunse), 12h. (near Almata and Samarkand), 15h. (near Bogota), 16h. (Rome and Sofia), 17h. (near Bogota), 18h. (Mizusawa), 19h. (Huancayo and near Bogota), 20h. (La Paz and Tucson), 23h. (Triest and Rome).

March 30d. 0h. 2m. 18s. Epicentre 2°·3N. 76°·3W. (as on 29d.).

$A = +\cdot2366$, $B = -\cdot9708$, $C = +\cdot0398$; $\delta = +2$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		3·2	44	i 1 42?	+50	i 2 28?	+56	i 1 52?	P*	—
Balboa Heights		7·4	334	e 1 52	0	i 3 16	− 2	—	—	—
Huancayo		14·3	176	e 3 18	− 8	e 6 7	+ 1	—	—	e 7·5
San Juan		18·8	32	i 4 24	+ 1	i 8 3	+13	e 6 12	?	e 9·0
La Paz	z.	20·3	157	4 42	+ 2	8 42	+19	—	—	12·2
St. Louis		38·4	343	e 7 24	− 1	e 13 48	+28	e 8 55	PP	e 18·7
Weston		40·2	7	e 7 41	+ 1	—	—	—	—	—
Tucson		44·1	317	e 8 11	− 1	—	—	i 9 21	?	—
Pierce Ferry		48·4	319	i 8 45	− 1	—	—	—	—	—
Boulder City		48·9	319	i 8 49	− 1	—	—	—	—	—
Palomar	z.	48·9	314	i 8 50	0	—	—	i 9 5	?	—
Riverside	z.	49·6	314	i 8 59	+ 4	—	—	—	—	—
Pasadena	z.	50·3	314	i 8 59	− 1	—	—	—	—	—
Toledo		74·9	52	i 11 44	0	—	—	—	—	—

Additional readings :—
Bogota $iS^* = 2m.41s.?$, $iS_z = 2m.51s.?$
St. Louis $eZ = 7m.41s.$ and $9m.37s.$
Long waves were also recorded at Bermuda.

March 30d. 17h. 22m. 31s. Epicentre 2°·3N. 76°·3W. (as at 0h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		14·3	176	e 3 22	− 4	e 5 55	−11	e 5 42	?	e 6·5
San Juan		18·8	32	e 4 24	+ 1	e 8 2	+12	—	—	e 8·5
Fort de France		19·4	52	e 4 35	+ 5	—	—	—	—	—
La Paz	z.	20·3	157	4 41	+ 1	—	—	—	—	12·5
Tucson		44·1	317	i 8 11	− 1	—	—	—	—	—
Riverside	z.	49·6	314	8 53	− 2	—	—	—	—	—
Tinemaha	z.	51·8	317	e 9 13	+ 1	—	—	—	—	—

March 30d. Readings also at 0h. (Pasadena, Riverside, Palomar, Tinemaha, Pierce Ferry, and Tucson), 1h. (Strasbourg, Zürich, Basle, Andijan, near Frunse and Almata), 4h. (La Paz, Tucson, and near Bogota), 5h. (near Andijan and Samarkand (2)), 6h. (near Bogota), 11h. (Tucson, Basle, near Andijan and Stalinabad), 13h. (Hyderabad), 15h. (Tucson), 16h. (Misuzawa), 17h. (Christchurch, Wellington, Auckland, and near Bogota), 18h. (near Tortosa), 19h. (near Apia), 20h. (near Algiers), 21h. (near Mizusawa), 22h. (Basle, Tucson, Riverside, Mount Wilson, and Tinemaha), 23h. (Santa Lucia, Tucson, and near Bogota).

March 31d. 11h. 30m. 0s. Epicentre 23°·0N. 96°·0E. Very rough and uncertain.

$A = -\cdot0963$, $B = +\cdot9164$, $C = +\cdot3885$; $\delta = -1$; $h = +4$;
$D = +\cdot995$, $E = +\cdot105$; $G = -\cdot041$, $H = +\cdot386$, $K = -\cdot921$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Calcutta	N.	7·1	267	—	—	i 2 54	−16	—
Pehpei		11·6	52	i 2 33	−17	i 4 29	−32	—
Hyderabad	N.	17·4	255	3 59	− 7	6 59	−20	—
New Delhi	N.	17·8	293	e 3 56	−15	e 6 31	−57	7·6
Kodaikanal	E.	21·8	239	e 4 42	−14	e 8 10	−42	9·8
Bombay		22·0	264	i 5 6	+ 8	i 8 36	−20	10·2
Colombo	E.	22·3	227	4 58	− 3	9 1	− 1	—
Almata		25·6	327	5 4	−28	9 7	−52	—
Andijan		26·6	317	e 5 12	−30	9 41	−35	—
Frunse		26·6	324	9 20	?	—	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Tashkent	28·9	316	e 6 28	+25	e 11 15	+22	—
Tchimkent	29·2	318	6 8	+ 3	—	—	—
Samarkand	29·7	311	6 19	+ 9	—	—	—
Sverdlovsk	42·5	333	—	—	13 24?	−58	—
Grozny	45·9	309	e 8 1?	−25	i 14 21?	−50	—
Erevan	46·4	305	8 19	−11	—	—	—
Helwan	57·7	292	10 5	+10	—	—	—

March 31d. Readings also at 0h. (near Malaga and San Juan), 4h. (near Almata and Frunse), 6h. (Tucson, Triest, near Florence and near Tacubaya), 7h. (Haiwee, Mount Wilson, Pasadena (2), Riverside (2), Tinemaha (2), Tucson (2), Boulder City, Pierce Ferry, Santa Lucia, Copenhagen, Basle, Zürich, and Strasbourg), 13h. (near Boulder City and Pierce Ferry), 14h. (Bucharest and near Sofia), 15h. and 16h. (near Andijan), 17h. (Tucson), 18h. (Erevan, near Grozny, and Leninakan), 20h. (near Almata and near Granada), 21h. (Helwan and Ksara), 23h (near Grozny and Leninakan).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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A digital hypocenter file of the ISS (Villaseñor and Engdahl, 2005) can be obtained from the USGS web site: http://earthquake.usgs.gov/scitech/iss/

Villaseñor, A., and E.R. Engdahl, *A digital hypocenter catalog for the International Seismological Summary,* Seism. Res. Lett., vol. 76, no. 5, pp. 554-559, 2005.

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