The International Seismological Summary.

1950 October, November, December.

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

The Director of the I.S.S. wishes to express his thanks to U.N.E.S.C.O. and H.M. Treasury for financial support, which has covered the cost and preparation of this volume.

The last quarter of 1950 contains 233 epicentres, 191 of which are repetitions from previous determinations.

Cases of abnormal focal depth are noted below :—

Oct.	5d. 16h. (9m.)	10·4°N.	85·7°W.	0·015
	5d. 16h. (48m.)	10·4N.	85·7W.	0·015
	5d. 20h.	10·4N.	85·7W.	0·015
	10d. 0h.	36·7N.	70·5E.	0·030
	10d. 23h.	17·8S.	178·8W.	0·080
	13d. 20h.	7·5N.	123·5E.	0·080
	16d. 5h.	5·0S.	80·7W.	0·010
	17d. 15h.	10·5N.	88·2W.	0·010
	19d. 20h.	42·9N.	142·1E.	0·010
	21d. 4h.	18·5S.	173·5W.	0·005
	22d. 15h.	48·6N.	153·5E.	0·015
	23d. 16h.	14·3N.	91·7W.	0·005
	23d. 17h. (5m.)	14·3N.	91·7W.	0·005
	23d. 17h. (47m.)	14·3N.	91·7W.	0·005
	23d. 17h. (59m.)	14·3N.	91·7W.	0·005
	23d. 19h.	14·3N.	91·7W.	0·005
	23d. 21h.	14·3N.	91·7W.	0·005
	23d. 23h.	14·3N.	91·7W.	0·005
	24d. 0h. (23m.)	14·3N.	91·7W.	0·005
	24d. 0h. (52m.)	14·3N.	91·7W.	0·005

	Oct.	24d. 5h.	14·3N.	91·7W.	0·005
		24d. 6h.	14·3N.	91·7W.	0·005
		24d. 9h.	14·3N.	91·7W.	0·005
		24d. 15h.	14·3N.	91·7W.	0·005
		25d. 5h.	14·3N.	91·7W.	0·005
		25d. 7h.	26·3N.	126·2E.	0·015
		26d. 7h.	21·8S.	170·8E.	0·005
		28d. 22h.	14·3N.	91·7W.	0·005
		30d. 2h.	12·9S.	172·7W.	Suggested Deep.
		30d. 10h.	17·4S.	71·0W.	0·025
	Nov.	1d. 12h.	10·4N.	85·7W.	0·015
		2d. 7h.	Undetermined shock		Deep.
		2d. 15h.	7·5S.	129·0E.	0·030
		2d. 18h.	7·5S.	129·0E.	0·030
		4d. 7h.	14·9S.	167·1E.	0·010
		5d. 16h.	14·3N.	91·7W.	0·005
		5d. 17h.	33·5N.	134·9E.	0·005
		9d. 11h.	46·5N.	150·7E.	0·030
		10d. 5h.	16·5S.	175·5W.	0·050
		16d. 0h.	18·7N.	145·4E.	0·015
		16d. 5h.	41·7N.	144·9E.	Suggested Deep.
		21d. 13h.	21·0S.	65·5W.	0·040
		22d. 1h.	37·6N.	71·6E.	0·030
	Dec.	1d. 14h.	14·4N.	47·3W.	0·010
		2d. 8h.	26·0S.	70·2W.	0·015
		2d. 15h.	8·2S.	71·0W.	0·100
		2d. 19h.	18·0S.	167·7E.	Suggested Deep.
		4d. 16h.	5·1S.	153·5E.	0·010
		4d. 21h.	21·0S.	67·5W.	0·005
		9d. 21h.	24·3S.	67·4W.	0·015
		10d. 2h.	14·6S.	76·3W.	Base of Superficial Layers.
		10d. 13h.	28·5S.	179·0W.	0·025
		11d. 3h.	23·3S.	66·4W.	0·010
		11d. 14h.	8·2S.	71·0W.	0·100
		14d. 1h.	19·7S.	175·9W.	0·030
		14d. 3h.	19·7S.	175·9W.	0·030
		15d. 1h.	22·3N.	142·5E.	0·020
		18d. 8h.	14·5N.	90·5E.	0·020
		21d. 11h.	29·5S.	71·5W.	0·005
		21d. 18h.	41·0N.	143·3E.	0·005

Dec.	23d.	8h.	36·9N.	141·3E.	0·005
	23d.	17h.	20·5S.	179·0W.	0·080
	24d.	4h.	36·7N.	70·5E.	0·030
	24d.	5h.	31·8N.	131·8E.	Base of Superficial Layers.
	27d.	4h.	Undetermined shock		Suggested Deep.
	27d.	23h. (9m.)	17·0N.	62·5W.	0·005
	27d.	23h. (19m.)	17·0N.	62·5W.	0·005
	28d.	14h.	8·2S.	71·0W.	0·100
	28d.	21h.	14·6S.	76·3W.	Base of Superficial Layers.
	28d.	22h.	22·5N.	143·5E.	0·010
	29d.	20h.	17·0N.	62·5W.	0·005
	30d.	6h.	31·8S.	176·5W.	0·020
	30d.	13h.	1·8S.	77·7W.	0·025
	30d.	21h.	18·5S.	175·0W.	0·030

Thanks are also due to the Director of the Meteorological Office and the Superintendent of Kew Observatory for hospitality extended to the staff and assistance with administration.

KEW OBSERVATORY,
Richmond,
December, 1958. SURREY.

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1950 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. Readings at 0h. (Nanking), 1h. (Christchurch, Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Victoria, College (2), Weston, Philadelphia, Stuttgart, and near Apia), 2h. (Calcutta, Nanking, Harvard, Palisades, Kew, and Stuttgart), 3h. (Weston, and near Garm), 5h. (near Ashkabad), 6h. (Nanking, Andijan, Fergana, Vladivostok, near Garm, and near Ashkabad), 7h. (near Garm, near Bandong, and Djakarta), 8h. (near Alicante), 9h. (Mount Wilson, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, and near Apia), 11h. (near Garm), 12h. (Nanking), 13h. (Mount Wilson, Tinemaha, Boulder City, Overton, Pierce Ferry, Mineral, Shasta Dam, Hungry Horse, Seattle, Victoria, and College), 14h. (Istanbul, Harvard, Overton, Pierce Ferry, Hungry Horse, Seattle, Victoria, College, near Bogota, and Chinchina), 15h. (Stuttgart, Fergana, near Andijan, Garm, Obi-garm, and Stalinabad), 16h. (Nanking and near Garm), 18h. (Copenhagen, Tamanrasset, Harvard, and Weston), 19h. (Copenhagen, Nanking, and Hungry Horse), 20h. (near Garm), 22h. (Helwan, Ksara, and Lenkoran).

Oct. 2d. 11h. 43m. 29s. Epicentre 20°·4N. 108°·8W. (as on 1943, Sept. 20d.).

$A = -\cdot3023$, $B = -\cdot8880$, $C = +\cdot3465$; $\delta = -1$; $h = +5$;
$D = -\cdot947$, $E = +\cdot322$; $G = -\cdot112$, $H = -\cdot328$, $K = -\cdot938$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guadalajara		5·1	87	e 1 59	P_g	—	—	—	—	—
Tacubaya		9·1	95	e 2 37	P*	i 4 24	S*	—	—	—
Tucson		11·9	352	i 2 52	− 2	—	—	—	—	e 5·6
Vera Cruz		12·0	96	—	—	e 5 31?	+20	—	—	—
Palomar		14·8	333	e 3 38	+ 6	—	—	—	—	e 7·0
Riverside	z.	15·5	333	e 3 46	+ 4	—	—	—	—	—
Pasadena		16·0	331	e 3 46	− 2	—	—	—	—	e 7·2
Pierce Ferry		16·3	345	i 3 51	− 1	—	—	—	—	e 10·3
Boulder City		16·4	342	e 3 51	− 2	—	—	—	—	e 7·3
Overton	z.	16·8	344	i 3 58	0	i 7 8	+ 3	—	—	e 10·3
Haiwee	z.	17·6	355	e 4 9	+ 1	—	—	—	—	—
Tinemaha	z.	18·6	337	e 4 9	−12	—	—	—	—	—
Fresno	z.	18·9	333	e 4 18a	− 6	—	—	—	—	—
Lick	z.	20·2	330	e 4 39	0	—	—	e 4 50	?	—
Salt Lake City		20·5	352	e 4 43	+ 1	e 8 35	+ 8	—	—	e 10·8
Santa Clara	E.	20·6	330	—	—	e 8 43	+14	—	—	e 11·6
Berkeley		21·0	330	e 4 46k	− 1	e 8 42	+ 5	—	—	e 10·0
Reno		21·3	336	e 4 49k	− 1	—	—	e 8 6	?	e 11·1
Logan		21·4	354	e 4 53	+ 2	—	—	—	—	e 9·0
Mineral	z.	22·7	334	e 5 4	0	—	—	—	—	—
Shasta Dam		23·3	333	e 5 9	− 1	—	—	—	—	—
Chicago		27·9	34	—	—	e 11 16	+39	—	—	e 11·9
Hungry Horse		28·2	353	e 5 52	− 4	—	—	—	—	—
Cleveland	z.	31·2	41	i 6 22a	− 1	—	—	—	—	—
Palisades		36·0	47	—	—	e 15 17	SS	—	—	i 19·4
Ottawa	z.	36·9	39	e 7 11	− 1	—	—	—	—	—
Harvard		38·2	46	e 7 23	0	—	—	—	—	e 21·6
College		51·3	340	e 9 14	+ 6	—	—	—	—	e 26·0

Long waves were also recorded at Scoresby Sund and other American stations.

Oct. 2d. Readings also at 0h. (Nanking, Hungry Horse, and near Garm), 3h. (Rome and near Garm), 5h. (Christchurch, Wellington, and near Ashkabad), 6h. (College), 7h. (Nanking), 8h. (Nanking (2) and Hungry Horse), 9h. (Andijan, Fergana, Samarkand, Stalinabad, near Kulyab, and Obi-garm), 10h. (Philadelphia, near Balboa Heights, Bogota, Chinchina, near Kulyab, and Obi-garm), 11h. (Nanking), 12h. (La Paz), 13h. (Tucson, Overton (2), Pierce Ferry, Hungry Horse, Tamanrasset, and near Garm (2)), 14h. (College and Pretoria), 16h. (near Granada and Malaga), 17h. (Nanking and Hungry Horse), 18h. (Brisbane and Wellington), 21h. (Overton, Pierce Ferry, Palisades, and near San Juan), 23h. (Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Philadelphia, and Collmberg).

Oct. 3d. 12h. 40m. 7s. Epicentre 65°·5N. 128°·6W.

$A = -·2602$, $B = -·3259$, $C = +·9089$; $\delta = +1$; $h = -11$;
$D = -·782$, $E = +·624$; $G = -·567$, $H = -·710$, $K = -·417$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		8·1	274	e 2 0	− 2	e 3 36	+ 1	—	—	e 4·2
Sitka		9·1	204	e 2 29	+15	i 4 47	S_g	—	—	e 5·2
Resolute Bay		14·4	36	e 3 24	− 3	5 55	−14	—	—	7·3
Victoria		17·3	167	4 1	− 3	—	—	—	—	e 9·0
Saskatoon		17·4	130	i 7 1	?	i 7 21	+ 2	—	—	—
Seattle		18·2	165	e 4 16	0	—	—	—	—	e 9·4
Hungry Horse		18·8	148	e 4 19	− 4	e 7 27	−23	—	—	e 8·4
Bozeman		22·1	145	e 5 7	+ 8	e 8 59	+ 1	—	—	e 10·2
Shasta Dam		25·1	168	e 5 28	0	—	—	—	—	—
Mineral	Z.	25·5	167	e 5 31	− 1	—	—	—	—	—
Logan		25·6	149	e 5 34	+ 2	—	—	—	—	e 12·8
Rapid City	E.	25·6	134	e 5 37	+ 5	e 10 0	+ 1	e 6 14	PP	e 11·0
Berkeley	Z.	27·9	168	e 5 54a	0	—	—	—	—	—
Lick	Z.	28·5	168	i 5 59k	0	—	—	—	—	—
Fresno	Z.	29·3	165	e 6 5	− 1	—	—	—	—	—
Haiwee	Z.	30·1	162	e 6 13	0	—	—	—	—	—
Overton	Z.	30·2	156	i 6 14	0	e 10 39	−34	—	—	e 16·3
Boulder City		30·7	156	e 6 11	− 8	—	—	—	—	—
Pierce Ferry		30·7	155	i 6 18	− 1	—	—	—	—	e 16·2
Pasadena	Z.	32·0	163	i 6 29	− 1	—	—	—	—	—
Riverside	Z.	32·3	163	i 6 32	− 1	—	—	—	—	—
Palomar		33·0	161	i 6 38	− 1	—	—	—	—	—
Florissant		34·6	122	—	—	e 13 59	SS	—	—	e 17·9
Ottawa		34·7	99	6 53	− 1	14 6	SS	17 14	S_cS	—
St. Louis		34·8	122	e 6 52	− 2	e 13 46	?	—	—	e 18·0
Shawinigan Falls	N.	35·0	95	—	—	e 13 58	?	—	—	—
Tucson		35·0	152	e 6 56	0	—	—	—	—	e 19·0
Seven Falls	E.	35·3	93	—	—	e 14 8	?	—	—	—
Little Rock		37·5	127	—	—	e 16 33	SSS	—	—	e 18·4
Harvard		38·8	97	i 7 29	+ 1	—	—	—	—	e 28·0
Weston		39·0	97	i 7 30	0	—	—	—	—	—
Alicante		68·9	42	e 10 46	−23	e 19 46	−27	20 8	S	e 30·9
Granada		69·1	45	11 16	+ 6	—	—	14 11	PP	—
Tamanrasset	Z.	85·3	42	e 12 41	+ 1	—	—	—	—	—

Additional readings :—
Seattle i = 4m.41s.
Mineral eZ = 6m.5s.
Berkeley eZ = 6m.38s.
Lick eZ = 6m.13s.
Boulder City e = 6m.16s.
Long waves were also recorded at other American stations.

Oct. 3d. 23h. 1m. 54s. Epicentre 27°·2N. 97°·4E. (as on 1950, Aug. 25d.).

$A = -·1147$, $B = +·8832$, $C = +·4546$; $\delta = -14$; $h = +3$;
$D = +·992$, $E = +·129$; $G = -·059$, $H = +·451$, $K = -·891$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	9·4	243	e 2 37	PPP	e 4 8	+ 1	i 4 19	SS	3·9
Dehra Dun	N.	17·3	286	e 10 12?	?	e 12 30?	S_cP	—	—	—
New Delhi		17·9	279	e 4 5	− 7	7 33	+ 3	4 18	PP	7·1
Murgab		22·6	306	5 7	+ 4	—	—	—	—	—
Almata		23·1	320	i 5 8	0	i 9 23	+ 7	—	—	—
Poona		23·3	253	i 5 9	− 1	9 21	+ 1	5 31	PP	10·2
Bombay		24·1	255	e 5 19	+ 1	e 9 33	− 1	9 38	Q	11·2
Frunse		24·3	316	e 5 18	− 2	i 9 43	+ 6	—	—	—
Andijan		24·7	309	e 5 23	− 1	9 54	+10	—	—	—
Fergana		24·9	309	e 5 24	− 2	e 10 5	sS	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	25·3	233	e 5 36	+ 6	e 9 59	+ 5	—	—	12·1
Kulyab		25·5	302	e 5 28	− 4	e 10 5	+ 8	—	—	—
Obi-garm		25·8	304	i 5 34	0	—	—	—	—	—
Stalinabad		26·5	304	i 5 38	− 3	—	—	—	—	—
Tashkent		27·1	309	i 5 45	− 1	—	—	—	—	—
Tchimkent		27·2	312	i 5 44	− 3	—	—	—	—	—
Samarkand		28·1	304	e 5 37	−18	—	—	—	—	—
Mary		31·6	299	e 6 27	+ 1	—	—	—	—	—
Djakarta		34·4	163	e 7 1	+10	e 12 40	+21	—	—	—
Ashkabad		34·5	298	e 6 49	− 3	12 26	+ 6	—	—	—
Bandong		35·3	162	e 8 43	PP	—	—	—	—	19·7
Kizyl-Arvat		36·2	300	e 7 7	+ 1	—	—	—	—	—
Sverdlovsk		39·5	330	e 7 30	− 4	13 32	− 5	—	—	—
Lenkoran		41·9	299	8 17	+23	—	—	—	—	—
Grozny		44·4	306	e 8 8	− 6	e 14 47	− 2	—	—	—
Tiflis		45·1	303	e 8 19	− 1	—	—	—	—	—
Moscow		51·1	322	e 9 5	− 1	e 16 23	− 1	—	—	—
Ksara		52·7	293	i 9 21	+ 3	i 16 50	+ 4	—	—	—
Pulkovo		55·4	326	e 9 37	− 1	e 17 22	0	—	—	—
Istanbul		56·9	303	e 9 47	− 2	e 17 36	− 6	—	—	—
Helwan		57·4	290	e 9 50	− 3	i 17 42	− 7	e 19 40	S_cS	—
Lwow		59·2	314	e 10 4	− 1	18 9?	− 3	—	—	—
Warsaw		60·8	317	e 10 3	−13	e 18 44	PS	12 26	PP	e 31·1
Skalnate Pleso		61·8	314	e 10 27	+ 4	e 18 11	−35	—	—	e 27·1
Upsala		61·8	326	e 10 24	+ 1	e 18 44	− 2	—	—	e 31·1
Belgrade		62·4	308	—	—	e 18 56	+ 3	—	—	e 41·7
Prague		65·3	316	e 10 45	− 1	e 19 13	−16	e 13 31	PP	e 32·1
Potsdam		65·6	318	—	—	e 27 6?	SSS	—	—	e 34·1
Taranto		65·8	305	e 13 20	PP	—	—	—	—	—
Collmberg		65·9	316	e 10 41	− 9	e 19 34	− 3	e 13 28	PP	e 27·6
Jena	E.	66·8	316	e 10 55	− 1	—	—	e 13 30	PP	—
Triest		66·8	311	e 11 1?	+ 5	e 19 44	− 4	—	—	—
De Bilt		68·7	319	—	—	e 20 36	PS	—	—	e 37·1
Rome		68·8	307	e 11 26	+18	20 6	− 5	24 33	SS	—
Stuttgart		68·9	315	e 11 7	− 2	e 20 12	− 1	e 11 30	P_cP	e 37·1
Florence, Xim.		69·1	310	e 11 42	P_cP	i 20 14	− 1	—	—	—
Strasbourg		69·9	315	e 11 13	− 2	e 20 26	+ 2	e 13 54	PP	e 33·1
Paris		73·1	317	i 11 32	− 2	—	—	i 11 56	P_cP	e 39·1
Kew		73·7	320	e 11 38	0	e 21 10	+ 2	e 22 11	SP	e 38·1
College		75·4	24	e 11 46	− 1	—	—	e 21 25	− 2	e 38·8
Rathfarnham Castle		76·3	323	e 11 46	− 6	e 21 26	−11	—	—	e 39·6
Algiers Univ.	z.	77·5	304	e 11 57	− 2	—	—	e 14 43	PP	—
Resolute Bay		78·1	4	—	—	e 22 0	+ 4	—	—	—
Alicante		79·4	308	11 45	−24	21 39	−31	14 35	PP	e 37·0
Tamanrasset	z.	81·5	292	e 12 19	− 2	—	—	e 15 23	PP	—
Granada		82·1	308	i 13 4a	+40	i 22 34	− 4	28 13	SS	40·6
Malaga	z.	82·9	308	i 13 10a	+42	—	—	—	—	47·0
Pretoria	z.	84·9	238	e 12 38	0	—	—	—	—	—
Pietermaritzburg	z.	85·4	234	i 12 11	−29	—	—	—	—	—
Hungry Horse		99·7	20	e 13 48	+ 1	—	—	e 17 48	PP	—
Overton	z.	109·9	27	e 19 18	PP	—	—	—	—	—
Pierce Ferry		110·4	26	e 18 47	[+13]	—	—	—	—	—
Tucson		115·1	26	e 18 46	[+ 3]	—	—	—	—	—
Bogota	z.	147·3	344	i 19 48	[+ 5]	e 30 4	{+ 1}	—	—	—
Chinchina	z.	147·3	347	e 19 47	[+ 4]	—	—	—	—	—
La Paz		162·9	306	e 21 30	PKP_2	i 26 36	[−31]	i 25 34	PP	—

Additional readings :—
New Delhi PPPEN =4m.26s., SSSE =7m.44s.
Poona PPPEZ =5m.42s., eSE =9m.2s., SSEN =9m.35s., SSSEN =9m.50s., P_cSE = 12m.27s., S_cSE =15m.59s.
Warsaw ePEZ =10m.17s., ePPP =14m.0s.
Skalnate Pleso e =21m.6s.
Belgrade e =26m.44s.
Prague eSSS? =26m.24s., and other e readings without phase.

Continued on next page.

Collmberg eE =10m.45s., eZ =10m.54s., eE =11m.55s., eN =12m.34s., ePPPN = 14m.23s., eE =16m.29s., eSN =19m.15s., eE =21m.59s.
Jena eP_cP?E =11m.10s., eP_cP?N =11m.14s., eN =13m.53s.
Rome PP =13m.58s.
Stuttgart eZ =11m.14s. and 12m.24s., eS_cS =21m.6s.
Strasbourg e =11m.16s., eP_cP =11m.33s., e =12m.26s., eSSS =28m.36s.
Paris i =11m.36s., 11m.40s., 12m.22s., and 14m.11s.
Algiers Univ. eZ =14m.18s.
Tamanrasset eP_cPZ =12m.27s., eZ =13m.1s., and 14m.25s., ePPPZ =17m.16s.
Long waves were also recorded at Nanking, Aberdeen, Jersey, Tortosa, Harvard, Weston, and Palisades.

Oct. 3d. Readings also at 2h. (Calcutta, Nanking, Vladivostok, Hungry Horse, Harvard, Weston, and near San Juan), 3h. (Pierce Ferry, Rome, and near Garm), 4h. (Fergana, Samarkand, near Andijan, Garm, Obi-garm, and Stalinabad). 5h. (Collmberg and near Prague), 6h. (Hungry Horse, Rome, Ksara, Nanking, Vladivostok, near Garm, and near Florence Xim), 7h. (De Bilt, Kew, Copenhagen, Potsdam, Strasbourg, Warsaw, and near Garm), 9h. (Christchurch, Wellington, Ottawa, Weston, Harvard, Philadelphia, Washington, Palisades, Cleveland, Saskatoon, Sitka, Seven Falls, Butte, Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Shasta Dam, Mineral, Hungry Horse, Resolute Bay, near College, and near Garm), 10h. (near Andijan), 11h. (Rome (2). Stuttgart, near Florence Xim, Prato, near Apia, College, Shasta Dam, and near Ukiah), 12h. (Haiwee, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Mineral, Shasta Dam, Hungry Horse, College, Tamanrasset, Collmberg, Stuttgart, and Calcutta), 16h. (near Garm), 17h. (near Garm and Obi-garm), 18h. (Salt Lake City, Ashkabad, and near Garm), 19h. (near Garm (3) and near Istanbul), 22h. (Stuttgart and Triest), 23h. (Tamanrasset, near Huancayo, and near Istanbul).

Sept. 4d. 18h. 1m. 36s. Epicentre 19°·0S. 169°·5E. Foreshock of 18h. 4m. (as on 1950, Aug. 30d.).

A = −·9304, B = +·1724, C = −·3236; δ = +8; h = +5.

		△	Az.	P.	O−C.
		°	°	m. s.	s.
Brisbane	E.	17·3	238	e 4 6	+ 2
Apia		18·5	78	e 4 18	− 1
Riverside	Z.	87·2	53	e 12 48	− 1
Overton	Z.	90·5	53	e 13 7	+ 2
Pierce Ferry		90·6	52	e 13 4	− 1
Tucson		91·6	57	e 13 11	+ 1
Bombay		102·0	286	e 13 24?	−33
Stuttgart	Z.	146·3	336	e 19 41	[0]

Oct. 4d. 18h. 4m. 3s. Epicentre 19°·0S. 169°·5E. (as on 1950 August 30d. and 18h. 1m. above).

A = −·9304, B = +·1724, C = −·3236; δ = +8; h = +5;
D = +·182, E = +·983; G = +·318. H = −·059, K = −·946.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		17·3	238	i 4 4	0	i 7 32	+16	—	—	—
Apia		18·5	78	e 4 17	− 2	e 7 37	− 7	—	—	—
Riverview		22·0	225	i 4 57a	− 1	i 9 4	+ 8	i 5 10	pP	e 10·8
Wellington		22·7	171	—	—	e 9 9	0	11 57	Q	12·4
Christchurch		24·6	175	e 5 57	PP	e 9 47	+ 5	—	—	e 10·8
Vladivostok		70·8	333	e 11 18	− 2	i 20 38	+ 3	—	—	—
Berkeley		85·4	48	e 12 41k	+ 1	—	—	—	—	e 38·2
Santa Clara	E.	85·4	48	e 17 21	pPP	—	—	—	—	e 40·4
Lick	Z.	85·6	48	e 12 41a	0	—	—	—	—	—
Pasadena	Z.	86·7	53	e 12 47	0	—	—	—	—	—
Shasta Dam		86·7	46	12 46	− 1	—	—	—	—	—
Mineral	Z.	87·0	46	e 12 47	− 1	—	—	—	—	—
Riverside	Z.	87·2	53	e 12 48	− 1	—	—	—	—	—
Palomar		87·4	55	e 12 53	+ 3	—	—	—	—	—
Haiwee	Z.	87·7	51	e 12 52	0	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno	z.	87·9	48	e 12 54 k	+ 1	—	—	—	—	—
Tinemaha	z.	87·9	51	e 12 53	0	—	—	—	—	—
College		89·7	17	e 12 59	− 2	e 23 37	[+ 6]	—	—	e 39·4
Boulder City		89·9	53	e 13 3	+ 1	—	—	—	—	—
Overton	z.	90·5	53	i 13 5	0	—	—	—	—	—
Pierce Ferry		90·6	52	i 13 5	0	—	—	—	—	—
Tucson		91·6	57	e 13 11	+ 1	—	—	17 3	PP	e 42·0
Huancayo		109·1	111	—	—	e 34 29	SS	e 38 23	SSS	e 49·7
Ksara		136·3	298	e 22 15	PP	38 21	?	—	—	—
Istanbul		139·8	312	e 20 46	?	—	—	—	—	83·0
Prague		143·2	333	e 20 58	?	—	—	e 22 17	PP	—
Rathfarnham Castle		145·6	355	e 19 44	[+ 4]	e 32 27	?	e 23 7	PP	—
Stuttgart	z.	146·3	336	e 19 42	[+ 1]	—	—	—	—	—
Triest		146·7	328	i 19 47 a	[+ 5]	—	—	—	—	—
Strasbourg		147·0	337	i 19 48	[+ 5]	—	—	—	—	—
Zürich		147·7	336	e 19 47	[+ 3]	—	—	—	—	—
Basle		147·9	337	e 19 49	[+ 5]	—	—	—	—	—
Taranto		148·0	318	—	—	e 27 37	[+46]	—	—	—
Paris		148·5	343	e 19 50	[+ 5]	—	—	—	—	—
Rome		150·0	324	e 23 55	PP	e 43 35	SS	—	—	e 84·2
Tamanrasset	z.	164·6	287	e 20 11	[+ 6]	e 24 57	PP	e 21 8	PKP_2	—

Additional readings :—
Riverview iE =5m.13s., iPPPZ =5m.38s., iN =6m.6s., isSE =9m.22s.
Berkeley eZ =12m.56s.
Huancayo eQ =43m.25s.
Rathfarnham Castle eZ =19m.0s.?, Z =20m.3s., ePPEN =21m.34s.
Stuttgart ePKPZ =19m.46s., eZ =19m.59s.
Triest i =20m.2s.
Strasbourg e =20m.19s. and 20m.26s.
Zürich e =20m.37s.
Basle e =20m.42s.
Paris i =19m.55s.
Rome e =68m.35s.
Long waves were also recorded at Perth, Alicante, Granada, and other American stations.

Oct. 4d. Readings also at 0h. (Overton, Pierce Ferry, College, Collmberg, and near Huancayo), 4h. (near Borzhomi, Erevan, Leninakan, Tiflis, and near Garm), 6h. (Mount Wilson, Pasadena, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Reno, Lincoln, near Garm, and near Leninakan), 7h. (Overton, Pierce Ferry, and Tacubaya), 8h. (Tamanrasset), 10h. (Pierce Ferry), 12h. (Andijan, Fergana, near Garm, Kulyab, Obi-garm, and Stalinabad), 13h. (Tucson, Overton, Pierce Ferry, Lick, Kulyab, Tchimkent, near Andijan, Fergana, Garm, Obi-garm, Samarkand, and Stalinabad), 14h. (Resolute Bay and College), 16h. (near Garm (2), Obi-garm, and Stalinabad), 17h. (Brisbane, Riverview, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, Tamanrasset, near Garm (3), Obi-garm, and Stalinabad), 21h. (near Grozny), 22h. (near Obi-garm and Stalinabad), 23h. (Tamanrasset, Frunse, near Fergana, and Garm).

Oct. 5d. 0h. 41m. 9s. Epicentre 18°·5S. 169°·1E. (as on 1950, April 3d.).

$A = -·9319$, $B = +·1795$, $C = -·3154$; $\delta = +14$; $h = +5$;
$D = +·189$, $E = +·982$; $G = +·310$, $H = -·060$, $K = -·949$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		17·3	236	i 4 9 a	+ 5	e 7 28	+12	i 4 20	PP	—
Apia		18·9	80	e 4 18	− 6	e 7 51	− 2	—	—	—
Auckland	N.	19·0	164	i 4 44	+18	—	—	—	—	e 9·6
Arapuni		20·3	166	e 3 59	−41	—	—	—	—	—
Tuai	N.	21·4	163	e 4 49	− 2	e 8 53	+ 8	—	—	—
Riverview		22·1	222	i 4 58 k	− 1	i 9 10	+12	i 5 31	PP	e 11·0
Wellington		23·2	170	i 5 6 a	− 3	8 38	−40	6 27	PP	11·4
Kaimata	N.E.	24·0	177	e 5 18	+ 1	—	—	—	—	—
Christchurch		25·1	175	e 5 25	− 3	8 29	?	—	—	10·1
Perth		49·6	244	i 9 16	+21	i 18 46	S_cS	i 14 44	P_cS	i 24·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Honolulu		51·1	42	—	—	e 16 31	+ 7	e 18 19	ScS	e 21·4
Bandong		60·8	273	e 10 23	+ 7	—	—	—	—	—
Djakarta		61·8	274	e 10 25	+ 2	e 18 56	+10	—	—	—
Vladivostok		70·2	333	e 11 19	+ 2	i 20 38	+10	—	—	—
Branner	z.	85·2	49	e 12 38a	− 1	—	—	—	—	—
Santa Clara		85·3	49	e 12 34	− 6	e 22 44	−26	—	—	e 39·2
Ukiah		85·3	47	—	—	e 23 25	+15	—	—	e 34·8
Berkeley		85·4	49	i 12 38a	− 2	e 23 14	+ 3	e 24 11	PPS	e 38·8
Fresno	z.	86·6	50	e 12 42	− 4	—	—	e 15 33	PP	—
Shasta Dam		86·6	45	e 12 44	− 2	—	—	—	—	—
Pasadena		86·7	53	e 12 43	− 4	e 23 21	− 3	—	—	e 39·2
Mineral	z.	87·0	46	e 12 46	− 2	—	—	—	—	—
Riverside	z.	87·2	54	i 12 46	− 3	—	—	—	—	—
Palomar	E.	87·4	54	i 12 49	− 1	—	—	—	—	—
Haiwee	z.	87·7	52	e 12 53	+ 1	—	—	—	—	—
Reno	z.	87·8	47	e 12 51a	− 1	—	—	—	—	—
Tinemaha	z.	87·9	51	e 12 50	− 3	—	—	—	—	—
Sitka		88·3	27	—	—	e 23 47	+ 8	e 29 35	SS	e 36·4
Boulder City		89·3	52	e 13 0	+ 1	—	—	—	—	—
College		89·4	17	e 13 0	0	e 23 20	[− 9]	e 16 22	PP	e 36·9
Victoria		89·7	38	13 12	+11	e 23 54	+ 2	—	—	—
Seattle		89·9	40	i 12 3	−59	—	—	—	—	e 38·8
Irkutsk		90·0	326	e 13 7	+ 4	e 23 51	− 3	—	—	—
Overton	z.	90·5	52	e 13 2	− 3	e 38 18	P'P'	e 16 3	PP	—
Pierce Ferry		90·6	52	i 13 3	− 2	—	—	e 38 33	P'P'	—
Colombo	E.	91·4	277	e 17 26	PP	—	—	—	—	—
Tucson		91·6	57	e 13 8	− 2	e 24 10	+ 1	e 17 11	PP	e 41·7
Salt Lake City		93·9	48	—	—	e 24 15	−14	—	—	e 43·0
Kodaikanal	E.	94·7	279	—	—	e 24 20	{ + 4}	—	—	—
Hungry Horse		95·2	41	e 13 39	+12	—	—	e 17 20	PP	—
Butte	N.	95·3	43	—	—	e 24 41	0	—	—	e 44·0
Bozeman		96·2	44	—	—	e 24 6	[− 2]	e 31 48	SS	e 44·0
Poona	E.	100·5	286	e 18 19	PP	24 38	[+ 9]	25 4	SKKS	—
Rapid City	E.	101·0	47	—	—	e 25 53	+24	—	—	e 48·2
Bombay		101·5	286	—	—	e 24 40	[+ 6]	—	—	—
Lincoln	E.	105·0	51	—	—	e 26 29	+27	e 33 25	SS	e 49·0
Fergana		107·2	308	e 18 49	PP	—	—	—	—	—
Stalinabad		109·2	306	e 19 4	PP	—	—	—	—	—
Tashkent		109·2	308	e 19 7	PP	i 25 16	[+ 7]	i 28 40	PS	—
Resolute Bay		109·3	16	—	—	e 28 24	PS	—	—	34·4
St. Louis		109·5	55	—	—	e 26 52	S	e 33 59	SS	e 52·8
Huancayo		109·6	111	e 14 21	P	e 24 58	[−13]	e 19 18	PP	e 43·4
La Plata		110·6	140	—	—	25 27	[+12]	34 27	SS	51·8
Chicago		111·8	51	e 28 48	PS	e 34 53	SS	—	—	e 53·6
La Paz		113·8	118	i 19 27	PP	29 3	PS	—	—	53·0
Sverdlovsk		115·4	324	e 19 50	PP	e 25 40	[+ 7]	e 26 55	SKKS	—
Cleveland	E.	116·4	52	—	—	e 29 29	PS	e 32 20	PPS	54·6
Bogota		116·9	94	e 30 7	PS	e 37 12	?	—	—	46·8
Pennsylvania	E.	119·2	52	e 29 46	PS	e 36 31	SS	—	—	—
Ottawa	z.	120·6	47	e 18 51	[− 3]	—	—	—	—	—
Philadelphia		121·2	53	—	—	e 38 1?	SS	—	—	e 51·1
Palisades		122·2	52	e 20 52	PP	e 37 16	SS	—	—	e 58·2
Vermont		122·7	48	—	—	e 37 4	SS	—	—	e 54·8
Seven Falls	E.	123·7	44	—	—	e 37 38	SS	—	—	—
Tiflis		127·6	309	e 19 11	[+ 4]	e 26 16	[+ 3]	e 21 19	PP	—
San Juan		127·8	80	e 21 29	PP	—	—	—	—	e 59·3
Bermuda		130·0	63	—	—	e 37 18	SS	—	—	e 54·1
Yalta		134·4	315	e 21 59	PP	e 22 51	PKS	e 31 47	SKSP	—
Ksara		136·5	299	i 19 38	[+14]	—	—	23 5	PKS	—
Istanbul		139·1	311	e 19 29	[0]	e 33 19	PS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan	z.	140·0	294	19 37	[+ 6]	—	—	22 42	PP	—
Potsdam		141·3	337	e 19 20	[−13]	—	—	—	—	65·8
Collmberg	z.	142·2	335	e 19 30	[− 4]	—	—	e 22 42	PP	—
Prague		142·6	333	e 19 38	[+ 3]	e 23 12	PKS	e 22 30	PP	e 61·8
Jena	E.	143·0	336	e 19 33?	[− 3]	—	—	e 22 24	PP	—
Athens		144·1	310	i 19 32a	[− 6]	—	—	i 19 40	PKP	—
Rathfarnham Castle		145·1	355	e 19 42	[+ 3]	e 33 31	PS	—	—	—
Stuttgart		145·7	336	e 19 40	[0]	—	—	e 42 51	SS	e 66·8
Karlsruhe	z.	145·8	337	e 19 40	[− 1]	—	—	—	—	—
Strasbourg		146·4	338	e 19 44	[+ 2]	—	—	e 53 51?	Q	e 63·8
Chur		147·1	335	e 19 45k	[+ 2]	—	—	—	—	—
Zürich		147·1	336	e 19 44	[+ 1]	—	—	—	—	—
Basle		147·3	336	e 19 46	[+ 3]	e 32 45	PS	—	—	—
Padova		147·8	328	e 19 58	[+14]	—	—	—	—	—
Paris		147·9	343	i 19 47	[+ 3]	i 23 33	PKS	i 19 58	PKP_2	e 73·8
Bologna		148·1	329	e 20 2	[+18]	e 30 57	{+49}	e 23 56	PP	—
Florence Xim		149·0	328	e 23 8	PKS	i 40 9	SS	—	—	—
Rome		149·3	326	e 19 49	[+ 3]	e 30 9	{− 5}	e 20 3	PKP_2	—
Toledo		157·9	346	e 20 32	PKP_2	—	—	e 24 41	PP	83·7
Algiers Univ.	z.	158·1	328	e 20 10	[+11]	e 22 52	PKS	e 20 34	PKP_2	—
Alicante		158·2	338	19 40	[−19]	26 36	[−27]	20 16	PKP_2	e 70·9
Granada		160·3	343	21 0k	PKP_2	i 31 48	{+34}	38 12	PPS	86·0
Tamanrasset	z.	164·1	292	i 20 6k	[+ 1]	e 24 48	PP	i 21 2	PKP_2	—

Additional readings :—
Brisbane iSS = 7m.39s.
Riverview iZ = 5m.5s., iPPPE = 5m.41s., iZ = 9m.14s., iE = 9m.18s., iSSN = 9m.26s.
Wellington iZ = 7m.34s.
Christchurch iPNZ = 5m.29s., eEN = 8m.47s.
Perth i = 11m.21s. and 20m.56s.
Berkeley eSSE = 29m.9s.
Fresno eNZ = 13m.0s., eZ = 14m.18s.
Pasadena iZ = 13m.8s.
Riverside iZ = 13m.4s. and 13m.10s.
Reno eZ = 15m.21s.
Tinemaha iZ = 13m.13s.
College eSS = 29m.28s.
Seattle i = 12m.10s., 13m.2s., 13m.21s., 13m.32s., 13m.55s., and 14m.14s.
Tucson ePS = 25m.14s., eSS = 30m.18s., e = 30m.47s., ePKP,PKP = 37m.18s.
Salt Lake City e = 24m.41s.
Bozeman e = 24m.24s.
Poona ePPPE = 20m.27s., SKSE = 25m.20s., eSE = 25m.30s., PSE = 27m.8s., PPSE = 27m.58s., SSPE = 32m.35s.
Tashkent eSS = 34m.28s.
St. Louis e = 27m.3s.
Huancayo eS = 26m.28s., e = 28m.29s., ePPS = 29m.11s., eSS = 32m.57s., e = 34m.17s. and 35m.1s., eSSS = 38m.3s.
La Plata N = 26m.21s., PPSEN = 28m.27s., PSSN = 34m.51s., SSSEN = 38m.45s., QE = 44m.27s.
La Paz iZ = 19m.58s.
Sverdlovsk ePS = 29m.32s., eSS = 35m.56s.
Pennsylvania iN = 36m.53s.
Philadelphia e = 46m.2s.?
Helwan eZ = 19m.45s.
Collmberg eZ = 19m.37s. and 21m.14s.
Prague e = 20m.13s., 20m.41s., 20m.55s., 21m.11s., and 22m.1s.
Jena eE = 19m.37s.
Rathfarnham Castle eZ = 20m.1s.
Stuttgart eZ = 19m.49s., e = 19m.54s., eZ = 20m.25s. and 21m.24s.
Strasbourg i = 19m.50s., 19m.57s., and 20m.54s., e = 22m.46s.
Basle e = 21m.17s.
Padova e = 20m.35s.
Paris i = 19m.52s., 21m.3s., and 23m.48s.
Rome e = 23m.9s., ePPZ = 23m.29s., SS = 42m.39s.
Alicante PP = 23m.44s., PPP = 27m.30s., PPS = 37m.20s., SS = 43m.44s., SSS = 49m.42s., Q = 64m.14s.
Granada SKP = 24m.36s., iSS = 46m.0s., SSS = 50m.54s., Q = 76·2m.
Tamanrasset eZ = 21m.49s., ePPPZ = 28m.38s.
Long waves were also recorded at New Plymouth, Galerazamba, Harvard, Weston, Washington, Columbia, Ivigtut, and other European stations.

Oct. 5d. 16h. 9m. 42s. Epicentre 10°·4N. 85°·7W. Depth of focus 0·015.
(as on 1949, November 13d.).

Damage at Punta Arenas. Casualties at San José.
Bull. Seismo. Soc. Amer., Vol. 41, No. 1, Jan. 1951, p. 68.

$A = +·0738$, $B = -·9810$, $C = +·1794$; $\delta = -1$; $h = +6$;
$D = -·997$, $E = -·075$; $G = +·013$, $H = -·179$, $K = -·984$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		6·2	104	i 1 11	−19	(i 2 43)	+ 2	—	—	i 2·7
Galerazamba		10·3	87	i 2 14	−11	i 4 18	− 1	i 2 24	pP	—
Merida		11·1	341	i 2 33k	− 3	i 3 48	−50	—	—	—
Chinchina		11·3	118	i 2 29	−10	i 4 53	+10	i 2 36	PP	—
Oaxaca		12·6	303	i 4 7a	+71	i 5 47	+34	—	—	—
Bogota		12·9	116	i 2 36?	−24	i 4 53?	−28	—	—	—
Vera Cruz		13·4	312	i 3 10a	+ 4	i 5 58	+26	—	—	—
Puebla		14·8	307	e 3 33	+ 9	i 6 18	+13	—	—	—
Port au Prince		15·3	57	i 3 28	− 2	i 6 23	+ 7	6 53	SS	e 7·3
Tacubaya		15·8	305	i 3 38a	+ 2	i 6 58	+30	—	—	—
Miami		16·2	18	i 3 41	0	—	—	—	—	—
Guadalajara		19·8	304	e 4 26	+ 4	e 8 6	+13	—	—	—
Manzanillo		20·0	299	e 4 27	+ 3	e 8 17	+20	—	—	—
San Juan		20·5	66	i 4 23	− 7	e 8 25	+18	—	—	e 9·5
Roosevelt Roads		20·9	64	i 4 28	− 6	—	—	—	—	—
Columbia		23·0	9	i 5 5	+11	i 9 24	+33	i 5 33	PP	i 10·5
Mazatlan		23·5	305	e 5 3	+ 4	i 9 19	+19	—	—	—
Fort de France		24·3	78	i 5 5	− 2	—	—	—	—	—
Huancayo		24·6	157	i 5 5	− 5	i 9 23	+ 5	i 5 21	pP	—
Little Rock		25·0	347	i 5 13	0	i 9 56	sS	—	—	—
St. Louis		28·4	353	i 5 42	− 2	i 10 54	sS	i 5 49	pP	—
Cincinnati		28·6	3	i 5 46	0	—	—	—	—	—
Bermuda		29·1	40	i 5 55	+ 4	i 11 12	sS	—	—	i 11·9
Georgetown		29·4	15	i 5 52	− 1	i 10 31	− 5	i 7 26	PPP	—
Washington		29·4	15	i 5 52	− 1	i 10 31	− 5	i 6 35	PP	i 13·6
Pittsburgh		30·4	9	e 6 2	0	—	—	—	—	—
Philadelphia		30·9	17	i 6 7	0	i 10 34	−26	—	—	i 11·6
Pennsylvania		31·0	12	e 6 4	− 4	—	—	i 6 28	pP	—
Cleveland	N.	31·2	6	e 6 8	− 1	i 11 49	sS	—	—	14·8
Chicago		31·3	357	i 6 6	− 4	i 10 52	−14	i 7 4	PP	i 12·7
Lincoln	E.	31·8	347	i 6 12	− 2	e 10 54	−20	e 7 10	PP	i 11·9
Tucson		31·8	317	e 6 15	+ 1	i 11 40	sS	i 7 40	PP	i 13·3
La Paz		31·9	147	i 6 16k	+ 1	i 11 11	− 5	i 7 17	PP	15·5
Fordham		32·1	19	e 6 18	+ 1	i 11 35	+16	i 11 52	pS	i 18·0
Palisades		32·2	19	i 6 17a	− 1	i 11 36	+16	i 7 21	PP	—
Buffalo		32·9	10	i 5 24	−60	i 12 45	SS	e 6 29	P	—
Harvard		34·3	20	i 6 34	− 2	e 11 43	−10	i 6 51	pP	—
Weston		34·3	20	i 6 34	− 2	i 11 38	−15	i 6 58	pP	—
Vermont		35·6	16	i 6 50	+ 3	i 12 29	+16	i 8 0	PP	i 14·5
Ottawa		35·9	12	i 6 47a	− 2	e 12 37	+20	i 7 3	pP	—
Pierce Ferry		36·2	320	i 6 55	+ 3	i 12 44	pS	i 8 20	PP	—
La Jolla		36·6	313	i 6 59	+ 4	—	—	—	—	—
Palomar		36·6	315	i 6 59	+ 4	e 13 13	ScP	i 9 16	PcP	—
Boulder City		36·7	320	e 6 58	+ 2	e 13 12	sS	e 9 8	PcP	e 16·3
Overton	Z.	36·8	320	i 7 0	+ 3	i 13 13	sS	—	—	—
Rapid City	E.	36·8	339	i 6 57	0	i 12 41	+10	i 8 15	PP	e 14·4
Antofagasta		37·0	157	e 6 59	0	e 15 0	SS	—	—	—
Riverside		37·3	314	i 7 4a	+ 3	e 12 39	0	9 18	PcP	—
Shawinigan Falls	N.	37·7	15	7 2	− 3	12 42	− 3	8 36	PP	—
Mount Wilson		37·9	314	i 7 10a	+ 4	i 13 18	ScP	i 9 19	PcP	—
Pasadena		38·0	314	i 7 10a	+ 3	i 12 52	+ 2	i 8 31	PP	i 16·1
Salt Lake City		38·1	328	i 7 9	+ 1	e 12 50	− 1	e 8 42	PP	e 15·9
Logan		38·7	329	i 7 11	− 2	e 13 24	PcS	i 8 41	PP	i 14·4
Seven Falls	E.	38·7	17	i 7 12	− 1	13 9	+ 9	7 26	pP	—
Haiwee		38·9	317	i 7 17a	+ 2	i 13 20	PcS	i 9 33	PcP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Halifax		39·1	25	7 19	+ 3	13 13	+ 7	8 52	PP	—
Santa Barbara		39·2	313	i 7 19	+ 2	e 13 19	ScP	i 9 32	PcP	—
Tinemaha		39·6	318	i 7 22a	+ 2	i 13 22	ScP	i 9 36	PcP	—
Fresno		40·4	317	e 7 28a	+ 1	e 13 52	sS	e 9 11	PP	—
Bozeman		41·3	334	e 7 34	0	i 14 4	sS	e 9 21	PP	i 17·2
Reno		41·9	320	i 7 42a	+ 3	e 13 57	+10	i 8 8	pP	e 19·7
Butte	N.	42·2	333	e 7 44	+ 2	e 13 28	−24	i 8 54	PP	e 16·4
Santa Clara		42·2	316	i 7 48	+ 6	i 14 27	sS	—	—	e 20·4
Branner		42·4	316	e 7 47	+ 4	e 14 11	pS	e 19 30	Q	e 22·6
Berkeley		42·7	316	e 7 48a	+ 2	e 14 14	pS	e 19 24	Q	e 22·8
Mineral		43·6	320	e 7 54	+ 1	e 13 38	−34	e 10 55	PPP	—
Ukiah		44·0	317	e 8 2	+ 6	e 14 46	pS	i 9 59	PP	e 18·1
Shasta Dam		44·3	320	e 7 58	− 1	i 13 42	−40	i 9 47	PP	e 16·3
Hungry Horse		44·7	334	e 8 2	0	i 13 40	−48	i 9 32	PP	—
Saskatoon		45·0	342	8 6	+ 2	15 5	sS	10 2	PcP	—
Arcata		45·4	320	e 8 10a	+ 3	e 13 45	−53	e 8 30	pP	e 25·0
Santiago		45·9	162	e 8 8	− 3	e 15 0	+15	—	—	—
Seattle		48·2	328	i 8 33k	+ 4	i 15 28	+10	i 8 59	pP	e 19·3
Victoria		49·4	328	i 8 40k	+ 1	15 44	+10	i 9 18	pP	—
La Plata	E.	52·2	151	i 8 59	− 1	16 11	− 2	11 6	PP	—
	N.	52·2	151	i 8 57	− 3	16 17	+ 4	11 12	PP	29·8
	Z.	52·2	151	8 54	− 6	—	—	20 36	SS	30·0
Ivigtut		57·7	21	i 9 37	− 2	e 17 29	+ 3	21 59	SS	27·3
Sitka		60·4	332	e 9 56	− 2	i 18 14	+13	e 10 46	PcP	—
Resolute Bay		64·5	358	10 27	+ 2	19 33	PS	11 0	PcP	—
College		69·0	337	i 10 52	− 2	i 19 47	+ 1	e 13 28	PP	i 28·2
Reykjavik		69·4	25	e 10 58	+ 2	i 20 57	+66	e 24 30	SS	e 32·1
Honolulu		69·7	290	e 11 6	+ 8	e 20 8	+13	e 13 58	PP	e 28·0
Scoresby Sund		71·6	19	i 11 9	0	—	—	—	—	—
Lisbon		73·1	53	11 16a	− 2	20 37	+ 3	13 57	PP	33·3
Rathfarnham Castle		75·4	37	i 11 29	− 2	e 20 52	− 7	e 14 8	PP	e 33·6
Malaga	Z.	76·9	55	i 11 36k	− 4	i 21 40	pS	i 14 58	PP	i 36·8
Toledo		77·0	52	i 11 37	− 3	i 21 17	+ 1	14 32	PP	35·5
Edinburgh	E.	77·3	35	11 20	−22	20 53	−27	11 59	pP	—
Granada		77·5	55	i 11 43k	0	i 21 49	pS	i 15 12	PP	—
Aberdeen		77·9	33	i 11 47	+ 2	i 22 7	sS	i 16 5	PPP	36·8
Jersey	E.	78·0	42	e 11 48	+ 2	e 22 3	sS	14 44	PP	37·3
Durham	E.	78·2	36	i 11 47	0	i 21 49	pS	i 12 0	PcP	—
Kew		79·1	39	i 11 50a	− 2	e 22 32	PS	e 14 42	PP	e 35·3
Alicante		79·9	53	i 11 50	− 6	i 21 38	− 9	12 18	pP	32·5
Bagnères		80·0	48	e 11 51	− 6	e 27 36	SS	e 22 12	pS	e 33·3
Tortosa		80·4	50	i 12 2	+ 3	i 22 17	sS	12 8	PcP	34·0
Paris		81·1	42	e 11 58	− 4	i 22 16	+16	i 15 7	PP	37·3
Bergen		81·5	30	12 6	+ 2	22 28	pS	e 12 38	pP	35·1
Barcelona		81·6	49	i 12 6	+ 1	i 22 48	sS	23 21	PS	e 34·2
Clermont-Ferrand		81·8	45	i 12 6	0	e 22 43	sS	e 15 18	PP	e 27·3
De Bilt		82·4	38	i 12 7a	− 2	i 22 13	0	i 15 21	PP	e 36·3
Algiers Univ.	Z.	82·9	54	i 12 10	− 2	e 38 45	P′P′	e 15 11	PP	—
Neuchatel		84·3	43	e 12 17	− 2	e 23 53	PS	—	—	—
Basle		84·6	43	e 12 19	− 1	e 22 34	− 1	e 15 33	PP	—
Strasbourg		84·6	41	e 12 18a	− 2	i 22 54	pS	e 15 36	PP	i 38·3
Karlsruhe		84·9	41	i 12 26	+ 4	e 22 47	+ 9	—	—	e 39·3
Zürich		85·3	43	e 12 21a	− 3	e 22 58	+16	e 15 45	PP	—
Stuttgart		85·5	41	i 12 24a	− 1	e 23 0	+16	e 12 44	pP	e 39·3
Lome		85·9	84	i 12 31	+ 4	i 23 6	+19	i 15 19	PP	e 36·2
Chur		86·1	43	e 12 27	− 1	e 23 5	+16	—	—	—
Copenhagen		86·1	34	e 12 27	− 1	i 23 13	+24	16 0	PP	39·3
Pavia		86·1	45	e 12 26k	− 2	e 29 11	SS	e 15 54	PP	e 40·7
Lund		86·5	34	12 32	+ 2	23 17	+24	—	—	—
Jena		86·6	39	e 12 27	− 3	e 23 8	+14	e 16 2	PP	e 40·6
Potsdam		87·1	37	i 12 29a	− 3	e 23 14	+15	i 15 52	PP	e 38·3
Tamanrasset	Z.	87·1	68	i 12 31k	− 1	e 22 49	[+ 4]	e 12 57	pP	e 44·4

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb		87·2	39	i 12 30	− 3	e 22 58	− 2	e 13 0	pP	—
Collmberg		87·3	39	e 12 32	− 1	e 23 16	+15	e 16 8	PP	e 36·8
Prato		87·7	46	i 12 34	− 1	i 24 26	PS	—	—	—
Upsala		87·7	30	e 12 34	− 1	e 23 5	+ 1	i 16 4	PP	e 40·3
Bologna		87·8	45	e 12 40	+ 4	e 23 18	+13	e 13 12	pP	e 41·6
Florence Xim		87·9	46	i 12 35	− 1	i 23 30	+24	i 29 29	SS	—
Padova		88·2	45	12 41	+ 3	23 28	+19	e 13 12	pP	—
Prague		88·5	40	e 12 36	− 3	e 23 14	+ 2	e 13 5	pP	e 37·3
Tunis		88·5	53	e 12 45	+ 6	e 23 28	+16	e 15 49	PP	e 36·3
Apia		88·7	256	e 12 59	pP	e 23 14	0	—	—	e 40·3
Rome		89·2	48	e 12 43	+ 1	e 23 32	+14	16 18	PP	—
Triest		89·2	44	i 12 46	+ 4	i 23 2	[+ 4]	i 16 39	PP	—
Rocca di Papa		89·4	48	e 12 46	+ 3	e 23 40	+20	—	—	e 43·3
Raciborzu		90·9	39	e 12 42	− 8	e 25 0	PS	i 13 10	pP	e 39·3
Helsinki		91·0	28	i 12 53	+ 2	e 23 34	0	i 16 30	PP	e 41·3
Ogyalla		91·5	41	e 12 54	+ 1	e 23 47	+ 8	e 16 21	PP	e 37·5
Warsaw		91·9	36	12 56	+ 1	22 18	[−56]	e 13 18	pP	e 35·3
Budapest	E.	92·2	41	e 13 4	+ 8	i 23 44	− 1	16 33	PP	42·8
	N.	92·2	41	e 13 5	+ 9	23 27	[+11]	16 33	PP	—
Messina		92·3	51	e 12 38	−19	e 25 21	PS	e 30 35	SS	—
Kalossa		92·4	42	e 12 58	+ 1	e 25 43	PS	e 16 37	PP	—
Skalnate Pleso		92·4	39	e 12 56	− 1	e 23 53	+ 6	e 13 38	sP	—
Taranto		93·0	48	13 2	+ 2	22 58	[−22]	—	—	—
Pulkovo		93·6	27	e 12 45	−18	23 54	− 3	e 16 52	PP	—
Belgrade		93·9	44	e 13 6k	+ 2	i 25 29	PS	i 16 59	PP	e 43·4
Klyuchi		94·0	329	i 13 9	+ 4	23 46	−15	—	—	—
Timisoara		94·2	42	13 48	+43	e 25 39	PS	—	—	e 41·6
Lwow		94·5	38	i 13 9	+ 2	i 25 43	PS	e 17 6	PP	—
Sofia		96·6	45	13 14	− 2	24 8	−15	17 12	PP	—
Bucharest	N.	97·9	42	e 17 21	PP	e 23 56	[+ 9]	i 26 6	PS	—
Athens		98·4	49	e 12 29	−56	e 26 23	PS	—	—	—
Kishinev		98·6	39	13 25	0	24 1	[+11]	17 29	PP	—
Moscow		99·1	29	e 13 32	+ 4	i 24 11	[+18]	e 17 42	PP	—
Istanbul		101·2	44	e 17 55	PP	e 24 38	[+35]	—	—	—
Theodosia		103·5	39	—	—	25 7	SKKS	—	—	—
Wellington		103·9	230	e 13 55	+ 6	i 25 18	− 6	i 18 6	PP	50·3
Christchurch		105·6	228	e 14 2	P	24 38	[+15]	e 18 26	PP	e 49·0
Helwan		107·4	54	i 14 9a	P	24 48	[+17]	18 26	PP	—
Sverdlovsk		107·5	18	i 14 8	P	i 24 52	[+21]	e 18 2	PKP	—
Ksara		109·2	49	e 14 14	P	28 26	PS	—	—	—
Borzhomi		110·1	38	e 18 53?	PP	—	—	—	—	—
Grozny		110·7	35	18 59	PP	—	—	—	—	—
Leninakan		111·0	39	19 30	PP	—	—	—	—	—
Tiflis		111·1	37	i 14 21	P	i 28 35	PS	i 18 49	PP	—
Sapporo		111·7	326	e 18 24	[+ 5]	e 25 10	[+21]	e 28 40	PS	e 42·8
Erevan		111·8	39	19 30	PP	—	—	—	—	—
Mori	N.	112·7	326	e 19 23	PP	—	—	—	—	59·5
Hatinohe		113·1	322	—	—	e 28 54	PS	—	—	e 56·5
Grahamstown	z.	114·2	122	i 18 28	[+ 4]	e 29 6	PKKP	i 19 19	PP	e 50·8
Mizusawa	N.	114·3	321	49 41	Q	—	—	—	—	—
Baku		114·9	36	e 14 45	P	e 22 11	PKS	e 19 22	PP	—
Sendai		114·9	321	e 29 33	PKKP	—	—	50 11	Q	57·2
Lenkoran		115·3	38	19 30	PP	—	—	—	—	—
Hukusima		115·5	320	—	—	e 29 32	PS	—	—	58·8
Pretoria	z.	115·9	113	i 19 1	[+33]	—	—	e 20 4	PP	e 56·8
Utunomiya		116·6	320	e 18 35	[+ 6]	—	—	—	—	59·8
Vladivostok		116·7	330	e 18 34	[+ 5]	e 25 36	[+28]	19 47	PP	—
Irkutsk		117·0	353	e 14 54	P	25 32	[+23]	i 19 45	PP	—
Maebasi		117·2	320	e 18 40	[+10]	—	—	—	—	e 53·2
Tokyo		117·2	319	—	—	29 26	PS	49 28	Q	58·3
Nagano		117·6	321	e 19 56	PP	e 29 36	PS	—	—	60·1
Matusiro		117·7	321	e 18 28	[− 3]	e 34 58	SS	e 23 32	PPP	39·8
Pietermaritzburg z.		117·7	118	e 18 37	[+ 6]	—	—	e 19 46	PP	e 62·0
Hunatu		118·0	320	e 19 52	PP	e 25 56	SKKS	e 29 50	PKKP	—
Shizuoka		118·6	319	e 29 24	PKKP	—	—	—	—	e 59·3

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Gihu		119·3	320	e 20 6	PP	e 29 19	PKKP	—	—	43·7
Nagoya		119·3	320	e 19 4	[+30]	—	—	—	—	e 60·1
Osaka		120·6	321	e 20 11	PP	e 27 27	?	—	—	62·3
Sumoto		121·2	321	e 18 43	[+ 5]	—	—	i 20 13	PP	62·4
Ashkabad		121·3	33	18 42	[+ 4]	—	—	e 23 3	PPP	—
Kôti		122·5	321	e 18 47	[+ 7]	e 25 56	[+28]	e 27 29	SKKS	e 50·4
Matuyama		122·8	322	e 18 56	[+15]	i 37 14	SS	i 20 30	PP	i 63·1
Tchimkent		122·9	22	e 18 45	[+ 4]	—	—	—	—	—
Riverview		123·2	236	18 54	[+12]	e 25 43	[+13]	e 20 35	PP	e 57·0
Mary		123·4	30	i 18 46	[+ 4]	i 25 43	[+12]	i 20 27	PP	—
Lunacharskoe		123·6	21	e 18 48?	[+ 6]	e 25 56	[+25]	e 22 33	PKS	—
Tashkent		123·6	21	e 18 50	[+ 8]	e 26 5	[+34]	i 20 29	PP	—
Frunse		124·0	17	i 18 47	[+ 4]	e 26 6?	[+34]	i 20 33	PP	—
Samarkand		124·1	25	e 18 50	[+ 7]	—	—	—	—	—
Almata		124·3	15	i 18 48	[+ 4]	—	—	23 15	PPP	—
Hukuoka		124·4	323	e 18 49	[+ 5]	e 30 18	PS	e 20 34	PP	47·0
Guam		124·6	295	18 42	[− 2]	—	—	—	—	—
Kumamoto		124·8	322	e 21 2	PP	—	—	—	—	e 61·8
Miyazaki		124·9	321	e 18 53	[+ 8]	e 25 53	[+18]	—	—	—
Andijan		125·2	20	e 18 50	[+ 5]	—	—	—	—	—
Fergana		125·3	21	e 18 50	[+ 4]	e 25 39?	[+ 3]	e 15 30?	P	—
Przhevalsk		125·4	12	i 18 54	[+ 8]	—	—	—	—	—
Naryn		125·7	15	i 18 53?	[+ 7]	e 25 27	[−10]	i 20 42	PP	—
Stalinabad		125·8	24	i 18 48	[+ 1]	—	—	e 23 34	PPP	—
Garm		126·0	23	e 18 55	[+ 8]	—	—	—	—	—
Obi-garm		126·0	23	e 18 52	[+ 5]	—	—	i 22 10	PKS	—
Zi-ka-wei	E.	131·1	329	i 22 30	PKS	—	—	—	—	—
Tananarive		134·1	106	e 21 36	PP	26 58	[+59]	i 22 45	PKS	59·8
Dehra Dun	N.	136·6	20	e 19 57	[+50]	e 35 24	?	—	—	e 70·4
New Delhi	N.	137·9	22	e 19 1	[− 8]	26 6	[+ 1]	22 49	PKS	65·6
Nanking		131·7	332	i 22 30	PP	(e 40 27)	SS	—	—	e 40·4
Bombay		144·0	36	i 19 24	[+ 4]	32 53	SKSP	22 31	PP	—
Poona		144·9	34	e 19 24	[+ 2]	26 29	[+13]	22 41	PP	66·7
Calcutta		146·8	10	i 19 33	[+ 8]	26 38	[+19]	23 5	PP	67·7
Hyderabad		148·2	29	19 30	[+ 3]	26 7	[−14]	31 43	PS	—
Perth		150·7	220	i 19 45	[+14]	i 30 6	SKKS	i 42 56	SS	i 70·2
Kodaikanal	E.	153·6	39	e 19 43	[+ 8]	26 43	[+15]	22 53	PP	68·9
Colombo	E.	157·6	41	19 50	[+ 9]	34 13	PS	—	—	81·9
Bandong		166·4	287	e 20 2	[+12]	i 23 29	PKS	e 21 8	PKP_2	—
Djakarta		166·9	290	e 19 55	[+ 5]	e 23 30	PKS	i 21 18	PKP_2	—

Additional readings :—
Chinchina iSS = 6m.29s.
San Juan i = 4m.28s.
Columbia iP_cP = 8m.33s.
St. Louis iPP = 6m.46s., isS = 10m.50s.
Georgetown i = 13m.36s.
Washington i = 7m.26s. and 11m.27s.
Pennsylvania iZ = 6m.21s., isP?Z = 6m.43s., iPPZ = 7m.12s., iZ = 8m.38s.
Cleveland iPE = 6m.12s.
Tucson i = 6m.53s., iP_cP? = 9m.15s.
La Paz iPPP = 7m.38s.
Palisades iPPP = 7m.42s., iP_cP = 8m.53s., i = 10m.41s., iP_cS = 12m.0s.
Buffalo ePP = 8m.58s.
Harvard isP = 7m.2s., iPP = 7m.43s.
Weston iPP = 7m.48s.
Vermont i = 8m.9s., 11m.26s., and 12m.41s.
Ottawa PP = 8m.8s., P_cS = 12m.45s., isS = 12m.57s., S_cS = 16m.51s.
Pierce Ferry i = 13m.10s.
Palomar iZ = 8m.42s., iS_cSN = 17m.24s.
Boulder City iP = 7m.1s. and i = 7m.58s.
Rapid City i = 7m.27s.
Riverside iZ = 8m.56s., iS_cPZ = 13m.15s., iZ = 13m.26s., eS_cSN = 17m.40s.
Shawinigan Falls SSN = 15m.18s.
Mount Wilson iZ = 13m.34s., eS_cSN = 17m.25s.
Pasadena iP_cPZ = 9m.26s., iS_cPZ = 13m.18s., iZ = 13m.28s.
Salt Lake City e = 7m.50s. and 9m.58s., i = 13m.18s.
Logan i = 7m.34s., iPPP = 9m.16s.
Seven Falls PPE = 8m.44s., SSE = 16m.16s.

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Halifax PPP =9m.19s., SS =16m.3s.
Santa Barbara iS_cSEN =17m.32s.
Fresno iE =8m.2s., iZ =8m.6s., iEZ =8m.23s., eN =11m.8s., eZ =13m.42s. and 18m.36s.
Bozeman iP =7m.39s., i =9m.25s., iP_cP? =9m.34s.
Reno iPPE =9m.10s.. iP_cPZ =9m.46s., eZ =14m.25s., eN =16m.48s.
Butte eN =8m.28s., iN =9m.46s., iSN =14m.16s.
Branner eE =8m.30s.
Berkeley iZ =13m.36s.
Mineral eN =14m.33s., eE =17m.17s.
Ukiah e =8m.48s., i =14m.58s.
Shasta Dam iP =8m.1s.
Saskatoon i =18m.18s.
Arcata eN =10m.15s., eE =14m.54s.
Seattle eP_cP =10m.9s., iP_cS =14m.0s., eS_cS =18m.28s., eSS =18m.48s., and many unidentified i readings.
Victoria PP =10m.41s., sS =16m.26s., SS =18m.8s.
La Plata PPPE =11m.47s., PPPN =12m.6s., P_cPE =13m.39s., P_cPN =14m.6s., EN =15m.6s., N =17m.42s., S_cSN =18m.42s., SSE =19m.59s., QN =21m.30s.
Ivigtut 10m.35s., i =11m.38s., 13m.15s., and 18m.38s., SSS =23m.42s.
Sitka iP_cP? =10m.51s., ePP =12m.14s., ePPP =13m.30s., iS_cS? =20m.7s.
Resolute Bay PP =12m.49s., PPP =14m.36s.
College iPP? =13m.40s., ePPP =15m.12s., eSS? =25m.35s., e =30m.13s., ePKP,PKP =39m.8s.
Reykjavik eSN =21m.15s.
Honolulu i =11m.43s., iS? =20m.23s., eSS =24m.43s.
Lisbon PN =11m.23s., PPZ =14m.6s., EZ =14m.36s., SKSN =20m.56s., PSZ =21m.0s., iPPSE =21m.39s., N =23m.16s., SS?E =24m.28s., SS?Z =25m.18s., SS?EN =25m.49s., Q?NZ =29m.6s.
Rathfarnham Castle ePSEN =22m.29s., SSEN =25m.58s., SSSEN =29m.15s., and other unidentified readings.
Malaga iPPPZ =16m.46s., iPSZ =22m.43s., iSSZ =27m.10s.
Toledo PPP =16m.17s., SKS =21m.38s., PS =22m.1s., SS =26m.13s., SSS =29m.32s.
Edinburgh P_cPE =11m.30s., SKSE =21m.11s., S_cSE =21m.18s., PSE =21m.48s., sSE =22m.1s., PPSE =22m.5s., SSE =25m.56s.
Granada P_cP =12m.52s., iSS =27m.0s., SSS =30m.36s.
Aberdeen iPN =12m.1s., iE =14m.39s., iN =18m.53s., iE =25m.22s. and 26m.15s., iN =29m.47s., iE =32m.15s., iN =33m.47s.
Jersey PSE =23m.14s., SSE =27m.45s., SSSE =30m.58s.
Durham iPPE =14m.47s., iE =21m.35s., iSKSN =22m.2s., iPSN =22m.41s., iSSN =27m.13s., iSSSEN =30m.51s.
Kew ePPPEZ =17m.17s., eSEN =22m.7s., eEZ =26m.28s., eSSZ =27m.18s., eSSSEN =30m.54s.
Alicante P_cP =11m.58s., PP =14m.42s., PPP =16m.24s., sS =21m.46s., PS =22m.30s., PPS =22m.52s., SS =26m.30s., SSS =29m.44s.
Bagneres e =21m.9s.
Tortosa PPN =15m.13s., PPPN =16m.57s., S_cSN =22m.38s., PSE =23m.16s., iSSE =27m.49s., SSSEN =31m.9s.
Paris iPPP =16m.51s., iPS =23m.9s., iSS =27m.48s., Q =33·3m., PKP,PKP =39m.0s. and other i readings.
Bergen PPEZ =15m.12s., eEN =23m.14s.? and 28m.1s., SSN =28m.22s.
Barcelona SS =28m.6s.
Clermont-Ferrand i =13m.13s., e =14m.24s., i =14m.37s., e =16m.22s., ePPP =17m.2s., e =17m.44s.
De Bilt iSS =28m.0s.
Algiers Univ. eZ =12m.59s. and 14m.56s., ePPPZ =17m.3s.
Basle ePS =23m.49s.
Strasbourg iPPP =17m.43s., iS =22m.59s., iPS? =23m.52s. and 23m.57s., iSS =28m.14s. and 28m.18s., iSSS =31m.46s., iQ =34m.4s., and many other unidentified readings.
Zürich ePPP =17m.43s.
Stuttgart iZ =12m.32s., eZ =13m.12s., e =13m.55s., ePP =15m.27s., iPP =15m.48s., e =21m.18s., eSP =24m.7s., eSS =28m.58s., eSSS =32m.28s.
Lome i =14m.32s., iPPP =17m.54s., ePS =24m.4s., ePPS =24m.39s., eSS =28m.57s., eSSS? =32m.18s.?
Copenhagen e =22m.48s., PS =24m.0s., 24m.18s., 25m.36s., and 26m.0s., SS =28m.42s., SSS =32m.30s.
Pavia eZ =13m.27s. and 15m.0s., e =21m.10s.
Jena ePEZ =12m.32s., ePN =12m.35s., ePPE =16m.5s., ePPN =16m.13s., ePPP?E =18m.12s., eSN =23m.15s., iPS =24m.20s., eSS?Z =28m.30s., eSS?EN =28m.58s., eSS?N =29m.8s., eSSS?E =32m.50s., eSSS?N =32m.54s., and other e readings.
Potsdam iP =12m.35s., iZ =14m.21s., iE =14m.24s., iPPE =15m.59s., PPZ =16m.3s., iN =17m.26s., iSN =23m.21s., iSZ =23m.28s., iPS =24m.16s., iSSZ =29m.12s.?, iZ =32m.10s., iSSSE =32m.57s.
Tamanrasset ePPZ =16m.3s., ePPPZ =18m.1s., ePPSZ =24m.31s., eSSZ =28m.59s., ePKP,PKPZ =38m.36s.
Cheb eE =12m.36s., e =12m.52s., iPPE =15m.59s., epPPE =16m.25s., eN =18m.46s., esS =23m.50s., ePS =24m.18s., eSS? =28m.21s., esSS =29m.26s., eSSS =32m.45s., e =36m.54s.

Continued on next page.

Collmberg ePN =12m.36s., eZ =13m.42s., eE =15m.22s., eZ =15m.26s., eN =15m.52s., ePPE =16m.12s., ePPPZ =17m.48s., ePPPE =17m.54s., eZ =18m.50s., eSN = 23m.22s., eSSE =29m.23s., eN =29m.45s., eSSS =32m.57s.
Upsala epPP =16m.36s., ePPP?E =17m.47s., epSN =23m.33s., ePS? =24m.12s., iPPS? =24m.26s., eSS?E =29m.11s., esSS =29m.32s., eSSSE =32m.49s., eQN = 38·3m. and other unidentified readings.
Bologna ePP =16m.20s., ePS =24m.24s., eSS =29m.39s.
Padova PP =16m.15s., PS =24m.22s.
Prague esP =13m.17s., e =14m.33s., ePP =15m.58s., epPP =16m.19s., ePPP =18m.21s., e =22m.27s., epS =23m.52s, esS =24m.12s., e =24m.22s., esPS =25m.11s., eSS = 28m.50s., eSSS =33m.0s., e =36m.18s.
Tunis e =13m.0s., ePS =24m.37s., e =27m.9s., eSS =29m.18s., eSS? =29m.53s., eSSS = 32m.54s.
Apia e =23m.24s.
Rome i =12m.48s., iSKS =23m.2s., PS =24m.43s., iSS =29m.52s.
Triest ePPP? =18m.51s., isSKS =23m.49s.
Raciborzu epP?E =13m.14s., eEN =14m.6s., eE =15m.12s. and 16m.36s., ePS?N = 25m.24s., eQE =29·3m.
Helsinki ePS =25m.12s., eN =27m.7s., iSS =30m.24s., eSSS =34m.10s.
Ogyalla ePPE =16m.24s., ePPP =18m.28s., esS =24m.28s., esPS =25m.38s., eSS = 29m.48s., eSSS =33m.48s., and other e readings.
Warsaw ePE =13m.1s., eNZ =14m.29s., PPZ =16m.35s., PPEN =16m.41s., esPPEN = 17m.17s., PPP =18m.23s., epPPP =19m.2s., SPP =25m.16s., iPPSN =25m.38s., SSE =29m.28s., sSSEN =30m.9s.
Budapest eE =13m.18s.?, PPPE =18m.44s., PPPN =19m.4s., SKSE =23m.0s., eSN = 23m.59s., iPSE =25m.12s., PSN =25m.18s., eE =26m.50s., SSN =30m.6s., iSSPE = 30m.40s., SSPN =30m.57s., SSSN =33m.34s., eSSSE =34m.18s.?
Messina e =16m.51s.
Kalossa eE =13m.1s., eN =18m.37s., eE =19m.28s., 24m.12s., and 24m.49s., eN = 25m.5s., eE =25m.55s. and 29m.48s., eN =31m.4s. and 33m.31s., eE =33m.50s.
Skalnate Pleso ePP =16m.30s., ePPP =18m.49s., eSKKS =23m.18s., epS =24m.18s., epPS =25m.17s., esPS? =25m.45s., eSS =29m.48s., esSS =30m.42s., with other unidentified e readings.
Pulkovo ePS =25m.31s.
Belgrade e =23m.15s., iSS =31m.4s.
Timisoara e =14m.54s., iN =27m.17s.
Sofia ePS =26m.1s., eSS =31m.37s.
Bucharest eN =17m.36s., eE =18m.27s. and 22m.31s., eN =22m.40s.
Kishinev eS =24m.50s.
Moscow eSKKS =24m.28s., iPS =26m.28s., eSS =31m.52s., eSS =35m.23s.
Wellington iZ =14m.13s., ePPP =20m.54s., iSKS =24m.38s., eS =25m.58s., S_cSPZ = 27m.24s., PPS =28m.49s., SSP =33m.20s., SSSZ =37m.28s., PKP,PKP =38m.13s., SKPPKP =40m.27s., i =43m.22s.
Christchurch iPEZ =14m.10s., eEZ =17m.28s., iPPZ =18m.40s., PPPEZ =20m.58s., eZ =22m.13s., SKKS?N =25m.58s., iPS =27m.48s., PPS?Z =28m.33s., ePKKPEZ =29m.33s., SS =33m.28s., SSSEN =37m.43s., eQEN =43m.48s.
Helwan PSN =27m.48s.
Sverdlovsk iPP =18m.33s., PPP =21m.10s., SKKS =25m.40s., iPS =27m.54s., iSS = 34m.23s., iSSS =37m.18s.
Tiflis iPPP =21m.17s.
Sapporo e =21m.16s. and 29m.52s.
Grahamstown iZ =18m.32s., eZ =18m.44s.
Pretoria ePKKPZ =29m.40s.
Vladivostok eP =15m.1s.?, iSS =36m.12s., SSS =40m.36s.
Irkutsk SS =36m.18s.
Matusiro e =28m.36s.
Osaka e =24m.49s.
Matuyama iN =33m.19s. and 50m.16s.
Riverview iE =25m.55s., iSKKKSE =27m.33s., iPSEZ =30m.32s., iPPSE =32m.0s., eE =34m.12s. and 36m.0s., eSSE =37m.16s,. iSSE =37m.42s., iZ =40m.36s., eQN =52·0m.
Mary iPKS =22m.25s.
Lunacharskoe eSKSP =30m.33s.
Tashkent eSKKS =27m.22s.?, iPS =30m.41s.
Frunse PPP =23m.10s.
Hukuoka e =30m.35s., sS =37m.20s., Q =43m.16s.
Fergana ePKS =22m.23s.
Naryn iPKS =22m.10s., i =24m.5s., 25m.48s., and 27m.7s., iSKKS =27m.42s., iSKSP =30m.37s., i =32m.14s.
Tananarive i =21m.48s., SP =31m.33s., PPS =33m.48s., SS =38m.1s., SSS =44m.3s., Q =54m.48s.
Dehra Dun eN =47m.3s. and 56m.39s.
New Delhi PPPN =25m.4s., iN =26m.53s., PKKP =28m.23s., SKSPN =32m.8s., PPSN =34m.22s., SKKSN =34m.49s., $SKKS_3N$ =35m.33s., SSN =40m.22s., SSPN =40m.53s., SSSN =45m.42s., QN =59m.15s.
Bombay SKSPE =33m.0s., iEN =36m.32s., SSN =41m.38s.
Poona PKSN =22m.59s., PPPN =25m.52s., ePPSEN =35m.33s., SSN =41m.55s., SSPN =42m.23s., SSSN =46m.48s., SSP_3N =54m.4s., QN =59m.44s., SSS_3N = 61m.55s.

Continued on next page.

Calcutta iE =20m.5s., PPPE =26m.25s., PKKPE =28m.10s., SKKSE =29m.29s., PKKSE =31m.42s., PSE =33m.27s., SSE =41m.32s., SSSE =46m.52s., QE = 60m.21s.
Hyderabad SKKSE =29m.2s., PSN =31m.47s., SSN =38m.29s., SSE =38m.35s.
Perth i =21m.51s., 22m.36s., and 48m.19s.
Kodaikanal SKKKSE =30m.23s., SKSPE =33m.8s., SSE =42m.22s., SSPE =43m.2s., SSSE =47m.52s., QE =61m.57s.
Long waves were also recorded at Auckland.

Oct. 5d. 16h. 48m. 34s. Epicentre 10°·4N. 85°·7W. Depth of focus 0·015. (as at 16h. 9m.).

		△	Az.	P.	O−C.	S.	O−C.		Supp.	
		°	°	m. s.	s.	m. s.	s.	m.	s.	
Balboa Heights		6·2	104	e 0 33	−57	—	—	—		—
Huancayo		24·6	157	i 5 5	− 5	—	—	—		—
Washington		29·4	15	i 5 51	− 2	—	—	—		—
Cleveland	N.	31·2	6	e 6 7	− 2	—	—	—		—
Tucson		31·8	317	e 6 19	+ 5	—	—	—		—
Palisades		32·2	19	i 6 16k	− 2	—	—	—		—
Weston		34·3	20	i 6 33	− 3	—	—	—		—
Ottawa	Z.	35·9	12	i 6 48k	− 1	—	—	—		—
Pierce Ferry		36·2	320	e 6 28	−24	e 8 28	PP	i 6 58		sP
Palomar		36·6	315	i 7 2	+ 7	—	—	—		—
Boulder City		36·7	320	e 7 1	+ 5	—	—	—		—
Overton	Z.	36·8	320	i 7 2	+ 5	—	—	—		—
Riverside	Z.	37·3	314	i 7 8	+ 7	—	—	i 9 23		P_cP
Pasadena	Z.	38·0	314	i 7 12	+ 5	—	—	—		—
Tinemaha	Z.	39·6	318	i 7 26	+ 6	—	—	i 9 28		P_cP
Berkeley	Z.	42·7	316	e 7 50	+ 4	—	—	—		—
Shasta Dam		44·3	320	e 6 40	?	—	—	—		—
Hungry Horse		44·7	334	i 8 4	+ 2	—	—	—		—
College		69·0	337	e 10 54	0	—	—	—		—
Alicante		79·9	53	11 50	− 6	21 22	−25	—		—
Paris		81·1	42	e 11 59	− 3	—	—	—		—
Strasbourg		84·6	41	e 12 17	− 3	—	—	—		—
Stuttgart	Z.	85·5	41	e 12 22	− 3	—	—	—		—
Tamanrasset	Z.	87·1	68	e 12 29	− 3	—	—	—		—
Mizusawa	N.	114·3	321	(19 7)	PP	(25 25)	[+26]	—		—

Additional readings :—
Berkeley ePZ =6m.38s. (early).
Paris eP =12m.3s.
Mizusawa readings given as S and L respectively.
Long waves were recorded at Prague.

Oct. 5d. 18h. 44m. 21s. Epicentre 16°·3N. 98°·6W. (as on 1947, October 3d.).

A = −·1436, B = −·9496, C = +·2789 ; δ = +15 ; h = +5 ;
D = −·989, E = +·150 ; G = −·042, H = −·276, K = −·960.

		△	Az.	P.	O−C.	S.	O−C.		Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Oaxaca		1·9	68	0 38	+ 4	—	—	—		—	1·0
Puebla		2·8	8	0 51	+ 4	—	—	—		—	1·4
Tacubaya		3·1	350	0 55	+ 4	—	—	—		—	1·6
Vera Cruz		3·7	39	1 7	P*	—	—	—		—	1·9
Manzanillo		6·0	298	—	—	e 2 54	+11	—		—	3·2
Tucson		19·4	328	e 4 27	− 3	—	—	—		—	e 8·8
Palomar		23·7	321	i 5 14	0	—	—	—		—	—
Pierce Ferry		24·0	328	i 5 17	0	e 12 41	L	—		—	(e 12·7)
Boulder City		24·3	327	e 5 19	− 1	—	—	—		—	—
Riverside	Z.	24·4	321	e 5 20	− 1	—	—	—		—	—
Overton	Z.	24·6	328	e 5 21	− 2	—	—	—		—	e 13·3
Mount Wilson	Z.	25·0	321	e 5 32	+ 5	—	—	—		—	—
Hungry Horse		34·4	341	e 6 49	− 2	—	—	—		—	—
College		58·7	338	e 9 55	− 7	—	—	—		—	—

For Notes see next page.

NOTES TO OCTOBER 5d. 18h. 44m. 21s.

Additional readings :—
Palomar iEZ =5m.23s.
Pierce Ferry i =5m.26s.
Riverside eZ =5m.29s.
Hungry Horse i =6m.55s.
College e =10m.4s.
Long waves were also recorded at Guadalajara.

Oct. 5d. 20h. 9m. 28s. Epicentre 10°·4N. 85°·7W. (as at 16h.). Depth of focus 0·015.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chinchina		11·3	118	i 2 33	− 6	i 4 47	+ 4	—	—	—
Bogota		12·9	116	i 2 58	− 2	—	—	—	—	—
Tacubaya		15·8	305	i 3 43	+ 7	—	—	—	—	—
San Juan		20·5	66	e 4 26	− 4	e 8 26	+19	i 4 46	PP	e 9·5
Columbia		23·0	9	e 5 5	+11	e 9 40	PP	—	—	e 12·5
Huancayo		24·6	157	e 5 7	− 3	i 9 25	+ 7	i 5 17	pP	—
Bermuda		29·1	40	e 5 51	0	—	—	e 6 56	PP	e 12·8
Washington		29·4	15	i 5 53	0	e 10 36	0	i 6 3	pP	e 17·2
Philadelphia		30·9	17	—	—	e 11 36	sS	—	—	e 15·6
Cleveland		31·2	6	i 6 8a	− 1	e 11 31	sS	—	—	16·4
Chicago		31·3	357	e 6 6	− 4	e 11 38	sS	e 7 10	PP	e 14·4
Tucson		31·8	317	e 6 16	+ 2	e 11 14	0	—	—	—
La Paz		31·9	147	i 6 10	− 5	12 52	SS	i 6 22	pP	i 14·7
Palisades		32·2	19	i 6 17	− 1	—	—	—	—	—
Harvard		34·3	20	e 6 34	− 2	—	—	—	—	e 18·9
Weston		34·3	20	e 6 36	0	—	—	—	—	—
Ottawa	Z.	35·9	12	i 6 49a	0	—	—	—	—	—
Pierce Ferry		36·2	320	i 6 55	+ 3	i 8 34	PP	i 7 7	pP	—
Palomar		36·6	315	i 6 59	+ 4	—	—	i 7 9	pP	—
Boulder City		36·7	320	e 7 0	+ 4	—	—	—	—	—
Overton	Z.	36·8	320	i 7 1	+ 4	—	—	—	—	—
Rapid City	E.	36·8	339	e 7 3	+ 6	e 13 7	sS	—	—	e 15·2
Riverside	Z.	37·3	314	i 7 4a	+ 3	—	—	i 9 22	PcP	—
Pasadena		38·0	314	i 7 9a	+ 2	—	—	i 9 23	PcP	—
Salt Lake City		38·1	328	e 7 6	− 2	—	—	—	—	e 20·3
Logan		38·7	329	e 7 12	− 1	—	—	—	—	—
Seven Falls	E.	38·7	17	e 7 12	− 1	—	—	—	—	—
Haiwee	Z.	38·9	317	i 7 17a	+ 2	—	—	—	—	—
Tinemaha		39·6	318	i 7 22a	+ 2	i 9 30	PcP	i 7 35	pP	—
Fresno	Z.	40·4	317	e 7 28a	+ 1	—	—	e 7 55	pP	—
Reno		41·9	320	e 7 43a	+ 4	—	—	—	—	—
Lick	Z.	42·0	316	e 7 43a	+ 3	—	—	—	—	—
Berkeley	Z.	42·7	316	i 7 48a	+ 2	—	—	i 9 39	PP	e 19·4
Mineral	Z.	43·6	320	e 7 55	+ 2	—	—	e 9 42	PP	—
Shasta Dam		44·3	320	i 7 58	− 1	—	—	i 9 43	PP	—
Hungry Horse		44·7	334	e 8 3	+ 1	e 13 38	−50	—	—	—
Victoria		49·4	328	e 8 37	− 2	—	—	e 10 2	PcP	—
College		69·0	337	e 10 52	− 2	—	—	e 13 15	PP	—
Alicante		79·9	53	11 52	− 4	21 50	+ 3	33 0	Q	e 37·4
Paris		81·1	42	e 12 3	+ 1	—	—	—	—	—
Strasbourg		84·6	41	e 12 23	+ 3	—	—	—	—	—
Stuttgart	Z.	85·5	41	e 12 24	− 1	—	—	—	—	—
Jena	E.	86·6	39	e 12 30	0	—	—	—	—	—
Tamanrasset	Z.	87·1	68	i 12 33k	+ 1	i 16 13	PP	i 12 59	pP	—
Collmberg	Z.	87·3	39	e 12 34	+ 1	—	—	—	—	—
Pretoria	Z.	115·9	113	e 19 2	pPKP	—	—	—	—	e 55·4

Additional readings :—
Huancayo e =9m.35s.
Washington ePP =6m.42s., i =7m.2s.
La Paz PP =7m.21s., iScS =16m.48s.
Riverside iZ =7m.11s.
Pasadena iZ =7m.16s. and 9m.30s.
Tinemaha iZ =7m.30s. and 9m.36s.
Paris i =12m.12s.

Oct. 5d. 23h. 7m. 49s. Epicentre 3°·4S. 80°·6W. (as on 1949, July 13d.).

A = +·1630, B = −·9849, C = −·0589 ; δ = +7 ; h = +7 ;
D = −·987, E = −·163 ; G = −·010, H = +·058, K = −·998.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chinchina		9·7	31	e 2 50	+28	e 5 14	+59	—	—	—
Huancayo		10·0	149	i 2 27	0	i 4 17	− 5	i 2 49	PP	e 4·5
Bogota		10·3	39	e 2 45	+13	i 4 55	+25	i 3 23	PP	—
Balboa Heights		12·3	5	i 3 0	+ 1	—	—	—	—	—
Galerazamba		15·1	21	i 3 44	+ 8	i 6 48	+23	—	—	8·2
La Paz		17·9	137	i 4 12a	0	i 7 42	+12	i 4 31	PP	9·6
San Juan		25·9	33	e 6 38	+63	e 10 23	+19	—	—	e 11·0
Fort de France		26·4	47	e 5 42	+ 2	—	—	—	—	—
Bermuda		38·7	22	e 9 4	?	—	—	—	—	e 16·8
Washington		42·2	5	i 7 55	− 1	—	—	—	—	—
Cleveland	Z.	44·7	359	i 8 15a	− 1	—	—	—	—	—
Tucson		45·6	324	e 8 23	− 1	—	—	—	—	e 23·4
Weston		46·3	11	i 8 30	+ 1	—	—	—	—	—
Harvard		46·4	11	i 8 31	+ 1	—	—	—	—	—
Ottawa	Z.	48·8	5	e 8 47	− 2	—	—	—	—	—
Palomar		50·0	321	i 9 7	+ 9	—	—	—	—	—
Pierce Ferry		50·2	325	i 8 59	− 1	—	—	—	—	—
Boulder City		50·6	324	i 9 3	+ 1	—	—	—	—	—
Riverside	Z.	50·8	321	e 9 2	− 2	—	—	—	—	—
Pasadena	Z.	51·4	321	e 9 8	− 1	—	—	—	—	—
Logan		53·1	332	e 9 19	− 2	—	—	—	—	—
Tinemaha	Z.	53·3	322	i 9 22	− 1	—	—	—	—	—
Fresno	Z.	54·1	322	e 9 25	− 4	—	—	—	—	—
Lick	Z.	55·6	321	e 9 39k	− 1	—	—	—	—	—
Shasta Dam		58·2	324	e 10 4	+ 6	—	—	—	—	—
Hungry Horse		59·2	335	e 10 4	− 1	—	—	—	—	—
Victoria	Z.	63·7	331	e 10 34	− 2	—	—	—	—	—
Malaga	Z.	81·0	52	i 12 19k	+ 1	i 22 28	+ 1	—	—	45·2
College		83·6	337	e 12 28	− 3	—	—	e 15 54	PP	e 42·0
Tamanrasset	Z.	87·7	67	i 12 52k	0	—	—	e 16 10	PP	—
Paris		88·0	41	i 12 53	0	—	—	—	—	—
Stuttgart	Z.	92·4	42	e 13 13	− 1	—	—	—	—	—
Jena	E.	94·0	39	e 13 20	− 1	—	—	—	—	—
Collmberg	Z.	94·9	39	e 13 25	0	—	—	—	—	—
Riverview	Z.	118·8	228	—	—	i 48 27	?	—	—	e 58·1
Poona	Z.	150·8	57	i 20 6	[+17]	—	—	—	—	—

Additional readings :—
Huancayo e = 3m.29s.
La Paz PPP = 4m.39s., P_cP = 8m.39s., S_cS = 16m.5s.
San Juan i = 6m.52s.
Washington i = 8m.8s.
Tucson e = 8m.32s.
Boulder City i = 9m.13s.
Riverside eZ = 9m.13s.
Pasadena eZ = 9m.18s.
Tinemaha iZ = 9m.32s.
Fresno eZ = 9m.36s.
Lick eZ = 9m.49s.
Hungry Horse i = 10m.14s.
Tamanrasset iZ = 14m.3s., eZ = 15m.12s. and 17m.11s.
Long waves were also recorded at Sitka, Christchurch, Wellington, De Bilt, Kew, Granada, and Potsdam.

Oct. 5d. Readings also at 2h. (Puebla and near Tacubaya), 4h. (Overton and Pierce Ferry), 5h. (Andijan, Stalinabad, near Garm (3), and Obi-garm), 6h. (Hungry Horse, Naryn, Samarkand, near Andijan, Fergana, Garm (2), Obi-garm, and Stalinabad), 8h. and 10h. (near Garm), 11h. (Hungry Horse, College, Pretoria, Tamanrasset, Ksara, and near Garm), 12h. (Algiers Univ. and near Garm), 14h. (Hungry Horse and Vladivostok), 16h. (Balboa Heights, Tamanrasset, and Stuttgart), 17h. (Balboa Heights (2), Tucson, and Tacubaya), 18h. (Balboa Heights and near Garm), 19h. (Nanking, Balboa Heights, Tucson, Overton, Pierce Ferry, and Ottawa), 20h. (Guam, Balboa Heights, Tacubaya, Riverside, Tucson, Pierce Ferry, Cleveland, Washington, San Juan, and Huancayo), 21h. (College and Mizusawa), 22h. (Mount Wilson, Riverside, Tucson, Hungry Horse, College (2), Galerazamba, Ottawa, Harvard, Washington, near Alicante, and near Mary), 23h. (near Algiers Univ.).

Oct. 6d. 8h. 16m. 0s. Epicentre 19°·8N. 65°·6W. (as on 1945, September 26d.).

A = +·3890, B = −·8575, C = +·3367 ; δ = −1 ; h = +5 ;
D = −·911, E = −·413 ; G = +·139, H = −·307, K = −·942.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		1·5	199	i 0 26	− 2	i 0 43	− 6	—	—	i 0·8
Fort de France		6·6	138	i 1 25	−16	i 2 41	−17	—	—	—
Bermuda		12·6	4	e 3 10	+ 7	e 5 8	−18	—	—	e 5·2
Bogota		17·2	210	i 4 1	− 2	i 7 23	+ 9	i 4 20	PP	8·5
Chinchina		17·7	215	e 4 15	+ 5	e 7 32	+ 6	—	—	—
Washington		21·5	336	e 4 51	− 1	—	—	—	—	—
Philadelphia		21·7	341	e 5 13	+18	e 9 3	+12	—	—	e 10·3
Palisades		22·3	343	e 5 6	+ 5	i 8 59	− 3	—	—	e 10·0
Weston		23·0	350	i 5 7	0	e 9 15	+ 1	—	—	—
Harvard		23·2	350	i 5 7	− 2	e 9 15	− 3	i 5 25	pP	e 14·0
Pennsylvania		23·4	336	e 5 6	− 5	i 9 37	+16	—	—	—
Cleveland		25·5	332	i 6 1k	PP	i 10 18	+21	—	—	—
Ottawa		26·9	344	e 5 39	− 6	i 11 7	+47	i 6 18	PP	—
Huancayo		33·1	198	e 6 33	− 7	e 11 27	−32	—	—	e 13·8
La Paz		36·2	183	e 7 7	+ 1	e 12 30	−17	e 8 32	PP	18·0
Tucson		42·2	297	e 7 56	0	—	—	e 10 8	PP	e 32·3
Logan		44·7	311	e 8 13	− 3	—	—	—	—	—
Pierce Ferry		45·3	302	e 8 23	+ 2	—	—	—	—	—
Riverside	Z.	47·8	299	i 8 41	0	—	—	—	—	—
Hungry Horse		48·1	319	e 8 59	+16	—	—	—	—	—
Tinemaha	Z.	48·8	302	e 8 50	+ 1	—	—	—	—	—
Berkeley		52·0	303	e 9 26	+13	—	—	—	—	e 27·1
Shasta Dam		52·4	306	e 9 13	− 3	—	—	—	—	—
Kew		59·4	41	—	—	e 19 0?	+45	—	—	—
Tortosa	E.	59·4	53	e 10 11	+ 5	—	—	10 41	P_cP	—
Strasbourg		64·5	44	e 13 13	PP	—	—	—	—	e 34·0
Stuttgart	Z.	65·4	44	e 10 38	− 9	—	—	—	—	—
Tamanrasset	Z.	65·7	73	e 10 37	−11	—	—	e 11 9	P_cP	—
College		69·0	334	e 11 3	− 6	—	—	—	—	e 28·4

Additional readings :—
Palisades i = 5m.16s. and 9m.11s.
La Paz SS = 15m.2s.
Riverside eZ = 9m.22s.
Tinemaha eZ = 9m.20s.
Strasbourg e = 13m.34s.
Tamanrasset eZ = 12m.19s., ePPZ = 12m.51s.
Long waves were also recorded at Sitka, Butte, and other European stations.

Oct. 6d. 11h. 20m. 6s. Epicentre 17°·0N. 68°·5W.

A = +·3507, B = −·8903, C = +·2906 ; δ = +7 ; h = +5 ;
D = −·930, E = −·367 ; G = +·107, H = −·270, K = −·957.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		2·6	59	e 0 37	− 7	i 0 58	P_g	—	—	i 1·6
Roosevelt Roads		3·0	66	i 0 54	+ 4	—	—	—	—	—
Port au Prince		4·0	294	e 1 8	+ 4	i 1 53	+ 1	i 1 18	P_g	2·1
Guantanamo Bay		6·9	296	i 1 47	+ 2	—	—	—	—	—
Fort de France		7·4	107	e 1 57	+ 5	—	—	—	—	—
Galerazamba		9·0	228	—	—	e 4 6	+ 8	e 4 56	S_g	—
Bogota		13·5	205	i 3 30	+15	e 6 9	+22	—	—	—
Miami		14·1	311	e 3 28	+ 5	e 6 16	+14	—	—	e 7·2
Washington		23·1	344	e 5 7	− 1	—	—	—	—	—
Philadelphia		23·6	348	—	—	e 9 22	− 3	—	—	e 13·7
Pennsylvania		25·1	343	i 5 27	− 1	i 10 21	SS	—	—	—
Weston		25·4	355	i 5 28	− 3	i 10 9	+13	—	—	—
Harvard		25·6	355	e 5 29	− 3	e 9 36	−23	e 10 0	S	—
Cleveland		26·8	338	e 5 33	−11	i 11 32	SS	—	—	—
St. Louis		28·7	323	e 6 2	+ 1	e 11 17	+27	e 6 40	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa	z.	28·9	350	—	—	e 12 13	SS	—	—	—
Huancayo		29·6	193	e 6 24	+15	e 11 11	+ 7	—	—	—
La Paz		33·3	179	e 6 42	+ 1	—	—	—	—	15·9
Tucson		41·1	300	e 7 49	+ 2	—	—	—	—	e 29·0
Logan		44·5	313	e 8 11	− 4	—	—	—	—	—
Pierce Ferry		44·5	305	i 8 17	+ 2	—	—	—	—	—
Boulder City		45·1	305	e 8 22	+ 2	—	—	—	—	—
Riverside	z.	46·8	302	e 8 34	+ 1	—	—	—	—	—
Mount Wilson	z.	47·4	302	i 8 39	+ 1	—	—	—	—	—
Tinemaha	z.	48·0	305	i 8 45k	+ 2	—	—	—	—	—
Hungry Horse		48·4	321	e 8 46	0	—	—	—	—	—
Fresno	z.	49·2	305	e 8 52a	0	—	—	—	—	—
Shasta Dam		51·9	309	i 9 10	− 2	—	—	—	—	—
Victoria	z.	54·4	318	e 9 29	− 2	—	—	—	—	—
Strasbourg		68·4	43	e 11 1	− 5	—	—	—	—	—
Tamanrasset	z.	69·2	71	e 11 7	− 3	—	—	e 13 40	PP	—
Stuttgart	z.	69·3	43	e 11 7	− 4	—	—	—	—	—
College		70·2	334	e 11 14	− 3	—	—	—	—	e 32·0
Collmberg	z.	71·6	41	e 11 22	− 3	—	—	—	—	—
Prague		72·7	42	e 11 27	− 5	—	—	—	—	—

Additional readings :—
Cleveland eZ =5m.45s.
Fresno eZ =9m.38s.
Tamanrasset iZ =11m.18s.
Prague e =11m.47s.
Long waves were also recorded at Bermuda, Berkeley, Pasadena, Alicante, and De Bilt.

Oct. 6d. 14h. U.S.A. Coast and Geodetic Survey give Lower California for origin.

Tucson iP =33m.13s., eL =34m.30s.
Palomar iPZ =33m.50s., iSEN =35m.59s.
Riverside ePZ =34m.2s., eZ =36m.24s.
Pasadena ePZ =34m.7s., iS =36m.52s.
Pierce Ferry iP =34m.11s.
Boulder City eP =34m.13s.
Haiwee iPZ =34m.30s.
Hungry Horse eP =36m.42s.
Victoria eZ =37m.2s.

Oct. 6d. 21h. 20m. 59s. Epicentre 33°·3N. 76°·5E. (given by the stations of the U.S.S.R).

A = +·1955, B = +·8144, C = +·5464 ; δ = +2 ; h = +1 ;
D = +·972, E = −·233 ; G = +·128, H = +·531, K = −·838.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dehra Dun	N.	3·2	156	e 0 25	?	—	—	—	—	—
New Delhi		4·7	173	1 1	−13	2 7	− 3	—	—	—
Murgab		5·5	338	1 22	− 3	2 24	− 6	—	—	—
Kulyab		7·2	312	e 1 58	+ 9	e 3 21	+ 8	—	—	—
Garm		7·6	320	e 1 51	− 4	—	—	—	—	—
Obi-garm		7·7	316	e 1 59	+ 3	i 3 27	+ 2	—	—	—
Fergana		8·0	333	e 1 59	− 1	3 33	0	—	—	—
Andijan		8·1	337	e 2 3	+ 1	3 37	+ 2	—	—	—
Naryn		8·1	357	e 2 5?	+ 3	e 3 38?	+ 3	—	—	—
Stalinabad		8·2	312	i 2 3	0	i 3 39	+ 1	—	—	—
Przhevalsk		9·3	9	i 2 22	+ 5	e 4 15	+10	—	—	—
Frunse		9·7	352	e 2 22	0	4 19	+ 4	—	—	—
Lunacharskoe		9·8	327	e 3 5	+41	—	—	—	—	—
Samarkand		9·9	312	e 2 19	− 6	—	—	—	—	—
Tashkent		9·9	326	e 3 2	+37	—	—	—	—	—
Almata		10·0	2	e 2 29	+ 2	—	—	—	—	—
Tchimkent		10·5	331	e 2 30	− 5	—	—	—	—	—
Bombay		14·7	194	e 3 1?	−30	e 5 47	−29	—	—	—
Poona	z.	14·9	190	e 3 2	−32	e 5 47	−33	e 6 7	SS	6·5
Calcutta	E.	15·0	133	e 5 1?	?	—	—	—	—	e 7·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ashkabad		15·5	293	e 3 50	+ 8	—	—	—	—	—
Hyderabad	E.	15·9	173	—	—	e 6 7	−37	—	—	7·8
Baku		22·4	296	—	—	e 9 8	+ 4	—	—	—
Shemakla		23·4	296	e 5 31?	+20	i 9 25?	+ 4	—	—	—
Sverdlovsk		25·9	340	e 5 43	+ 8	e 10 7	+ 3	—	—	—

Additional readings :—
New Delhi P*EN =1m.9s., P_gEN =1m.17s., PPPEN =1m.20s., QEN =1m.33s., iSEN = 1m.48s., S*EN, =1m.58s.
Poona SSSZ =6m.21s.
Long waves were also recorded at Colombo.

Oct. 6d. Readings also at 0h. (Balboa Heights, Hungry Horse, and near Garm), 1h. (Riverside, Tinemaha, Tucson, and Boulder City), 2h. (College, Ksara, and Tamanrasset), 4h. (College, near San Juan), 5h. (near Garm and near Athens), 8h. (near Athens), 10h. (College and near Garm). 11h. (Tamanrasset), 12h. (Nanking, Vladivostok, College, Tinemaha, Pierce Ferry, Tucson, Hungry Horse, Ottawa, Palisades, Harvard, Weston, Pennsylvania, Bermuda, Fort de France, Bogota, Galerazamba, near San Juan, near Athens, and near Messina), 13h. (Potsdam, Mary, Fergana, Kulyab, Naryn, Samarkand, Tashkent, near Andijan, Murgab, Obi-garm, and Stalinabad), 14h. (La Paz), 15h. (Shasta Dam and near Collmberg), 16h. (Tamanrasset and near Huancayo), 17h. (Ashkabad, Baku, Shemakla, Mary, Kizyl-Arvat, Tashkent, Ksara, Bombay, and Poona), 18h. (Helwan, Triest (2), Algiers Univ., Sverdlovsk, Tamanrasset, Pierce Ferry, and near Victoria), 19h. (Apia, Mount Wilson, Riverside, College, Tucson, Overton, and Pierce Ferry), 20h. (College, Collmberg, near Manila, and near Bogota), 22h. (near Messina and near Garm), 23h. (Athens, Ashkabad (3), Hungry Horse, College, and near Manila).

Oct. 7d. 13h. 34m. 31s. Epicentre 46°·7N. 1°·2W.

Intensity V at la Mothe-Achard, Ste. Hermine, les Moutiers-les-Mauxfaits, Vendrennes, Dompierre-sur-Yon, and Boulogne ; IV-V at Beaurepaire ; IV at La Ferrière.
Epicentre as adopted. Macroseismic area 4500 sq. km.

J. P. Rothé and N. Dechevoy.
La Séismicité de la France de 1940 à 1950. Annales de l'Institut de Physique du Globe de Strasbourg, 3e partie. Geophysique, Nouvelle série, Tome VII, Le Puy, 1954, p.61 with macroseismic chart.

$$A = +\cdot6881,\ B = -\cdot0150,\ C = +\cdot7255\ ;\quad \delta = +6\ ;\quad h = -4\ ;$$
$$D = -\cdot022,\ E = -1\cdot000\ ;\quad G = +\cdot725,\ H = -\cdot016,\ K = -\cdot688.$$

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Clermont-Ferrand	3·2	107	i 0 50	− 2	i 1 30	− 2	i 1 35	S_g	i 1·8
Paris	3·3	50	i 0 55	+ 2	i 1 33	− 2	i 1 15	P_g	—
Basle	6·1	79	e 1 44	P*	e 2 59	S*	—	—	—
Strasbourg	6·4	69	e 1 52	P*	e 3 17	S*	—	—	—
Zürich	6·7	81	e 1 48	+ 6	e 3 23	S*	—	—	—
Stuttgart Z.	7·3	70	e 2 10	P*	e 3 48	S*	e 4 3	S_g	—

Additional readings :—
Paris i =1m.2s., iS =1m.23s., iS_g =1m.39s., i =1m.49s.
Strasbourg i =1m.57s., e =3m.22s.
Stuttgart eZ =3m.42s. and 3m.51s.
Collmberg, Jena, and Prague record long waves.

Oct. 7d. 19h.-20h. Off British Columbia.
Victoria iPZ =59m.20s.k, eS =60m.13s., 60m.35s., and 60m.44s.
Seattle eP =59m.44s., e =60m.11s., eS =60m.40s.
Shasta Dam eP =60m.51s.
Mineral eP?Z =61m.1s.
Hungry Horse eP =61m.41s., iS =64m.0s.
Logan eP =61m.42s.
Fresno ePZ =61m.52s.s.
Tinemaha iPZ =61m.59s., iZ =62m.5s.
Haiwee iPZ =62m.9s.
College eP =62m.14s., eL =67m.3s.
Overton iPZ =62m.21s.
Pasadena iPZ =62m.26s.
Pierce Ferry iP =62m.27s.
Riverside iPZ =62m.32s.
Rapid City ePE =62m.35s.
Palomar iPEN =62m.41s.
Tucson eP =63m.16s.

Oct. 7d. Readings also at 0h. (near Alicante), 1h. (Nanking and near Djakarta), 2h. (near College), 3h. (Kizyl-Arvat, Ksara, near Ashkabad, and near Chinchina), 4h. (Tucson, Pierce Ferry. La Paz, near Bogota, and near Galerazamba), 5h. (near Bogota), 7h. (Tucson, Pierce Ferry, Hungry Horse, College, Palisades, Philadelphia, Harvard, and Tacubaya), 9h. (Apia, Mount Wilson, Tinemaha, Tucson, Pierce Ferry. Shasta Dam, College, Collmberg, and near Obi-garm), 13h. (Balboa Heights and Rathfarnham Castle), 14h. (Palomar, Pasadena, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, Prague, Obi-garm, near Garm, and near Klyuchi), 15h. (near Garm), 16h. (Hungry Horse and near Garm), 17h. (La Paz and Tamanrasset), 19h. (Athens, Tamanrasset, Collmberg, Stuttgart, near Messina, Taranto, near Andijan, and Garm), 20h. (Samarkand, near Kulyab, Obi-garm, and Stalinabad), 21h. (Nanking, Vladivostok, Calcutta, Shasta Dam, Hungry Horse, and near Huancayo), 22h. (Bombay, Calcutta, Nanking, Zi-ka-wei, Irkutsk, Vladivostok, Przhevalsk, Tashkent, Samarkand, Ashkabad, Shasta Dam, Hungry Horse, and College), 23h. (Auckland, Rome, Potsdam, Kew, and near Przhevalsk).

Oct. 8d. 3h. 23m. 9s. Epicentre 4°·0S. 128°·5E. (as on 1945 Nov. 27d.).

Felt at Amboina. Tsunami on the coast of Ceram.
Epicentre 3°·75S. 128°·25E.
Annales de l'Institut de Physique du Globe de Strasbourg 2e partie, Séismologie, 1950, Nouvelle Série T. XV, Strasbourg, 1954, p. 75.

$A = -\cdot6210$, $B = +\cdot7807$, $C = -\cdot0693$; $\delta = -6$; $h = +7$;
$D = +\cdot783$, $E = +\cdot623$; $G = +\cdot043$, $H = -\cdot054$, $K = -\cdot998$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		19·9	338	i 4 35	− 1	—	—	—	—	—
Bandong	N.	21·0	262	i 4 46	− 1	—	—	—	—	—
Djakarta		21·7	264	i 4 50	− 5	i 8 49	− 2	—	—	—
Guam		23·7	41	5 35	+21	—	—	—	—	—
Perth		30·2	201	6 21	+ 7	10 56	−17	7 1	?	—
Zi-ka-wei		35·6	349	7 5	+ 4	12 33	− 5	e 10 59	?	—
Miyazaki		35·8	5	i 7 5k	+ 2	12 27	−14	e 14 35	SS	—
Tomie		36·4	0	i 7 13	+ 5	e 12 55	+ 5	i 8 32	PP	—
Riverview		36·4	148	i 7 8a	0	i 12 45	− 5	i 7 17	pP	—
Kumamoto		36·7	4	e 7 13	+ 3	12 55	+ 1	—	—	17·0
Simidu		36·8	7	e 7 14	+ 3	e 13 5	+ 9	e 9 35	PcP	—
Nanking		37·0	346	i 7 13a	0	i 13 7	+ 8	8 49	PP	i 18·2
Ooita		37·2	5	e 7 15a	0	e 13 8	+ 6	—	—	e 21·6
Hukuoka		37·4	3	e 7 16	0	13 12	+ 7	8 49	PP	16·1
Kôti		37·7	7	e 7 19	0	e 13 21	+11	e 8 46	PP	16·8
Matuyama		37·9	6	e 7 20	0	e 13 15	+ 2	e 8 49	PP	18·7
Hirosima		38·4	6	7 23	− 2	e 13 21	+ 1	e 10 25	?	—
Owase	N.	38·6	9	e 7 26	0	13 34	+11	9 1	PP	—
Sumoto		38·6	10	i 7 28a	+ 2	13 22	− 1	—	—	16·4
Osaka		39·0	10	e 7 30	0	e 13 32	+ 3	—	—	e 16·4
Kameyama		39·4	11	i 7 36	+ 3	i 13 58	+23	14 51?	?	17·8
Omaesaki		39·6	12	e 7 34	− 1	—	—	e 9 31	PPP	—
Hikone		39·7	10	7 36	0	i 13 42	+ 2	e 9 51	PcP	e 19·8
Nagoya		39·8	11	e 7 37	+ 1	13 47	+ 5	e 16 40	SS	e 22·3
Toyooka		39·8	7	7 49k	+13	13 52	+10	—	—	—
Osima		39·9	14	e 7 39	+ 2	e 13 53	+10	e 17 0	SSS	—
Gihu		40·0	11	7 37	− 1	13 39	− 5	e 9 20	PP	16·8
Misima		40·1	13	7 38	− 1	13 55	+ 9	9 30	PPP	17·4
Hunatu		40·5	13	i 7 45	+ 3	e 13 47	− 5	—	—	17·2
Kohu		40·5	13	i 7 48	+ 6	e 13 56	+ 4	e 8 52	?	—
Yokohama		40·6	13	7 50	+ 7	—	—	e 13 1	?	17·2
Tokyo		40·9	13	i 7 51	+ 5	14 22	+24	9 30	PP	20·4
Matumoto		41·0	12	i 7 51	+ 5	e 14 10	+11	—	—	e 17·4
Kumagaya		41·2	13	7 48k	0	e 13 47	−15	17 24	SSS	19·4
Matusiro		41·3	11	i 7 47	− 2	i 14 18	+14	17 18	SS	19·9
Maebasi		41·4	12	i 7 51k	+ 1	e 13 43	−22	—	—	e 20·1
Tukubasan		41·5	13	7 51	+ 1	—	—	—	—	21·4
Nagano		41·5	11	e 7 51	+ 1	e 14 5	− 2	e 9 22	PP	16·8
Mito		41·7	13	i 7 53	+ 1	e 14 11	+ 1	9 53	PcP	17·8
Wazima		41·9	9	7 54	0	e 14 17	+ 4	—	—	e 17·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukusima		43·0	13	8 4	+ 1	i 14 32	+ 3	—	—	e 19·9
Sendai		43·6	14	i 8 9	+ 1	i 14 42	+ 4	—	—	18·2
Mizusawa		44·5	14	8 17	+ 2	14 57	+ 6	—	—	—
Akita		44·8	13	i 8 21k	+ 4	e 15 0	+ 5	—	—	e 21·9
Morioka		45·0	14	e 8 19a	0	e 15 1	+ 3	—	—	e 18·6
Miyako		45·2	15	e 8 19	− 1	e 14 59	− 2	—	—	e 20·6
Aomori		46·0	13	8 31	+ 4	i 15 27	+15	—	—	—
Vladivostok		47·0	4	i 8 34	− 1	i 19 3	SS	i 10 10	P_cP	—
Mori	E.	47·2	12	e 8 38	+ 2	15 30	+ 1	—	—	22·0
Calcutta	E.	47·3	306	i 8 37	0	e 15 20	−11	10 16	P_cP	—
Sapporo		48·3	12	i 8 46a	+ 1	e 15 47	+ 2	e 10 20	P_cP	e 25·5
Nemuro		49·6	16	8 54	− 1	16 7	+ 4	—	—	e 22·4
Colombo	E.	49·7	282	8 51	− 5	16 6	+ 2	—	—	29·2
Kodaikanal	E.	52·8	286	i 9 9	−10	i 16 35	−12	11 8	PP	24·4
Auckland	N.	53·5	134	i 12 58	PPP	e 17 7	+10	e 20 48	SS	22·8
Hyderabad		53·8	295	i 9 23	− 3	i 16 57	− 4	11 19	PP	24·6
New Plymouth	E.	54·0	136	e 9 31	+ 3	e 17 11	+ 8	—	—	—
Kaimata	N.E.	54·1	141	e 9 34	+ 5	e 17 5	0	—	—	—
Arapuni		54·7	135	e 9 39	+ 6	e 17 16	+ 3	—	—	—
Christchurch		55·4	142	9 35	− 3	i 17 27	+ 5	e 21 21	SS	e 26·7
Wellington		55·6	139	i 9 40	0	i 17 23	− 2	23 34	SSS	—
Tuai	N.	56·1	135	9 45	+ 2	e 17 28	− 4	—	—	—
Poona		58·3	295	i 9 54	− 5	i 17 54	− 7	10 46	P_cP	26·4
Dehra Dun	N.	59·0	309	9 30	−34	e 17 36	−34	—	—	e 27·2
New Delhi		59·0	307	e 10 0	− 4	i 18 6	− 4	10 48	P_cP	27·9
Bombay		59·3	295	i 10 4	− 2	i 18 10	− 4	i 12 19	PP	28·0
Irkutsk		59·7	343	10 6	− 3	18 9	−10	12 14?	PP	—
Apia		59·8	103	10 10	+ 1	e 18 40	PS	—	—	—
Przhevalsk		64·7	322	i 10 41	− 1	i 19 28	+ 6	—	—	—
Naryn		65·7	320	i 10 45	− 3	—	—	i 13 11	PP	—
Almata		66·1	321	i 10 48	− 3	i 19 44	+ 5	—	—	—
Andijan		67·8	316	e 10 59	− 3	20 7	+ 5	—	—	—
Fergana		68·1	316	i 11 0	− 4	e 20 4	+ 1	—	—	—
Kulyab		68·4	313	e 11 16	+10	—	—	—	—	—
Garm		68·5	315	e 11 4	− 2	—	—	—	—	—
Stalinabad		69·4	314	i 11 8	− 4	—	—	—	—	—
Lunacharskoe		70·2	316	e 11 14	− 3	i 20 33	+ 5	—	—	—
Tashkent		70·2	316	i 11 13?	− 4	i 20 35?	+ 7	i 13 55	PP	—
Samarkand		71·1	314	e 11 20	− 2	e 20 45?	+ 7	—	—	—
Mary		74·2	311	i 11 39	− 1	—	—	e 14 29	PP	—
Honolulu		76·1	66	i 11 51	0	e 21 19	−16	e 26 40	SS	e 31·8
Ashkabad		77·0	310	11 54	− 2	—	—	—	—	—
Kizyl-Arvat		78·8	311	i 12 2	− 4	—	—	—	—	—
Tananarive		80·2	252	e 12 9	− 5	i 22 16	− 3	30 53	SSS	e 37·0
Sverdlovsk		81·4	329	i 12 17	− 3	i 22 23	− 8	23 30	PS	—
Baku		83·9	311	i 12 33	0	i 23 3	+ 7	—	—	—
Lenkoran		84·5	309	12 37	+ 1	24 24	PPS	—	—	—
Grozny		87·4	314	12 50	0	23 34	+ 4	—	—	—
Tiflis		87·9	311	i 12 51	− 2	i 23 40	+ 5	—	—	—
Borzhomi		89·0	311	12 57	− 1	23 35	(+ 1)	—	—	—
Abastumanj		89·4	311	12 59	− 1	e 23 38	(+ 1)	—	—	—
Piatigorsk		89·5	314	i 12 59?	− 1	i 23 36?	(− 2)	—	—	—
Zugdidi		90·2	312	e 13 3	− 1	—	—	—	—	—
College		90·9	25	e 13 3	− 4	e 23 50	(+ 2)	e 16 25	PP	e 38·2
Moscow		93·8	325	13 21	+ 1	e 24 29?	+ 1	17 13	PP	—
Ksara		94·4	303	i 13 21	− 2	24 38	+ 5	—	—	—
Theodosia		95·0	315	e 13 33?	+ 7	24 8?	[+ 7]	—	—	—
Pietermaritzburg	z.	95·1	241	e 12 59	−27	—	—	e 17 14	PP	—
Yalta		95·9	314	13 28	− 2	e 24 46	0	e 24 7	SKS	—
Sitka		96·7	33	e 13 33	0	e 24 16	[+ 6]	i 17 27	PP	e 40·0
Pretoria	z.	97·5	244	i 13 36	− 1	—	—	e 17 33	PP	e 53·4
Pulkovo		97·6	329	i 13 43	+ 5	i 24 53	− 7	i 17 29	PP	—
Grahamstown	z.	97·7	236	e 13 39	+ 1	—	—	e 17 36	PP	e 41·8
Helwan		98·2	299	e 13 36	− 4	i 25 9	+ 4	17 41	PP	—
Kishinev		99·5	317	i 13 46	0	24 27	[+ 2]	17 53	PP	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		99·7	311	e 13 47	0	e 27 1	PS	—	—	—
Helsinki		100·2	331	e 13 55	+ 6	i 24 32	[+ 4]	18 3	PP	e 48·8
Bucharest		101·6	314	i 13 58	+ 2	i 24 34	[− 1]	i 18 19	PP	48·8
Lwow		102·4	320	i 13 58	− 1	—	—	i 18 11	PP	—
Sofia		103·8	313	e 14 3	− 2	i 24 47	[+ 2]	i 18 31	PP	—
Upsala		103·8	331	e 18 13	PP	e 24 53?	[+ 8]	e 25 12	SKKS	e 48·8
Warsaw		103·8	323	e 14 6	+ 1	24 48	[+ 3]	18 28	PP	e 41·8
Athens		104·1	308	e 14 5	− 2	e 24 48	[+ 2]	e 18 27	PP	—
Skalnate Pleso		104·9	320	e 14 11	+ 1	e 24 51	[+ 1]	e 18 38	PP	e 43·4
Timisoara	E.	104·9	316	e 14 25	+15	i 25 1	[+11]	e 18 43	PP	—
Victoria		104·9	40	14 14	+ 4	25 0	[+10]	18 40	PP	—
Resolute Bay	Z.	105·0	10	14 12	+ 1	—	—	—	—	—
Belgrade		105·6	315	e 14 10a	− 3	i 27 52	PS	i 18 32	PP	e 43·7
Arcata	Z.	105·8	48	e 17 44a	?	e 24 43	[−11]	e 18 38	PP	e 48·8
Seattle		105·8	41	i 14 39k	P	i 25 7	[+13]	i 18 36	PP	—
Budapest	E.	106·0	318	e 14 13	− 2	25 3	[+ 8]	18 43	PP	51·8
	N.	106·0	318	e 14 38	+23	25 13	[+18]	21 3	PPP	54·8
Raciborzu		106·0	321	e 14 14	− 1	—	—	e 18 41	PP	—
Kalossa	E.	106·3	318	e 14 17	0	e 25 6	[+10]	e 18 45	PP	e 36·8
	N.	106·3	318	e 14 36	+19	e 26 24	+11	e 18 58	PP	e 36·4
Ogyalla		106·5	319	e 14 24	+ 6	e 24 54	[− 3]	e 18 49	PP	e 44·4
Ukiah		106·7	50	e 14 21	+ 2	e 25 0	[+ 2]	e 18 36	PKP	e 43·6
Shasta Dam		107·1	49	e 14 21	+ 1	e 26 32	+12	i 18 27	PKP	—
Berkeley		107·6	52	e 14 26a	+ 4	e 25 4	[+ 2]	e 18 50	PP	e 56·6
Mineral	Z.	107·7	49	e 14 25	+ 3	—	—	e 17 56	?	—
Copenhagen		107·8	328	e 14 26	P	i 25 11	[+ 8]	i 18 58	PP	51·8
Santa Clara		107·9	52	i 14 38	P	i 25 10	[+ 7]	i 28 23	PS	e 55·6
Prague		108·4	322	e 14 30	P	e 25 6	[+ 1]	e 18 53	PP	e 46·8
Potsdam		108·5	324	i 14 31k	P	i 26 42	S	i 21 20	PPP	e 54·8
Taranto		108·7	311	13 6	?	23 56	?	17 46	?	—
Collmberg		108·9	323	e 14 27	P	e 26 38	S	e 19 3	PP	e 47·4
Reno		109·2	49	e 14 29a	P	e 25 27	[+18]	e 19 0	PP	e 50·4
Bergen	E.	109·3	334	—	—	e 25 21	[+12]	—	—	—
Cheb		109·6	322	e 14 38	P	e 25 15	[+ 4]	e 19 11	PP	52·8
Fresno		109·7	52	e 14 35a	P	e 25 26	[+15]	e 28 35	PS	e 59·4
Jena	E.	109·8	323	e 14 54	P	e 25 19	[+ 8]	e 18 58	PP	e 42·5
	N.	109·8	323	e 17 59	[−34]	e 25 13	[+ 2]	e 19 9	PP	—
	Z.	109·8	323	e 14 39?	P	e 29 35	PPS	e 19 3	PP	—
Trieste		110·0	317	e 18 44	[+11]	i 25 17	[+ 5]	e 14 49	P	e 54·8
Messina		110·4	309	e 18 19	[−15]	e 25 24	[+10]	e 19 18	PP	—
Scoresby Sund		110·9	350	19 23	PP	25 16	[0]	—	—	—
Tinemaha	Z.	110·9	52	e 18 31	[− 4]	—	—	e 14 40	P	—
Hungry Horse		111·0	39	i 18 31	[− 4]	e 25 14	[− 2]	e 14 41	P	—
Haiwee	Z.	111·3	53	e 14 42	P	—	—	—	—	—
Pasadena		111·5	55	i 18 35	[− 1]	i 25 26	[+ 8]	e 14 41	P	i 45·2
Padova		111·6	317	e 15 4	?	26 59	S	19 31	PP	—
Rocca di Papa		111·8	314	e 18 20	[−17]	—	—	e 16 46	?	—
Rome		111·9	314	i 14 43	P	e 26 0	(−18)	i 19 27	PP	—
Bologna		112·0	317	e 15 3	P	e 27 31	S	e 19 49	PP	e 59·2
Stuttgart		112·0	321	e 18 36	[− 1]	e 25 1	[−19]	e 14 40	P	54·8
Florence Xim		112·2	316	e 14 43	P	i 25 29	[+ 8]	—	—	—
Riverside		112·2	55	e 14 42	P	—	—	e 19 23	PP	—
Prato		112·3	316	e 18 24	[−13]	i 27 58	S	—	—	—
Karlsruhe		112·4	322	e 18 33	[− 5]	e 27 7	S	—	—	e 46·8
Chur		112·5	319	e 18 18	[−20]	—	—	e 19 27	PP	—
Butte	N.	112·7	40	e 19 16	PP	e 25 19	[− 4]	e 39 18	SSS	e 46·1
Zürich		112·9	320	e 18 44	[+ 5]	—	—	e 14 47	P	—
Strasbourg		113·0	322	e 18 35	[− 4]	i 25 31	[+ 7]	e 14 49	P	52·8
De Bilt		113·1	326	i 14 53k	P	i 29 9	PS	i 19 36	PP	e 53·8
Pavia		113·2	318	e 18 43	[+ 3]	e 29 18	PS	e 14 46	P	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Basle		113·5	321	e 18 40	[0]	e 29 14	PS	—	—	—
Boulder City		113·8	52	i 18 43	[+ 2]	—	—	e 14 52	P	—
Bozeman		113·8	40	e 19 42	PP	e 25 42	[+15]	e 26 26	SKKS	e 46·6
Overton	Z.	114·0	51	i 18 43	[+ 2]	e 26 55	{+22}	e 14 52	P	—
Saskatoon		114·0	33	19 35	PP	25 24	[− 4]	26 41	SKKS	—
Neuchatel		114·1	321	e 18 43	[+ 2]	e 29 56	PPS	—	—	—
Aberdeen	N.	114·3	333	i 17 1	P	i 29 33	PS	i 22 4	PPP	50·8
Pierce Ferry		114·4	51	i 18 44	[+ 2]	—	—	e 14 56	P	—
Logan		114·6	45	e 18 39	[− 3]	i 29 12	PS	e 14 52	P	e 48·9
Salt Lake City		114·8	46	e 19 19	?	e 29 19	PS	i 19 43	PP	e 46·8
Durham		115·1	330	i 19 56	PP	i 29 48	PS	i 24 11	?	—
Edinburgh	E.	115·5	332	—	—	e 30 44	PPS	—	—	—
Paris		116·1	323	i 18 45	[0]	i 25 44	[+ 8]	e 19 55	PP	e 55·8
Reykjavik	N.	116·3	346	—	—	e 30 21	PPS	—	—	e 60·2
Kew		116·4	327	e 15 10	P	i 25 45	[+ 8]	i 20 0	PP	e 51·8
Clermont-Ferrand		117·0	320	e 19 5	PKP_2	i 26 26	{−28}	e 22 27	PPP	e 45·6
Tucson		117·9	55	e 18 43	[− 6]	e 25 55	[+12]	e 15 14	P	e 47·4
Rathfarnham Castle		118·5	331	e 18 42	[− 8]	e 30 1	PS	e 20 16	PP	e 54·8
Jersey	E.	118·6	325	20 11	PP	25 51?	[+ 6]	30 12	PS	50·7
Barcelona		119·1	316	e 19 55	PP	i 30 10	PS	36 10	SS	e 45·5
Rapid City	E.	119·6	40	e 19 5	[+13]	i 30 8	PS	i 20 22	PP	e 50·2
Algiers Univ.	Z.	120·4	310	i 18 53k	[− 1]	e 25 10	[−41]	e 20 22	PP	—
Tortosa		120·8	316	19 28	[+34]	26 22	S	37 3	SSP	e 59·8
Tamanrasset	Z.	121·9	294	i 18 56k	[0]	e 26 9	[+12]	e 20 34	PP	—
Alicante		122·4	314	18 59	[+ 2]	26 3	[+ 5]	20 43	PP	e 56·1
Ivigtut		122·9	358	e 20 36	PP	e 26 12	[+12]	e 30 18	PS	e 56·8
Toledo		124·3	317	i 20 49	PP	25 54	[− 9]	27 30	SKKS	58·8
Granada		125·2	314	i 19 7a	[+ 4]	i 25 50	[−16]	i 20 35	PP	i 67·4
Lincoln	E.	125·4	41	e 20 59	PP	e 38 41	SSP	e 42 53	SSS	e 59·6
Malaga	Z.	125·9	314	i 19 5a	[+ 1]	26 19	[+10]	i 20 59	PP	58·8
Guadalajara		127·0	66	—	—	e 26 21	[+ 9]	e 28 23	SKKS	—
Lisbon		128·3	318	19 6a	[− 3]	22 35	PKS	21 19	PP	63·8
Chicago		130·4	35	e 21 25	PP	e 28 25	{+ 2}	i 22 38	PKS	e 54·8
Florissant		130·6	40	e 19 9	[− 4]	i 22 33	PKS	e 21 21	PP	—
St. Louis		130·7	40	e 19 10	[− 3]	e 22 35	PKS	i 21 23	PP	—
Tacubaya		131·0	68	e 19 26	[+12]	e 29 32	S	i 21 51	PP	—
Little Rock		131·3	46	e 19 18	[+ 4]	e 22 41	PKS	e 21 29	PP	—
Puebla		132·0	67	e 22 48	PKS	e 26 33	[+ 8]	—	—	—
Ottawa		133·6	23	19 11	[− 8]	22 51	PKS	21 43	PP	—
Shawinigan Falls	N.	133·8	19	19 16	[− 3]	e 22 45	PKS	e 21 46	PP	—
Seven Falls	E.	133·9	18	19 17	[− 2]	28 23	{−21}	21 55	PP	—
Vera Cruz		133·9	66	e 19 18	[− 1]	e 29 44	S	i 21 46	PP	—
Cleveland		134·0	31	e 19 20k	[0]	i 22 52	SKP	i 21 46	PP	—
Buffalo		134·3	27	i 18 21	[−59]	—	—	e 21 59	PP	—
Vermont		135·4	22	e 19 28	[+ 6]	i 22 58	SKP	e 22 9	PP	e 54·7
Pittsburgh		135·6	30	i 19 49?	[+26]	i 23 6?	SKP	—	—	—
Pennsylvania		136·4	29	e 19 23	[− 1]	i 23 3	SKP	i 22 10	PP	—
Harvard		137·7	21	i 19 17	[− 9]	e 26 37	[+ 2]	i 22 7	PP	—
Weston		137·9	21	i 19 19	[− 8]	i 23 6	PKS	i 22 21	PP	—
Palisades		138·0	24	i 19 26	[− 1]	i 23 6	PKS	i 22 12	PP	—
Fordham		138·2	24	e 19 25	[− 2]	i 23 4	PKS	e 22 13	PP	—
Halifax		138·2	12	19 26	[− 1]	22 58	PKS	22 6	PP	—
Washington		138·2	29	i 19 27	[0]	i 29 3	{− 7}	i 22 11	PP	—
Philadelphia		138·3	27	e 19 28	[+ 1]	e 29 11	{ 0}	e 22 14	PP	e 56·7
Columbia		139·4	39	e 19 25	[− 4]	e 26 55	[+17]	e 22 27	PP	e 55·0
La Plata	E.	140·8	172	22 51	PKS	32 33	PS	40 57	SS	60·8
	N.	140·8	172	19 51	[+19]	32 37	PS	45 45	SSS	63·6
	Z.	140·8	172	19 39	[+ 7]	—	—	—	—	70·8
Bermuda		149·2	22	e 19 54	[+ 8]	e 27 8	[+15]	i 23 36	PP	e 62·0
Huancayo		151·4	124	e 19 53	[+ 3]	i 29 56	{−30}	i 43 36	SSP	e 58·6

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights	151·7	77	e 19 27	[−23]	—	—	—	—	—
La Paz	153·8	141	i 19 55a	[+ 2]	i 26 55	[− 3]	i 24 4	PP	73·8
Galerazamba	155·5	71	i 20 9?	[+14]	—	—	i 20 42	PKP_2	—
Chinchina	155·9	84	i 19 59	[+ 3]	e 23 47	PKS	i 20 35	PKP_3	75·0
Bogota	157·5	87	i 20 0	[+ 2]	—	—	i 20 33	PKP_2	—
San Juan	159·8	43	e 20 1	[+ 1]	e 44 51	SS	e 28 6	PPP	e 67·0
Fort de France	165·7	40	e 20 11	[+ 5]	—	—	—	—	—

Additional readings :—
Tomie iN =8m.54s.
Riverview i =7m.26s., iZ =8m.0s., iEN =8m.42s. and 12m.56s., iSSEN =15m.16s.
Nanking iZ =8m.3s., Q?N =15m.45s.
Hukuoka eZ =7m.19s., eE =7m.32s., PPP =9m.15s., e =13m.20s.
Kôti eSS =15m.55s.
Matuyama ePPPN =9m.17s., eSSS =16m.6s.
Sumoto PP? =8m.43s., i =11m.11s.
Omaesaki e =16m.46s.
Hikone ePP =8m.51s., eSS =16m.51s.
Osima e =10m.7s.
Gihu ePPP =10m.4s.
Misima i =11m.22s.
Tokyo PPPE =10m.52s., Q =17m.1s.
Kumagaya PP?E =8m.53s.
Mito PPPEN =10m.57s.
Sendai iN =8m.53s., e =12m.49s.
Calcutta PPP?E =10m.24s., P_cSE =14m.10s., PPSE =15m.40s., SSE =18m.36s., E =20m.1s.
Sapporo ePP =10m.52s., ePPP =12m.1s., iSS =19m.30s., eQ =23m.42s.
Kodaikanal PPPE =12m.11s., SSE =20m.9s.
Hyderabad SSE =21m.35s.
Christchurch i =9m.55s., eQEN =23m.11s.
Wellington P_cP =10m.25s., SS =21m.24s.
Poona PPE =12m.3s., PPPE =13m.19s., P_cSE =14m.33s., PPSE =18m.17s., S_cSE = 19m.50s., SSE =21m.28s., SSSE =24m.6s., QE =24m.21s.
New Delhi PPN =12m.19s., PPPN =13m.49s., PPSN =18m.29s., S_cSN =19m.52s., iN = 22m.41s., SSSN =24m.34s., QN =24m.57s.
Bombay iPPPEN =13m.48s., iSSN =21m.51s., iSSE =22m.15s., QN =24m.41s.
Irkutsk PPP =13m.40s., PS =18m.54s., SS =22m.36s.
Naryn iPPP =14m.58s.
Tashkent ePPP =15m.49s., iS_cS =21m.22s., iSS =24m.53s., iSSS =28m.15s.
Honolulu e =12m.13s., 12m.22s., and 12m.57s., ePP =15m.34s., e =16m.5s. and 22m.25s., eSSS? =29m.42s., eSSS =29m.49s.
Tananarive e =12m.20s. and 13m.2s., PPP =17m.24s., i =24m.21s.
Sverdlovsk iPP =15m.18s., i =16m.13s., 16m.57s., 18m.54s., and 22m.33s., e =23m.4s., SS =28m.16s.
College i =16m.44s., ePPP =18m.45s., iSS? =30m.10s., ePKKP =30m.28s., iPKP,PKP = 39m.3s.
Moscow SKS =24m.5s., ePS =26m.3s., eSS =30m.58s.
Sitka iPPP =20m.3s., e =23m.3s., ePS =26m.3s., iPS =26m.19s., e =29m.51s., eSS = 31m.29s.
Pretoria ePKKPZ =30m.11s.
Helwan PSE =26m.21s.
Helsinki iPPP =20m.3s., iS =25m.34s., ePS =26m.46s., ePPS =27m.42s., eSS =32m.18s., eN =33m.53s.
Bucharest iPN =14m.3s., iSKSN =24m.43s., eSKKSN =25m.17s., iSKKSE =25m.23s., iSN =25m.43s., iPSN =27m.7s., iPSE =27m.19s., iSSE =32m.13s.
Sofia iPS =27m.42s., i =30m.47s.
Upsala eS =25m.40s., ePS? =27m.31s., eSS =33m.9s., iPKKSE =33m.32s., eQN = 43·8m., and many other e readings.
Warsaw PPN =18m.47s., SKKSE =25m.7s., SKKSN =25m.10s., eS?N =25m.34s., eS?E =25m.42s., PS =27m.38s., PPSNZ =28m.18s., PPSE =28m.25s., SSE = 32m.46s., SSN =33m.6s., SSS =37m.0s.
Athens eS? =25m.55s.
Skalnate Pleso ePKP =18m.7s., eSKKS =25m.25s., ePS =27m.33s., ePPS =28m.31s., eSS =32m.57s., eSSS =38m.21s., and several other e readings.
Timisoara eE =21m.42s., eSKKSEN =25m.38s., iSN =26m.12s., ePSE =27m.57s.
Victoria PKPZ =18m.26s., S =26m.14s., PS =27m.50s., SSS =37m.27s.
Belgrade i =31m.1s.
Arcata eN =19m.2s., eZ =28m.33s.
Seattle i =15m.2s., iPP =18m.22s., i =18m.55s. and 19m.55s., iPPP =20m.24s., i = 26m.51s.
Budapest PPN =18m.58s., SKKSE =25m.40s., SKKSN =25m.51s.?, iSN =26m.18s., PSE =28m.1s., PPSE =29m.7s., iN =31m.22s., SSE =33m.11s., SSN =33m.22s., SSPE =34m.10s., SSSN =37m.40s.

Continued on next page.

Raciborzu ePKPZ =17m.54s., ePKPE =17m.58s., ePPN =18m.46s.
Kalossa eE =18m.29s., 26m.44s., and 28m.5s.
Ogyalla ePE =14m.27s., ePKPN =18m.11s., eSKKSN =25m.37s., ePS =27m.49s., ePPS? =29m.11s., eSS =34m.21s., eSSS =38m.15s., and several other unidentified e readings.
Ukiah ePS =28m.0s., eSS =34m.10s., iSSS =38m.9s.
Shasta Dam i =22m.35s.
Berkeley ePKPZ =17m.31s., ePPPZ =21m.5s., eZ =25m.35s., ePSE =28m.18s., eZ = 28m.31s.
Copenhagen e =17m.57s. and 18m.34s.
Santa Clara iPPE =19m.9s., eE =49m.23s.
Prague ePKP =18m.6s., ePP =19m.5s., eSKP? =20m.3s., ePPP =21m.18s., e =23m.5s., eSKKS =25m.51s., eS?N =26m.36s., e =27m.48s., ePS =28m.11s., ePPS = 29m.21s., eSS =34m.21s., eSSS =38m.39s., e =39m.45s., eE =42m.51s., eN = 44m.41s.
Potsdam iPP =18m.49s., iPKSE =22m.8s., iPKSZ =22m.12s., iPSEN =28m.18s., iPPSE =29m.20s., iPPSZ =29m.23s., iSSPZ =34m.44s., iSSPN =34m.47s.
Collmberg ePKPZ =17m.44s., ePPPN =21m.11s., eSKSN =24m.37s., ePPSN = 29m.28s., eSSN =34m.55s.?, eSSSN =38m.41s., and many other unidentified e readings.
Reno ePKPZ =17m.40s., eE =18m.28s., eZ =28m.53s.
Bergen eN =32m.23s., 33m.47s.?, and 36m.12s.
Cheb ePKP =18m.24s., ePPP =21m.50s., ePS =28m.20s., ePPS =29m.2s. and 29m.38s., eSS =34m.51s., eSSS =38m.45s. and other unidentified e readings.
Fresno eZ =18m.14s., ePPZ =19m.7s.
Jena ePKP?Z =18m.7s., ePP?N =18m.55s., eN =19m.53s., eE =19m.59s., eZ = 21m.23s., eN =21m.27s. and 21m.30s., eZ =22m.27s., eN =22m.30s. and 23m.8s., eE =23m.11s., eSKS?N =24m.54s., eN =25m.57s., eS?N =26m.51s., ePS?E = 28m.33s., ePS?N =28m.36s., eE =29m.43s., eN =29m.47s., eSSS?E =38m.51s., eSSS?Z =38m.59s.
Trieste iPPZ =19m.23s., iPPPZ =21m.52s., iSKKS =26m.10s., iS =27m.9s., iPS = 28m.59s., iPPS =29m.59s., iSS =34m.48s.
Messina ePS? =28m.40s., eSS? =34m.41s.
Tinemaha eZ =17m.39s., ePPZ =18m.58s.
Hungry Horse ePP =19m.8s.
Pasadena iZ =16m.34s. and 17m.56s., iPP =19m.18s., iPPPZ =21m.28s., iSN =27m.3s., iPS =28m.55s., iPPSN =30m.0s., iSSEN =34m.14s.
Padova S =27m.24s., PS =29m.15s.
Rocca di Papa eN =19m.24s.
Rome e =18m.6s., i =22m.30s., S =27m.8s., iPS =29m.12s., SS =35m.0s.
Bologna e =18m.53s., ePS =29m.12s.
Stuttgart ePKPZ =18m.2s., ePP =19m.7s., ePPP =21m.53s., eS =27m.7s., ePS = 28m.51s., ePPS =30m.1s., eSS =35m.6s., eSSS =39m.13s., eQ =46·0m.
Butte e =19m.55s., eSSN =34m.19s.
Zürich ePP =19m.28s.
Strasbourg e =16m.45s. and 18m.17s., ePP =19m.19s., iPPP =22m.2s., eS =27m.15s., iPS =29m.4s., iPPS =30m.14s., iSS =34m.43s., iSSS =39m.2s., Q =46m.16s.
De Bilt eSS =35m.34s., eSSS =39m.27s.
Pavia ePP =19m.36s., eS =26m.43s.
Boulder City ePP =19m.34s.
Bozeman iPS =29m.10s., iPPS =30m.25s., eSS? =35m.58s., eSSS =39m.54s.
Overton ePPZ =19m.43s., iPKKPZ =29m.30s.
Saskatoon PPP =22m.6s., PS =29m.15s., SS =35m.37s., SSS =39m.51s.?
Aberdeen PKPN =17m.57s., ePPN =19m.13s., iSN =27m.8s., iN =27m.30s. and 32m.40s., iSSN =34m.46s., iN =40m.20s.
Logan ePKP? =18m.28s., iPP =19m.38s., e =26m.54s., ePSPS =36m.3s., eSSS =40m.0s.
Salt Lake City e =24m.3s., iPS =29m.31s., eSS =35m.51s., eSSS =39m.47s.
Paris i =18m.52s., 19m.27s., and 20m.5s., iPPP =22m.20s., i =23m.20s., iSKKS = 26m.50s., iS? =27m.44s., iPKKP =29m.20s., iPS =29m.38s., iSS =36m.13s., i =38m.8s., iSSS =40m.32s.
Kew e =21m.37s., eSKKSEN =27m.3s., iPSEN =29m.34s., iZ =31m.27s., iSS = 35m.55s., eEN =39m.55s., eSSSEN =40m.51s.?, eEN =44m.59s.
Clermont-Ferrand i =24m.2s., iPS =29m.46s., iPPS =31m.1s., eSS =36m.9s.
Tucson iPKP =18m.50s., ePP =20m.1s., i =23m.50s., eS? =27m.20s., eS =27m.59s., ePKKP =29m.13s., ePS =29m.55s., iPS =29m.59s., eSS =37m.17s., e =38m.46s.
Rathfarnham Castle eEN =21m.32s., eSKS =26m.28s., ePPSEN =31m.3s., eSSEN = 36m.21s., eSSSEN =40m.41s.
Rapid City eSKS?E =25m.22s., eSSE =37m.4s., eSSSE =41m.50s.
Algiers Univ. eZ =19m.54s., ePPPZ =22m.53s., eZ =23m.34s.
Tortosa PPE =20m.48s., PSEN =30m.27s., PPSE =31m.48s., SSSEN =41m.26s.
Tamanrasset ePPPZ =23m.11s., eZ =29m.53s., ePSZ =30m.26s., eZ =32m.20s.
Alicante PPP =23m.15s., SKKS =27m.35s., PS =30m.27s., PPS =31m.55s., SS = 37m.23s., SSP =37m.47s., Q =50m.35s.
Ivigtut e =22m.56s.
Toledo PPP =23m.18s., PS =30m.42s., SS =37m.28s., SSS =43m.3s.
Granada SKP =21m.56s., PPP =23m.11s., sSKS =26m.20s., iSKKS =28m.14s., PS = 30m.47s., PPS =32m.20s., iSS =36m.50s., sSS =37m.59s., SSS =43m.0s., Q =61·2m.

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Lincoln eE =29m.11s. and 46m.49s.
Malaga PPPZ =23m.35s., PPSZ =34m.29s., SSZ =37m.45s.
Guadalajara e =27m.17s.
Lisbon PKPZ =19m.9s., iPP =21m.24s., PPP?Z =24m.4s., N =26m.48s., eZ =30m.34s., EN =34m.31s., 41m.4s., and 48m.21s.
Chicago ePKS =22m.33s., eSS =39m.19s., eSSS =44m.9s.
Tacubaya i =25m.58s.
Ottawa e =19m.19s., PPP =24m.34s., PS =31m.42s., PPS =34m.9s., SS =39m.21s., SSS =44m.51s.
Seven Falls PKSE =22m.51s., PSE =31m.33s., SSE =39m.51s.
Vera Cruz i =25m.22s., eSKSP =31m.50s.
Cleveland ePPE =21m.49s., iPSKSN =31m.45s., iN =32m.1s.
Buffalo e =20m.52s.
Vermont eSKS? =27m.4s., iPPS =34m.14s., iSS =40m.4s., iSSS? =45m.26s.
Pennsylvania iZ =19m.27s., iE =19m.39s., iPPNZ =22m.26s., iZ =23m.17s.
Harvard iPKS =23m.6s., ePPP =24m.46s., e =25m.20s., 25m.55s., and 27m.36s., eSKKS =28m.38s., eSKKKS =29m.13s., ePcS,PKP =29m.47s., e =31m.20s., ePPS =34m.30s., ePPPS =35m.45s., ePKP,PKP =36m.40s., eSS =41m.1s., eS_cSS_cS =42m.11s., eSSS =45m.31s.
Weston iSS =40m.44s.
Palisades iPPP =25m.20s., iPS =32m.45s.
Fordham iPPP =25m.21s.
Halifax e =19m.50s., PS =32m.30s., SS =39m.51s.?
Washington iPPS =34m.47s.
Philadelphia iPP =22m.17s., iPKS =23m.9s., eSKSP =32m.12s., iPS =32m.53s., iPPS =34m.36s., eSS =40m.41s., iPSPS =41m.22s., i =42m.20s.
Columbia iPKS =23m.14s., eSKSP =32m.8s.?, eSS =40m.36s., eSSS? =46m.13s.
La Plata PKP?E =19m.57s., PKSN =22m.39s., SKKSN =28m.9s., PPSN =34m.45s., PSSN =40m.45s., PSS?E =40m.57s., SSSE =45m.51s., and many other unidentified readings.
Bermuda i =20m.11s., eSKSP =33m.54s., e =36m.20s., ePPS =36m.41s., eSS =42m.12s., eSSS =48m.51s.
Huancayo i =22m.36s., ePP =24m.21s., i =26m.15s., iSKSP? =34m.19s., eSSS =49m.53s.
La Paz $iPKP_2Z$ =20m.35s., iPPSZ =37m.4s.?, SSZ =43m.27s., iSSPZ =44m.21s., iSSS =50m.6s.
Chinchina eSKS =27m.47s., eSKKS =30m.39s., ePSKSEN =34m.35s., ePPSEN =37m.47s.
Bogota iPPPZ =24m.13s., i =25m.1s.
San Juan iPKP =20m.51s., e =25m.24s. and 30m.25s., eSKSP =34m.23s., e =39m.15s.

Oct. 8d. 4h. 50m. 12s. Epicentre 29°·2N. 95°·1E. (as on Sept. 14d.).

Intensity VI at Dibrugarh ; V at Tezpur.

Seismological Bulletin, Oct., 1950. Government of India, p.7. Epicentre 29°·5N. 93°·5E. According to Seismo. Bull. of U.S.S.R., epicentre 29°·0N. 97°·5E.

$A = -\cdot0777$, $B = +\cdot8709$, $C = +\cdot4853$; $\delta = +2$; $h = +2$;
$D = +\cdot996$, $E = +\cdot089$; $G = -\cdot034$, $H = +\cdot483$, $K = -\cdot874$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	9·0	224	i 2 5	− 8	i 3 34	−24	2 19	PP	3·4
Dehra Dun	N.	14·9	279	(e 3 42)	+ 8	(e 5 51)	−29	—	—	—
New Delhi		15·7	272	e 3 32	−12	i 6 9	−30	3 43	PP	6·1
Przhevalsk		18·9	320	i 4 28	+ 4	i 7 59	+ 6	—	—	—
Hyderabad		19·2	236	i 4 17	−11	i 7 40	−19	—	—	9·6
Naryn		19·8	315	i 4 36	+ 1	i 8 19	+ 6	—	—	—
Almata		20·2	320	4 43	+ 4	8 33	+12	—	—	—
Nanking		20·6	75	4 53a	+10	i 9 7	SSS	—	—	i 11·2
Frunse		21·4	315	i 4 54	+ 3	i 8 57	SS	—	—	—
Andijan		21·8	308	i 4 58	+ 2	9 4	+12	—	—	—
Fergana		22·1	308	4 58	− 1	e 9 0	+ 2	—	—	—
Poona		22·1	246	i 4 52	− 7	i 8 37	−21	5 21	PP	10·0
Garm		22·7	304	e 5 3	− 1	—	—	—	—	—
Bombay		22·8	249	i 5 3	− 2	i 9 1	−10	—	—	11·1
Irkutsk		24·0	13	i 5 28	+11	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lunarcharskoe		24·2	307	i 5 20	+ 1	—	—	—	—	—
Tashkent		24·2	307	i 5 20	+ 1	i 9 42	+ 7	—	—	—
Kodaikanal	E.	25·1	226	i 9 45	S	(i 9 45)	− 6	—	—	—
Samarkand		25·3	302	e 5 33	+ 3	e 10 2	+ 8	—	—	—
Colombo	E.	26·4	216	e 5 35	− 5	9 48?	−24	—	—	19·3
Mary		28·9	297	i 6 1	− 2	—	—	—	—	—
Kizyl-Arvat		33·4	299	i 6 41	− 1	—	—	—	—	—
Sverdlovsk		36·7	329	i 7 14	+ 4	i 13 0	+ 6	—	—	—
Grozny		41·6	304	7 53	+ 2	—	—	—	—	—
Borzhomi		43·4	302	e 8 6	0	e 14 34	− 1	—	—	—
Piatigorsk		43·6	305	e 8 7	− 1	—	—	—	—	—
Abastumanj		43·8	302	e 8 8	− 1	—	—	—	—	—
Zugdidi		44·5	303	e 8 12	− 3	—	—	—	—	—
Ksara		50·1	291	e 8 43	−16	e 16 11	+ 1	—	—	—
Skalnate Pleso		58·9	313	e 10 18?	+15	e 18 7	− 1	e 12 36	PP	—
Upsala		59·0	325	—	—	e 18 10	0	e 22 4	SS	e 26·8
Belgrade		59·6	307	e 10 6a	− 2	e 18 24	+ 7	e 25 28	SS	e 35·5
Raciborzu	Z.	60·1	314	e 10 11	0	—	—	—	—	—
Ogyalla		60·5	312	e 12 56	PP	e 18 24	− 5	—	—	—
Copenhagen		62·4	321	i 10 28	+ 1	—	—	—	—	36·8
Prague		62·5	315	e 10 28	0	e 18 49	− 5	e 12 53	PP	e 33·8
Potsdam		62·8	318	i 10 28	− 2	—	—	—	—	35·8
Taranto		63·0	303	e 9 38	−53	—	—	—	—	—
Collmberg	Z.	63·1	316	e 10 31	− 1	—	—	e 12 40	PP	e 38·0
Cheb		63·7	315	e 12 2	?	e 18 51	−19	e 13 2	PP	e 31·3
Jena	N.	64·0	316	e 10 41	+ 3	—	—	—	—	—
Triest		64·0	310	i 10 52a	+14	i 19 26	+13	11 0	pP	—
Messina		64·9	302	e 10 45k	+ 2	e 19 20	− 4	—	—	—
Rome		66·0	306	e 10 48	− 2	—	—	—	—	—
Stuttgart	Z.	66·1	314	e 10 50a	− 1	—	—	i 11 0	pP	—
Prato		66·3	308	e 10 48	− 4	e 21 34	SS	—	—	—
Chur		66·5	312	e 10 52a	− 2	—	—	—	—	—
Zürich		66·9	313	e 10 53	− 3	—	—	—	—	—
Strasbourg		67·1	315	i 10 57	0	—	—	e 13 29	PP	—
Basle		67·5	313	e 11 0	0	e 20 55	+59	—	—	—
Paris		70·3	316	e 11 18	+ 1	—	—	i 13 54	PP	—
Kew	Z.	70·9	319	i 11 23	+ 2	—	—	—	—	—
Rathfarnham C.	Z.	73·5	323	e 11 35?	− 1	—	—	—	—	—
College		74·4	23	i 11 46	+ 4	—	—	—	—	—
Algiers Univ.	Z.	74·7	304	i 11 42a	− 1	—	—	e 14 30	PP	—
Tortosa		74·8	309	11 50	+ 6	21 18	− 2	12 13	PcP	—
Resolute Bay	Z.	76·2	3	11 54	+ 2	—	—	—	—	—
Alicante		76·5	307	11 52	− 2	21 32	− 7	12 12	PcP	e 35·5
Tamanrasset	Z.	78·9	290	i 12 5k	− 2	e 22 2	− 3	i 12 13	PcP	—
Pretoria	Z.	84·3	236	e 12 31	− 4	—	—	—	—	—
Pietermaritzburg	Z.	85·0	232	e 12 9	−29	—	—	—	—	—
Victoria	Z.	95·3	24	e 13 33	+ 6	—	—	—	—	—
Hungry Horse		98·5	19	e 13 45	+ 3	—	—	i 17 37	PP	—
Shasta Dam		102·3	28	e 18 7	PP	—	—	—	—	—
Mineral	Z.	102·9	27	e 18 12	PP	—	—	—	—	—
Reno	Z.	104·3	26	e 18 21	PP	—	—	—	—	—
Tinemaha	Z.	107·1	27	e 18 51	PP	—	—	—	—	—
Haiwee	Z.	107·9	27	e 18 57	PP	—	—	—	—	—
Overton	Z.	109·0	24	e 18 52	PP	—	—	—	—	—
Boulder City		109·3	24	18 58	PP	—	—	—	—	—
Pierce Ferry		109·5	24	i 19 13	PP	—	—	—	—	—
Pasadena	Z.	109·6	28	e 19 12	PP	—	—	—	—	—
Riverside	Z.	110·0	28	e 19 15	PP	—	—	—	—	—
Tucson		114·1	24	e 18 47	[+ 6]	—	—	—	—	—

Additional readings and note :—
Calcutta SSE =3m.45s.
Dehra Dun readings have been reduced by 8m.
New Delhi PPPEN =3m.52s., SSEN =6m.25s., SSSEN =6m.39s.

Continued on next page.

Poona PPPE =5m.35s., P_cPE =8m.52s., QE =9m.0s., SSE =9m.15s., SSSE =9m.36s.
Skalnate Pleso eE =12m.13s., eN =12m.24s., ePPP? =13m.41s., e =20m.24s., eSSS? = 24m.6s.
Upsala eN =21m.35s.
Belgrade e =12m.15s.
Ogyalla eSE =18m.32s.
Prague e =13m.1s., ePPP =13m.56s., e =19m.54s., eSS? =22m.48s., eSSS? =24m.56s.
Potsdam iPZ =10m.31s.
Collmberg eZ =10m.46s. and 10m.56s.
Cheb eSS =23m.19s., e =24m.36s. and 26m.42s.
Jena eEN =10m.55s.
Paris i =11m.26s.
Algiers Univ. iZ =11m.50s. and 11m.58s.
Alicante S_cS =22m.4s., SS =26m.36s., SSS =30m.14s.
Tamanrasset eZ =13m.2s. and 13m.40s., iPPZ =15m.2s., ePPPZ =16m.55s.
Pretoria eZ =13m.2s.
Overton iPPZ =19m.11s.
Boulder City ePP =19m.7s.

Oct. 8d. 11h. 9m. 35s. Epicentre 31°·5N. 40°·8W. (as on 1943, July 6d.).

$A = +·6466$, $B = -·5582$, $C = +·5199$; $\delta = -3$; $h = +1$;
$D = -·653$, $E = -·757$; $G = +·394$, $H = -·340$, $K = -·854$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		20·4	278	e 4 41	0	e 8 35	+10	—	—	e 9·2
San Juan		26·3	246	e 5 45	+ 6	e 10 13	+ 2	—	—	e 11·0
Weston		26·6	304	e 5 38	− 4	—	—	—	—	—
Harvard		26·8	304	e 5 41	− 3	—	—	—	—	e 12·3
Philadelphia		29·0	296	—	—	e 11 1	+ 7	—	—	e 12·1
Granada		31·1	68	i 6 41k	+19	—	—	i 8 18	PP	—
Alicante		33·6	66	6 49	+ 5	11 53	−13	14 33	SSS	e 16·4
Tortosa		34·3	63	i 7 0	+10	—	—	—	—	—
Algiers Univ.	z.	36·4	69	e 7 9	+ 1	—	—	—	—	—
Paris		36·8	49	i 7 13	+ 2	—	—	—	—	
Strasbourg		40·2	51	e 7 41	+ 1	—	—	—	—	—
Stuttgart	z.	41·1	51	e 7 48	+ 1	—	—	—	—	—
Tamanrasset	z.	41·9	90	e 7 54	0	e 9 56	P_cP	e 9 36	PP	—
Rome		43·4	61	—	—	e 14 22	−13	—	—	—
Collmberg	z.	43·8	47	e 8 11	+ 2	—	—	—	—	—
Triest	z.	44·1	55	i 8 11a	− 1	—	—	e 10 5	PP	—
Prague		44·6	48	e 8 16	0	—	—	e 10 0	PP	—
La Paz	z.	54·5	212	e 9 33	+ 1	—	—	—	—	—
Logan		56·4	302	e 9 38	− 7	—	—	—	—	—
Hungry Horse		56·5	310	e 9 44	− 2	—	—	—	—	—
Tucson		58·4	291	e 9 59	− 1	—	—	—	—	e 28·9
Pierce Ferry		59·7	296	i 10 9	0	—	—	—	—	—
Overton	z.	59·9	297	i 10 11	+ 1	—	—	—	—	—
Boulder City		60·4	296	e 10 13	0	—	—	—	—	—
Haiwee	z.	62·7	297	e 10 29	0	—	—	—	—	—
Riverside	z.	63·0	295	e 10 37	+ 6	—	—	—	—	—
Ksara		63·1	66	e 10 48	+16	—	—	e 7 44	?	—
Pasadena		63·6	295	e 10 35	0	—	—	—	—	e 31·4
Mineral	z.	63·9	303	e 10 38	+ 1	—	—	—	—	—
Shasta Dam		64·4	303	e 10 36	− 4	—	—	—	—	—
College		68·7	334	e 11 6	− 1	—	—	—	—	—

Additional readings :—
Paris i =7m.19s. and 7m.23s.
Strasbourg e =8m.1s.
Tamanrasset ePPPZ =10m.5s., eZ =12m.51s.
Prague eN =8m.25s.
Long waves were also recorded at Palisades, Washington, Rapid City, and Berkeley.

Oct. 8d. 11h. Fiji region, very deep.

Apia eP? =38m.55s., e =39m.12s. and 41m.12s., eS? =41m.21s.
Wellington eP =39m.21s., eS =42m.5s.
Kaimata ePNE =39m.42s., eSNE =42m.38s.
Tuai eN =41m.14s.
Pasadena iPZ =47m.30s.
Riverside iPZ =47m.33s.
Palomar iPZ =47m.35s.
Haiwee iPZ =47m.38s.
Tinemaha iPZ =47m.39s.
Overton ePZ =47m.51s.
Pierce Ferry iP =47m.51s.
Tucson eP =47m.52s., e =49m.45s.
College eP? =48m.15s.
Hungry Horse eP =50m.17s.

Oct. 8d. 12h. 24m. 18s. Epicentre 40°·6N. 124°·6W. (as on 1949, Sept. 6d.).

$A = -\cdot4324$, $B = -\cdot6268$, $C = +\cdot6482$; $\delta = +1$; $h = -2$;
$D = -\cdot823$, $E = +\cdot568$; $G = -\cdot368$, $H = -\cdot534$, $K = -\cdot762$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arcata		0·5	55	i 0 16	+ 2	i 0 26	+ 3	—	—	—
Ukiah		1·8	144	e 0 30	− 2	e 0 50	− 6	—	—	e 1·0
Mineral		2·3	96	i 0 40	0	e 1 10	+ 1	—	—	—
Berkeley		3·3	145	i 0 50k	− 3	i 1 26	− 9	—	—	e 1·7
San Francisco		3·3	147	i 0 50	− 3	i 1 25	−10	e 1 12	P_g	—
Branner		3·7	148	i 0 54a	− 6	e 1 36	− 9	—	—	—
Reno		3·8	104	e 1 2a	+ 1	i 1 54	+ 7	—	—	—
Santa Clara		3·8	147	e 1 19	P_g	i 2 13	S_g	—	—	—
Lick		4·0	143	i 1 0	− 4	e 1 41	−11	—	—	—
Fresno		5·4	134	i 1 21a	− 3	e 2 25	− 3	—	—	—
Tinemaha	z.	6·0	125	i 2 36	S	(i 2 36)	− 7	i 3 0	S*	—
Haiwee		6·9	128	i 1 44	− 1	—	—	—	—	—
Victoria		8·0	5	e 2 3	+ 3	3 27	− 6	—	—	—
Pasadena		8·2	138	i 1 59	− 4	i 3 30	− 8	—	—	—
Riverside	z.	8·7	136	e 2 6	− 4	—	—	—	—	—
Overton	z.	8·9	114	i 2 17	+ 5	—	—	i 2 39	S*	—
Boulder City		9·0	118	e 2 22	+ 9	—	—	—	—	—
Pierce Ferry		9·4	115	e 2 22	+ 4	—	—	—	—	e 4·7
Hungry Horse		10·8	41	i 2 42	+ 2	—	—	—	—	—
Tucson		13·9	123	e 3 21	0	—	—	—	—	—
Rapid City	E.	16·2	71	i 4 1	+11	—	—	—	—	—
Ottawa	z.	35·6	65	e 7 1	0	—	—	—	—	—
La Paz		77·3	125	e 11 52	− 6	—	—	—	—	—

Additional readings :—
Arcata iN =24s. and 44s., iE =50s.
Mineral eE =1m.2s.
Reno eEN =1m.28s., iE =1m.34s. and 2m.27s.
Pasadena iZ =2m.2s.
Tucson e =3m.29s.

Oct. 8d. 14h. 49m. 36s. Epicentre 5°·1S. 153°·5E. (as on 1949, October 20d.).

$A = -\cdot8914$, $B = +\cdot4445$, $C = -\cdot0883$; $\delta = -3$; $h = +6$;
$D = +\cdot446$, $E = +\cdot895$; $G = +\cdot079$, $H = -\cdot039$, $K = -\cdot996$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		28·7	184	i 6 1k	0	i 10 49	− 1	—	—	e 13·6
Tuai	N.	39·8	151	e 7 40	+ 4	e 13 41	− 1	—	—	—
Wellington		40·7	155	7 45	+ 1	13 53	− 2	14 10	PS	18·4
Christchurch		41·8	159	7 59	+ 6	14 14	+ 3	e 9 24	PP	19·8
Perth		44·2	228	i 11 14	?	i 17 52	SS	—	—	i 22·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		49·5	321	8 52a	− 2	e 15 58	− 4	—	—	e 20·0
Vladivostok		51·8	341	e 9 6	− 6	i 16 31	− 2	—	—	—
Irkutsk		70·7	330	e 11 19	− 1	—	—	—	—	—
Poona	z.	81·8	290	i 12 21	− 1	—	—	—	—	—
College		81·9	22	i 12 22	− 1	e 22 38	+ 2	e 31 51	SSS	—
Przhevalsk		82·5	314	e 12 26	0	—	—	—	—	—
Bombay		82·9	290	e 13 31	+63	e 22 44	− 2	—	—	—
Naryn		84·0	312	e 12 34	+ 1	22 54	− 3	—	—	—
Frunse		85·4	314	e 12 40	0	e 23 2	[− 1]	—	—	—
Andijan		86·6	311	12 47	+ 1	23 19	− 4	—	—	—
Garm		87·9	309	e 12 52	− 1	—	—	—	—	—
Obi-garm		88·3	308	i 12 55	0	—	—	—	—	—
Berkeley		88·6	52	—	—	—	—	e 36 36	Q	e 41·2
Stalinabad		89·0	308	e 12 57	− 1	—	—	—	—	—
Lunacharskoe		89·0	312	e 12 59	+ 1	—	—	—	—	—
Tashkent		89·0	312	e 12 56	− 2	i 23 41?	− 4	i 23 24	SKS	—
Mineral	z.	89·4	50	e 13 4	+ 4	—	—	—	—	—
Fresno	z.	90·4	53	e 13 11	+ 7	—	—	—	—	—
Samarkand		90·5	310	e 13 9	+ 4	—	—	—	—	—
Reno	z.	90·7	51	e 13 10	+ 4	—	—	e 16 53	PP	—
Tinemaha	z.	91·6	53	i 13 13	+ 3	—	—	—	—	—
Haiwee	z.	91·8	54	e 13 15	+ 4	—	—	—	—	—
Pasadena		92·0	56	e 13 12	0	—	—	—	—	e 42·1
Riverside	z.	92·1	56	e 13 18	+ 6	—	—	—	—	—
Palomar	E.	92·5	57	e 13 17	+ 3	—	—	—	—	—
Overton	z.	94·7	53	e 13 29	+ 5	—	—	e 18 13	PP	—
Pierce Ferry		95·0	54	e 13 29	+ 3	—	—	—	—	—
Hungry Horse		95·4	42	e 13 30	+ 2	—	—	—	—	—
Sverdlovsk		95·8	326	13 28	− 1	24 2	[− 3]	17 16	PP	—
Tucson		97·5	58	e 14 19	+42	—	—	e 17 47	PP	e 43·5
Ksara		115·7	304	e 19 48	PP	33 28	SS	—	—	—
Ottawa	z.	121·4	38	i 18 58a	[+ 3]	—	—	—	—	—
Collmberg	z.	123·5	331	e 19 1	[+ 1]	—	—	—	—	—
Palisades		124·6	42	i 19 5	[+ 3]	—	—	—	—	e 61·6
Harvard		125·4	39	i 19 7	[+ 4]	—	—	e 20 20	PP	e 65·2
Triest	z.	126·6	326	e 19 4	[− 1]	—	—	e 20 53	PP	—
Stuttgart	z.	127·0	331	e 19 8	[+ 2]	—	—	—	—	—
Strasbourg		127·8	332	e 19 11	[+ 3]	e 39 48	SS	—	—	63·4
Zürich		128·2	330	e 19 8	[− 1]	—	—	—	—	—
Basle		128·6	331	e 19 12	[+ 3]	—	—	—	—	—
Rome		129·6	323	e 20 55	PP	—	—	e 22 26	PKS	e 62·9
Paris		129·9	335	i 19 16	[+ 4]	—	—	e 22 57	PKS	—
Chinchina		131·1	86	i 19 19	[+ 5]	—	—	i 22 43	PKS	—
La Paz		133·6	119	19 27	[+ 8]	i 26 27	[− 1]	22 59	PKS	73·4
Algiers Univ.	z.	138·4	322	e 19 23	[− 5]	—	—	e 22 6	PP	—
Tamanrasset	z.	144·4	304	e 19 38	[0]	—	—	e 23 1	PP	—

Additional readings :—
Riverview iN =11m.2s. and 11m.23s., iE =13m.9s.
Christchurch P_cSZ =14m.2s., eQEN =16m.29s., S_cS =17m.42s.
Perth i =11m.53s. and 15m.14s.
Poona iZ =12m.28s.
Fresno eZ =13m.46s.
Reno eZ =13m.48s.
Tinemaha eZ =13m.32s.
Pasadena eZ =13m.38s.
Sverdlovsk SKKS =24m.24s., PS =26m.8s., SS =31m.25s., SSS =35m.29s.
Collmberg eZ =19m.17s.
Stuttgart eZ =19m.24s.
Rome e =22m.49s., eN =59m.3s.
Paris i =19m.28s. and 19m.48s., e =22m.34s.
La Paz iE =23m.30s.
Algiers Univ. eZ =19m.33s.
Tamanrasset iZ =19m.50s., eZ =21m.45s., iZ =24m.46s.
Long waves were also recorded at Honolulu, Ivigtut, Bogota, and other American and European stations.

Oct. 8d. 16h. 37m. 24s. (I)
16h. 40m. 37s. (II)
16h. 49m. 10s. (III)
} Epicentre 31°·5N. 40°·8W. (as at 11h.).

A = +·6466, B = −·5582, C = +·5199 ; δ = −3 ; h = +1 ;
D = −·653, E = −·757 ; G = +·394, H = −·340, K = −·854.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
II	Bermuda	20·4	278	e 4 44	+ 3	e 8 5	−20	—	—	e 9·2
II	Fort de France	25·0	231	—	—	e 9 36	−13	—	—	—
II	San Juan	26·3	246	e 5 32	− 7	(e 10 14)	+ 3	—	—	e 10·2
I	Weston	26·6	304	i 5 40	− 2	—	—	—	—	—
II		26·6	304	i 5 40	− 2	—	—	—	—	—
III		26·6	304	e 6 10	+28	—	—	—	—	—
II	Harvard	26·8	304	i 5 45	+ 1	—	—	—	—	i 12·7
I	Philadelphia	29·0	296	e 10 51	S	(e 10 51)	− 3	—	—	e 16·4
II		29·0	296	i 11 3	S	(i 11 3)	+ 9	—	—	—
II	Malaga z.	30·5	68	i 6 20k	+ 3	i 11 14	− 4	7 26	PP	14·9
I	Granada	31·1	68	i 5 28a	−54	—	—	6 58	PP	—
II		31·1	68	i 6 26a	+ 4	—	—	—	—	—
III		31·1	68	i 5 56a	−26	(i 11 44)	+16	6 50	PP	—
II	Alicante	33·6	66	6 47	+ 3	13 11	+65	8 11	PPP	e 16·5
I	Algiers Univ. z.	36·4	69	7 8	0	—	—	—	—	—
II	z.	36·4	69	e 7 8	0	—	—	e 8 2	PP	—
III	z.	36·4	69	e 7 8	0	—	—	—	—	—
I	Paris	36·8	49	i 7 16	+ 5	—	—	—	—	—
II		36·8	49	i 7 13	+ 2	—	—	—	—	—
III		36·8	49	e 7 11	0	—	—	—	—	—
II	Basle	39·9	54	e 7 40	+ 3	—	—	—	—	—
III		39·9	54	e 7 30	− 7	—	—	—	—	—
I	Strasbourg	40·2	51	e 7 50	+10	—	—	—	—	—
II		40·2	51	e 7 42	+ 2	—	—	e 8 38	PP	—
III		40·2	51	e 7 46	+ 6	—	—	—	—	—
II	Bogota	41·1	235	—	—	e 14 26	+25	—	—	—
I	Stuttgart z.	41·1	51	e 7 46	− 1	—	—	—	—	—
II	z.	41·1	51	e 7 48	+ 1	—	—	—	—	—
III	z.	41·1	51	e 7 47	0	—	—	—	—	—
I	Tamanrasset z.	41·9	90	i 7 55a	+ 1	e 9 59	P_cP	e 9 37	PP	—
II	z.	41·9	90	i 7 50k	− 4	—	—	e 9 28	PP	—
III	z.	41·9	90	e 7 52	− 2	e 9 53	P_cP	e 9 31	PP	—
I	Chinchina	42·0	237	i 7 55	+ 1	—	—	—	—	—
II		42·0	237	(e 7 54)	0	—	—	—	—	e 7·9
II	Jena E.	42·9	48	e 8 2	0	—	—	—	—	—
II	Rome	43·4	61	e 8 6	0	—	—	—	—	—
I	Collmberg z.	43·8	47	e 8 9	0	—	—	—	—	—
II	z.	43·8	47	e 8 9	0	—	—	—	—	—
III	z.	43·8	47	e 8 8	− 1	—	—	—	—	—
I	Triest z.	44·1	55	i 8 13	+ 1	—	—	—	—	—
II	z.	44·1	55	i 8 15?	+ 3	—	—	—	—	—
III	z.	44·1	55	i 8 13	+ 1	—	—	—	—	—
I	Prague	44·6	48	e 8 20	+ 4	—	—	—	—	—
II		44·6	48	e 8 16	0	e 14 51?	− 1	—	—	e 21·6
III		44·6	48	e 8 16	0	—	—	—	—	—
II	Raciborzu z.	47·1	48	e 8 31	− 4	—	—	—	—	—
II	Resolute Bay z.	50·6	344	e 8 55	− 7	—	—	—	—	—
I	La Paz	54·5	212	9 30	− 2	—	—	—	—	—
II		54·5	212	i 9 33	+ 1	i 16 11	−59	11 40	PP	29·4
I	Logan	56·4	302	e 9 37	− 8	—	—	—	—	—
II		56·4	302	e 9 34	−11	—	—	—	—	—
I	Hungry Horse	56·5	310	e 9 42	− 4	—	—	—	—	—
II		56·5	310	e 9 45	− 1	—	—	—	—	—
III		56·5	310	e 9 42	− 4	—	—	—	—	—
I	Tucson	58·4	291	e 9 59	− 1	—	—	—	—	—
II		58·4	291	e 9 59	− 1	—	—	—	—	e 27·3
III		58·4	291	e 9 59	− 1	—	—	—	—	—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Pierce Ferry		59·7	296	e 10 7	− 2	—	—	—	—	—
II			59·7	296	e 10 7	− 2	—	—	—	—	—
III			59·7	296	e 10 7	− 2	—	—	—	—	—
I	Overton	z.	59·9	297	e 10 8	− 2	—	—	—	—	—
I	Boulder City		60·4	296	e 10 12	− 1	—	—	—	—	—
II			60·4	296	e 10 12	− 1	—	—	e 12 20	PP	—
III			60·4	296	e 10 13	0	—	—	—	—	—
II	Helwan	z.	61·0	71	e 9 47	−31	—	—	e 11 0	PP	—
I	Tinemaha	z.	62·6	298	e 10 26	− 2	—	—	—	—	—
II		z.	62·6	298	i 10 28	0	—	—	—	—	—
III		z.	62·6	298	e 10 26	− 2	—	—	—	—	—
I	Haiwee	z.	62·7	297	e 10 27	− 2	—	—	—	—	—
II		z.	62·7	297	e 10 31	+ 2	—	—	—	—	—
III		z.	62·7	297	e 10 25	− 4	—	—	—	—	—
II	Palomar		62·8	294	e 10 27	− 3	—	—	—	—	—
I	Ksara		63·1	66	e 5 22	?	—	—	—	—	—
II			63·1	66	(e 10 35)	+ 3	e 10 35	P	—	—	—
III	Mount Wilson	z.	63·4	295	e 10 31	− 3	—	—	—	—	—
I	Pasadena	z.	63·6	295	e 10 30	− 5	—	—	—	—	—
II			63·6	295	i 10 32	− 3	—	—	—	—	e 31·8
I	Mineral	z.	63·9	303	e 11 32	+55	—	—	—	—	—
II		z.	63·9	303	e 10 34	− 3	—	—	—	—	—
III		z.	63·9	303	e 10 40	+ 3	—	—	—	—	—
II	Shasta Dam		64·4	303	e 10 57	+17	—	—	—	—	—
I	College		68·7	334	e 11 5	− 2	—	—	—	—	e 35·9
II			68·7	334	e 11 6	− 1	—	—	—	—	—
III			68·7	334	i 11 5	− 2	—	—	—	—	—

Additional readings :—
Granada III S is given as a later P.
Alicante II P_cP =9m.27s.
Paris II i =7m.19s. and 7m.27s., III i =7m.17s.
Strasbourg I e =7m.54s.
Stuttgart II eZ =7m.54s.
Tamanrasset I iZ =8m.1s., ePPPZ =10m.6s., II ePPPZ =9m.59s., III iZ =7m.55s.
Jena II eEN =8m.9s.
Collmberg II eZ =9m.3s.
Prague II i =8m.24s.
Long waves were also recorded at Salt Lake City, Rapid City, Seven Falls, Washington, and De Bilt.

Oct. 8d. Readings also at 0h. (College (2), Palisades, Almata, Lunacharskoe, Przhevalsk, near Andijan, Fergana, Garm, Kulyab, Murgab, Naryn, Samarkand, Stalinabad, near Apia and near Mary), 1h. (Andijan, Fergana, Lunacharskoe, near Garm, Kulyab, and Murgab), 2h. (Nanking and Hungry Horse), 3h. (Algiers Univ., Tamanrasset, Collmberg, Strasbourg, and Stuttgart), 4h. (Balboa Heights), 5h. (Balboa Heights, Collmberg, Stuttgart, and near Garm), 6h. (Boulder City (2), Overton, Pierce Ferry (2), and near Garm), 7h. (Haiwee (2), Mount Wilson, Pasadena, Riverside, Tinemaha (2), Tucson (2), Boulder City (2), Overton (2), Pierce Ferry, Mineral, Hungry Horse (2), College (3), Harvard, Weston (2), Bermuda (2), Tamanrasset (3), Granada (2), and Stuttgart), 8h. (Vera Cruz, near Puebla, Tacubaya, and near Alicante (2)), 9h. (Nanking, Haiwee, Pasadena, Riverside, Tinemaha, Boulder City, Tucson, Overton, Pierce Ferry, Hungry Horse, Shasta Dam, College, Tamanrasset, near Kulyab, and Stalinabad), 10h. (Tucson), 11h. (Riverview, Wellington, Mount Wilson, Tinemaha, Tucson, Boulder City, Overton, College, Weston, La Paz, Stuttgart, Triest, Granada, and Tamanrasset (3)), 13h. (Balboa Heights and Pierce Ferry), 14h. (Haiwee, Palomar, Pasadena, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, and Shasta Dam), 16h. (Nanking and Tamanrasset), 18h. (Huancayo and near Athens), 20h. (Granada, Collmberg, and near Athens), 21h. (Abastumanj, Gori, near Borzhomi, and Tiflis).

Oct. 9d. Readings at 0h. (Pierce Ferry), 1h. (Ksara, Kizyl-Arvat, near Ashkabad, Mary, and near Garm), 2h. (near Garm and Obi-garm), 3h. (Pretoria), 4h. (Pierce Ferry and near Messina), 5h. (Boulder City), 6h. (near Messina and near Apia), 7h. (Overton, Pierce Ferry, and College), 10h. (Overton, Pierce Ferry, Ashkabad, near Messina, and near Zürich), 11h. (Garm, near Almata, Frunse, and Naryn), 12h. (College and Pretoria), 13h. (Pietermaritzburg, Grahamstown, and Pretoria), 14h. (Overton (2), Pierce Ferry, Hungry Horse, Garm, and near Fergana), 15h. (Columbia), 17h. (Haiwee, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, La Paz, and near Guam), 18h. (Bombay, Poona, Calcutta, Andijan, Lunacharskoe, Naryn, Tchimkent, Tashkent, near Fergana, Garm, Kulyab, Murgab, Obi-garm, and Stalinabad), 20h. (Collmberg, Overton, Pierce Ferry, and near Santa Clara), 21h. (Hungry Horse), 22h. and 23h. (Shasta Dam).

Oct. 10d. 0h. 2m. 52s. Epicentre 36°·7N. 70°·5E. Depth of focus 0·030
(as on 1950, July 9d.).

A = +·2683, B = +·7576, C = +·5951 ; δ = +9 ; h = 0 ;
D = +·943, E = −·334 ; G = +·199, H = +·561, K = −·804.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kulyab		1·3	335	i 0 30	− 5	i 0 56	− 5	—	—	—
Garm		2·3	356	e 0 45	+ 1	1 18	+ 1	—	—	—
Stalinabad		2·3	323	i 0 44	0	i 1 18	+ 1	—	—	—
Murgab		3·2	59	0 53	− 1	1 35	0	—	—	—
Fergana		3·8	15	i 1 2	+ 1	1 49	+ 1	—	—	—
Samarkand		4·1	319	i 1 9	+ 5	i 1 57	+ 3	—	—	—
Andijan		4·3	20	e 1 8	+ 1	e 2 1	+ 2	—	—	—
Lunacharskoe		4·7	349	i 1 16	+ 4	i 2 11	+ 3	—	—	—
Tashkent		4·7	349	i 1 15?	+ 3	i 2 11?	+ 3	—	—	—
Tchimkent		5·6	354	i 1 26	+ 3	i 2 29	+ 1	—	—	—
Naryn		6·4	41	i 1 30	− 3	i 2 43	− 3	—	—	—
Frunse		6·9	26	e 1 40	0	2 59	+ 1	—	—	—
Mary		6·9	280	—	—	e 3 0	+ 2	—	—	—
Almata		8·2	35	i 1 58	+ 1	i 3 31	+ 3	—	—	—
Przhevalsk		8·4	44	i 1 59	0	i 3 33	+ 1	—	—	—
New Delhi		9·8	143	i 2 12	− 5	3 54	−11	2 20	PP	—
Kizyl-Arvat		11·5	286	e 2 38	− 1	—	—	—	—	—
Bombay	N.	17·8	172	3 56	+ 2	e 7 8	+ 5	—	—	—
Poona		18·3	170	i 3 57	− 3	i 7 22	+10	4 8	PP	8·4
Grozny		20·0	297	4 20	+ 3	—	—	—	—	—
Sverdlovsk		21·2	345	i 4 32	+ 3	i 8 25	+19	—	—	—
Collmberg	z.	42·8	309	e 7 39	+ 2	—	—	e 9 24	PP	—
Triest	z.	42·8	302	e 9 27	PP	—	—	—	—	—
Copenhagen		43·0	316	i 7 42	+ 3	—	—	—	—	—
Jena		43·7	308	e 7 46	+ 1	—	—	e 9 33?	PP	—
Stuttgart	z.	45·5	306	e 8 1	+ 2	—	—	e 9 34	PP	—
Tamanrasset	z.	57·1	277	i 9 26k	+ 1	—	—	e 10 15	pP	—
Pretoria	z.	73·8	220	i 11 11	− 1	—	—	—	—	—
College		74·4	17	e 11 15	0	—	—	e 13 51	PP	—
Pietermatitzburg	z.	76·0	216	i 11 24	0	—	—	—	—	—
Grahamstown	z.	80·8	217	e 11 50?	0	—	—	—	—	—
Harvard		93·9	333	e 16 1	PP	e 19 55	?	—	—	—
Hungry Horse		95·2	4	e 16 7	PP	—	—	e 19 16	PPP	—
Overton	z.	107·0	4	e 18 36	PP	—	—	—	—	—
Boulder City		107·5	5	e 19 0	PP	—	—	—	—	—

Additional readings :—
Poona PPPE = 4m.19s., QE = 7m.33s., SSE = 7m.49s., SSSE = 8m.1s.
Overton eZ = 19m.1s.

Oct. 10d. 16h. A suggested repetition of Oct. 5d. 16h. but the readings do not agree with that position.

Balboa Heights iP = 21m.13s., eS = 23m.0s.
Chinchina eP = 22m.59s.?, eS = 25m.13s.?.
Bogota iPEN = 23m.36s., eSEN = 25m.52s.
Tacubaya eP = 24m.8s., i = 24m.16s., and 28m.38s.
San Juan eP = 24m.51s., e = 25m.7s., eS = 28m.52s., eL = 30m.38s.
Huancayo e = 25m.37s., eS? = 29m.55s.
La Paz ePZ = 25m.40s., iS? = 31m.39s., SS = 33m.42s., L = 36·7m.
Galerazamba eS?EN = 25m.42s.
Tucson eP = 26m.43s., eL = 39m.45s.
Ottawa iZ = 27m.15s.k.
Pierce Ferry iP = 27m.22s.
Boulder City eP = 27m.26s.
Palomar iPEN = 27m.26s.
Riverside iPZ = 27m.31s.
Pasadena iPZ = 27m.36s.
Haiwee iPZ = 27m.45s.
Tinemaha iPZ = 27m.50s., ePcPZ = 29m.54s.
Lick ePZ = 28m.10s.a.
Reno ePZ = 28m.10s.k.
Hungry Horse iP = 28m.29s., i = 30m.11s.
College iP = 31m.19s.
Tamanrasset ePZ = 32m.58s.
Long waves were also recorded at Bermuda and Philadelphia.

Oct. 10d. 16h. 51m. 20s. Epicentre 19°·2N. 121°·2E. (as on 1949, Sept. 14d.).

$A = -·4896$, $B = +·8084$, $C = +·3269$; $\delta = +8$; $h = +5$;
$D = +·855$, $E = +·518$; $G = -·169$, $H = +·280$, $K = -·945$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Manila		4·6	184	e 1 8	− 4	i 2 8	+ 1	—	—
Vladivostok		25·5	19	e 5 34	+ 2	i 10 4	+ 7	—	—
Calcutta	E.	30·9	283	—	—	e 11 17	− 7	e 13 35	SSS
Irkutsk		35·6	343	e 7 40?	+39	—	—	—	—
Przhevalsk		42·9	313	8 4	+ 2	—	—	—	—
Almata		44·1	314	e 8 12	0	e 14 49	+ 4	—	—
Naryn		44·3	311	e 8 16?	+ 3	14 50?	+ 2	—	—
Poona	Z.	44·7	277	i 8 14	− 2	—	—	i 9 55	PP
Bombay		45·6	278	e 9 40?	PP	—	—	—	—
Fergana		47·1	308	e 8 36	+ 1	—	—	—	—
Garm		48·0	306	e 8 42	− 1	—	—	—	—
Stalinabad		49·1	305	e 9 2	+11	—	—	—	—
Tashkent		49·1	309	e 9 2	+11	—	—	—	—
Ashkabad		57·2	303	e 9 50	− 1	—	—	—	—
Sverdlovsk		58·1	327	i 9 57	− 1	17 57	− 1	—	—
Kizyl-Arvat		58·9	306	e 10 8	+ 5	—	—	—	—
Borzhomi		68·5	309	e 11 5	− 1	—	—	—	—
College		73·2	27	i 11 34	− 1	—	—	—	—
Hungry Horse		96·7	33	i 13 34	+ 1	—	—	—	—

Long waves were recorded at Nanking.

Oct. 10d. 18h. 42m. 20s. Epicentre 45°·0S. 167°·0E. (as on 1949, May 27d.).

Intensity V-VI at Milford Sound, less strong at Otago and the Southland. Epicentre 45°·2S. 167°·1E.

R. C. Hayes.
Earthquake origins in New Zealand during the year 1950. New Zealand Journal of Science and Technology, Sect. B., Vol. 33, No. 4., Jan., 1952, p.308.

$A = -·6913$, $B = +·1596$, $C = -·7047$; $\delta = -3$; $h = -4$;
$D = +·225$, $E = +·974$; $G = +·687$, $H = -·159$, $K = -·710$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kaimata	N.E.	4·1	54	e 1 3	− 2	i 1 49	− 6	—	—	—
Christchurch		4·3	71	e 1 6	− 2	i 1 53	− 7	—	—	—
Wellington		6·8	59	e 1 42	− 2	2 52	−11	—	—	—
New Plymouth	E.	7·9	44	1 57	− 2	3 20	−10	—	—	—
Tuai	N.	9·8	54	e 2 30	+ 6	e 4 21	+ 4	—	—	—
Auckland	N.	10·0	39	e 2 24	− 3	e 3 10	?	—	—	—
Riverview		16·5	307	i 3 54k	0	e 6 58	0	e 4 7	PP	e 7·9
Brisbane		20·7	324	i 4 44k	0	i 8 45	+14	i 5 6	PP	—
Apia		35·9	38	7 4	0	e 10 34	?	—	—	—
Shasta Dam		106·2	48	e 18 35	PP	—	—	—	—	—
Overton	Z.	107·7	55	e 18 54	PP	—	—	—	—	—
Pierce Ferry		107·7	57	e 18 40	PP	—	—	—	—	—
College		115·1	19	e 18 35	[− 8]	—	—	—	—	e 54·7
Ksara		141·2	271	e 19 23	[−10]	—	—	—	—	—
Tamanrasset	Z.	153·2	221	e 19 45	[− 7]	e 23 40	PP	i 20 7	PKP_2	—
Triest	Z.	160·7	282	i 19 53	[− 8]	e 24 21	PP	e 20 38	PKP_2	—
Collmberg	Z.	161·6	298	e 19 54	[− 8]	—	—	e 20 58	PKP_2	—
Stuttgart	Z.	164·4	293	e 19 56	[− 9]	e 24 38	PP	e 20 54	PKP_2	—
Strasbourg		165·3	292	e 19 58	[− 8]	—	—	e 20 58	PKP_2	—
Granada		169·5	227	i 21 34k	PKP_2	31 42	{−18}	25 9	PP	89·9
Rathfarnham C.	Z.	170·6	335	e 20 39	[+29]	—	—	—	—	—

Additional readings :—
Riverview i = 3m.58s., ePPPZ = 4m.17s., iN = 7m.7s., iZ = 7m.12s., eQN = 7·3m., iSSE = 7m.19s., iSSSN = 7m.30s.
Brisbane ePEN = 4m.47s., ePPN = 5m.9s.
Tamanrasset iZ = 19m.55s.
Strasbourg e = 20m.31s.

Oct. 10d. 23h. 15m. 19s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·080.
(as on 1950, July 27d.).

A = −·9526, B = −·0199, C = −·3038; δ = +14; h = +5;
D = −·021, E = +1·000; G = +·304, H = +·006, K = −·953.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		7·9	60	1 52	− 5	e 3 22	− 9	—	—
Brisbane		27·7	245	i 5 8k	+ 2	—	—	—	—
Lick	z.	76·8	43	e 10 57a	0	—	—	e 12 55	pP
Mount Wilson	z.	77·5	48	i 11 0	− 1	—	—	e 12 59	pP
Palomar		77·9	50	i 11 3	0	—	—	—	—
Riverside	z.	77·9	48	i 11 2	− 1	—	—	i 12 58	pP
Haiwee	z.	78·6	46	i 11 6	− 1	—	—	e 13 5	pP
Tinemaha	z.	78·9	45	i 11 8	0	—	—	e 13 26	pP
Boulder City		80·7	48	e 11 18	0	—	—	—	—
Overton	z.	81·3	47	i 11 21	0	—	—	i 13 23	pP
Pierce Ferry		81·4	48	i 11 21	0	—	—	i 13 21	pP
Tucson		81·9	52	i 11 24	0	—	—	e 13 23	pP
College		85·7	12	e 11 40	− 3	—	—	—	—
Tacubaya		86·5	68	17 40	PPP	—	—	—	—
Hungry Horse		87·4	37	e 11 49	− 2	—	—	—	—
Collmberg	z.	145·3	349	e 18 37	[+ 1]	—	—	—	—
Stuttgart	z.	148·4	352	e 18 45	[+ 4]	—	—	—	—
Tamanarsset	z.	173·6	—	e 19 9k	[+ 3]	e 20 43	PKP,	e 21 44	pPKP

Tamanrasset gives also ePPZ = 24m.8s.

Oct. 10d. Readings also at 0h. (near San Juan), 3h. (Mount Wilson, Riverside, Tinemaha, College, and near Istanbul), 4h. (Copenhagen, Stuttgart, Rome, Haiwee, Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, Resolute Bay, Vladivostok, and near Mizusawa), 5h. (Nanking and Hungry Horse), 7h. (Overton, Pierce Ferry, and College), 8h. (Helwan, Ksara, Overton, near Bandong, Djakarta, and near Huancayo), 9h. (Tamanrasset, near New Delhi, near Garm, and near Algiers Univ. (2)), 10h. (near Athens and near Istanbul), 11h. (Hungry Horse, Nanking, and near Garm), 13h. (Brisbane, Calcutta, Poona, College, near Huancayo, near Obi-garm, and near Sotchi), 14h. (Bombay, Calcutta, and College), 15h. (near Huancayo (2)), 16h. (near Ottawa and near Shemakla), 17h. (Ashkabad, Ksara, and near Sotchi), 18h. (Ashkabad, La Paz, near Huancayo, and near Garm (2)), 20h. (Tacubaya, Gori, near Borzhomi, and Tiflis (2)).

Oct. 11d. 2h. 54m. 20s. Epicentre 5°·8N. 82°·7W. (as on 1949, April 9d.).

A = +·1264, B = −·9869, C = +·1004; δ = +3; h = +7;
D = −·992, E = −·127; G = +·013, H = −·100, K = −·995.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		4·4	45	i 0 40	−30	—	—	—	—	e 4·2
Chinchina		7·1	97	i 1 44?	− 4	e 3 1?	− 9	—	—	—
Bogota		8·7	96	i 2 5	− 5	i 3 47	− 3	i 4 51	S_s	—
Galerazamba		8·9	56	—	—	i 3 36	−19	—	—	—
Huancayo		19·2	158	e 4 22	− 6	e 7 49	−10	e 5 9	PP	e 8·3
San Juan		20·5	50	e 4 42	0	e 8 38	+11	—	—	e 9·5
Tacubaya		21·0	311	e 4 56	+ 9	—	—	—	—	—
Fort de France		23·0	66	e 4 25	−42	e 9 25	+11	—	—	—
La Paz		26·5	147	i 5 44	+ 3	i 10 20	+ 6	11 30	SS	12·9
Tucson		37·1	319	e 7 15	+ 1	—	—	—	—	e 20·6
Pierce Ferry		41·6	321	i 7 53	+ 2	—	—	—	—	—
Palomar		41·9	316	i 7 54	0	—	—	—	—	—
Boulder City		42·1	320	e 7 56	+ 1	—	—	—	—	—
Overton	z.	42·2	321	i 7 58	+ 2	—	—	—	—	—
Riverside	z.	42·6	316	i 8 1	+ 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena	z.	43·3	316	e 8 6	+ 1	—	—	—	—	—
Haiwee	z.	44·2	319	e 8 13	+ 1	—	—	—	—	—
Tinemaha	z.	44·9	319	e 8 20	+ 2	—	—	—	—	—
Lick	z.	47·4	317	e 8 37k	− 1	—	—	—	—	—
Hungry Horse		50·1	334	i 8 58	− 1	—	—	—	—	—
College		74·4	336	e 11 42	0	—	—	—	—	—
Tamanrasset	z.	86·1	68	e 12 46	+ 2	—	—	—	—	—

Additional readings :—
Huancayo e = 7m.15s.
Pasadena eZ = 8m.42s.
Long waves were also recorded at Bermuda.

Oct. 11d. Readings also at 2h. (Hungry Horse, Tamanrasset, La Paz, and near Huancayo (2)), 3h. (near Huancayo), 4h. (Balboa Heights, Tacubaya, Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Mineral, Hungry Horse, and College), 7h. (Collmberg), 8h. (Tacubaya, Haiwee (2), Palomar (2), Pasadena (2), Riverside (2), Tinemaha (2), Tucson (2), Boulder City (2), Overton (2), Pierce Ferry (2), Berkeley (2), Lick (2), Mineral (2), Shasta Dam (2), Hungry Horse (2), Seattle (2), near College (2), and near Garm), 10h. (Ksara, Frunse, Kulyab, Przhevalsk, Samarkand, near Andijan, Fergana, Garm (2), and Naryn), 11h. (Andijan, Samarkand, near Fergana, Garm, Kulyab, Obi-garm, and Stalinabad), 12h. (Tacubaya), 13h. (College, Mizusawa, Brisbane, and near Apia), 14h. (Poona, Victoria, Mount Wilson, Riverside, Tucson, Overton, Pierce Ferry, Hungry Horse, Shasta Dam, and College), 16h. (Harvard, Messina, and near Garm), 18h. (College, near Balboa Heights, and near Huancayo), 19h. (Bogota, Chinchina, Andijan, near Garm, Kulyab, Obi-garm, and Stalinabad), 20h. (Hungry Horse), 22h. (Samarkand, near Andijan, Garm, Kulyab, Stalinabad, and near Ottawa).

Oct. 12d. 23h. 49m. 20s. Epicentre 5°·0S. 129°·2E. (as on 1942, February 20d.).

$A = -·6296$, $B = +·7720$, $C = -·0866$; $\delta = -12$; $h = +7$;
$D = +·775$, $E = +·632$; $G = +·055$, $H = -·067$, $K = -·996$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		21·1	338	i 4 47	− 1	e 7 13	?	—	—	—
Bandong		21·5	265	e 4 51	− 1	i 8 39	− 8	—	—	—
Djakarta		22·3	267	e 4 53	− 8	i 9 5	+ 3	—	—	—
Brisbane		31·9	139	i 5 52	−37	—	—	i 6 48	?	—
Riverview		35·2	149	—	—	i 13 7	+36	i 15 41	SSS	e 19·2
Nanking	z.	38·2	346	i 7 25	+ 2	—	—	—	—	—
Vladivostok		48·0	4	i 8 45	+ 2	i 15 44	+ 3	—	—	—
Calcutta	E.	48·4	306	i 8 50	+ 4	—	—	—	—	i 25·6
Wellington		54·4	139	—	—	e 24 15	?	—	—	e 32·7
New Delhi		60·1	307	e 10 9	− 2	e 18 10	−14	12 21	PP	—
Bombay		60·4	295	i 10 12	− 1	i 18 19	− 9	—	—	—
Irkutsk		60·9	343	10 19	+ 2	—	—	—	—	—
Przhevalsk		66·0	322	e 10 50	0	—	—	—	—	—
Naryn		66·9	320	i 10 57	+ 1	—	—	—	—	—
Almata		67·3	323	e 10 58	− 1	19 45	− 9	—	—	—
Frunse		68·6	320	e 11 9	+ 2	20 3	+ 6	—	—	—
Andijan		69·0	317	e 11 8	− 1	—	—	—	—	—
Fergana		69·3	317	e 11 10	− 1	e 20 6	−11	—	—	—
Stalinabad		70·6	315	11 19	0	i 21 19	S_cS	—	—	—
Lunacharskoe		71·4	317	11 26	+ 2	—	—	—	—	—
Tashkent		71·4	317	e 11 25	+ 1	e 20 31?	−11	—	—	—
Samarkand		72·3	314	e 11 30	+ 1	—	—	—	—	—
Mary		75·4	311	i 11 48	+ 1	—	—	—	—	—
Ashkabad		78·1	310	e 12 5	+ 3	—	—	—	—	—
Sverdlovsk		82·6	329	i 12 14	−12	22 31	−12	15 36	PP	—
Lenkoran		85·6	310	i 12 39	− 2	—	—	i 16 5	PP	—
Grozny		88·6	314	i 13 1	+ 5	—	—	—	—	—
Borzhomi		90·2	311	e 13 8	+ 4	—	—	—	—	—
Zugdidi		91·4	311	e 13 11	+ 2	—	—	—	—	—
College		91·5	24	e 13 15	+ 5	e 27 0	?	e 16 51	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		95·5	303	e 13 32	+ 4	e 28 30	?	—	—	—
Istanbul		100·9	311	e 12 40?	−72	—	—	—	—	—
Shasta Dam		107·2	49	e 18 28	[0]	—	—	—	—	—
Lick	z.	108·2	52	e 19 4	PP	—	—	—	—	—
Reno	z.	109·3	49	e 19 11	PP	—	—	—	—	—
Collmberg	z.	110·1	323	e 18 49	[+16]	—	—	—	—	—
Hungry Horse		111·3	39	e 18 37	[+ 1]	e 29 51	PPS	i 19 36	PP	—
Rome		113·1	314	—	—	e 32 51	?	e 48 51	Q	e 53·2
Stuttgart	z.	113·2	322	e 18 44?	[+ 5]	—	—	—	—	—
Boulder City		113·9	52	18 32	[− 9]	—	—	e 18 53	PP	—
Overton	z.	114·1	52	e 18 54	[+13]	e 29 38	PPS	—	—	—
Pierce Ferry		114·5	52	e 15 13	P	—	—	e 18 41	PKP	—
Tucson		117·9	56	e 19 1	[+12]	—	—	—	—	—
Tamanrasset	z.	122·9	294	e 19 7	[+ 9]	—	—	e 20 7	PP	—
Huancayo		150·3	125	e 20 4	[+16]	—	—	—	—	—
La Paz		152·6	143	e 19 53	[+ 2]	—	—	i 20 20	PKP,	—
Bogota		156·8	89	20 45	PKP,	e 46 22	?	—	—	—

Additional readings :—
New Delhi PSEN =18m.18s.
College e =31m.30s.
Hungry Horse e =18m.47s.
Tamanrasset eZ =19m.18s.
Huancayo i =20m.10s.
Long waves were also recorded at Christchurch, Kew, Potsdam, and Granada.

Oct. 12d. Readings also at 2h. (Obi-garm and near Garm (2)), 3h. (Prague), 4h. (near Garm), 5h. (College and Huancayo), 7h. (Bogota, Huancayo, La Paz, Mount Wilson, Riverside, Tucson, Overton, Pierce Ferry (2), Hungry Horse (2), College (2), Nanking, and near Garm (2)), 9h. (Hungry Horse), 10h. (near Garm (3)), 11h. (Kulyab, Samarkand, near Andijan, Fergana, Garm, and Obi-garm), 12h. (Collmberg, Ksara, and near Garm), 14h. (near Garm), 15h. (College), 16h. (Samarkand, near Andijan, Fergana, Garm (2), Obi-garm, and Stalinabad), 17h. (near Garm), 18h. (Brisbane, Pierce Ferry, and Collmberg), 19h. (Boulder City, Overton, and Pierce Ferry), 20h. (Poona, New Delhi, Guadalajara, and Manzanillo), 21h. (Tacubaya (2), Haiwee, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Reno, Shasta Dam, Mineral, Hungry Horse, Lincoln, Andijan, near Fergana, and Garm (2)), 22h. (Samarkand, Stalinabad, near Andijan, Fergana, Garm, Kulyab, and Obi-garm).

Oct. 13d. 20h. 17m. 17s. Epicentre 7°·5N. 123°·5E. Depth of focus 0·080.
(as on 1940, September 22d.).

A = −·5473, B = +·8269, C = +·1297 ; δ = +12 ; h = +·7 ;
D = +·834, E = +·552 ; G = −·072, H = +·108, K = −·992.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Manila		7·4	343	i 1 56	+ 4	i 3 36	+16	—	—
Brisbane	z.	45·0	141	i 7 22a	− 7	—	—	—	—
Irkutsk		47·3	344	e 7 43	− 3	—	—	—	—
Naryn		53·9	318	i 8 7	−27	—	—	—	—
Almata		54·1	320	i 8 38	+ 2	—	—	—	—
Frunse		55·5	317	e 8 47	+ 1	—	—	—	—
Andijan		56·1	314	8 50	0	e 16 0	+ 2	—	—
Fergana		56·4	314	i 8 53	+ 1	e 16 3	+ 2	—	—
Stalinabad		58·0	312	i 9 3	0	i 16 23	+ 1	—	—
Lunacharskoe		58·5	314	e 9 7	+ 1	—	—	—	—
Tashkent		58·5	314	e 9 8	+ 2	i 16 29?	+ 1	—	—
Ashkabad		65·9	309	9 56	+ 2	—	—	—	—
Sverdlovsk		69·1	329	10 12	− 1	18 33	− 3	—	—
College		82·7	26	e 11 27	− 1	—	—	—	—
Overton	z.	110·3	46	i 28 41	PPS	—	—	—	—
Tamanrasset	z.	112·3	298	i 17 52	[+18]	—	—	i 20 58	PP

Tamanrasset gives also eZ =18m.12s.

Oct. 13d. Readings also at 1h. (Puebla and near Tacubaya), 2h. (near Kulyab), 4h. (Overton, Fergana, Garm, near Kulyab, and Obi-garm), 6h. (Christchurch, Kaimata, and near Garm), 7h. (Wellington and Pierce Ferry), 8h. (Overton, Pierce Ferry, and near Garm), 9h. (Tucson and near Victoria), 10h. (Bandong and College), 11h. (near Tiflis), 13h. (Andijan, Frunse, Lunacharskoe, near Fergana, Garm, Kulyab, Murgab, Obi-garm, and Stalinabad), 14h. (Brisbane, Wellington, Haiwee, Mount Wilson, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, and College), 16h. (College and near Zugdidi), 17h. (Brisbane, Wellington, La Paz, Rome, Strasbourg, Stuttgart, Algiers Univ., and Tamanrasset), 18h. (near Garm and near Messina), 19h. (Andijan, Fergana, near Garm, Kulyab, Murgab, and Obi-garm), 20h. (near Obi-garm), 21h. (Tamanrasset, Mount Wilson, Boulder City, Overton (2), Pierce Ferry (2), Hungry Horse (2), Resolute Bay, near College (3), and near Garm), 22h. (Pierce Ferry, near Mizusawa, Strasbourg, near Basle, Chur, Zürich, and Stuttgart), 23h. (Overton, Fergana, near Andijan, Garm, Murgab, and Naryn).

Oct. 14d. 5h. New Britain region.

Brisbane ePZ = 4m.27s.
Christchurch eS? = 8m.40s., eLZ = 21m.0s.
Riverview eS?N = 10m.14s., eLN = 14·0m.
College iP = 11m.52s.
Victoria ePZ = 12m.33s.
Pasadena iPZ = 12m.45s.
Tinemaha iPZ = 12m.45s., eZ = 13m.31s.
Riverside iPZ = 12m.48s.
Haiwee iPZ = 12m.49s.
Boulder City eP = 12m.59s.
Overton iPZ = 13m.1s., ePPZ = 16m.52s.
Pierce Ferry eP = 13m.1s.
Hungry Horse eP = 13m.2s.
Wellington e = 17m., eLZ = 20m.
Stuttgart ePKPZ = 18m.35s.
Tamanrasset ePKPZ = 19m.3s.
Long waves were also recorded at Sitka.

Oct. 14d. 13h. 27m. 12s. I, 17h. 41m. 29s. II — Epicentre 10°·4N. 85°·7W. (as on 5d.).

A = +·0738, B = −·9810, C = +·1794; $\delta = -1$; $h = +6$.

		△	Az.	P.	O−C.	S.	O−C.		Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Balboa Heights	6·2	104	e 0 55	−40	—	—	—	—	—
II		6·2	104	e 0 51	−44	e 2 10	−38	—	—	—
I	Galerzamba	10·3	87	—	—	e 4 15	−15	—	—	4·8
II		10·3	87	—	—	e 4 57	+27	—	—	6·5
I	Bogota	12·9	116	i 3 32	+25	e 5 38	+ 5	—	—	6·6
II		12·9	116	i 3 31	+24	e 5 19	−14	—	—	6·2
I	Tacubaya	15·8	305	i 4 0	+15	e 7 11	+29	—	—	—
II		15·8	305	i 4 7	+22	—	—	—	—	—
I	San Juan	20·5	66	e 4 42	0	e 7 48	−39	e 5 1	PP	e 8·7
I	Huancayo	24·6	157	e 5 20	− 3	e 9 44	+ 2	—	—	—
II		24·6	157	e 5 7	−16	e 9 49	+ 7	i 5 42	?	e 11·8
I	Tucson	31·8	317	e 6 28	0	—	—	—	—	—
II		31·8	317	e 6 29	+ 1	—	—	—	—	—
I	La Paz	31·9	147	e 6 0	−29	i 13 48	SSS	—	—	—
II	Palisades	32·2	19	i 8 14	PPP	—	—	—	—	—
II	Ottawa z.	35·9	12	i 7 0k	− 4	—	—	—	—	—
I	Pierce Ferry	36·2	320	i 7 7	+ 1	—	—	—	—	—
II		36·2	320	i 7 7	+ 1	—	—	—	—	—
I	Palomar	36·6	315	i 7 10	0	—	—	—	—	—
II	E.	36·6	315	i 7 13	+ 3	—	—	—	—	—
I	Boulder City	36·7	320	i 7 11	+ 1	—	—	—	—	—
II		36·7	320	i 7 12	+ 2	—	—	—	—	—
I	Overton z.	36·8	320	i 7 12	+ 1	—	—	—	—	—
II	z.	36·8	320	e 7 13	+ 2	—	—	—	—	—
I	Riverside z.	37·3	314	i 7 16	0	—	—	—	—	—
II	z.	37·3	314	i 7 16	0	—	—	—	—	—
I	Pasadena z.	38·0	314	i 7 22	+ 1	—	—	—	—	—
II	z.	38·0	314	i 7 22	+ 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Haiwee	z.	38·9	317	i 7 29	0	—	—	—	—	—
II	z.	38·9	317	i 7 29	0	—	—	—	—	—
II Tinemaha	z.	39·6	318	i 7 35	0	—	—	—	—	—
I Fresno	z.	40·4	317	e 7 40a	− 1	—	—	—	—	—
II		40·4	317	e 7 40	− 1	—	—	e 7 50	?	—
II Reno	z.	41·9	320	i 7 55	+ 1	—	—	—	—	—
I Lick	z.	42·0	316	e 7 57k	+ 3	—	—	e 8 3	?	—
II	z.	42·0	316	e 7 55a	+ 1	—	—	e 8 3	?	—
I Berkeley	z.	42·7	316	e 8 0k	0	—	—	—	—	—
II	z.	42·7	316	e 8 1	+ 1	—	—	—	—	—
I Mineral	z.	43·6	320	e 8 6	− 2	—	—	—	—	—
II Shasta Dam		44·3	320	e 8 8	− 5	—	—	—	—	—
I Hungry Horse		44·7	334	e 8 13	− 3	—	—	e 9 57	PP	—
II		44·7	334	i 8 15	− 1	—	—	i 9 7	?	—
I Victoria	z.	49·4	328	e 8 50	− 3	—	—	—	—	—
II	z.	49·4	328	e 8 51	− 2	—	—	—	—	—
I College		69·0	337	e 11 5	− 4	—	—	—	—	—
II		69·0	337	e 11 5	− 4	—	—	—	—	—

Pasadena I gives also iZ = 7m.29s.
Long waves were also recorded to both shocks at Philadelphia, Washington, and Harvard, and to shock II at San Juan and Resolute Bay.

Oct. 14d. Readings also at 0h. (Ksara, Triest, Rome, Collmberg, Stuttgart, Strasbourg, Paris, Algiers Univ., Tamanrasset, Hungry Horse, Boulder City, Overton, Pierce Ferry, Tucson, and near Garm (2)), 1h. (near Garm), 2h. (Apia, College, Overton, Pierce Ferry, Stuttgart, and near Garm), 5h. (College (2)), 6h. (College (4) and Hungry Horse), 7h. (near Garm (2)), 8h. (Helwan, Ksara, and Tamanrasset), 10h. (Pierce Ferry), 11h. (near Garm), 12h. (near Istanbul and near Naryn), 13h. (Frunse, near Almata, and near Balboa Heights), 14h. (Ksara, Jena, near Prague, and Collmberg), 15h. (near Victoria), 17h. (near Victoria, near Manzanillo, Guadalajara, and Tacubaya), 18h. (Victoria, Seattle, Hungry Horse, Shasta Dam, Overton (2), Pierce Ferry, Mount Wilson, Riverside, Tinemaha, Berkeley, Lick (2), near Huancayo, and near Garm), 19h. (near Garm), 20h. (Overton, near Pierce Ferry, and near Athens), 23h. (Reno).

Oct. 15d. 15h. 59m. 52s. Epicentre 9°·7S. 159°·6E.

A = −·9241, B = +·3437, C = −·1674; δ = +11; h = +7;
D = +·349, E = +·937; G = +·157, H = −·058, K = −·986.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·7	198	i 4 23k	+ 1	i 8 2	SS	e 8 56	PcP	e 9·4
Riverview		25·2	196	i 5 31k	+ 2	e 10 1	+ 9	i 10 16	sS	e 12·3
Guam		27·3	327	5 5	−43	—	—	5 43	P	—
Apia		28·3	102	6 5	+ 8	—	—	e 6 36	PP	e 13·1
Wellington		34·2	160	i 6 47	− 2	e 12 10	− 6	e 8 26	PPP	16·3
Christchurch		35·6	164	i 6 59	− 2	e 12 33	− 5	e 8 23	PP	17·0
Perth		46·1	235	e 8 28	0	15 15	+ 1	18 26	SS	22·6
Bandong		51·4	270	e 8 47	−22	15 59	−29	—	—	—
Mizusawa		51·5	343	9 12	+ 3	16 32	+ 3	16 22	?	—
Djakarta		52·3	271	e 9 11	− 4	i 16 38	− 2	—	—	—
Nanking		56·9	319	9 51a	+ 2	i 17 47	+ 5	10 35	pP	—
Vladivostok		58·3	337	i 10 0	+ 1	i 18 3	+ 2	—	—	—
Klyuchi		65·8	2	10 45	− 4	—	—	—	—	—
Calcutta	E.	76·8	297	e 11 57	+ 2	i 21 44	+ 2	14 51	PP	—
Irkutsk		77·7	330	e 12 1	+ 1	i 21 53	+ 1	—	—	—
College		84·0	20	e 12 31	− 2	e 22 50	− 7	e 28 14	SS	e 37·2
Kodaikanal	E.	84·1	282	—	—	e 22 39	−19	—	—	—
Sitka		85·2	30	e 12 36	− 3	e 23 2	− 7	—	—	e 35·5
Berkeley		86·7	52	e 12 47a	0	e 23 22	− 2	i 24 25	PS	e 39·9
Santa Clara	E.	86·8	52	e 13 55	+68	e 23 42	S_cS	—	—	e 41·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lick	z.	87·0	52	e 12 48a	0	—	—	e 16 7	PP	—
Shasta Dam		87·3	48	e 12 49	− 1	e 23 21	− 8	—	—	—
Mineral	z.	87·8	49	e 12 52	0	—	—	e 13 2	P_cP	—
Fresno	z.	88·3	53	e 12 55a	0	e 23 48	+ 9	e 13 4	P_cP	—
Victoria		88·7	41	e 13 4	+ 7	e 23 39	− 4	—	—	—
Pasadena		89·0	56	i 12 58a	0	i 23 41	− 4	e 16 32	PP	e 40·3
Reno		89·0	50	e 12 59	+ 1	e 23 47	+ 2	e 13 8	PP	—
Poona		89·1	289	i 13 0	+ 2	i 23 41	− 5	e 23 24	S_cS	—
Haiwee	z.	89·6	54	e 13 1	0	—	—	—	—	—
Riverside	z.	89·6	56	e 13 1a	0	—	—	—	—	—
Tinemaha	z.	89·6	53	i 13 1a	0	—	—	—	—	—
Palomar		89·9	57	i 13 3	+ 1	i 23 54	0	—	—	—
Bombay		90·1	289	—	—	e 23 33	[0]	—	—	—
Przhevalsk		90·1	313	i 13 3	0	—	—	—	—	—
Naryn		91·6	312	e 13 21?	+11	e 23 40	[− 2]	—	—	—
Boulder City		92·1	54	i 13 14	+ 2	e 23 49	[+ 4]	e 16 59	PP	—
Overton	z.	92·5	54	i 13 16	+ 2	—	—	e 16 44	PP	—
Pierce Ferry		92·8	54	i 13 16	0	—	—	e 16 56	PP	—
Frunse		92·9	312	e 13 16	0	23 48	[− 2]	i 24 5	SKKS	—
Andijan		94·2	310	e 13 23	+ 1	e 23 55	[− 2]	e 16 58	PP	—
Fergana		94·5	310	e 13 24	+ 1	e 23 56	[− 2]	—	—	—
Tucson		94·7	58	e 13 29	+ 5	e 24 44	+ 8	e 17 11	PP	e 44·2
Logan		95·3	48	e 13 10	−17	—	—	—	—	e 48·5
Tchimkent		96·4	312	—	—	i 24 5	[− 4]	—	—	—
Stalinabad		96·6	308	e 13 32	− 1	—	—	—	—	—
Tashkent		96·6	311	i 13 33	0	i 24 9	[− 1]	e 17 15?	PP	—
Sverdlovsk		103·0	326	e 14 9	+ 7	i 24 39	[− 2]	e 25 42	S	—
St. Louis		111·7	52	e 19 11	[+34]	e 27 3	S	e 28 54	PS	—
Pretoria	z.	121·1	232	e 19 6	[+11]	—	—	—	—	—
Ksara		123·3	303	i 20 45	PP	36 36	SS	—	—	—
Harvard		124·8	44	e 19 17	[+15]	—	—	—	—	e 59·9
Warsaw	z.	125·9	330	20 59	PP	—	—	—	—	e 67·1
La Paz		126·1	118	e 19 20	[+16]	—	—	—	—	—
Istanbul		126·4	314	e 21 3	PP	e 26 7	[− 3]	—	—	—
Copenhagen		127·4	337	—	—	26 32	[+19]	—	—	63·1
Helwan	z.	127·8	300	e 21 11	PP	—	—	—	—	—
Potsdam		129·5	334	i 21 21	PP	i 22 30	PKS	—	—	e 65·1
Collmberg	z.	130·3	332	e 19 13	[0]	e 22 51	PKS	e 21 29	PP	—
Prague		130·5	331	e 19 15	[+ 2]	e 22 0	PKS	e 24 45	PPP	—
Jena		131·2	332	e 19 52?	[+38]	e 22 59	PKS	e 21 34	PP	—
De Bilt		132·9	338	i 21 45	PP	i 22 46	PKS	e 32 8?	PS	e 61·1
Stuttgart		133·8	333	e 19 20	[+ 1]	e 22 48	PKS	e 34 20	PPS	e 70·1
Triest		133·8	327	e 19 20	[+ 1]	e 28 44	{ 0}	e 23 3	PKS	—
Strasbourg		134·6	334	e 19 23	[+ 3]	e 22 44	PKS	e 40 8	SSP	e 64·1
Rathfarnham Castle		135·1	347	e 19 28	[+ 6]	e 40 58	SSP	e 22 24	PP	e 58·1
Kew		135·2	342	e 21 58	PP	e 32 31	PS	e 22 53	PKS	e 55·1
Padova		135·4	327	e 18 34	?	—	—	e 23 6	PKS	—
Prato		136·4	326	e 20 4	[+40]	—	—	—	—	—
Paris		136·6	338	i 19 26	[+ 2]	e 23 13	PKS	e 22 7	PP	e 70·1
Rome		136·8	323	e 19 23	[− 2]	e 40 40	SSP	e 25 17	PPP	—
Jersey	E.	137·8	342	19 38	[+11]	e 41 8?	SSP	—	—	—
Tortosa		143·9	332	i 19 54	[+17]	29 42	{ − 1}	23 24	PP	—
Algiers Univ.	z.	145·7	325	i 19 42k	[+ 2]	—	—	i 23 6	PP	—
Alicante		146·3	331	20 4	[+23]	27 49	[+60]	27 28	PPP	e 74·9
Toledo	z.	146·6	336	i 19 46	[+ 4]	—	—	e 23 10	PP	—
Granada		148·7	333	i 19 55a	[+10]	i 26 27	[−25]	i 23 17	PP	i 79·6
Malaga	z.	149·4	334	i 19 51k	[+ 5]	23 27	PKS	—	—	78·9
Tamanrasset	z.	152·0	301	e 19 53	[+ 3]	—	—	i 23 41	PP	—

Additional readings :—
Riverview iN =5m.54s., iEN =10m.52s., iN =11m.2s., iE =11m.15s., iN =11m.57s.
Wellington eSS =15m.16s.
Christchurch iP_cPZ =9m.7s., eZ =9m.38s., iZ =11m.44s., QE =14m.58s.
Nanking iPPE =11m.55s., PSE =18m.2s.
Calcutta PPE =16m.30s., SKSE =21m.59s., S_cSE =22m.5s., PSE =22m.12s., PPSE = 22m.30s., SSE =26m.44s., SSSE =29m.45s.

Continued on next page.

College i =13m.33s. and 17m.15s.
Berkeley iZ =12m.56s., eN =36m.26s.
Lick eZ =12m.57s. and 14m.50s.
Fresno eE =15m.53s., eZ =18m.53s.
Pasadena iZ =13m.7s., 13m.28s., and 13m.39s.
Haiwee eZ =13m.34s.
Riverside iZ =13m.10s. and 13m.33s.
Tinemaha iZ =13m.10s. and 13m.42s.
Pierce Ferry ePKP,PKP =38m.42s.
Tucson ePS =25m.48s.
Tashkent ePS =26m.9s.?.
Sverdlovsk iPP =18m.18s., ePS =27m.25s.
Warsaw eZ =22m.11s.
Helwan eZ =21m.25s. and 22m.21s.
Collmberg eZ =19m.23s. and 22m.36s.
Prague e =20m.8s. and 20m.26s., ePP =21m.29s., e =21m.53s., and 23m.14s.
Jena ePKPN =19m.55s.?, eN =22m.44s. and 22m.52s., eE =22m.56s.
De Bilt e =23m.2s.
Stuttgart eZ =19m.29s., ePPZ =21m.43s., eSKPZ =23m.6s.
Triest iZ =22m.48s., eSS? =38m.47s.
Strasbourg e =19m.33s., ePP =21m.50s., ePKS =23m.5s., ePPS =33m.50s., e =59m.8s.?
Rathfarnham Castle eZ =24m.5s., eEN =48m.8s.
Kew eSSS =44m.4s.
Paris e =19m.34s., ePP? =21m.56s., e =22m.20s.
Rome ePPZ =22m.7s., eSKPZ =22m.55s., eSE =30m.1s.
Tortosa P?N =17m.18s.
Algiers Univ. iZ =19m.52s.
Toledo iZ =19m.55s.
Granada pPKP =20m.7s., PKP_2 =20m.49s., pPP =24m.21s., sPP =24m.41s., SKKS = 31m.4s., SKSP =35m.19s., iSS =45m.21s., SSS =54m.1s.
Malaga $iPKP_2Z$ =21m.6s., iPPZ =24m.49s.
Tamanrasset iZ =20m.1s., $iPKP_2Z$ =20m.9s., ePPPZ =27m.3s.?.
Long waves were also recorded at Honolulu, La Plata, Philadelphia, Chicago, Seattle, Upsala, Aberdeen, Washington, Scoresby Sund, Grahamstown, and Palisades.

Oct. 15d. Readings also at 2h. (near Garm), 3h. (near Andijan, Fergana, and Garm), 5h. (Tchimkent, Lunacharskoe, near Andijan, Fergana, Frunse, Garm, Naryn, Obi-garm, and near Bogota), 6h. (near Ottawa), 7h. (Hungry Horse and near Bogota), 8h. (near Tacubaya), 9h. (near Garm), 10h. (Obi-garm, Tashkent, Tchimkent, near Andijan, Fergana, Frunse, Garm, Lunacharskoe, Murgab, and Stalinabad), 11h. (Zugdidi, near Borzhomi, Leninakan, Tiflis, and near Athens), 13h. (Andijan, Fergana, Stalinabad, near Almata, Naryn (2), Frunse (2), Garm, and Przhevalsk, three shocks; near Rocca di Papa, and Rome), 14h. (Christchurch, Wellington, Riverview, Mount Wilson (2), Riverside, Tinemaha, Overton, Pierce Ferry, Berkeley, Shasta Dam, Hungry Horse, Sitka, College (3), Ksara, Stuttgart, and near Algiers Univ.), 15h. (Brisbane, College, Palisades, Potsdam, and Prague), 16h. (Overton, Pierce Ferry, College, near Ottawa, and near Shawinigan Falls), 17h. (Tamanrasset, Brisbane, and near Balboa Heights), 18h. (Apia, Riverview, Wellington, Mount Wilson, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Shasta Dam, Collmberg, Jena, Potsdam, Prague, Strasbourg, Stuttgart, Paris, Triest, and Tamanarsset), 19h. (near Bandong, Djakarta, and near Garm), 20h. (Tamanrasset, Palisades, near Garm, near Boulder City, Overton, and Pierce Ferry), 21h. (College and near Garm (2)), 23h. (Mount Wilson, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, College, and near Apia).

Oct. 16d. 5h. 25m. 28s. Epicentre 5°·0S. 80°·7W. Depth of focus 0·010
(as on 1948, Feb. 20d.).

Intensity V at Olmos; IV at Piura, and Morropon. Suggested depth 60km.

E. Silgado.
Datos Sismológicos del Perú, 1949-1950. Bol. No. 4, Lima, Peru, 1952, p.24.

A = +·1610, B = −·9831, C = −·0866; δ = −9; h = +7;
D = −·987, E = −·162; G = −·014, H = +·085, K = −·996.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo	8·8	143	e 1 59	− 7	e 3 49	+ 5	e 2 14	pP	e 4·7
Bogota	11·6	35	e 2 56	+12	e 5 8	+16	—	—	—
La Paz	16·8	134	3 49	− 1	e 7 2	+ 9	e 4 4?	PP	8·2
Tucson	46·8	325	i 8 22	0	—	—	—	—	—
Weston	47·9	10	i 8 30	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa	z.	50·4	5	i 8 46k	− 3	—	—	—	—	—
Palomar	E.	51·3	321	i 8 57	+ 1	—	—	—	—	—
Pierce Ferry		51·4	326	i 8 57	0	—	—	—	—	—
Boulder City		51·8	326	e 9 3	+ 3	—	—	e 9 16	pP	—
Overton	z.	52·0	326	i 9 2	+ 1	—	—	—	—	—
Riverside	z.	52·0	321	i 9 1	0	—	—	i 9 17	pP	—
Pasadena	z.	52·6	321	i 9 6	0	—	—	i 9 22	pP	—
Haiwee	z.	53·8	324	e 9 14	− 1	—	—	e 9 30	pP	—
Logan		54·5	333	e 9 0	−20	—	—	—	—	—
Tinemaha	z.	54·6	324	i 9 20	− 1	—	—	i 9 36	pP	—
Lick	z.	56·8	322	e 9 36k	0	—	—	e 9 51	pP	—
Mineral	z.	58·7	325	e 9 49	− 1	—	—	—	—	—
Shasta Dam		59·4	325	e 9 52	− 2	—	—	—	—	—
College		85·0	337	e 12 2	−24	—	—	e 12 26	P	—
Tamanrasset	z.	88·4	67	e 12 45	+ 3	—	—	—	—	—

Additional readings :—
Huancayo esS = 4m.4s.
La Paz eSS = 7m.22s.

Oct. 16d. 15h. 42m. 23s. Epicentre 27°·5N. 96°·4E. (as on 1950, Sept. 13d.).

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.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	8·8	237	e 2 24	+13	i 4 9	+16	4 21	SS	4·0
New Delhi		17·0	278	e 3 52	− 9	i 6 42	−28	4 2	P	6·6
Hyderabad	N.	19·3	242	e 4 29	0	e 8 6	+ 4	—	—	10·2
Nanking		20·0	71	4 51k	+14	8 36	+19	i 5 35	PP	—
Przhevalsk		20·9	320	i 4 42	− 4	—	—	—	—	—
Naryn		21·7	315	i 4 50	− 5	8 37	−14	—	—	—
Almata		22·3	320	i 4 57	− 4	i 8 50	−12	—	—	—
Poona		22·5	252	5 6	+ 4	i 9 8	+ 3	5 30	PP	10·6
Bombay		23·3	253	e 5 15	+ 5	(9 45)	+25	—	—	9·8
Frunse		23·4	316	5 9	− 2	i 9 13	− 8	—	—	—
Andijan		23·8	309	e 5 12	− 3	e 9 21	− 7	—	—	—
Fergana		24·0	309	e 5 15	− 2	—	—	—	—	—
Irkutsk		25·5	10	5 36	+ 4	9 58	+ 1	—	—	—
Stalinabad		25·6	303	i 5 32	0	9 48	−11	—	—	—
Tashkent		26·1	309	e 5 36	− 1	—	—	—	—	—
Tchimkent		26·3	310	i 5 35	− 4	—	—	—	—	—
Samarkand		27·2	304	e 5 47	0	—	—	—	—	—
Ksara		51·8	293	e 9 14	+ 2	—	—	e 10 40	PP	—
Copenhagen		64·4	322	e 10 40	0	—	—	—	—	32·6
Prague		64·5	315	e 10 41	0	e 13 0	PP	—	—	—
Potsdam		64·8	318	e 10 43	0	—	—	—	—	e 33·3
Collmberg	z.	65·1	316	e 10 42	− 3	—	—	e 13 3	PP	—
Jena		66·0	316	e 10 51	+ 1	—	—	—	—	—
Triest	z.	66·0	311	i 10 49a	− 1	—	—	—	—	—
Stuttgart		68·1	315	e 11 3	− 1	e 19 51	−12	—	—	e 36·6
Strasbourg		69·1	315	e 11 10a	0	—	—	e 11 31	P_cP	—
Besançon		70·6	314	e 11 19	0	—	—	—	—	—
Paris		72·3	316	i 11 30	+ 1	—	—	—	—	—
College		75·5	23	i 11 53	+ 5	—	—	i 12 4	pP	—
Tamanrasset	z.	80·5	291	e 12 18	+ 3	—	—	e 15 16	PP	
Pretoria	z.	84·3	237	i 12 42?	+ 7	—	—	—	—	—
Overton	z.	110·0	26	e 19 14	PP	—	—	—	—	—
Pierce Ferry		110·5	25	e 19 8	PP	—	—	—	—	—
Bogota		146·8	342	i 19 52	[+10]	—	—	—	—	—

For Notes see next page.

NOTES TO OCTOBER 16d. 15h. 42m. 23s.

Additional readings :—
New Delhi PPPN =4m.9s., SSEN =7m.3s., SSSN =7m.10s.
Poona PPPEZ =5m.42s., QEZ =9m.28s., SSZ =9m.48s., SSSZ =10m.2s.
Bombay eSEN =5m.19s.
Prague e =11m.3s., 11m.18s., and 11m.28s., eE =11m.42s.
Collmberg eZ =12m.16s.
Stuttgart eZ =11m.14s.
Strasbourg e =11m.21s. and 11m.53s.
Besançon e =11m.30s.
Paris i =11m.59s.
Tamanrasset iZ =12m.30s., eZ =14m.7s.
Pretoria eZ =12m.54s.?.
Bogota i =20m.5s.
Long waves were also recorded at De Bilt, Kew, and Rathfarnham Castle.

Oct. 16d. 21h. 45m. 54s. Epicentre 20°·4N. 108°·8W. (as on Oct. 2d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Tuscon		11·9	352	e 2 39	−15	e 3 49	?	e 4·3
Palomar	E.	14·8	333	i 3 31	− 1	—	—	—
Riverside	Z.	15·5	333	e 3 41	− 1	—	—	—
Pasadena	Z.	16·0	331	i 3 58	+10	—	—	—
Pierce Ferry		16·3	345	e 3 43	− 9	—	—	e 7·4
Boulder City		16·4	342	e 3 47	− 6	—	—	—
Overton	Z.	16·8	344	e 3 46	−12	—	—	e 8·0
Tinemaha	Z.	18·6	337	e 4 12	− 9	—	—	—
Lick	Z.	20·2	330	e 4 39a	0	—	—	—
Salt Lake City		20·5	352	e 4 34	− 8	—	—	e 9·6
Berkeley		21·0	330	e 4 53	+ 6	—	—	e 9·5
Reno	N.	21·3	336	e 5 5	+15	—	—	—
Mineral	Z.	22·7	334	e 5 6	+ 2	—	—	—
Shasta Dam		23·3	333	e 5 11	+ 1	—	—	—
Rapid City	E.	24·1	9	e 5 21	+ 3	e 9 38	+ 4	e 11·2
Palisades		36·0	47	e 7 27	+22	—	—	e 18·7
Ottawa		36·9	39	e 7 26	+14	—	—	e 18·9
Harvard		38·2	46	i 7 41	+18	—	—	e 22·6
College		51·3	340	e 9 17	+ 9	—	—	—

Additional readings :—
Tinemaha eZ =4m.24s.
Mineral eZ =5m.18s.
Shasta Dam eP =3m.31s.
Long waves were also recorded at Tacubaya, Butte, Seattle, Resolute Bay, Chicago, and Seven Falls.

Oct. 16d. Readings also at 0h. (Boulder City and Tucson), 2h. (Potsdam and College (3)), 3h. (near Garm), 4h. (College), 5h. (Tananarive, College (2), Zugdidi, near Borzhomi, and Tiflis), 7h. (College), 8h. (Rathfarnham Castle, Kew, De Bilt, Potsdam, Stuttgart, Tamanrasset, Bermuda, Harvard, Mount Wilson, Tinemaha, Tucson, Boulder City, Overton (2), Pierce Ferry (2), Lick, College, and Apia), 10h. (College), 11h. (College, near Andijan, Garm (2), and Stalinabad), 12h. (Overton, Tucson, Pierce Ferry, Huancayo, and near Garm), 13h. (Shasta Dam), 15h. (near Klyuchi), 17h. (Clermont-Ferrand and near Garm (2)), 18h. (Palisades and near Garm), 19h. Collmberg, Jena, Prague, Stuttgart, College, and near Victoria (4)), 20h. (near Victoria), 22h. (Tucson, College, Stalinabad, near Garm (2), Kulyab, and near Istanbul).

Oct. 17d. 3h. 54m. 12s. Epicentre 39°·6N. 116°·7W.

Epicentre 39°36′N. 116°41′W. given by Berkeley.

A = −·3471, B = −·6902, C = +·6349 ; δ = −5 ; h = −3 ;
D = −·893, E = +·449 ; G = −·285, H = −·567, K = −·773.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno	z.	2·4	268	i 0 42	+ 1	—	—	—	—	—
Tinemaha		2·8	206	e 0 48	+ 1	i 1 22	0	—	—	—
Overton	z.	3·5	149	e 1 8	P*	i 2 7	S_g	i 1 16	P_g	e 2·8
Haiwee	z.	3·6	197	e 1 8	P*	—	—	—	—	—
Fresno	z.	3·7	222	i 1 8a	P*	—	—	—	—	—
Mineral		3·8	283	i 1 2	+ 1	e 2 1	S*	—	—	—
Salt Lake City		3·9	71	—	—	e 1 43	− 7	—	—	i 2·8
Pierce Ferry		4·1	148	i 1 15	P*	i 2 15	S_g	i 1 24	P_g	i 2·5
Logan		4·3	58	—	—	e 1 30	P_g	—	—	i 1·9
Lick		4·5	242	e 1 10	− 1	e 2 14	S*	e 1 17	P*	—
Shasta Dam		4·5	286	i 1 12	+ 1	i 2 20	S*	i 1 20	P*	—
Berkeley		4·7	250	i 1 30k	P*	e 2 20	S*	i 1 36	P_g	i 2·9
Santa Clara		4·7	243	—	—	i 2 29	S_g	—	—	—
Pasadena		5·6	193	e 1 40	P*	e 2 51	S*	—	—	—
Tucson		8·7	145	e 2 28	+18	e 4 15	S*	1 3 2	P_g	e 5·0
College		31·1	335	e 6 41	+19	—	—	—	—	—
Rome	E.	86·7	35	e 16 12	PP	—	—	—	—	—

Long waves were also recorded at Butte and Seattle.

Oct. 17d. 10h. Costa Rica.

Balboa Heights eP = 32m.25s.
Bogota eP = 34m.49s., eS? = 37m.0s.
Tacubaya iP = 35m.48s., eS = 38m.54s.
Huancayo eP = 37m.0s., eS = 41m.22s.
La Paz eP = 38m.6s., iPZ = 38m.9s., L = 47·5m.
Tucson eP = 38m.17s.
Pierce Ferry iP = 38m.56s.
Overton ePZ = 39m.0s.
Mount Wilson ePZ = 39m.13s.
Shasta Dam eP = 40m.2s.
College eP = 42m.51s., epP? = 43m.15s.
Tamanrasset ePZ = 44m.29s.
Palisades e = 47m.45s.

Oct. 17d. 14h. 56m. 14s. Epicentre 10°·4N. 85°·7W. (as on 14d.).

A = +·0738, B = −·9810, C = +·1794 ; δ = −1 ; h = +6 ;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		6·2	104	e 0 37	−58	—	—	—	—	—
Galerazamba		10·3	87	i 2 28	− 4	i 5 19	?	—	—	—
Merida		11·1	341	e 3 6	PPP	—	—	—	—	—
Puebla		14·8	307	e 3 42	PP	—	—	—	—	e 5·9
Tacubaya		15·8	305	i 3 57	PP	e 7 22	L	—	—	(e 7·4)
San Juan		20·5	66	e 4 27	−15	e 8 33	+ 6	e 5 6	pP	e 9·5
Huancayo		24·6	157	e 5 10	−13	e 9 27	−15	—	—	—
Pennsylvania		31·0	12	—	—	e 11 18	− 8	—	—	—
Tucson		31·8	317	e 6 31	+ 3	—	—	—	—	—
La Paz		31·9	147	6 21	− 8	i 11 56	+16	13 50	SS	15·4
Palisades		32·2	19	e 7 45	PP	—	—	e 14 31	Q	e 16·2
Ottawa	z.	35·9	12	e 7 0	− 4	—	—	—	—	—
Pierce Ferry		36·2	320	i 7 10	+ 4	—	—	—	—	—
Palomar	E.	36·6	315	i 7 15	+ 5	—	—	—	—	—
Overton	z.	36·8	320	i 7 14	+ 3	—	—	e 9 31	P_cP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	z.	37·3	314	i 7 17	+ 1	—	—	—	—	—
Pasadena	z.	38·0	314	i 7 23	+ 2	—	—	—	—	—
Logan		38·7	329	e 7 24	− 3	—	—	—	—	—
Tinemaha	z.	39·6	318	i 7 37	+ 2	—	—	—	—	—
Fresno	z.	40·4	317	e 7 43k	+ 2	—	—	—	—	—
Reno	z.	41·9	320	e 7 57	+ 3	—	—	—	—	—
Lick	z.	42·0	316	e 7 57k	+ 3	—	—	—	—	—
Mineral	z.	43·6	320	e 8 8	0	—	—	—	—	—
Victoria	z.	49·4	328	e 9 52	+59	—	—	—	—	—
College		69·0	337	e 11 5	− 4	—	—	—	—	—
Tamanrasset	z.	87·1	68	i 12 46k	− 3	—	—	e 15 48	PP	—
Rome	N.	89·2	48	—	—	e 24 52	PS	—	—	—

Long waves were also recorded at Vera Cruz, Chicago, Philadelphia, Harvard, De Bilt, and Strasbourg.

Oct. 17d. 15h. 6m. 45s. Epicentre 10°·5N. 88°·2W. Depth of focus 0·010
(as on 1947, Feb. 26d.).

$A = +·0309$, $B = -·9830$, $C = +·1811$; $\delta = +4$; $h = +6$;
$D = -1·000$, $E = -·031$; $G = +·006$, $H = -·181$, $K = -·984$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		8·7	99	(e 2 4)	− 1	e 2 4	P	—	—	—
Merida		10·5	353	2 24k	− 5	i 4 16	− 9	i 3 46	?	—
Oaxaca		10·6	309	—	—	e 4 19	− 9	—	—	—
Vera Cruz		11·6	319	e 2 36	− 8	—	—	—	—	—
Puebla		12·9	313	e 2 51	−10	e 5 12	−10	—	—	—
Tacubaya		13·8	311	e 3 13?	+ 1	i 5 30	−14	i 3 29	PP	—
Huancayo		25·8	149	e 6 15	PP	—	—	—	—	—
Tucson		30·1	319	e 7 3	+61	—	—	—	—	—
Palisades		32·9	20	i 6 44	pP	—	—	—	—	—
La Paz		33·4	142	e 6 21	−10	i 11 25	−19	—	—	15·0
Pierce Ferry		34·6	322	i 6 41	− 1	—	—	i 9 29	P_cP	—
Palomar	E.	34·8	315	i 6 45	+ 2	—	—	—	—	—
Boulder City		35·0	321	e 6 50a	+ 5	—	—	e 9 30	P_cP	—
Harvard		35·0	22	i 6 48	+ 3	—	—	i 7 3	pP	—
Weston		35·0	22	i 6 48	+ 3	—	—	7 3	pP	—
Overton	z.	35·1	322	i 6 49	+ 3	—	—	—	—	—
Riverside	z.	35·5	316	i 6 50	+ 1	—	—	i 9 31	P_cP	—
Pasadena		36·1	316	i 6 55	+ 1	—	—	i 9 34	P_cP	e 16·6
Ottawa		36·3	15	e 7 54	+58	—	—	—	—	—
Haiwee	z.	37·1	318	i 7 7	+ 4	—	—	—	—	—
Logan		37·4	331	e 7 2	− 3	e 18 3	?	e 23 34	?	—
Tinemaha	z.	37·9	319	i 7 10	+ 1	i 13 20	P_cS	i 9 36	P_cP	—
Lick	z.	40·2	318	e 7 29k	+ 1	—	—	e 8 4	pP	—
Hungry Horse		43·5	336	e 7 53	− 2	—	—	e 8 29	pP	—
Victoria	z.	48·0	329	e 8 28	− 3	—	—	—	—	—
Resolute Bay		64·3	358	10 28	+ 1	18 45	−11	19 9	PS	—
College		67·9	337	e 10 48	− 2	—	—	e 11 24	pP	e 29·9
Collmberg	z.	88·8	38	e 16 7	PP	—	—	—	—	—

Additional readings and note :—
Vera Cruz i = 3m.51s. and 4m. 14s.
Puebla e = 4m.40s.
Tucson iP = 7m.6s.
Pasadena iZ = 6m.32s.
Logan readings given as P, S, and sS.
Tinemaha iZ = 7m.29s.
Lick eZ = 7m.46s.
Collmberg eZ = 16m.15s.
Long waves were also recorded at Scoresby Sund and Stuttgart.

Oct. 17d. 16h. 35m. 18s. Epicentre 14°·0S. 166°·0E.

A = −·9419, B = +·2348, C = −·2404 ; δ = +10 ; h = +6 ;
D = +·242, E = +·970 ; G = +·233, H = −·058, K = −·971.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·1	221	e 4 16	+ 2	e 7 49	+14	—	—	—
Apia		21·6	92	e 4 53	− 1	—	—	—	—	—
Riverview		23·9	212	i 5 12a	+ 5	i 9 44	+14	i 5 35	pP	e 12·1
Christchurch		30·0	171	—	—	e 14 37	Q	—	—	e 17·4
Guam		34·5	322	12 31	S	(12 31)	+11	—	—	—
Perth		49·1	240	—	—	i 16 7	+11	—	—	i 23·5
Vladivostok		64·9	334	i 10 41	− 2	e 19 22	− 2	—	—	—
Irkutsk		84·7	327	e 12 36	− 1	e 23 1	− 3	—	—	—
Lick	z.	84·9	50	e 12 41	+ 3	—	—	e 12 47	PcP	—
Shasta Dam		85·6	47	e 12 40	− 1	—	—	—	—	—
College		86·0	18	e 12 39	− 4	e 23 9	[+ 2]	i 12 49	PcP	e 36·9
Pasadena	z.	86·4	54	i 12 44	− 1	—	—	i 12 57	PcP	—
Riverside	z.	87·0	54	i 12 47	− 1	—	—	i 12 56	PcP	—
Boulder City		89·6	53	e 13 0	− 1	—	—	—	—	—
Pierce Ferry		90·3	53	i 13 4	0	—	—	—	—	—
Tucson		91·7	57	e 13 10	0	—	—	—	—	—
Hungry Horse		93·8	41	e 13 17	− 3	—	—	—	—	—
Tashkent		103·6	309	e 18 22	PP	—	—	—	—	—
Sverdlovsk		110·0	326	—	—	e 26 25	S	—	—	—
Ksara		130·8	302	19 18	[+ 4]	—	—	—	—	—
Istanbul		133·9	314	e 19 18	[− 1]	—	—	e 21 37	PP	—
Prague		137·2	333	e 18 27	?	—	—	e 20 30	?	—
Jena	E.	137·7	335	e 18 27	?	—	—	e 19 9	?	—
Rathfarnham C.	z.	140·3	353	e 22 22	PP	—	—	—	—	—
Stuttgart	z.	140·4	336	e 19 25?	[− 6]	—	—	e 22 27	PP	—
Triest		140·7	329	e 19 32	[0]	e 23 24	PKS	e 23 7	PP	—
Strasbourg		141·1	337	e 19 33	[+ 1]	—	—	e 22 33	PP	—
Prato		143·3	329	e 19 31	[− 5]	—	—	—	—	—
Rome		144·0	326	e 19 33a	[− 4]	e 23 26	PKS	—	—	—
Clermont-Ferrand		145·2	339	i 19 42	[+ 2]	—	—	—	—	—
Toledo	z.	152·8	343	e 20 1	[+ 9]	—	—	e 20 12	PKP_2	—
Tamanrasset	z.	159·6	299	i 20 2a	[+ 2]	—	—	e 20 41	PKP_2	—

Additional readings :—
Brisbane ePEN = 4m.19s., eSZ = 7m.52s.
Riverview iPP = 5m.53s., iN = 9m.48s., isS?N = 10m.7s., eQN = 10·5m., iSSE = 10m.42s.
Stuttgart ePKPZ = 19m.32s.
Strasbourg e = 19m.59s.
Toledo eZ = 20m.26s.
Tamanrasset eZ = 21m.38s., ePPZ = 24m.23s.
Long waves were also recorded at Wellington, Berkeley, Palisades, and Philadelphia.

Oct. 17d. 22h. 7m. 22s. Epicentre 9°·7N. 84°·8W. (as on 1939, Dec. 26d.).

A = +·0893, B = −·9818, C = +·1674 ; δ = −7 ; h = +7 ;
D = −·996, E = −·091 ; G = +·015, H = −·167, K = −·986.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights	5·2	97	e 0 42	−39	e 1 52	−30	—	—	—
Galerazamba	9·5	83	e 2 54	+34	e 4 40	+30	e 9 38	PcP	e 5·6
Bogota	11·8	115	e 2 58	+ 5	e 5 33	+27	—	—	—
Tacubaya	16·9	306	e 4 5	+ 6	e 7 20	+13	i 4 17	PP	—
San Juan	20·1	62	e 4 43	+ 5	e 8 46	SS	e 5 3	PPP	e 9·8
Fort de France	23·6	76	e 4 51	−22	—	—	e 8 55	PcP	—
Huancayo	23·6	156	e 5 15	+ 2	e 9 28	+ 3	e 6 0	PPP	—
Washington	29·9	13	e 6 15	+ 3	—	—	—	—	e 13·0
La Paz	30·8	147	e 6 13	− 7	i 11 22	− 1	i 12 48	SS	15·1
Palisades	32·6	16	—	—	e 11 54	+ 3	—	—	e 15·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		32·9	317	e 6 36	− 2	e 11 54	− 2	—	—	e 15·7
Weston		34·6	17	e 6 42	−11	—	—	—	—	—
Ottawa	z.	36·4	11	e 7 5	− 3	—	—	—	—	—
Pierce Ferry		37·3	320	i 7 15	− 1	—	—	—	—	—
Boulder City		37·8	319	e 7 19	− 1	—	—	—	—	—
Overton	z.	37·9	320	e 7 19	− 1	e 16 23	SSS	—	—	—
Riverside	z.	38·4	314	e 7 24	− 1	—	—	—	—	—
Mount Wilson	z.	39·0	314	e 7 29	− 1	—	—	—	—	—
Logan		39·8	328	e 7 31	− 5	—	—	—	—	e 23·2
Tinemaha	z.	40·7	318	e 7 42	− 2	—	—	—	—	—
Fresno	z.	41·5	316	e 7 48a	− 2	—	—	—	—	—
Lick	z.	43·1	317	e 8 2a	− 2	—	—	—	—	—
Reno	z.	43·1	321	e 8 6	+ 2	—	—	—	—	—
Berkeley		43·8	317	e 8 8a	− 1	e 14 40	0	—	—	e 23·5
Mineral	z.	44·7	320	e 8 14	− 2	—	—	—	—	—
Shasta Dam		45·4	320	e 8 18	− 4	—	—	—	—	—
Hungry Horse		45·7	334	e 8 21	− 3	—	—	e 10 0	P_cP	—
Victoria	z.	50·4	328	e 8 59	− 2	—	—	—	—	—
Resolute Bay	E.	65·2	358	—	—	e 26 36	SSS	—	—	—
College		70·0	337	e 11 10	− 5	—	—	—	—	e 35·4
Stuttgart		85·4	42	e 12 41	+ 1	—	—	—	—	e 38·6
Tamanrasset	z.	86·6	68	i 12 48k	+ 2	—	—	e 16 1	PP	—
Prague		88·5	40	e 13 3	+ 7	—	—	—	—	—
Rome	E.	89·0	48	—	—	e 23 58	+13	—	—	—

Additional readings :—
Bogota $ePcPN$ =7m.8s., $eScP?$ =11m.46s.
Lick eZ =8m.16s.
Tamanrasset eZ =12m.57s., iZ =13m.52s.
Long waves were also recorded at La Plata, Merida, Vera Cruz, Bermuda, Philapeldhia, Harvard, Sitka, Granada, Kew, Paris, and Potsdam.

Oct. 17d. Readings also at 0h. (Prague, Fergana, Tchimkent, near Mary, and Ashkabad), 1h. (College and near Garm), 2h. (Tinemaha, College, Overton, Pierce Ferry, Tucson, and Palisades), 3h. (College and near Garm), 4h. (near Huancayo), 5h. (Mount Wilson, Riverside, Tinemaha, Overtcn, Pierce Ferry, Tucson, Pretoria, and near Garm), 6h. (Jcna and near Huancayo), 9h. (near Frunse), 11h. (College), 12h. (Pierce Ferry and near Klyuchi), 13h. (College, Palisades, and near Istanbul), 14h. (Seattle, Harvard (2), Upsala, and Stuttgart), 15h. (near Prague), 16h. (near Garm), 17h. (near College), 18h. (near Istanbul (2)), 19h. (College, Hungry Horse, Shasta Dam, Boulder City, Overton, Pierce Ferry, Tucson, and Pretoria), 20h. (near Istanbul), 21h. (Seattle, Samarkand, near Garm (2), Stalinabad, and Andijan), 22h. (Rome and Resolute Bay).

Oct. 18d. 18h. 7m. 23s. I
18h. 20m. 4s. II
21h. 35m. 9s. III
} **Epicentre 47°·2N. 14°·5E. (as on 1950, May 31d.).**

Shock II, intensity V-VI at Obdachersattel (Steiermark).
Epicentre 47°N. 14°·7E. Macroseismic area 10,000 sq. km.

Makroseismiche Beobachtungen, 1950. Jahrbucher der Zentralanstalt für Meteorologie und Geodynamik. Jahrgang, 1950. Neue Folge 87. Band, Vienna, 1951, pp. E1, E2, with macroseismic chart.

$A = +·6602$, $B = +·1707$, $C = +·7314$; $\delta = -5$; $h = -4$;
$D = +·250$, $E = -·968$; $G = +·708$, $H = +·183$, $K = -·682$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
I	Triest	1·6	198	e 0 33a	+ 3	e 0 52	+ 1	i 0 56	S_g		—
II		1·6	198	i 0 29	− 1	i 0 52	+ 1	i 0 41	P_g		—
III		1·6	198	i 0 29a	− 1	i 0 52?	+ 1	i 0 36	PP		—
I	Prague	2·9	359	0 45	− 3	e 1 28	+ 4	e 0 55	P_g		—
II		2·9	359	e 0 54	P_g	i 1 23	− 1	i 1 30	S*		—
III		2·9	359	e 0 46	− 2	e 1 19	− 5	e 0 53	P*		—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Cheb		3·2	334	e 0 37?	−15	—	—	—	—	—
II			3·2	334	(e 0 56?)	+ 4	—	—	—	—	—
III			3·2	334	e 0 51?	P*	—	—	—	—	—
I	Padova		3·3	214	e 1 26	?	—	—	—	—	—
II			3·3	214	e 1 15	P_g	e 1 51	S_g	—	—	—
III			3·3	214	e 1 16	P_g	e 2 0	S_g	—	—	—
I	Chur		3·4	266	e 1 6	P_g	e 1 48	S_g	—	—	—
II			3·4	266	e 0 57k	+ 2	—	—	e 1 3	P*	—
III			3·4	266	e 0 57	+ 2	e 1 49	S_g	1 3	P*	—
I	Ravensburg	z.	3·4	282	e 1 12	P_g	—	—	—	—	—
II		z.	3·4	282	e 1 2	P*	e 1 51	S_g	e 1 8	P_g	—
III		z.	3·4	282	e 1 5?	P_g	—	—	—	—	—
II	Raciborzu	z.	3·8	39	e 1 14	P_g	e 2 17	S_g	—	—	—
I	Stuttgart	z.	3·9	296	e 1 5	+ 3	e 2 12	S_g	e 1 21	P_g	—
II		z.	3·9	296	e 1 1	− 1	e 1 44	− 6	e 1 18	P_g	—
III		z.	3·9	296	e 1 1	− 1	e 1 44	− 6	e 1 18	P_g	—
I	Zürich		4·0	275	e 1 7	+ 3	e 2 14	S_g	—	—	—
II			4·0	275	e 1 3	− 1	e 2 11	S_g	1 16	P_g	—
III			4·0	275	e 1 1	− 3	e 2 12	S_g	e 1 14	P*	—
I	Collmberg	z.	4·2	347	e 1 9	+ 2	e 1 45	−12	e 1 25	P_g	—
II		z.	4·2	347	e 1 6	− 1	e 1 49	− 8	e 1 22	P_g	—
III		z.	4·2	347	e 1 9	+ 2	e 1 50	− 7	e 1 24	P_g	—
I	Jena		4·2	334	—	—	e 1 59	+ 2	e 2 23	S_g	—
II			4·2	334	e 1 0	− 7	e 1 58	+ 1	e 1 13	P*	—
III			4·2	334	e 1 38	P_g	e 2 10	S*	e 2 19	S_g	—
II	Pavia		4·2	244	—	—	e 2 23	S_g	—	—	e 2·7
II	Karlsruhe		4·5	296	i 2 26	S_g	—	—	—	—	—
II	Basle		4·7	277	e 1 23	P*	—	—	e 2 41	S_g	—
III			4·7	277	e 1 23	P*	e 2 41	S_g	—	—	—
II	Strasbourg		4·7	290	e 1 32	P_g	i 2 24	S*	e 2 38	S_g	—
III			4·7	290	e 1 31	P_g	e 2 0	−10	e 2 37	S_g	—
II	Besançon		5·8	274	e 1 49	P_g	e 2 56	S*	e 3 5	S_g	—
III			5·8	274	e 1 47	P*	e 3 12	S_g	—	—	—

Additional readings :—
Triest II iP_gP_g = 0m.36s.
Prague I eP* = 49s., e = 1m.1s., eS* = 1m.31s., eS_g = 1m.35s., II e = 57s., i = 1m.17s., iS* = 1m.27s., III e = 59s., 1m.14s., and 1m.23s., eS* = 1m.27s., iS_g = 1m.31s.
Cheb II Readings increased by one minute.
Stuttgart I eP*Z = 1m.17s., eZ = 2m.17s., eS_gZ = 2m.23s., II eP*Z = 1m.13s., eZ = 1m.26s., eS*Z = 2m.8s., eZ = 2m.14s., eS_gZ = 2m.20s., III eZ = 1m.4s., eP*Z = 1m.13s., eZ = 1m.26s., eS*Z = 2m.8s. and 2m.11s., eZ = 2m.13s., eS_gZ = 2m.20s.
Collmberg I eS*?Z = 2m.9s., eS_gZ = 2m.20s., iZ = 2m.25s., eZ = 2m.33s., II eZ = 1m.34s., eS*?Z = 2m.2s., iS_gZ = 2m.16s., iZ = 2m.21s., III eZ = 1m.36s., eS*?Z = 2m.4s., eZ = 2m.13s., iS_gZ = 2m.16s., iZ = 2m.21s.
Jena I eN = 2m.3s. and 2m.13s., eEN = 2m.17s., eN = 2m.20s., II eP*?N = 1m.7s., eS_gN = 2m.10s., eE = 2m.13s. and 2m.17s., eEN = 2m.20s., III eN = 1m.45s., eEN = 2m.13s.
Strasbourg II e = 1m.54s., eS* = 2m.30s.; also long waves to shock I.
Long waves to shocks II, III were recorded at Potsdam.

Oct. 18d. Readings also at 0h. (Collmberg and Jena), 1h. (near Alicante, Granada, Malaga, and Toledo), 3h. (Tacubaya), 4h. (Clermont-Ferrand and near Garm (2)), 5h. (near Huancayo, near Garm, and near Fort de France), 6h. (Haiwee, Pasadena, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Mineral, Shasta Dam, Hungry Horse, Victoria, and College), 7h. (Palisades and Rome), 8h. (Ottawa, Tamanrasset, near Algiers Univ., and near Kulyab), 9h. (Palisades, Weston, and near Algiers Univ.), 10h. (Tacubaya and near Tiflis), 11h. (Tucson, Overton, and Pierce Ferry), 12h. (Palisades, Weston, College, Ksara, near Gori, Tiflis, and near Vladivostok), 13h. (Tucson and College), 14h. (Besançon, Strasbourg, Stuttgart, Tamanrasset, and near Alicante), 15h. (Tucson, Boulder City, Overton, and Pierce Ferry), 16h. (Huancayo and La Paz), 18h. (Prague and Stuttgart), 19h. (near Mizusawa), 21h. (College), 22h. (Raciborzu, Collmberg, Jena, Prague, Stuttgart, Zürich, Naryn, Tchimkent, near Andijan, Fergana, Garm, Lunacharskoe, Murgab, Obi-garm, Stalinabad, and near Istanbul).

Oct. 19d. 3h. 48m. 27s. Epicentre 19°·3N. 64°·6W.

A = +·4051, B = −·8532, C = +·3285; δ = −3; h = +5;
D = −·903, E = −·429; G = +·141, H = −·297, K = −·944.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		1·7	237	e 0 35	+ 4	i 0 56	+ 2	i 0 38	P_g	e 1·2
Fort de France		5·6	144	e 1 28	+ 1	e 2 42	+ 9	—	—	—
Bermuda		13·0	0	e 3 10	+ 1	e 5 28	− 7	—	—	e 6·6
Galerazamba		13·3	232	e 3 49	+36	—	—	—	—	—
Bogota	z.	17·3	214	i 4 8	+ 4	e 7 19	+ 3	i 4 18	PP	—
Chinchina		17·8	218	e 4 33?	+22	e 7 45?	+17	—	—	—
Balboa Heights		17·8	237	e 3 30	−41	—	—	—	—	—
Washington		22·3	335	i 5 3	+ 2	—	—	—	—	—
Philadelphia		22·5	339	i 5 3	+ 1	e 9 3	− 2	i 5 56	PPP	e 10·4
Fordham		22·9	344	e 5 5	− 1	e 9 16	+ 3	—	—	—
Palisades		23·1	344	i 5 6	− 2	i 9 18	+ 2	i 10 13	SSS	—
Weston		23·7	349	e 5 13	− 1	e 9 23	− 4	—	—	—
Harvard		23·9	349	i 5 15	− 1	e 9 27	− 3	—	—	14·0
Cleveland		26·4	331	e 5 40	0	e 10 18	+ 6	i 6 9	PP	—
Ottawa		27·6	344	e 5 53	+ 2	11 9	+37	6 25	PP	—
St. Louis		29·4	317	i 6 48	PP	e 10 57	− 4	e 12 26	SS	14·5
Huancayo		32·9	199	e 6 38	0	e 11 51	− 5	—	—	14·8
La Paz		35·7	186	e 7 1	− 1	—	—	—	—	18·0
Tucson		43·3	297	e 8 6	+ 1	—	—	—	—	—
Logan		45·7	311	e 8 16	− 8	—	—	—	—	e 22·8
Pierce Ferry		46·3	302	i 8 31	+ 2	—	—	—	—	—
Overton	z.	46·7	303	i 8 34	+ 2	—	—	—	—	—
Boulder City		47·0	302	i 8 6	−29	—	—	—	—	—
Riverside	z.	48·9	299	e 8 52	+ 2	—	—	—	—	—
Hungry Horse		49·1	319	i 8 50	− 1	—	—	—	—	—
Haiwee	z.	49·5	302	e 8 54	0	—	—	—	—	—
Pasadena		49·6	299	e 8 55	0	—	—	—	—	e 26·4
Tinemaha	z.	49·8	303	e 8 58	+ 2	—	—	—	—	—
Lick	z.	52·6	304	e 9 18a	0	—	—	—	—	—
Mineral	z.	52·8	307	e 9 18	− 1	—	—	—	—	—
Shasta Dam		53·4	307	i 9 22	− 2	—	—	—	—	—
Malaga	z.	55·1	58	i 9 35a	− 1	i 16 53	−25	—	—	26·2
Victoria	z.	55·2	317	e 9 34	− 3	—	—	—	—	—
Toledo	z.	55·5	55	e 9 36	− 3	—	—	—	—	—
Granada		55·7	58	10 9	+29	18 3	+37	—	—	27·2
Kew		59·2	41	—	—	e 21 33	SS	—	—	—
Paris		60·7	44	i 10 12	− 3	—	—	—	—	—
De Bilt		62·6	40	—	—	e 18 57	+ 1	—	—	e 29·6
Besançon		63·0	46	e 10 29	− 2	—	—	—	—	—
Strasbourg		64·2	44	e 10 37	− 2	—	—	e 11 7	P_cP	—
Tamanrasset	z.	65·0	73	e 10 44	0	—	—	e 13 3	PP	—
Stuttgart		65·1	44	e 10 41	− 4	—	—	—	—	31·8
Collmberg	z.	67·5	42	e 10 58	− 2	—	—	—	—	—
Rome		67·9	51	e 10 59	− 3	e 24 34	SS	e 15 31	PPP	—
Prague		68·0	43	e 11 8	+ 5	21 7	PPS	—	—	—
College		69·8	334	e 11 12	− 2	—	—	—	—	34·0
Ksara		87·8	56	e 12 55	+ 3	e 23 33	− 1	—	—	—

Additional readings :—
Bogota eSSZ = 8m.49s.
Fordham iP = 5m.20s., iS = 9m.19s.
Palisades i = 5m.23s.
Harvard i = 5m.32s.
Cleveland eSN = 10m.22s., iN = 10m.48s., eE = 10m.51s.
St. Louis iPPP = 6m.55s.
Huancayo e = 7m.4s.
La Paz iZ = 7m.17s.
Tucson eP_cP = 9m.2s.
Mineral eZ = 9m.46s.
Tamanrasset iZ = 10m.50s.
Long waves were also recorded at Potsdam and other American stations.

Oct. 19d. 9h. 51m. 16s. Epicentre 32°·8S. 178°·1W. (as on 1949, July 14d.).

$A = -·8418$, $B = -·0279$, $C = -·5391$; $\delta = +3$; $h = +1$;
$D = -·033$, $E = +·999$; $G = +·539$, $H = +·018$, $K = -·842$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai	N.	7·1	211	e 1 34	−14	e 2 44	−26	—	—	—
New Plymouth	E.	8·9	223	e 2 9	− 3	i 3 46	− 9	—	—	—
Wellington		10·2	212	e 2 14	−17	i 3 53	−34	—	—	—
Kaimata	N.E.	12·8	217	e 2 54	−12	e 4 55	−35	—	—	—
Christchurch		13·0	212	e 3 4	− 5	—	—	—	—	—
Apia		19·8	20	e 4 49	+14	e 8 34	+12	—	—	—
Brisbane		25·5	274	i 5 31a	− 1	e 10 10	+13	—	—	—
Honolulu		57·2	23	e 9 49	− 2	—	—	—	—	—
Santa Clara		87·2	41	e 13 5	+16	e 23 46	+18	e 37 14	Q	e 47·8
Pasadena		87·2	46	i 12 49k	0	—	—	—	—	e 36·1
Lick	Z.	87·4	41	e 12 50k	0	—	—	—	—	—
Berkeley		87·4	41	i 12 51k	+ 1	e 24 44	PS	e 16 27	PP	e 36·4
Palomar		87·5	47	i 12 50	− 1	—	—	—	—	—
Riverside		87·6	46	i 12 50k	− 1	—	—	—	—	—
Fresno	Z.	88·0	43	e 12 54k	+ 1	—	—	—	—	—
Vladivostok		88·3	326	e 13 1	+ 6	e 23 25	[+ 3]	—	—	—
Haiwee	Z.	88·7	44	i 12 56	− 1	—	—	—	—	—
Tinemaha	Z.	89·2	44	e 12 59	0	—	—	—	—	—
Shasta Dam		89·4	39	i 13 0	0	—	—	e 16 30	PP	—
Mineral	Z.	89·6	40	e 13 1	0	—	—	e 30 31	PKKP	—
Reno		90·0	41	e 13 3	0	—	—	—	—	—
Boulder City		90·5	47	i 13 5	0	—	—	—	—	—
Tucson		90·6	51	e 13 6	+ 1	—	—	e 30 25	PKKP	41·4
Overton	Z.	91·1	46	i 13 9	+ 1	—	—	—	—	—
Pierce Ferry		91·1	47	i 13 8	0	—	—	e 16 52	PP	—
Tacubaya		91·4	68	e 13 17	+ 8	—	—	—	—	—
Huancayo		94·1	107	e 13 20	− 2	e 31 12	SS	e 24 6	SKS	43·5
Victoria	Z.	94·5	33	e 13 24	+ 1	—	—	—	—	—
Logan		96·0	43	e 13 26	− 4	—	—	—	—	51·0
Sitka		96·5	21	—	—	e 24 54	+ 3	—	—	45·1
La Paz		97·1	115	e 14 2	+27	24 20	[+ 8]	i 17 56	PP	46·7
Hungry Horse		99·0	37	e 13 47	+ 3	—	—	—	—	—
College		100·2	12	e 13 48	− 1	—	—	e 17 23	PP	e 46·2
Resolute Bay		119·6	17	e 18 51	[− 1]	—	—	e 30 5	PS	—
Ottawa	Z.	120·7	52	e 18 51	[− 3]	—	—	—	—	—
Weston		122·8	57	e 19 14	[+16]	—	—	—	—	—
Fergana		124·7	299	e 18 59	[− 3]	—	—	—	—	—
Tashkent		126·8	300	e 19 3	[− 3]	e 26 16	[+ 5]	e 31 15	PS	—
Mary		131·5	293	i 22 39	PKS	—	—	—	—	—
Sverdlovsk		133·7	319	e 19 18	[− 1]	e 28 35	{− 8}	i 22 48	PKS	—
Pulkovo		147·1	334	e 19 44	[+ 1]	—	—	—	—	—
Ksara		151·7	281	19 52	[+ 2]	—	—	23 43	PP	—
Helwan	Z.	154·7	271	e 19 56	[+ 2]	—	—	e 20 4	PKP_2	—
Copenhagen		156·0	346	e 19 26	[−30]	—	—	—	—	80·7
Istanbul		156·8	299	e 20 0	[+ 3]	—	—	e 23 31	PP	—
Rathfarnham C.	Z.	158·7	14	e 20 46	[+47]	—	—	—	—	—
Collmberg	Z.	159·8	339	e 20 25	[+24]	—	—	e 24 30	PP	—
Prague		160·4	336	e 19 55	[− 6]	—	—	e 20 38	PKP_2	—
Jena		160·5	340	e 20 22?	[+21]	—	—	e 24 32?	PP	—
De Bilt		160·6	354	e 20 5	[+ 3]	44 44?	SS	—	—	81·7
Kew		161·3	4	e 28 31	PKKP	—	—	—	—	83·7
Stuttgart		163·1	344	e 20 1	[− 3]	e 35 44	PSKS	e 24 47	PP	—
Strasbourg		163·6	346	e 20 6	[+ 2]	e 38 22	PPS	e 24 44	PP	e 79·7
Paris		164·0	359	e 20 7	[+ 2]	—	—	i 24 48	PP	e 97·7
Triest		164·2	329	—	—	32 11	{+37}	—	—	—
Besançon		165·2	349	e 20 7	[+ 1]	—	—	24 52	PP	—
Clermont-Ferrand		167·0	356	—	—	e 43 20	?	—	—	—
Rome		167·6	321	e 20 10	[+ 2]	e 31 48	{− 3}	e 24 54	PP	—
Tamanrasset	Z.	169·5	194	20 7a	[− 2]	e 23 37	PKS	i 25 10	PP	—
Toledo	Z.	171·5	—	e 20 14	[+ 4]	—	—	e 25 28	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Malaga	z.	173·5	—	i 20 14k	[+ 3]	—	—	i 25 38	PP	—
Granada		173·7	—	e 20 18k	[+ 7]	32 50	{+29}	i 25 44	PP	85·4
Alicante		174·1	—	20 10	[− 1]	—	—	—	—	76·9
Algiers Univ.	z.	175·9	—	e 20 9	[− 3]	—	—	e 25 31	PP	—

Additional readings :
Christchurch eS? = 4m.59s.
Pasadena iZ = 13m.9s.
Lick eZ = 13m.6s.
Berkeley iZ = 13m.11s., eN = 22m.47s., eE = 23m.47s.
Fresno eZ = 15m.38s.
Tinemaha iZ = 13m.41s.
Mineral eZ = 13m.16s. and 13m.51s.
Tucson e = 14m.55s.
Overton eZ = 29m.23s.
Pierce Ferry e = 29m.2s.
Huancayo e = 27m.8s.
La Paz PS = 26m.28s., i = 27m.27s.
College e = 29m.48s.
Resolute Bay eE = 19m.27s. and 22m.14s.
Tashkent ePKS = 22m.29s.
Sverdlovsk ePS = 32m.18s.
Helwan eZ = 21m.26s.
Rathfarnham Castle eZ = 22m.5s. and 29m.12s., e = 41m.29s.
Collmberg eZ = 20m.42s., ePKPZ = 21m.22s.
Jena ePKP?N = 20m.49s., ePP?N = 24m.35s.
Kew ePPZ = 32m.13s., eSSE = 50m.41s., eSSSEN = 58m.49s.
Stuttgart ePKP$_2$Z = 21m.1s., ePPP = 28m.44s., e = 32m.50s.
Strasbourg e = 20m.36s., ePKP$_2$ = 20m.57s., e = 21m.1s., i = 21m.5s., ePP = 24m.56s., e = 30m.56s. and 32m.11s., eSSS = 50m.44s.?.
Paris e = 20m.12s., ePKP$_2$ = 20m.59s., i = 21m.10s., e = 24m.32s.
Triest eSS = 48m.20s.
Besançon ePKP$_2$ = 21m.8s., e = 21m.28s. and 24m.44s.
Rome ePKP$_2$Z = 21m.2s., ePSKSE = 35m.33s.
Tamanrasset iPKP$_2$Z = 21m.19s., iZ = 21m.37s., eZ = 27m.37s., ePPPZ = 29m.5s., eZ = 29m.35s.
Toledo ePKP$_2$Z = 21m.34s.
Malaga iPKP$_2$Z = 21m.42s., PPPZ = 29m.56s.
Granada PKP$_2$ = 21m.44s., SKKS = 29m.51s., iSS = 47m.14s.
Algiers Univ. iZ = 20m.13s., ePKP$_2$Z = 21m.10s., eZ = 26m.10s., ePPPZ = 29m.2s.
Long waves were also recorded at Ivigtut, Scoresby Sund and other American stations.

Oct. 19d. 20h. 24m. 14s. Epicentre 42°·9N. 142°·1E. Depth of focus 0·010.

Intensity IV at Urakawa and Hatinohe ; II-III at Sapporo and Kusiro. Epicentre as adopted, depth 30-100km., macroseismic radius 200-300km.

Seismo. Bull., Cent. Met. Obs., Japan, 1950, Tokyo, 1952, pp. 43, 44, with macroseismic chart.

$A = -\cdot5798$, $B = +\cdot4516$, $C = +\cdot6782$; $\delta = +7$; $h = -3$;
$D = +\cdot614$, $E = +\cdot789$; $G = -\cdot535$, $H = +\cdot417$, $K = -\cdot735$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Sapporo	0·6	287	0 18a	+ 1	0 31	+ 2
Mori	1·4	235	0 57	+32	1 14	+30
Aomori	2·3	205	0 37	0	1 3	− 2
Hatinohe	2·4	190	0 43	+ 5	1 11	+ 4
Nemuro	2·6	80	0 46	+ 5	1 19	+ 7
Miyako	3·3	182	0 46	− 5	1 20	− 9
Morioka	3·3	192	0 47k	− 4	1 21	− 8
Akita	3·5	206	0 52	− 2	1 24	−10
Mizusawa	3·8	192	0 57	− 1	1 35	− 7
Sendai	4·7	192	1 6	− 4	1 56	− 8
Hukusima	5·3	194	1 17	− 1	2 11	−7
Mito	6·6	192	2 34	S	(2 34)	−16
Utunomiya	6·6	196	2 18	?	—	—
Tukubasan	6·8	194	2 41	S	(2 41)	−14
Maebasi	6·9	201	2 7	+27	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kumagaya		7·1	198	1 48	+ 5	2 51	−12
Tokyo		7·4	195	1 45	− 2	—	—
Hunatu		7·8	201	1 42	−10	—	—
Mera		8·2	193	3 16	S	(3 16)	−14
Osima		8·4	196	3 17	S	(3 17)	−17
College		43·9	35	e 7 59	0	—	—
Hungry Horse		67·2	44	i 10 46	0	—	—
Shasta Dam		67·2	55	e 10 46	0	—	—
Tinemaha	z.	72·1	56	e 11 16	0	—	—
Riverside	z.	74·6	58	e 11 29	− 1	—	—
Overton	z.	74·7	54	i 11 32	+ 1	—	—
Boulder City		74·8	55	e 11 32	+ 1	—	—
Pierce Ferry		75·2	54	i 11 35	+ 1	—	—
Tucson		79·8	55	i 12 0	+ 1	—	—

Oct. 19d. Readings also at 0h. (Overton, Mount Wilson, College, near Garm, Obi-garm (2), and near Istanbul), 1h. (near Garm (2) and Kulyab), 2h. (Tinemaha, Pierce Ferry, Tucson, Overton, and College), 3h. (Toledo), 4h. (near Grozny), 6h. (College, Naryn, Tchimkent, near Andijan, Fergana, Garm, Kulyab, Lunacharskoe, Murgab, Obi-garm, Stalinabad, and near Algiers Univ.), 7h. (near Naryn), 9h. (Tacubaya, Bermuda, Palisades, Ottawa, Harvard, Weston, Tucson, College, Nanking, near San Juan, and near Naryn), 10h. (Bombay, Tucson, and near Huancayo), 11h. (College and near Algiers Univ.), 12h. (College, near Gori, and Tiflis), 13h. (Apia, Tinemaha, Tucson, Overton (2), Pierce Ferry (2), Hungry Horse, Sitka, Seattle, and near College), 14h. (Tananarive and near College), 17h. (Prague and Wellington), 20h. (near Mizusawa), 23h. (Overton and Pierce Ferry).

Oct. 20d. 7h. 44m. 42s. Epicentre 19°·8N. 65°·6W. (as on 6d.).

$A = +·3890$, $B = -·8575$, $C = +·3367$; $\delta = -1$; $h = +5$;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		1·5	199	e 0 29	+ 1	i 0 51	+ 2	i 0 32	P_g	i 1·1
Bermuda		12·6	4	e 3 6	+ 3	e 5 18	− 8	—	—	e 7·1
Bogota		17·2	210	e 4 4	+ 1	i 7 28	+14	i 7 48	SSS	—
Washington		21·5	336	e 4 58	+ 6	e 9 2	+15	e 16 28	S_gS	—
Philadelphia		21·7	341	e 5 0	+ 5	e 9 0	+ 9	—	—	e 10·5
Palisades		22·3	343	i 5 1	0	i 9 13	+11	i 5 17	PP	—
Weston		23·0	350	i 5 9	+ 2	e 9 17	+ 3	—	—	—
Harvard		23·2	350	i 5 10	+ 1	e 9 16	− 2	—	—	i 13·9
Pennsylvania	N.	23·4	336	i 5 24	+13	i 9 22	+ 1	—	—	—
Pittsburgh		24·0	332	e 6 11	+54	i 10 29	+57	—	—	—
Cleveland		25·5	332	i 6 4	PP	e 10 6	+ 9	—	—	—
Ottawa	z.	26·9	344	e 5 48	+ 3	—	—	—	—	—
Huancayo		33·1	198	e 6 33	− 7	e 11 36	−23	—	—	e 20·0
La Paz		36·2	183	e 7 0	− 6	12 58	+11	—	—	17·3
Tucson		42·2	297	e 8 0	+ 4	—	—	e 12 58	?	e 31·0
Pierce Ferry		45·3	302	i 8 25	+ 4	—	—	e 40 23	P′P′	—
Overton	z.	45·7	303	i 8 28	+ 4	—	—	e 40 27	P′P′	—
Palomar	z.	47·4	298	e 8 46	+ 8	—	—	—	—	—
Riverside	z.	47·8	299	e 8 44	+ 3	—	—	—	—	—
Hungry Horse		48·1	319	i 8 44	+ 1	—	—	—	—	—
Mount Wilson	z.	48·4	299	e 8 44	− 2	—	—	—	—	—
Tinemaha	z.	48·8	302	e 8 51	+ 2	—	—	—	—	—
Lick	z.	51·5	303	e 9 8	− 1	—	—	—	—	—
Shasta Dam		52·4	306	i 9 15	− 1	—	—	—	—	—
Victoria	z.	54·2	316	e 9 27	− 2	—	—	—	—	—
Resolute Bay		55·9	350	—	—	e 17 40	+11	—	—	27·0
Kew		59·4	41	—	—	e 25 18?	SSS	—	—	—
College		69·0	334	e 11 6	− 3	—	—	—	—	e 31·5

Additional readings :—
Palisades i = 5m.7s., iSS = 9m.18s.?.
Harvard i = 5m.26s., e = 9m.32s.
Pennsylvania iEN = 9m.36s. and 9m.45s.
Cleveland iZ = 6m.15s., eSN = 10m.10s., eN = 10m.20s., iE = 10m.23s., eE = 10m.37s.
Ottawa e = 6m.19s., 10m.50s., and 11m.8s.
Long waves were also recorded at Berkeley, Bozeman, Butte, Seattle, Sitka, and Granada.

Oct. 20d. Readings also at 0h. (Nanking, College, Hungry Horse, Andijan, near Kulyab, Obi-garm, Stalinabad, and Fergana), 1h. (Hungry Horse, Shasta Dam, Mount Wilson, Riverside, Palomar, Haiwee, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and near Obi-garm (2)), 2h. (near Kulyab), 3h. (near Andijan), 5h. (College, Hungry Horse, Overton, Pierce Ferry, Huancayo, near La Paz (3), Tamanrasset, and near Apia), 7h. (near Athens), 9h. (Tacubaya and near Naryn), 10h. (Tananarive), 11h. (Overton, Pierce Ferry, Tucson, Andijan, Stalinabad, near Murgab, Naryn, and Fergana), 12h. (College), 14h. (Pavia, Tiflis, Borzhomi, Piatigorsk, near Grozny, and near San Juan), 15h. (Borzhomi, near Grozny, and Tiflis, Pierce Ferry, Tamanrasset, near Lome, and near Ottawa), 19h. (Pierce Ferry), 23h. (near New Delhi).

Oct. 21d. 4h. 12m. 59s. Epicentre 18°·5S. 173°·5W. Depth of focus 0·005.

A = −·9429, B = −·1074, C = −·3154; δ = +7; h = +5;
D = −·113, E = +·994; G = +·313, H = +·036, K = −·949.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		5·0	20	e 1 9	− 5	e 2 1	−11	—	—	—
Tuai	N.	21·8	201	4 46	− 2	e 8 34	− 6	—	—	—
New Plymouth	E.	23·2	206	e 5 2	0	e 9 10	+ 5	—	—	—
Wellington		24·9	203	i 5 11	− 7	i 9 38	+ 4	—	—	12·1
Kaimata	N.E.	27·2	206	e 5 32	− 8	e 10 14	+ 2	—	—	—
Christchurch		27·6	203	i 5 42	− 1	i 10 15	− 3	11 21	SS	e 13·3
Brisbane		32·0	248	i 6 21 a	− 1	i 11 27	− 1	i 7 33	PP	i 15·4
Riverview		35·0	238	e 6 51	+ 3	i 12 11	− 4	i 7 2	pP	e 16·3
Honolulu		42·4	22	e 7 50	0	e 14 19	+13	e 8 10	pP	e 19·6
Guam		52·0	305	i 9 5	0	—	—	—	—	—
Santa Clara		73·8	40	e 11 33	+ 4	e 21 1	+ 7	e 25 41	SS	e 32·6
Berkeley		73·9	40	i 11 31 a	+ 1	i 21 6	+11	e 11 50	pP	—
Lick	Z.	73·9	40	e 11 29 a	− 1	—	—	i 11 47	pP	—
Ukiah		74·1	38	—	—	e 20 57	0	—	—	e 32·2
Pasadena		74·2	45	i 11 32	0	i 21 8	+ 9	i 11 49	pP	e 31·8
Fresno		74·7	42	e 11 36 a	+ 2	e 21 13	+ 9	i 11 55	pP	—
Palomar		74·7	46	i 11 35 a	+ 1	—	—	i 11 53	pP	—
Riverside	Z.	74·7	45	i 11 35	+ 1	—	—	i 11 53	pP	—
Haiwee		75·6	44	e 11 41	+ 1	—	—	i 12 0	pP	—
Shasta Dam		75·6	38	e 11 41	+ 1	e 21 21	+ 7	i 12 0	pP	—
Mineral	Z.	75·9	39	e 11 41	0	—	—	e 12 1	pP	—
Tinemaha		75·9	43	i 11 43	+ 2	e 21 28	+11	i 12 2	pP	—
Reno		76·4	40	e 11 45 a	+ 1	e 21 33	+10	e 12 5	pP	—
Boulder City		77·5	45	i 11 51	+ 1	—	—	i 12 10	—	—
Overton	Z.	78·1	45	i 11 55	+ 1	e 22 14	S_cS	i 12 14	pP	—
Pierce Ferry		78·2	46	i 11 55	+ 1	e 21 52	+10	i 12 14	pP	—
Tucson		78·4	50	i 11 52	− 3	e 21 55	+11	i 12 11	pP	—
Vladivostok		79·2	323	i 12 0	0	e 21 58	+ 5	i 22 6	SKS	—
Seattle		80·2	33	i 12 8 k	+ 3	i 22 15	+12	i 12 54	pP	e 38·0
Victoria		80·3	31	i 12 5 a	0	22 15	+11	—	—	—
Nanking		82·0	308	i 12 15 a	+ 1	—	—	e 15 45	PP	—
Salt Lake City		82·1	42	e 12 19	+ 4	e 22 32	+ 9	—	—	e 35·8
Tacubaya		82·1	67	e 12 19	+ 4	e 22 30	+ 7	e 22 42	S_cS	—
Sitka		82·2	20	e 12 15	0	e 22 15	− 9	e 27 51	SS	e 36·3
Logan		82·7	42	e 12 9	− 9	e 22 22	− 7	i 12 27	pP	e 37·6
Butte	N.	84·5	37	—	—	e 22 56	+ 9	—	—	e 37·7
Hungry Horse		85·0	35	e 12 30	0	e 22 53	+ 1	e 38 24	P'P'	—
Bozeman		85·3	39	—	—	e 23 1	S_cS	—	—	e 41·2
College		85·4	11	i 12 32	0	i 22 55	− 1	i 23 24	sS	e 35·4
Rapid City	E.	89·3	43	e 13 15	+25	e 23 19	−14	e 24 49	PS	e 41·0
Saskatoon		91·1	35	—	—	i 23 32	−17	e 30 1	SS	—
Huancayo		93·8	104	e 13 13	+ 2	e 24 13	+ 1	e 30 49	SS	e 39·7
St. Louis		96·8	52	e 13 23	− 2	i 24 43	+ 5	i 23 57	SKS	—
La Paz		98·8	111	13 37	+ 3	i 25 15	+20	31 57	SS	46·8
La Plata	E.	99·0	132	—	—	24 7	[+ 1]	—	—	46·3
Chicago		99·1	49	—	—	e 24 5	[− 1]	—	—	e 45·4
Irkutsk		99·8	322	e 13 38	0	e 25 7	+ 4	e 26 37	PS	—
Bogota		100·4	89	—	—	e 24 16	[+ 3]	e 26 18	SKKS	47·0
Galerazamba		101·1	83	—	—	e 23 35	[−41]	—	—	—
Resolute Bay	E.	104·7	16	e 18 27	PP	i 27 37	PS	18 44	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pennsylvania		106·0	52	e 27 30	PS	i 24 45	[+ 6]	i 33 38	SS	—
Philadelphia		107·9	53	e 28 13	PS	e 24 56	[+ 8]	e 34 8	SS	e 51·4
Palisades		109·0	52	e 28 20	PS	e 25 0	[+ 8]	e 34 31	SSP	e 51·6
Harvard		110·9	50	i 27 42	PS	—	—	—	—	e 52·6
Kodaikanal	E.	111·1	274	e 19 1	pPP	—	—	—	—	—
Seven Falls	E.	111·9	45	—	—	e 26 7	SKKS	—	—	—
Bermuda		115·3	62	e 24 31	?	e 35 37	SS	e 29 41	PS	e 56·2
Bombay		117·5	282	e 18 1	[−37]	—	—	e 19 49	PP	—
Frunse		118·3	309	e 18 42?	[+ 2]	—	—	—	—	—
Andijan		120·0	307	e 18 46	[+ 3]	—	—	e 20 11	PP	—
Fergana		120·4	307	e 18 46	[+ 2]	—	—	20 13	PP	—
Tashkent		122·3	308	i 18 49	[+ 2]	i 27 27	SKKS	e 23 1	PPP	—
Sverdlovsk		124·7	327	i 18 55	[+ 2]	e 22 41	PKS	e 20 39	PP	—
Tananarive		125·2	230	—	—	e 45 56	?	—	—	60·5
Scoresby Sund		125·3	12	i 18 55	[+ 2]	—	—	—	—	57·0
Mary		128·3	304	i 19 2	[+ 3]	e 22 25	PKS	—	—	—
Ashkabad		131·0	305	i 19 7	[+ 2]	i 22 34	PKS	—	—	—
Pretoria	Z.	131·2	207	e 19 6	[+ 1]	—	—	—	—	—
Pulkovo		135·3	343	—	—	e 22 40	PKS	—	—	—
Moscow		136·0	335	e 19 18	[+ 4]	e 22 49	PKS	—	—	—
Copenhagen		142·6	355	e 19 24	[− 2]	—	—	—	—	69·0
Rathfarnham Castle		143·9	13	i 19 30	[+ 2]	i 29 38	SKKS	i 19 56	—	—
Theodosia		144·2	324	e 19 30	[+ 2]	—	—	—	—	—
Warsaw		144·5	344	e 19 29	[0]	e 41 23	SS	e 26 0	PPP	e 73·0
Yalta		145·3	324	19 33	[+ 3]	22 58	PKS	—	—	—
Lwow		145·7	340	i 19 32	[+ 1]	—	—	—	—	—
Potsdam		145·8	353	i 19 37	[+ 5]	—	—	i 20 5	pPKP	—
Kishinev		146·2	331	i 19 35	[+ 3]	—	—	—	—	—
De Bilt		146·4	1	i 19 37a	[+ 4]	e 42 1	SS	i 20 8	pPKP	e 73·0
Kew		146·7	7	i 19 34a	[+ 1]	i 29 53	SKKS	e 22 58	PP	e 62·0
Collmberg	Z.	146·9	351	i 19 38	[+ 5]	—	—	e 20 55	pPKP	—
Raciborzu		147·1	346	e 18 29	[−55]	—	—	e 18 41	[−43]	—
Jena	N.	147·4	353	e 19 39	[+ 5]	—	—	e 23 30	PP	—
Prague		147·9	350	i 19 40	[+ 5]	e 42 1	SS	i 20 1	pP	—
Ogyalla		149·2	344	e 19 46	[+ 9]	—	—	e 20 3	pPKP	—
Bucharest	N.	149·4	331	e 19 45	[+ 7]	—	—	e 21 22	pPKP	—
Karlsruhe		149·5	357	i 19 41	[+ 3]	—	—	—	—	—
Paris		149·6	5	i 19 40	[+ 2]	e 23 59	PKS	i 19 59	pPKP	e 76·0
Ksara		149·7	306	i 19 40	[+ 2]	—	—	23 19	PP	—
Stuttgart		149·7	356	e 19 39a	[+ 1]	e 30 13	SKKS	e 20 3	pPKP	e 76·0
Strasbourg		150·0	357	e 19 39a	[+ 1]	e 30 12	SKKS	i 20 4	pPKP	72·0
Istanbul		150·3	324	e 19 41	[+ 3]	—	—	e 23 20	PP	—
Basle		151·0	357	e 19 42a	[+ 2]	—	—	—	—	—
Zürich		151·2	357	e 19 41a	[+ 1]	—	—	e 23 24	PP	—
Belgrade		151·3	338	e 19 42a	[+ 2]	e 30 36	SKKS	—	—	e 83·7
Besançon		151·3	0	e 19 43	[+ 3]	e 23 20	PKS	i 20 8	pPKP	—
Chur		151·6	355	e 19 43a	[+ 3]	—	—	—	—	—
Neuchatel		151·6	358	e 19 38	[− 2]	—	—	—	—	—
Triest		152·3	349	e 19 42	[+ 1]	e 43 34	SS	e 23 48	PP	e 73·0
Clermont-Ferrand		152·7	5	i 19 42	[0]	—	—	—	—	e 79·2
Pavia	Z.	153·3	355	e 19 45a	[+ 2]	—	—	—	—	—
Padova		153·7	351	19 58	[+14]	26 56	[+14]	24 6	PP	—
Bologna		153·8	352	e 19 57	[+13]	—	—	e 20 24	PKP_2	—
Prato		154·4	351	e 19 41	[− 3]	—	—	—	—	—
Florence Xim		154·5	351	i 19 50	[+ 5]	e 29 31	SKKS	—	—	—
Helwan	Z.	154·7	302	i 19 46k	[+ 1]	—	—	23 48	PP	—
Rome		156·1	350	i 19 48	[+ 1]	e 43 56	SS	e 37 21	PPS	—
Taranto		156·2	341	18 21	?	42 41	SS	—	—	73·4
Toledo	Z.	156·8	21	e 19 51	[+ 3]	—	—	e 24 5	PP	—
Tortosa		157·2	11	i 19 53	[+ 5]	—	—	24 8	PP	—
Messina		158·8	341	e 20 19	[+29]	e 23 48	PKS	—	—	—
Alicante		159·3	15	19 54	[+ 3]	27 36	[+48]	24 32	PP	e 78·6
Granada		159·4	23	i 19 54k	[+ 3]	i 44 26	SS	37 51	PPS	i 76·4
Malaga	Z.	159·5	25	i 19 54k	[+ 3]	31 4	SKKS	28 14	PPP	77·7
Algiers Univ.	Z.	161·5	8	i 19 55k	[+ 2]	—	—	e 24 36	PP	—
Tamanrasset	Z.	175·6	—	i 20 6k	[+ 4]	—	—	i 20 36	pPKP	—

For Notes see next page.

NOTES TO OCTOBER 21d. 4h. 12m. 59s.

Additional readings :—
Wellington iZ =9m.45s.
Kaimata eP?NE =5m.39s.
Christchurch ePPZ =6m.31s., eEN =8m.24s., ePcP? =9m.21s., S =10m.26s.
Riverview iZ =8m.12s., iE =8m.17s., iEZ =8m.28s., iSSN =14m.16s., eQE =14·4m.
Berkeley eZ =14m.12s., ePPZ =14m.34s., eZ =32m.25s., eEN =33m.13s. and 34m.7s.
Pasadena iPPZ =14m.40s.
Fresno iZ =12m.46s., ePKP,PKPZ =39m.5s.
Palomar iZ =11m.43s.
Haiwee ePKP,PKPZ =39m..7s.
Shasta Dam ePP =14m.27s.
Mineral eZ =12m.11s.
Tinemaha ePKP,PKPZ =39m.4s.
Reno eZ =12m.26s., ePPZ =14m.53s.
Boulder City ePKP,PKP =38m.57s.
Overton iZ =13m.59s., ePPZ =15m.9s., ePKP,PKPZ =39m.2s.
Pierce Ferry ePKP,PKP =38m.57s.
Tucson ePP =15m.7s., ePPP? =17m.21s., ePKP,PKP =38m.56s.
Seattle i =12m.26s., 13m.8s., 13m.27s. and 13m.35s., ePP =15m.51s., e =22m.43s., and 23m.2s., eSS =27m.45s., eZ =28m.39s.
Victoria i =12m.24s.
Tacubaya e =12m.39s., esPP =16m.16s.
Sitka ePPP? =18m.38s.
College i =13m.18s., ePP =15m.34s., eSS? =28m.47s., eSSS? =32m.13s.
Huancayo eSKS =23m.39s., eSKKS =23m.52s., ePS =25m.44s.
St. Louis eSKKS =24m.35s.
La Paz iSKS =24m.21s., SKKS =24m.44s.
La Plata SKSN =25m.13s., PPSN =29m.1s., E =31m.19s.
Irkutsk eSKKS =24m.31s., eSSS =36m.1s.
Pennsylvania ePSE =25m.27s., isSEN =26m.11s., eSSN =32m.26s.
Philadelphia e =25m.48s., eS =26m.30s.
Tashkent iPP =20m.21s.
Rathfarnham Castle iZ =20m.12s., eEN =20m.34s., eZ =21m.37s., eSSEN =40m.51s., eSSSEN =45m.56s.
Warsaw eEZ =19m.47s., eNZ =20m.18s., 20m.48s., and 21m.11s., eSKKSN =29m.39s.
Potsdam iN =19m.53s.
Kew iPKP$_2$Z =20m.5s., e =29m.37s., eZ =30m.56s., ePPSEN =36m.0s.
Collmberg iPKP$_2$Z? =19m.56s.
Jena iPKPE =19m.41s., ePKP$_2$N =19m.59s., eE =21m.38s., eN =22m.9s., eE =22m.38s.
Prague iPKP$_2$N =19m.56s., epPKP =20m.4s., isPKP?E =20m.17s., e =21m.55s., 22m.17s., and 22m.37s., ePP =23m.27s., epPS? =34m.31s.
Ogyalla e =20m.29s., eE =21m.24s., e =22m.24s., ePPN =23m.30s., eN =25m.57s.
Bucharest eE =20m.13s.
Karlsruhe e =20m.10s.
Paris iPKP$_2$ =19m.45s. and 20m.5s., i =20m.41s., iPP =23m.15s., e =25m.15s.
Ksara pPP =23m.42s.
Stuttgart i =19m.45s., iPKP$_2$Z =19m.52s., i =21m.8s., e =22m.13s., ePP =23m.34s., eZ =33m.19s., eSS =43m.49s.
Strasbourg i =19m.46s., iPKP$_2$ =20m.0s., iPPKP$_2$ =20m.28s., i =20m.36s., e =21m.27s., i =22m.8s., 22m.16s., and 22m.27s., ePP =23m.23s., ePSKS =33m.19s. and 33m.26s., e =35m.1s., eSPP =36m.5s., e =38m.10s., eSS =42m.49s., e =43m.12s., eSSS =48m.26s., e =60m.55s.
Basle e =22m.22s.
Zürich iPKP =19m.48s.
Belgrade i =19m.50s., e =22m.25s. and 25m.38s.
Besançon i =19m.49s., iPKP$_2$ =20m.3s., isPKP =20m.18s., epPKP$_2$ =20m.35s., e =21m.8s., 21m.29s., and 22m.9s., ePP =23m.28s., e =30m.47s.
Triest ePKP =19m.49s., ePKP$_2$ =20m.8s., ePKS =23m.13s., ePPP =27m.33s., eSKKS =29m.59s., ePSKS =33m.54s.
Pavia eZ =19m.54s., e =19m.59s., 20m.35s., and 21m.35s.
Helwan iZ =20m.9s. and 21m.54s.
Rome iPKP$_2$Z =20m.0s., iSKPE =22m.59s., ePPZ =23m.59s.?, eSKKSN =30m.21s.?, ePSKSN =34m.12s.
Taranto e =21m.11s. and 26m.41s.
Toledo iPKP$_2$Z =20m.21s.
Tortosa PKP$_2$?N =20m.20s.
Messina e =20m.44s.
Alicante PKP$_2$ =20m.42s., SSP =47m.8s., SSS =52m.26s.
Granada PKP$_2$ =20m.30s., iPP =24m.12s., pPP =24m.30s., iSKKS =30m.51s., SKSP =34m.52s., SSS =50m.18s.
Malaga iPKP$_2$Z =20m.32s.a, iPPZ =24m.50s.
Algiers Univ. eZ =20m.9s., iZ =20m.41s., ePKP$_2$Z =20m.59s., epPP =25m.17s., eZ =32m.11s.
Tamanrasset esPKPZ =20m.46s., ePKP$_2$?Z =21m.44s., ipPKP$_2$Z =22m.22s., iPPZ =25m.35s., ePPPZ =29m.7s.
Long waves were also recorded at Washington, Weston, and Aberdeen.

Oct. 21d. 8h. 57m. 11s. Epicentre 17°·8N. 105°·5W. (as on 1949, May 24d.).

A = −·2546, B = −·9181, C = +·3038; δ = +2; h = +5;
D = −·964, E = +·267; G = −·081, H = −·293, K = −·953.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		1·7	42	0 30	− 1	0 54	0	—	—	—
Guadalajara		3·5	35	0 52	− 5	1 43	+ 3	—	—	—
Tacubaya		6·2	74	e 1 37	+ 2	3 2	+14	—	—	—
Puebla		7·0	77	—	—	e 3 28	+20	—	—	e 4·1
Tucson		15·2	342	i 3 39	+ 1	e 7 1	SS	—	—	e 8·0
Palomar	z.	18·5	330	i 4 20	+ 1	—	—	—	—	—
Riverside	z.	19·3	329	e 4 28	− 1	—	—	—	—	—
Pierce Ferry		19·7	340	i 4 34	0	—	—	—	—	e 12·4
Pasadena		19·8	329	e 4 37	+ 2	—	—	—	—	e 9·6
Overton	z.	20·3	339	i 4 39	− 1	—	—	—	—	—
Haiwee	z.	21·3	332	e 4 50	0	—	—	—	—	—
Tinemaha	z.	22·2	333	i 5 0	0	—	—	—	—	—
Fresno	z.	22·7	330	e 5 5k	+ 1	—	—	—	—	—
Lick	z.	24·1	328	e 5 15k	− 3	—	—	—	—	—
Lincoln	E.	24·2	16	—	—	e 9 48	+13	—	—	e 12·7
Santa Clara	E.	24·3	328	—	—	e 10 9	+32	—	—	—
Berkeley		24·8	328	e 5 24a	− 1	e 10 4	+18	—	—	e 13·0
Reno		25·0	334	e 5 27	0	—	—	e 6 25	PP	—
Mineral	z.	26·4	332	e 5 39	− 1	—	—	—	—	—
Shasta Dam		27·1	332	e 5 33	−13	—	—	—	—	—
Hungry Horse		31·3	350	e 6 23	− 1	—	—	—	—	—
Pennsylvania		33·0	40	e 10 11	?	—	—	—	—	e 18·4
Victoria	z.	33·9	339	e 6 46	− 1	—	—	—	—	—
Palisades		35·6	43	i 7 1	0	e 12 41	+ 3	—	—	i 19·8
Ottawa	z.	37·0	35	e 7 12	− 1	—	—	—	—	—
College		54·9	340	e 9 33	− 2	—	—	—	—	—

Additional readings :—
Palomar iZ = 4m.31s.
Riverside iZ = 4m.40s.
Lick eZ = 5m.25s.
Berkeley eN = 10m.18s.
Reno eZ = 5m.36s.
Mineral eZ = 5m.49s.
College e = 9m.36s.
Long waves were also recorded at Vera Cruz, Chicago, Rapid City, Seattle, and Resolute Bay.

Oct. 21d. 9h. 42m. 58s. Epicentre 17°·8N. 105°·5W. (as at 8h.).

A = −·2546, B = −·9181, C = +·3038; δ = +2; h = +5;
D = −·964, E = +·267; G = −·081, H = −·293, K = −·953.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo	1·7	42	i 0 25	− 6	i 0 50	− 4	—	—	—
Guadalajara	3·5	35	i 0 56	− 1	i 1 48	+ 8	—	—	—
Tacubaya	6·2	74	i 1 35a	0	i 3 6	+18	—	—	—
Puebla	7·0	77	i 1 51a	+ 5	i 3 29	+21	—	—	—
Oaxaca	8·4	94	—	—	e 3 56	+13	—	—	—
Vera Cruz	9·0	80	e 2 13	0	4 17	+19	—	—	4·8
Chihuahua	10·8	357	i 2 22k	−17	i 4 50	SS	—	—	—
Tucson	15·2	342	i 3 41	+ 3	i 6 48	+20	—	—	i 7·6
Merida	15·3	76	e 3 37	− 2	i 6 44	+14	—	—	—
Lubbock	16·1	11	3 50	+ 1	—	—	—	—	—
Palomar	18·5	330	i 4 21k	+ 2	—	—	—	—	—
La Jolla	19·2	328	i 4 20	− 8	—	—	—	—	—
Riverside	19·3	329	i 4 31k	+ 2	—	—	—	—	—
Pierce Ferry	19·7	340	i 4 36	+ 2	e 7 56	−14	—	—	—
Pasadena	19·8	329	i 4 37k	+ 2	i 8 28	+15	i 5 2	PP	i 9·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City		19·9	338	e 4 38	+ 2	e 8 31	+16	—	—	—
Overton	Z.	20·3	339	i 4 42	+ 2	e 8 39	+16	—	—	e 12·7
Little Rock		20·6	32	e 4 45	+ 2	e 8 36	+ 7	—	—	e 11·0
Swan Island		20·6	86	i 4 41	− 2	—	—	—	—	—
Haiwee		21·3	332	i 4 52	+ 2	—	—	—	—	—
Tinemaha	Z.	22·2	333	i 5 2	+ 2	—	—	—	—	—
Fresno		22·7	330	e 5 5a	+ 1	e 9 7	− 2	—	—	e 12·3
Salt Lake City		23·5	348	i 5 16	+ 4	i 9 38	+15	—	—	e 11·7
Lick		24·1	328	i 5 18	0	e 9 46	+12	e 6 18	PP	e 12·9
Lincoln	E.	24·2	16	e 5 18	− 1	i 9 46	+11	—	—	e 10·8
Logan		24·5	349	e 5 13	− 9	i 9 55	+15	e 5 46	PP	i 12·3
Miami		24·7	63	i 5 27	+ 3	—	—	—	—	—
Florissant		24·7	29	i 5 26	+ 2	i 9 38	− 6	—	—	—
St. Louis		24·7	29	i 5 25	+ 1	i 9 51	+ 7	i 6 1	PP	e 12·1
Berkeley		24·8	328	i 5 27a	+ 2	e 10 2	+16	—	—	e 12·5
Reno		25·0	334	e 5 29k	+ 2	e 9 45	− 4	e 6 36	PP	—
Rapid City	E.	26·3	4	e 5 40	+ 1	e 10 21	+10	—	—	e 13·5
Ukiah		26·3	328	e 5 44	+ 5	e 10 23	+12	—	—	e 12·3
Mineral		26·4	332	i 5 41	+ 1	—	—	e 6 22	PP	e 14·8
Shasta Dam		27·1	332	e 5 44	− 2	e 10 46	+22	e 6 31	PP	e 15·5
Columbia		27·2	48	e 5 48	+ 1	e 10 30	+ 5	—	—	e 13·4
Arcata		28·0	330	e 5 58a	+ 3	e 10 33	− 5	e 6 28	PP	e 14·9
Cincinnati		28·0	35	e 1 26	?	—	—	—	—	—
Bozeman		28·2	353	e 5 57	+ 1	i 10 47	+ 6	e 6 33	PP	e 14·3
Chicago		28·4	27	e 5 57	− 1	i 10 47	+ 2	—	—	e 12·1
Butte	N.	28·7	350	e 6 3	+ 2	e 10 46	− 4	e 6 51	PP	e 12·2
Guantanamo Bay		28·9	80	i 6 1	− 2	—	—	—	—	—
Cleveland		31·3	36	i 6 26k	+ 2	i 11 33	+ 2	i 12 28	SS	e 17·2
Hungry Horse		31·3	350	e 6 24	0	e 11 48	+17	e 7 36	—	e 15·0
Pittsburgh		31·5	38	e 6 5	−21	i 11 13	−21	—	—	—
Washington		32·5	43	i 6 36	+ 2	e 10 29	?	—	—	e 14·6
Seattle		32·8	340	i 6 38k	+ 1	e 12 5	+11	e 7 37	PP	e 16·2
Pennsylvania		33·0	40	i 6 32	− 7	i 12 0	+ 3	e 7 34	PP	—
Bogota		33·4	109	e 6 46	+ 4	i 12 10	+ 7	i 13 56	SS	—
Victoria		33·9	339	6 46	− 1	12 25	+14	8 4	PP	—
Philadelphia		34·3	44	e 6 51	+ 1	e 12 19	+ 2	e 8 17	PP	e 15·8
Saskatoon		34·3	359	8 17	PP	12 24	+ 7	—	—	15·0
Fordham		35·6	43	i 6 58	− 3	e 12 43	+ 5	—	—	—
Palisades		35·6	43	i 7 4	+ 3	i 12 43	+ 5	e 8 28	PP	i 19·8
Ottawa		37·0	35	i 7 14	+ 1	13 2	+ 3	9 14	PPP	—
Roosevelt Roads		37·1	82	e 7 31	+17	—	—	—	—	—
San Juan		37·4	82	e 7 16	0	e 13 8	+ 3	e 8 36	PP	e 15·1
Weston		38·0	42	i 7 25	+ 4	i 13 18	+ 4	—	—	—
Shawinigan Falls	N.	39·4	35	e 7 37	+ 4	—	—	—	—	—
Bermuda		39·5	60	e 7 37	+ 3	e 13 48	+11	e 9 17	PP	e 17·1
Seven Falls	E.	40·8	36	e 7 45	0	14 2	+ 6	17 6	SS	—
Huancayo		42·0	133	e 8 5	+11	e 14 20	+ 6	e 9 20	PP	e 17·6
Fort de France		42·6	87	e 7 50	− 9	e 14 22	− 1	—	—	—
Halifax		44·0	44	—	—	e 14 47	+ 4	—	—	—
Sitka		45·5	338	e 10 5	PP	i 15 6	+ 1	e 18 17	SS	e 22·2
Honolulu		49·3	284	e 9 23	+30	e 16 16	+17	—	—	e 20·4
La Paz		50·2	130	9 4	+ 4	i 16 14	+ 3	i 11 5	PP	24·4
College		54·9	340	e 9 33	− 2	e 17 28	+12	e 12 41	PPP	e 24·1
Resolute Bay		57·2	4	9 52	+ 1	17 11?	−35	e 13 11	PPP	—
Ivigtut		59·0	29	—	—	18 8	− 2	22 15	SS	30·0
La Plata	E.	69·2	139	17 56	?	21 20	PS	23 38	SS	33·3
	N.	69·2	139	17 50	?	21 32	PS	23 20	SS	34·3
Scoresby Sund		71·2	20	i 11 24	+ 1	e 20 45	+ 5	25 20	SS	33·0
Rathfarnham Castle		81·3	37	e 12 24	+ 4	e 22 37	+ 7	e 15 35	PP	e 34·0
Kew		85·4	37	e 12 54	+14	e 23 18	+ 7	e 23 38	PS	e 34·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo		87·2	49	e 12 52	+ 3	i 23 34	+ 6	—	—	—
Paris		88·1	39	e 12 54	0	e 23 44	+ 7	e 16 38	PP	42·0
Malaga	z.	88·1	52	i 12 55a	+ 1	i 24 17	PS	i 16 51	PP	—
De Bilt		88·2	35	e 12 47	− 7	e 23 46	+ 8	e 16 27	PP	e 39·0
Granada		88·5	52	i 13 13k	+17	i 23 49	+ 8	13 37	P_cP	50·0
Clermont-Ferrand		89·8	42	—	—	i 24 3	+10	—	—	e 45·7
Copenhagen		90·1	30	—	—	24 26	+31	—	—	44·0
Tortosa		90·1	47	16 26	PP	—	—	18 49	PPP	e 43·0
Alicante		90·4	49	e 12 59	− 5	23 59	+ 1	16 43	PP	e 44·3
Besançon		90·9	39	e 13 7	0	—	—	e 16 44	PP	—
Strasbourg		91·3	38	e 13 23	+14	e 24 9	+ 3	e 16 48	PP	e 40·0
Stuttgart		92·0	37	e 13 12	0	e 24 16	+ 4	e 16 52	PP	47·0
Prague		94·2	34	e 13 34	+12	e 24 7	[+10]	e 25 36	PS	e 47·0
Florence Xim		95·8	40	—	—	i 24 52	+ 7	i 31 26	SS	—
Padova		95·8	39	e 14 14	+45	—	—	—	—	—
Triest		96·3	38	i 13 33	+ 1	i 24 52	+ 3	e 17 30	PP	e 42·0
Ogyalla		97·5	34	e 13 44	+ 7	e 24 32	(− 4)	e 17 26	PP	—
Rome		97·6	42	e 14 13	+35	e 25 7	+ 7	i 17 49	PP	e 44·4
Tamanrasset	z.	101·4	61	e 13 57	+ 2	—	—	e 18 7	PP	—
Taranto		101·4	41	—	—	e 27 23	PS	—	—	—
Bombay		143·5	2	e 19 2?	[−35]	e 41 39	SS	—	—	—

Additional readings :—
Puebla e =3m.17s.
Palomar iZ =5m.0s.
Riverside iZ =4m.49s.
Pasadena i =4m.43s.
Tinemaha i =5m.18s.
Fresno iZ =5m.50s., eE =7m.45s., eZ =10m.16s.
Logan iPP =5m.56s., i =6m.34s.
St. Louis iPPP =6m.10s., eP_cP =9m.4s., e =10m.4s., eSS =10m.52s., eSSS =11m.7s., iS_cP =12m.44s., iS_cS =16m.27s.
Berkeley eZ =5m.43s. and 5m.57s.
Reno eE =6m.25s., eP_cP?Z =8m.26s.
Mineral eZ =7m.15s., eN =8m.17s.
Arcata eN =12m.30s.
Seattle i =6m.42s. and 8m.13s., e =8m.20s., i =8m.50s., eP_cS =12m.19s., e =13m.40s., 14m.41s., and 15m.17s.
Pennsylvania iEZ =8m.17s., iN =10m.2s., iEZ =10m.30s.
Victoria SS =15m.1s.
Palisades iSS =15m.15s.
OttawaP_cP =9m.25s.
La Paz iS_eS =18m.52s., iSS =19m.52s., iSSS =21m.16s., Q =22·9m.
College eSS? =21m.26s.
Resolute Bay iE =20m.19s., SSE =21m.48s.
Ivigtut 24m.44s.
La Plata N =19m.38s.
Scoresby Sund 21m.5s., SSS =28m.44s.
Rathfarnham Castle ePS =23m.12s., eEN =26m.35s., eSS =27m.27s., eSSS =30m.42s.
Kew eZ =13m.27s., eSS =28m.56s.
Toledo eZ =13m.48s.
Paris e =16m.20s.
Malaga iZ =17m.23s.
Granada iPP =16m.35s., PS =24m.59s., SS =29m.37s.
Alicante PS =25m.17s., PPS =25m.57s., SS =29m.57s., SSS =33m.47s., Q =38m.13s.
Strasbourg e =16m.13s. and 24m.18s., ePS =25m.38s., eSS =30m.10s., e =30m.14s., ePKP,PKP =38m.44s.
Stuttgart e =24m.39s., eSS =30m.26s., eSSS =34m.2s., eQ =42·0m.
Prague eS? =25m.20s., eSS =30m.50s., eSSS? =35m.2s., e =43m.2s.?
Triest ePS =26m.28s., iSS =31m.28s.
Ogyalla e =25m.12s., eSS? =30m.32s.
Rome eSKSN =24m.27s., ePSN =26m.19s., iSSN =31m.43s.
Tamanrasset ePPPZ =20m.11s.
Long waves were also recorded at Apia, Wellington, Christchurch, Kodaikanal, Warsaw, Potsdam, Basle, and Aberdeen.

Oct. 21d. 13h. 33m. 55s. Epicentre 1°·4N. 85°·3W. (as on 1944, June 11d.).

$A = +·0819$, $B = -·9963$, $C = +·0243$; $\delta = -9$; $h = +7$;
$D = -·997$, $E = -·082$; $G = +·002$, $H = -·024$, $K = -1·000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		11·7	74	e 2 49	− 2	i 5 6	+ 2	—	—	—
Galerazamba		13·6	47	i 3 12	− 5	e 6 32	+42	—	—	—
Huancayo		16·6	144	(e 4 0)	+ 4	(e 6 22)	−38	—	—	e 6·4
La Paz		24·6	137	i 5 19	− 4	i 9 49	+ 7	—	—	12·8
Tucson		39·0	325	e 7 31	+ 1	—	—	—	—	—
Palomar		43·4	321	i 8 8a	+ 2	—	—	—	—	—
Pierce Ferry		43·6	326	e 8 9	+ 1	—	—	—	—	—
Boulder City		44·0	325	e 8 11	0	—	—	—	—	—
Overton	z.	44·2	326	e 8 14	+ 2	—	—	—	—	—
Riverside	z.	44·2	321	e 8 14	+ 2	—	—	—	—	—
Pasadena	z.	44·8	321	e 8 19	+ 2	—	—	—	—	—
Lick	z.	49·0	322	e 8 50a	0	—	—	—	—	—
Mineral	z.	50·8	325	e 9 5	+ 1	—	—	—	—	—
Shasta Dam		51·5	325	e 9 6	− 3	—	—	—	—	—
Hungry Horse		52·9	337	e 9 20	0	—	—	—	—	—
Victoria	z.	57·2	331	e 9 52	+ 1	—	—	—	—	—
College		77·3	338	e 11 57	− 1	—	—	—	—	—

Additional readings and note :—
Galerazamba e?EN = 10m.57s.
Huancayo readings have been increased by 2m.
Pasadena eZ = 8m.44s.
Long waves were recorded also at Seattle.

Oct. 21d. Readings also at 0h. (Andijan, Fergana, Frunse, Kulyab, Naryn, Przhevalsk, and Stalinabad), 2h. (Huancayo), 3h. (Boulder City, Overton, Pierce Ferry, College, and La Paz), 4h. (Gori, Piatigorsk, near Borzhomi, Grozny, and Tiflis), 5h. (Huancayo), 6h. (Brisbane, Pretoria, Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, Logan, Harvard, Palisades, New Delhi, Ashkabad, Mary, Almata, Andijan, Fergana, Frunse, Naryn, Przhevalsk, Tashkent, Stalinabad, Lunacharskoe, Bandong, and near Djakarta; numerous shocks), 8h. (Guadalajara, Manzanillo, Vera Cruz, Tacubaya, Haiwee, Mount Wilson, Palomar, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, Lick, Resolute Bay, and Lincoln), 9h. (Puebla, Tacubaya, Tucson, Santa Clara, Shasta Dam, Nanking, Gori, Zugdidi, Tiflis, near Borzhomi, near Klyuchi, and near Rome), 12h. (near Klyuchi), 13h. (near Andijan, Fergana, and Stalinabad), 16h. (Brisbane, Haiwee, Palomar, Pasadena, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Fresno, Reno, Shasta Dam, Mineral, Hungry Horse, and Cclege), 17h. (Tacubaya), 18h. (Ashkabad), 22h. (near Andijan), 23h. (Overton, Pierce Ferry, College, near Andijan, Fergana, Kulyab, Lunacharskoe, Obi-garm, Samarkand, and Stalinabad).

Oct. 22d. 5h. 52m. 2s. Epicentre 34°·8N. 26°·2E. (as on 1949, September 17d.).

Intensity VI at Sitia; V at Hierapetra; IV at Fourni.
Epicentre 35°·1N. 26°·2E.

A. Galanopoulos.
Seismological Institute Bulletin, 1950, Athens, 1951, p. 22.

$A = +·7384$, $B = +·3633$, $C = +·5681$; $\delta = -4$; $h = 0$;
$D = +·442$, $E = -·897$; $G = +·510$, $H = +·251$, $K = -·823$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		3·2	328	e 1 3a	P_g	i 1 46	S_g	—	—	—
Helwan	z.	6·6	137	e 1 40	− 1	2 54	− 4	8 41	P_cP	—
Istanbul		6·7	20	e 1 39	− 3	e 3 14	+14	—	—	—
Ksara		8·1	98	e 0 13	?	e 4 8	S*	—	—	—
Taranto		9·1	311	e 3 15	+61	—	—	—	—	e 4·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Messina	Z.	9·2	294	e 2 15	− 1	e 3 52	−11	—	—	—
Bucharest		9·6	358	e 3 46	?	e 4 10	− 2	—	—	i 5·4
Belgrade		10·9	339	—	—	e 5 15	S*	—	—	e 8·3
Yalta		11·4	30	2 48	+ 1	5 35	L	—	—	(5·6)
Rome		12·9	307	e 3 8	+ 1	e 6 2	+29	e 6 43	SS	i 8·0
Triest		14·4	327	e 3 35	+ 8	e 6 1	− 8	e 4 0	PP	i 7·8
Florence Ximi		14·6	312	e 4 5	PP	e 6 32	+19	—	—	i 9·3
Padova		15·2	319	e 4 40	+62	—	—	—	—	e 7·6
Prague		17·5	334	e 4 8	+ 1	e 7 29	+ 8	e 4 23	PP	—
Warsaw		17·8	350	e 4 34	P	e 7 50	+22	—	—	e 9·0
Cheb	E.	18·3	330	—	—	e 8 13	SS	—	—	—
Stuttgart	Z.	18·8	323	e 4 20	− 3	e 8 3	+13	—	—	e 10·4
Algiers Univ.	Z.	18·9	281	i 4 23k	− 1	e 7 58	+ 5	e 4 46	PP	—
Basle		18·9	319	e 4 26	+ 2	e 8 4	+11	—	—	—
Collmberg	Z.	19·1	332	e 4 24	− 3	—	—	e 4 34	PP	—
Jena		19·3	332	e 4 26	− 3	—	—	e 4 43	PP	—
Strasbourg		19·4	320	i 4 30s	0	e 7 51	−13	e 4 43	PP	e 10·5
Besançon		19·6	316	e 4 30	− 2	e 8 12	+ 4	e 4 41	PP	—
Tortosa	E.	21·1	295	4 49	+ 1	8 35	− 4	5 14	PP	—
Alicante		21·7	288	e 5 7	+12	e 8 45	− 6	5 26	PP	e 10·4
Tamanrasset	Z.	21·7	242	i 4 58s	+ 3	e 9 9	+18	i 5 26	PP	—
Paris		22·4	315	i 5 0	− 2	—	—	i 5 15	PP	—
De Bilt		22·9	326	—	—	e 9 26	+13	—	—	e 11·0
Granada		24·2	284	i 5 23k	+ 4	i 9 47	+12	i 6 11	PP	13·0
Toledo	Z.	24·5	290	i 5 22	0	—	—	—	—	—
Kew		25·3	319	—	—	e 9 58?	+ 4	—	—	—
Weston		72·4	309	i 11 29	− 1	—	—	—	—	—
Ottawa	Z.	73·5	313	e 11 36	0	—	—	—	—	—
College		80·6	357	e 12 15	− 1	—	—	—	—	—
Hungry Horse		89·9	335	i 13 1	− 1	—	—	—	—	—
Overton	Z.	100·1	328	e 18 8	PP	—	—	—	—	—

Additional readings :—
Athens eS*? = 2m.1s., iS_g = 2m.8s.
Helwan P*Z = 1m.46s.
Belgrade e = 5m.58s., 6m.44s., and 6m.59s.
Triest i = 6m.20s., $iS_gS_gS_g$ = 7m.42s.
Prague e = 4m.14s. and 4m.37s., i = 4m.51s., e = 5m.23s., eSS? = 7m.40s.
Algiers Univ. ePPPZ = 4m.56s.
Collmberg ePPPZ = 4m.49s., eZ = 5m.25s.
Jena ePN = 4m.30s.
Strasbourg ePPP = 5m.5s., e = 5m.22s.
Besançon ePPP = 4m.52s., e = 5m.11s. and 5m.35s.
Tortosa PP?E = 5m.22s.
Alicante PPP = 5m.43s., SS = 9m.22s., SSS = 9m.37s., P_cP = 10m.6s.
Tamanrasset iZ = 5m.7s., ePPPZ = 5m.40s.
Paris i = 5m.4s. and 5m.10s., iPPP = 5m.25s., i = 5m.34s.
Granada SS = 11m.41s.
Long waves were also recorded at Timisoara and Potsdam.

Oct. 22d. 15h. 10m. 56s. Epicentre 48°·6N. 153°·5E. Depth of focus 0·015.
(as on 1949, November 3d.).

A = −·5940, B = +·2962, C = +·7479 ; δ = −8 ; h = −5 ;
D = +·446, E = +·895 ; G = −·669, H = +·334, K = −·664.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Vladivostok		16·0	258	e 3 43	+ 4	e 7 3	+31	—		—	—
College		34·6	40	i 6 37	− 1	—	—	i 7 1		pP	—
Resolute Bay	Z.	49·0	20	e 7 37	−59	—	—	—		—	—
Hungry Horse		57·5	52	e 9 36	− 2	—	—	i 10 2		pP	—
Shasta Dam		57·5	64	e 9 37	− 1	—	—	i 10 1		pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mineral	z.	58·2	64	e 9 42	− 1	—	—	e 10 16	pP	—
Lick	z.	60·1	66	e 10 1	+ 5	—	—	e 10 19	pP	—
Tinemaha	z.	62·3	65	e 10 12	+ 1	—	—	i 10 35	pP	—
Mount Wilson	z.	64·3	67	e 10 22	− 2	—	—	i 10 46	pP	—
Pasadena		64·3	67	i 10 48	pP	—	—	—	—	—
Overton	z.	64·9	63	i 10 28	0	—	—	i 10 52	pP	—
Boulder City		65·1	64	i 10 30	+ 1	—	—	i 10 53	pP	—
Pierce Ferry		65·5	63	e 10 31	− 1	—	—	i 10 56	pP	—
Palomar	z.	65·6	67	i 10 57	pP	—	—	—	—	—
Tucson		70·0	64	e 11 25	pP	—	—	—	—	—
Collmberg	z.	74·9	336	e 11 29?	+ 1	—	—	—	—	—
Prague		75·6	334	e 11 32	0	—	—	—	—	—
Ottawa	z.	77·0	34	e 11 38	− 2	—	—	—	—	—
Stuttgart	z.	78·2	337	e 11 47	0	—	—	—	—	—
Strasbourg		78·8	338	i 11 51	+ 1	—	—	e 12 20	pP	—
Paris		79·8	342	i 11 55	0	—	—	—	—	—
Besançon		80·4	338	i 12 0	+ 1	—	—	e 12 27	pP	—
Harvard		81·0	32	i 12 2	0	—	—	—	—	—
Weston		81·2	32	i 12 2	− 1	—	—	—	—	—
Rome		83·5	332	e 12 11	− 4	—	—	e 15 15	PP	—

Additional readings :—
Tinemaha iZ = 10m.45s.
Boulder City isP = 11m.3s.

Oct. 22d. Readings also at 0h. (Collmberg, Strasbourg, Stuttgart (2), and near Klyuchi), 2h. (near Alicante), 5h. (Ashkabad), 6h. (Alicante (2)), 7h. (Pretoria, Overton, and Pierce Ferry), 8h. (Mount Wilson, Palomar, Tinemaha, Overton, and Pierce Ferry), 9h. (near Klyuchi). 11h. (Brisbane, Wellington, and Overton), 12h. (near Tortosa), 14h. (La Plata, Haiwee, Palomar, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, Victoria, College (2), and near Klyuchi), 16h. (near Klyuchi), 18h. (Huancayo, La Paz, Brisbane, Kulyab, near Andijan, Obi-garm (2), and Stalinabad), 19h. (Riverview, Wellington, Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Shasta Dam, and College), 22h. (Helwan, Ksara, Tamanrasset (2), Tucson, Andijan, near Fergana, Kulyab, Obi-garm, and Stalinabad), 23h. (Collmberg, Tacubaya, and near Obi-garm).

Oct. 23d. 8h. 12m. 43s. Epicentre 39°·6N. 116°·7W. (as on 17d.).

$A = -·3471$, $B = -·6902$, $C = +·6349$; $\delta = -5$; $h = -3$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno		2·4	268	e 0 37	− 4	e 1 1	−11	—	—	—
Tinemaha		2·8	206	e 0 45	− 2	i 1 19	− 3	i 0 48	P*	—
Overton	z.	3·5	149	i 1 4	+ 7	i 1 59	S_g	i 1 14	P_g	—
Haiwee		3·6	197	e 0 56	− 2	e 1 44	+ 2	—	—	—
Fresno	z.	3·7	222	e 0 59k	− 1	—	—	—	—	—
Mineral	z.	3·8	283	i 0 59	− 2	—	—	—	—	—
Boulder City		3·9	157	e 1 8	+ 6	e 2 6	S_g	1 1 18	P_g	—
Pierce Ferry		4·1	148	i 1 12	+ 7	i 2 3	S*	i 2 17	S_g	—
Lick	z.	4·5	242	e 1 5a	− 6	i 2 2	− 3	—	—	—
Shasta Dam		4·5	286	i 1 8	− 3	i 2 5	0	—	—	—
Berkeley		4·7	250	e 1 7k	− 7	i 2 9	− 1	i 1 20	P*	e 3·0
Santa Clara		4·7	243	i 0 35	−39	i 1 18	−52	—	—	—
Pasadena		5·6	193	e 1 29	+ 2	i 2 50	S*	—	—	—
Riverside		5·6	186	e 1 26	− 1	e 2 51	S*	—	—	—
Palomar		6·2	181	i 1 35	0	i 3 11	S*	i 1 54	P*	—
Tucson		8·7	145	e 2 19	+ 9	e 4 48	S_g	—	—	e 5·4
Hungry Horse		9·0	11	e 2 22	+ 9	e 5 0	S_g	—	—	—

Lick gives also iZ = 1m.15s., eZ = 1m.58s.
Long waves were also recorded at Salt Lake City.

Oct. 23d. 16h. 13m. 26s. Epicentre 14°·3N. 91°·7W. Depth of focus 0·005 (as on 1940, July 27d.).

Much damage at San Marcos, many houses destroyed and several people injured. Felt at Chiapas, according to Tacubaya. Followed by an aftershock on October 28d. at 22h. 16m., which, according to Tacuabya, was strongly felt at Tapachula and Chiapas. Epicentre 14°·5N. 91°·5W. (Gutenberg).

Seismological Notes, Bulletin of the Seismological Society of America, Vol. 41, No. 1, January, 1951, p.71.

$A = -·0288$, $B = -·9690$, $C = +·2454$; $\delta = +1$; $h = +6$;
$D = -1·000$, $E = +·030$; $G = -·007$, $H = -·245$, $K = -·969$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		5·5	299	1 20	− 1	2 32	+ 8	—	—	—
Vera Cruz		6·5	319	e 1 32	− 3	i 2 38	−11	—	—	3·2
Merida		6·9	17	i 1 44 a	+ 3	i 3 14	+15	—	—	—
Puebla		7·8	309	i 1 50 a	− 3	3 26	+ 5	—	—	—
Swan Island		8·1	67	i 1 18	−39	—	—	—	—	—
Tacubaya		8·8	306	i 2 3 a	− 4	3 48	+ 2	—	—	—
Guadalajara		12·8	301	e 2 58	− 3	i 5 22	0	—	—	—
Balboa Heights		13·0	113	i 3 13	+ 9	i 5 55	SS	—	—	e 6·5
Manzanillo		13·0	294	i 3 0	− 4	i 5 49	SS	—	—	—
Miami		15·7	41	i 3 40	+ 2	—	—	—	—	—
Galerazamba		16·4	100	i 3 55	+ 8	i 6 56	+ 9	—	—	—
Mazatlan		16·5	305	e 3 46	− 3	6 54	+ 5	—	—	—
Guantanamo Bay		16·8	68	i 3 54	+ 2	—	—	—	—	—
Chinchina		18·2	119	i 4 12	+ 2	i 7 49	sS	i 4 25	pP	—
Port au Prince		19·0	76	e 4 24	+ 5	e 8 9	SS	4 47	PP	e 9·5
Chihuahua		19·5	320	e 4 23	− 1	i 8 1	+ 5	i 4 47	pP	—
Bogota		19·9	118	i 4 32	+ 3	i 8 34	SS	—	—	11·1
Columbia		21·9	23	e 4 49	0	e 8 49	+ 7	e 6 16	?	e 10·9
St. Louis		24·3	3	5 11	− 1	9 25	+ 1	5 31	pP	—
San Juan		24·9	76	i 5 18	0	i 9 16	−18	i 6 16	PPP	i 10·2
Tucson		25·0	320	i 5 17	− 2	e 9 29	− 7	i 5 35	pP	i 9·9
Roosevelt Roads		25·3	75	i 5 22	0	—	—	—	—	—
Cincinnati		25·5	14	i 4 39	−45	i 8 41	−63	—	—	—
Lincoln	E.	26·8	355	e 5 45	+ 9	e 10 9	+ 4	—	—	e 11·6
Chicago		27·7	6	e 5 43	− 1	e 10 9	−11	e 6 39	PP	—
Washington		27·7	28	i 5 48	+ 4	e 11 16	− 4	—	—	i 12·4
Pittsburgh		28·0	21	e 6 1	pP	i 11 0	+35	i 6 14	PP	—
Cleveland		28·5	16	e 5 50	− 1	i 10 36	+ 3	i 6 48	PP	—
Ann Arbor		28·7	12	e 5 51	− 2	i 10 3	−33	—	—	—
Pennsylvania		29·0	23	i 5 56	0	i 10 59	sS	i 6 14	pP	—
Philadelphia		29·4	28	i 5 57	− 2	i 10 47	0	i 7 0	PP	e 13·1
Pierce Ferry		29·5	322	i 5 58	− 2	e 10 9	−40	—	—	—
Fort de France		29·6	85	e 6 0	− 1	i 11 11	sS	—	—	—
Palomar		29·7	315	i 5 58	− 4	—	—	—	—	—
Boulder City		29·9	321	i 6 1	− 3	—	—	i 9 9	P_cP	e 12·2
Overton	z.	30·0	322	i 6 3	− 2	—	—	—	—	—
Bermuda		30·4	49	i 6 13	+ 5	e 10 39	−24	e 8 35	?	i 12·2
Riverside		30·4	315	i 6 7	− 1	e 12 51	P_cS	i 6 19	pP	—
Buffalo		30·6	20	e 6 7	− 3	e 11 12	+ 6	—	—	—
Fordham		30·7	28	i 6 10	− 1	i 11 6	− 2	—	—	—
Huancayo		30·8	147	i 6 15	+ 3	i 11 19	+10	—	—	—
Palisades		30·8	27	i 6 11	− 1	i 11 16	+ 7	i 7 21	PP	—
Pasadena		31·1	315	6 10 a	− 4	i 11 16	+ 2	i 6 24	pP	i 13·6
Rapid City	E.	31·3	345	e 6 18	+ 2	e 11 8	− 9	e 7 22	PP	e 12·9
Salt Lake City		31·7	330	e 6 19	− 1	i 11 26	+ 3	e 7 30	PP	e 14·0
Haiwee		32·0	320	e 6 19	− 3	e 13 0	P_cS	i 6 34	pP	—
Logan		32·4	333	i 6 12	−14	i 11 29	− 5	—	—	i 13·9
Tinemaha		32·8	320	e 6 26	− 3	i 13 1	P_cS	i 6 40	pP	—
Harvard		33·0	28	i 6 30	− 1	e 11 37	− 7	—	—	—
Weston		33·1	28	i 6 28	− 4	i 11 50	+ 5	i 6 52	pP	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fresno	Z.	33·6	318	e 6 31 a	− 5	e 14 48	SSS	e 8 15	PPP	—
Ottawa		33·8	20	i 6 37	0	12 3	+ 7	i 8 7	PP	—
Vermont		34·0	24	e 6 36	− 4	i 12 1	+ 2	e 7 46	PP	e 14·2
Lick	Z.	35·1	317	e 6 46 k	− 3	—	—	e 8 26	PPP	—
Reno		35·2	323	e 6 49	− 1	e 12 35	+17	e 7 4	pP	e 20·3
Bozeman		35·3	337	e 6 50	− 1	i 12 26	+ 7	e 8 16	PP	e 15·3
Santa Clara		35·3	317	i 6 44	− 7	i 12 38	sS	—	—	e 17·1
Berkeley		35·8	317	e 6 53 a	− 2	e 12 42	+15	e 9 27	PcP	e 21·2
Shawinigan Falls	N.	35·9	22	e 7 0	+ 4	e 12 32	+ 4	e 8 32	PPP	—
Butte	N.	36·2	338	e 6 57	− 1	e 12 33	0	e 8 35	PPP	e 15·9
Mineral		36·8	322	e 7 1	− 2	e 12 54	+12	—	—	—
Seven Falls	E.	37·1	33	7 7	+ 1	12 53	+ 6	e 8 50	PPP	—
Ukiah		37·1	318	e 7 2	− 4	e 12 56	+ 9	e 8 44	PPP	e 15·4
Shasta Dam		37·5	322	e 7 3	− 6	e 12 47	− 6	e 9 21	PcP	—
La Paz		38·4	141	i 7 18 a	+ 1	i 13 22	+15	i 8 58	PP	18·6
Halifax		38·5	33	7 15	− 3	13 15	+ 7	8 57	PP	—
Hungry Horse		38·6	337	7 17	− 1	e 17 32	ScS	e 9 22	PcP	—
Arcata		38·7	320	e 7 24 a	+ 5	e 13 30	eS	e 7 38	pP	—
Saskatoon		39·6	347	7 34	+ 7	13 34	+ 9	9 5	PP	—
Seattle		41·9	330	i 7 44 a	− 2	i 13 49	−10	i 8 3	pP	e 19·6
Victoria		42·9	330	i 7 51	− 3	14 28	sS	e 9 42	PcP	—
Sitka		53·9	333	e 9 16	− 3	i 16 54	+ 6	e 10 6	PcP	e 21·0
Ivigtut		56·3	24	—	—	17 25	+ 5	21 26	SS	27·6
La Plata		58·5	147	9 51	− 1	17 46	− 3	12 10	PP	23·9
Resolute Bay		60·4	359	10 4	− 1	i 18 21	+ 8	i 12 23	PP	—
Honolulu		63·0	287	e 10 21	− 1	e 18 50	+ 4	e 22 59	SS	i 26·4
College		63·1	337	e 10 20	− 3	e 18 55	+ 8	e 11 5	PcP	i 26·1
Reykjavik	E.	68·4	26	—	—	e 20 28	PPS	—	—	e 34·6
Scoresby Sund		69·9	19	11 6	0	i 20 15	+ 5	24 40	SS	—
Lisbon		75·5	54	11 37 a	− 2	21 18	+ 5	12 2	pP	34·6
Rathfarnham Castle		75·9	38	i 11 40	− 1	e 21 13	− 4	11 54	pP	e 37·6
Edinburgh	E.	77·5	35	11 44	− 6	21 36	+ 1	12 23	pP	—
Aberdeen		77·9	34	i 11 50	− 2	i 21 43	+ 4	i 10 29	?	37·8
Durham	E.	78·5	37	i 11 53	− 3	i 21 49	+ 4	i 14 55	PP	—
Jersey	E.	79·1	41	11 58	− 1	21 58	+ 6	14 44	PP	38·6
Toledo		79·2	52	i 11 59	− 1	i 21 58	+ 5	15 0	PP	37·1
Malaga	Z.	79·5	55	i 12 1 k	0	i 22 1	+ 5	i 15 9	PP	36·8
Kew		79·8	39	i 12 0 a	− 3	i 21 58	− 1	e 23 8	PPS	e 32·6
Granada		80·0	54	i 12 13 a	+ 9	i 22 3	+ 2	i 15 25	PP	i 37·7
Bergen		81·1	30	12 9	− 1	22 18	+ 5	15 20	PP	33·8
Paris		82·1	42	i 12 14	− 1	i 22 22	− 1	e 15 42	PP	e 40·6
Alicante		82·2	53	e 12 24	+ 9	i 22 30	+ 6	15 24	PP	34·2
Tortosa		82·4	50	12 19	+ 3	i 22 30	+ 4	15 35	PP	e 38·6
De Bilt		83·0	38	i 12 20 a	0	e 22 37	+ 5	e 15 34	PP	e 35·7
Clermont-Ferrand		83·2	45	i 12 20	− 1	e 22 36	+ 2	e 15 33	PP	e 38·8
Barcelona		83·5	49	e 12 9	−13	22 39	+ 2	28 20	SS	—
Apia		84·0	254	e 12 42	pP	e 22 44	+ 2	e 34 26	?	—
Besançon		84·8	43	e 12 27	− 2	—	—	i 12 46	pP	—
Algiers Univ.	Z.	85·3	54	e 12 32	+ 1	—	—	e 12 53	pP	—
Neuchatel		85·5	42	e 12 30?	− 2	e 22 55	− 2	—	—	—
Strasbourg		85·5	41	e 12 32 a	0	i 22 58	+ 1	e 15 47	PP	i 40·6
Basle		85·7	42	e 12 34	+ 1	e 22 56	− 3	e 15 54	PP	—
Copenhagen		86·1	33	i 12 35	0	22 59	− 4	28 44	SS	39·6
Karlsruhe		86·2	40	12 34?	− 1	e 22 58	[+ 5]	—	—	e 36·6
Stuttgart		86·4	40	i 12 36 a	0	e 23 2	− 3	i 13 0	pP	e 36·6
Zürich		86·4	43	e 12 33	− 3	e 23 3	− 2	e 15 55	PP	—
Lund		86·5	33	12 38	+ 1	23 4	− 2	—	—	—
Chur		87·2	43	e 12 40	0	e 23 14	+ 1	e 16 14	PP	—
Jena		87·2	39	e 12 39	− 1	e 23 6	− 7	e 16 2	PP	e 37·0
Pavia		87·5	44	e 12 44 a	+ 2	e 23 34	sS	e 16 11	PP	—
Potsdam		87·6	37	i 12 41 a	− 1	i 23 8	[+ 6]	i 13 2	pP	38·6
Salo		88·2	43	e 12 47 a	+ 2	e 23 11	[+ 5]	e 16 19	PP	—
Bologna		89·1	44	e 12 56	+ 7	e 23 20	[+ 9]	e 23 39	S	—
Prague		89·2	38	e 12 48	− 2	e 23 39	+ 7	e 13 17	pP	e 36·6
Prato		89·2	45	e 12 54	+ 4	e 23 30	− 2	—	—	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florence Xim		89·3	45	i 12 54	+ 4	23 17	[+ 4]	24 58	PS	44·1
Padova		89·5	44	12 58	+ 7	23 40	+ 6	13 20	pP	44·1
Helsinki		90·3	27	e 12 54	− 1	i 23 25	[+ 6]	e 29 36	SS	e 37·6
Triest		90·4	43	e 13 1	+ 6	e 23 20	[+ 1]	i 23 54	S	—
Rome		90·8	46	i 12 57	0	i 23 29	[+ 7]	i 13 21	pP	—
Rocca di Papa		91·0	46	e 13 4	+ 6	e 24 22	SP	—	—	—
Tamanrasset	z.	91·2	65	i 12 58 a	− 1	i 23 34	[+10]	i 13 16	pP	42·6
Lome		91·3	82	e 13 4	+ 4	e 23 36	[+12]	e 25 25	PPS	e 36·6
Raciborzu		91·4	36	e 13 6	+ 6	e 23 58	+ 7	e 16 18	PP	e 40·1
Warsaw		91·5	35	e 13 6	+ 5	24 1	+ 9	e 13 30	pP	e 37·6
Ogyalla		92·3	38	e 13 6	+ 2	e 23 57	− 2	e 16 53	PP	—
Pulkovo		92·8	26	e 13 9	+ 2	i 24 6	+ 2	e 16 55	PP	—
Budapest		93·0	40	13 27	pP	e 23 34	[0]	e 17 12	PP	46·6
Skalnate Pleso		93·0	37	e 17 1	PP	e 23 43	[+ 9]	e 24 15	S	—
Messina		94·3	48	—	—	e 31 16	PSS	e 45 17	?	—
Taranto		94·7	45	e 13 11	− 4	e 23 56	[+13]	—	—	44·8
Lwow		94·9	35	i 13 17	+ 1	e 24 24	+ 2	e 17 8	PP	—
Belgrade		95·0	42	e 13 19 a	+ 2	e 23 50	[+ 5]	e 17 28	PP	e 35·0
Timisoara		95·1	39	e 16 34 ?	PP	e 24 36	+13	—	—	—
Sofia		97·8	42	e 13 34	+ 5	i 24 8	[+ 8]	e 17 42	PP	—
Moscow		98·3	26	e 13 31	− 1	e 24 51	+ 1	e 17 35 ?	PP	—
Bucharest		98·8	40	e 15 49	?	e 24 8	[+ 3]	e 17 27	PP	—
Kishinev		99·1	35	13 38	+ 3	24 11	[+ 5]	—	—	—
Athens		100·3	46	—	—	e 24 14	[+ 2]	—	—	—
Wellington		101·9	231	e 13 39	− 9	e 24 14	[− 6]	i 18 12	PP	46·4
Istanbul		102·4	41	e 18 5	PP	e 24 24	[+ 2]	—	—	—
Yalta		103·6	36	e 14 0	+ 5	e 24 34	[+ 6]	e 18 12	PP	—
Christchurch		103·8	229	e 13 54	− 2	24 36	[+ 7]	18 14	PP	47·7
Sverdlovsk		105·5	15	e 14 2	− 1	24 44	[+ 7]	i 18 26	PP	—
Piatigorsk		108·8	32	e 18 45	PP	—	—	—	—	—
Vladivostok		110·3	327	e 14 14	P	i 25 4	[+ 7]	e 18 52	PP	—
Borzhomi		110·5	34	e 18 31	PP	—	—	—	—	—
Grozny		110·7	32	e 18 47	PP	—	—	—	—	—
Gori		110·8	34	e 18 40	PP	—	—	—	—	—
Ksara		110·9	46	e 14 30	P	28 46	PS	19 4	PP	—
Tiflis		111·3	34	e 18 35	[+ 8]	—	—	—	—	—
Leninakan		111·5	35	e 19 9	PP	—	—	—	—	—
Irkutsk		112·3	350	e 14 32	P	24 57	[− 8]	19 9	PP	—
Baku		115·0	32	e 19 35	PP	—	—	—	—	—
Lenkoran		115·6	32	i 18 33	[− 2]	22 4	PKS	—	—	—
Brisbane		118·7	247	e 20 6	PP	e 24 51	[−38]	—	—	—
Riverview		120·3	239	e 18 47	[+ 3]	e 25 42	[+ 7]	e 15 13	P	e 55·0
Tchimkent		121·1	15	e 18 59	[+14]	—	—	—	—	—
Grahamstown	z.	121·2	119	i 18 48	[+ 2]	—	—	i 20 19	PP	e 62·5
Frunse		121·7	11	i 18 52	[+ 6]	i 25 56	[+17]	e 20 24	PP	—
Almata		121·8	8	i 18 53	[+ 6]	e 25 48	[+ 8]	—	—	—
Lunacharskoe		121·9	16	e 18 56	[+ 9]	—	—	—	—	—
Tashkent		121·9	16	e 18 48	[+ 1]	i 25 44	[+ 4]	i 20 24	PP	—
Mary		122·7	24	i 18 52	[+ 3]	25 56	[+13]	20 44	PP	—
Pretoria	z.	122·8	110	e 18 52	[+ 3]	—	—	i 18 57	PKP	e 63·6
Samarkand		122·8	20	e 18 59	[+10]	—	—	—	—	—
Andijan		123·3	14	18 55	[+ 5]	e 25 59	[+14]	e 20 37	PP	—
Naryn		123·4	10	e 18 56	[+ 6]	—	—	—	—	—
Obi-garm		123·4	17	i 18 53	[+ 3]	e 25 50	[+ 5]	—	—	—
Fergana		123·5	14	e 18 51	[+ 1]	—	—	—	—	—
Stalinabad		124·3	17	e 18 52	[0]	—	—	—	—	—
Pietermaritzburg	z.	124·7	115	e 18 58	[+ 6]	—	—	e 20 44	PP	e 69·6
Nanking		125·4	327	e 18 58	[+ 4]	e 28 51	?	20 52	PP	—
Dehra Dun	N.	134·5	11	e 20 10	[+59]	e 33 1	SPP	—	—	e 45·0
New Delhi	N.	136·0	13	e 19 14	[0]	26 41	[+25]	21 57	PP	63·1
Tananarive		140·7	101	19 35	[+13]	23 8	PKS	22 23	PP	65·4
Calcutta	E.	143·4	0	e 19 24 ?	[− 3]	26 35	[+ 7]	22 35	PP	66·8
Bombay		143·7	26	e 19 25	[− 3]	29 34	SKKS	e 23 5	PP	68·8
Poona		144·4	23	19 28	[− 1]	26 13	[−17]	22 56	PP	67·6
Hyderabad	N.	147·0	17	19 34	[+ 1]	e 30 17	SKKS	22 47	PP	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		149·3	231	e 19 53	pPKP	i 43 24	SSP	—	—	i 72·4
Kodaikanal	E.	153·4	23	i 19 3	[−40]	43 28	SSP	23 28	PP	73·5
Colombo	E.	157·3	23	19 59	[+11]	—	—	—	—	78·6
Bandong		159·6	289	e 19 43	[− 8]	e 20 7	PKP_2	—	—	—
Djakarta		160·1	292	i 20 22	[+31]	i 20 44	?	—	—	—

Additional readings and notes :—
Galerazamba iPP =4m.25s., iSS? =10m.4s.
Port au Prince ePNE =4m.32s., PP?NE =4m.56s., PPP?NW =4m.59s., PPP?NE = 5m.11s., SS? =8m.54s.
Chihuahua i =5m.3s.
St. Louis sP =5m.47s., P_cP =8m.44s., sS =10m.3s., SS =10m.31s.
Cleveland iPEN =5m.57s., iSN =10m.39s.
Pennsylvania isPN =6m.29s., iEZ =6m.36s., iN =6m.47s., iPP?EZ =6m.52s., isPP?Z = 7m.20s., iZ =8m.17s. and 9m.16s., iN =9m.32s., isSZ =11m.21s.
Riverside iZ =6m.40s. and 7m.29s., iP_cPZ =9m.6s., iZ =9m.17s.
Palisades i =6m.14s.
Pasadena iZ =6m.18s. and 7m.39s., iP_cPNZ =9m.11s., eS_cPZ =12m.55s.
Salt Lake City i =6m.58s.
Haiwee iZ =6m.27s., iP_cPZ =9m.18s.
Logan i =8m.4s. and 12m.2s.
Tinemaha iZ =6m.34s., 6m.45s., and 6m.57s., iP_cPZ =9m.15s.
Fresno eZ =6m.40s. and 6m.58s., eE =10m.14s., eN =11m.36s., eZ =17m.17s., eNZ = 18m.4s.
Ottawa e =11m.53s., SS =14m.23s.
Vermont e =7m.1s.
Lick eZ =18m.52s. and 21m.4s.
Reno eN =7m.16s., eE =12m.22s., eZ =12m.59s., eQN =16m.34s.
Berkeley eZ =9m16s., 9m.27s., and 13m.14s., eQEN =15·8m.
Shawinigan Falls iSN =13m.7s.
Butte eN =13m.15s.
Mineral eZ =8m.11s. and 13m.0s., eN =16m.28s., eZ =19m.10s.
Seven Falls eE =12m.31s. and 15m.52s.
Ukiah ePP? =8m.10s., e =9m.0s.
Shasta Dam iP =7m.6s.
La Paz iZ =7m.54s., iPPP =9m.27s., iSS =16m.10s., iSSS =16m.50s.
Halifax SS =16m.1s.
Arcata eZ =7m.32s., eE =9m.48s., eN =17m.46s., eE =19m.22s.
Saskatoon PPP =9m.24s., SS =16m.14s.
Seattle iPP =9m.6s., iP_cP =9m.31s., ipP_cP =9m.50s., eSS =17m.2s., and other unidentified readings.
Victoria SS =17m.41s.
Sitka ePP =11m.5s., ePPP =12m.34s., iS_cS =19m.18s.
Ivigtut =23m.43s.
La Plata P_cPE =11m.34s., SN =17m.52s., PSN =18m.46s., SSN =21m.34s., SSE = 21m.40s.
Resolute Bay P_cP =11m.3s., i =14m.3s.
Honolulu iP =10m.24s., i =19m.1s.
College i =11m.56s., iPP =12m.59s., iPPP =14m.4s., e =15m.8s., eS_cS =20m.12s., eSS =23m.34s., ePKP,PKP =39m.20s.
Scoresby Sund 13m.52s. and 15m.34s.
Lisbon PPS =22m.15s., SS =26m.4s., EZ =26m.24s., SSSEZ =29m.28s., Q =31m.58s.
Rathfarnham Castle ePPZ =14m.35s., ePSEN =22m.12s., eSSEN =26m.40s.
Edinburgh P_cPE =11m.54s., eSE =21m.20s., S_cSE =21m.44s., PSE =22m.28s., SSE = 26m.24s.
Aberdeen iN =13m.40s., iPPE =14m.46s., iPPPEN =16m.28s., iPSN =22m.25s., iE = 23m.13s., iSSEN =26m.56s., iSSSE =30m.3s., iN =33m.20s.
Durham iP_cPE =12m.5s., iSKSE =22m.16s., iS_cSE =22m.31s., iSSE =27m.9s., iSSSE = 30m.31s.
Jersey PSE =22m.54s., SSE =27m.37s.
Toledo PPPZ =16m.54s., PPSE =23m.23s., SSE =27m.11s., SSS?E =31m.8s.
Malaga PPPZ =17m.11s., iPSZ =22m.59s., iSSZ =27m.13s.
Kew iP_cP?EZ =12m.7s., e =12m.26s., ePP =14m.48s., ePS =22m.16s., eSS =26m.42s., eSSS =31m.5s.
Granada P_cP =12m.43s., PS =23m.25s., iSS =27m.58s., SSS =31m.13s.
Bergen SSE =27m.40s., eE =31m.30s.?
Paris i =12m.19s. and 15m.48s., iPPP =17m.27s., eSKS =22m.27s. iS_cS =22m.42s., iPS =23m.9s., iPPS =23m.30s., e =24m.3s., iSS? =28m.15s., iSSS =31m.21s.
Alicante P_cP =12m.30s., PPP =17m.20s., S_cS =22m.51s., PS =23m.24s., PPS = 23m.53s., SS =28m.6s., SSS =31m.43s
Tortosa S_cSE =22m.49s., PSEN =23m.17s., SSEN =27m.43s. =SSSN =35m.18s.
De Bilt eSS =28m.20s., eSSS =31m.54s.
Clermont-Ferrand i =13m.20s., ePS =23m.26s., e =24m.46s. and 29m.58s.
Besançon i =12m.30s. and 13m.26s., ePP? =15m.26s., e =16m.25s. and 17m.10s.
Algiers Univ. ePPZ =16m.6s., epPPZ =16m.27s.

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1950 **866**

Strasbourg ePP =15m.43s., ePPP =17m.39s. and 17m.46s., eSKS =22m.40s., iPS = 23m.55s., iPPS =24m.16s., iSS =28m.35s., iSSS =32m.31s., iQ? =35m.34s., and other unidentified readings.
Basle e =13m.0s.
Copenhagen S =23m.14s., SSS =32m.52s.
Stuttgart eZ =12m.40s. and 13m.38s., e =15m.7s., ePP =16m.10s., e =21m.34s. and 25m.34s., eSS =28m.40s., eSSS =32m.52s.
Zürich e =12m.37s.
Jena ePEZ =12m.42s., ePN =12m.45s., eE =13m.29s., ePPN =16m.5s., eZ =16m.30s., eN =16m.41s., ePSN =23m.45s., eZ =24m.48s., eSSN =29m.1s. and 29m.4s., eSSS?N =33m.9s.?, eSSS?E =33m.16s.
Pavia eZ =13m.43s., e =15m.5s., ePPP =18m.6s., ePS =24m.15s., e =35m.0s.
Potsdam iP$_c$PNZ =13m.17s., iPPEN =16m.15s., ipPPZ =16m.53s., epPPE =16m.56s., iPSEN =24m.49s., iPSZ =24m.52s., iSSE =28m.57s., eSSSN =32m.56s., and numerous unidentified readings.
Salo eZ =15m.30s., ePPZ =16m.30s., eSE =23m.28s.
Bologna e =24m.7s., eSS =30m.16s.
Prague esP =13m.28s., ePP =16m.14s., epPP =16m.44s., ePPP =17m.40s., e =18m.24s., eSKS =23m.1s., e =23m.56s., ePS =24m56s., ePPS? =25m.16s., eSS =29m.34s., eSSS =33m.40s.
Florence Xim. PPP? =18m.49s., SS? =30m.34s.
Padova PP =16m.22s., SKS =23m.22s.
Helsinki ePP =17m.0s., iE =37m.12s.
Triest iS =24m.12s., iPS =25m.10s.
Rome iZ =14m.0s., ePPZ =16m.25s., iE =16m.44s., iSKSE =22m.45s., iPSE =24m.19s., iSSN =29m.42s.
Tamanrasset iPPZ =16m.40s., iZ =17m.32s., ePPPZ =18m.52s., ePSZ =24m.34s., iPPSZ =25m.37s., iZ =27m.22s., iSSZ =29m.34s., eSSSZ =33m.40s., iZ =34m.7s., eZ =36m.46s., iQZ =37m.46s.
Lome e =13m.7s., eSS =29m.46s., eSSS =33m.51s.
Warsaw esPZ =13m.49s., ePPEZ =16m.26s., epPPEZ =16m.57s., esPPZ =17m.6s., ePPPEN =18m.38s., SKSEN =23m.35s., eS =24m.35s., PSE =25m.3s., PSN = 25m.12s., PPSEN =25m.44s., SS =29m.50s., sSS =30m.25s., SSSEN =33m.24s.
Ogyalla e =14m.9s., epPPE =17m.17s., e =18m.0s., eSKS =23m.10s., eSP =24m.58s., e =26m.0s., eSSN =30m.16s., eSSS =34m.4s.
Pulkovo iSKS =23m.39s.
Budapest eE =13m.34s., SKKSE =24m.2s., SKKSN =24m.17s., SE =24m.34s., e = 25m.34s.?, SSEN =30m.34s., eSSSN =34m.4s., SSSE =34m.34s.
Skalnate Pleso ePPPN =18m.51s., ePPPE =18m.55s., e =23m.17s., ePS =24m.25s., eSP =25m.13s., e =25m.46s., eSS?E =29m.40s., eSSS =34m.40s.
Lwow e =15m.58s., ePPP =19m.16s., iSKS =23m.48s., eSKKS =24m.5s.
Belgrade ePS =26m.5s.
Sofia i =26m.17s.
Moscow iSKKS =24m.37s.
Bucharest eE =20m.50s.
Wellington PS =26m.50s., ePPSZ =27m.53s., PKKPZ =29m.18s., SS =32m.10s., SSSZ =36m.2s., eZ =41m.39s., e =42m.24s.
Christchurch ePE =14m.4s., ePPPZ =20m.54s., eSKS?Z =24m.24s., PSE =26m.38s., ePS?NZ =27m.19s., PKKPE =29m.24s., eSSEN =32m.19s., eSSSE =36m.34s., eSSSS?E =40m.4s., eQN =42m.44s.
Sverdlovsk iPPP =20m.45s., PS =27m.42s., SS =33m.26s.
Vladivostok iSKKS =25m.58s., iPS =28m.34s., iSS =34m.36s.
Irkutsk PS =28m.32s., SS =35m.47s.?.
Riverview ePPEZ =20m.11s., ePPPZ =22m.39s., ePPP?E =22m.50s., eE =24m.56s., eSKKS?E =27m.12s., ePSE =30m.0s., iPSZ =30m.6s., ePPSE =31m.20s., iEZ = 31m.38s., eSSE =36m.26s., eSSPN =36m.43s., isSSE =37m.2s., eEN =40m.28s., eSSSZ =40m.48s., iSSSE =40m.51s., eQN =50·5m.
Grahamstown iZ =18m.51s., eSZ =29m.4s., esS?Z =30m.14s.
Frunse iPS =30m.40s.?.
Tashkent ePPP =23m.10s.?, eSS =37m.10s.?.
Mary PS =30m.35s.
Nanking e =38m.8s.
New Delhi SKPN =22m.45s., iN =23m.6s., PPPN =25m.6s., SKKSN =28m.46s., SKKKSN =29m.6s., SKSPN =31m.50s., PPSN =33m.56s., SKKS(△ >180°)N = 35m.36s., iN =41m.40s., SSSN =44m.56s.
Tananarive PPS =35m.6s., SS =40m.56s., SSS =46m.38s., Q =59m.22s.
Calcutta PKSE =22m.56s., PKS(△ >180°)E =23m.23s., PPPE =25m.39s., PKKPE = 28m.31s., SKKSE =29m.39s., PKKSE =32m.8s., PSE =33m.4s., PPP(△ >180°)E = 34m.9s., SKKS(△ >180°)E =35m.35s., SKKKSE =37m.10s., SSE =40m.51s., SSSE =46m.5s., SSP(△ >180°)E =54m.39s., QE =57m.58s., SSS(△ >180°)E = 62m.34s.
Bombay ePPE =23m.11s., SKKSE =29m.49s., eSSEN =42m.10s., SSE =48m.5s.
Poona PKP$_2$Z =19m.31s., PKSN =23m.12s., PPPN =25m.57s., SKKSN =29m.35s., SKKKSN =30m.1s., SKSPN =32m.35s., PSN =33m.23s., SKKSN =34m.27s., SSN =41m.23s., SSPN =42m.12s., SSSN =47m.43s., QN =57m.34s.
Hyderabad SSN =35m.54s.
Perth i =20m.14s., 21m.38s., and 40m.9s.
Kodaikanal PKSE =22m.35s., PKKSE =30m.3s., PPP(△ >180°)E =32m.1s., SKKKSE 35m.10s., SSSE =49m.34s., QE =65m.48s.

Oct. 23d. 17h. 5m. 30s. I
17h. 47m. 58s. II
17h. 59m. 42s. III
19h. 50m. 56s. IV
21h. 32m. 5s. V
Epicentre 14°·3N. 91°·7W. Depth of focus 0·005 (as at 16h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Oaxaca	5·5	299	e 1 29	+ 8	e 2 35	+11	—	—	—
II		5·5	299	1 18	− 3	2 30	+ 6	—	—	—
III		5·5	299	e 1 27	+ 6	(2 26)	+ 2	—	—	2·4
IV		5·5	299	1 30	+ 9	2 43	+19	—	—	—
I	Vera Cruz	6·5	319	1 35	0	3 1	+12	—	—	—
II		6·5	319	1 35	0	i 2 35	−14	—	—	—
III		6·5	319	—	—	2 45	− 4	—	—	—
IV		6·5	319	1 37	+ 2	—	—	—	—	3·3
V		6·5	319	1 47	+12	3 11	+22	—	—	—
I	Puebla	7·8	309	1 51	− 2	3 29	+ 8	—	—	—
II		7·8	309	1 49	− 4	3 25	+ 4	—	—	—
III		7·8	309	e 1 54	+ 1	3 14	− 7	—	—	—
IV		7·8	309	2 0	+ 7	3 35	+14	—	—	—
V		7·8	309	1 59?	+ 6	3 35?	+14	—	—	—
I	Tacubaya	8·8	306	2 7	0	3 53	+ 7	—	—	—
II		8·8	306	2 5	− 2	—	—	—	—	4·2
III		8·8	306	1 49	−18	3 34	−12	—	—	—
IV		8·8	306	i 2 5	− 2	i 3 51	+ 5	—	—	—
V		8·8	306	2 19	+12	4 5	+19	—	—	—
II	Guadalajara	12·8	301	3 3	+ 2	5 28	+ 6	—	—	—
I	Balboa Heights	13·0	113	e 3 12	+ 8	—	—	—	—	—
II		13·0	113	e 1 19	?	—	—	—	—	—
IV		13·0	113	e 3 7	+ 3	—	—	—	—	—
V		13·0	113	e 3 13	+ 9	—	—	—	—	—
II	Manzanillo	13·0	294	3 4	0	5 29	+ 2	—	—	—
III		13·0	294	—	—	e 5 45	+18	—	—	—
II	Chinchina	18·2	119	i 4 14	+ 4	—	—	—	—	—
IV		18·2	119	i 4 7	− 3	e 7 38	+11	—	—	—
V		18·2	119	i 4 15	+ 5	i 6 53	−34	—	—	—
IV	Bogota	19·9	118	i 4 26	− 3	i 8 16	+12	—	—	—
II	Columbia	21·9	23	e 4 56	+ 7	e 8 50	+ 8	i 5 12	PP	e 9·0
IV	San Juan	24·9	76	e 5 6	−12	e 10 26	+52	e 5 49	PP	e 10·9
V		24·9	76	e 5 40	+22	—	—	e 6 15	PPP	e 10·5
I	Tucson	25·0	320	i 5 19	0	—	—	i 5 34	pP	e 10·0
II		25·0	320	i 5 18	− 1	i 9 54	+18	i 5 36	pP	e 12·0
III		25·0	320	i 5 19	0	e 9 55	+19	e 5 39	pP	e 13·2
IV		25·0	320	e 5 19	0	e 9 54	+18	e 5 34	pP	e 10·1
V		25·0	320	e 5 18	− 1	e 9 55	+19	e 5 39	pP	e 13·4
II	Lincoln	E. 26·8	355	e 6 27	+51	e 10 13	+ 8	—	—	e 13·4
II	Chicago	27·7	6	e 5 41	− 3	e 10 19	− 1	e 5 55	pP	e 13·8
V		27·7	6	—	—	e 10 28	+ 8	—	—	e 12·5
II	Washington	27·7	28	i 5 46	+ 2	e 11 14	+54	i 6 0	pP	i 13·0
II	Pittsburgh	z. 28·0	21	i 5 58	+11	—	—	—	—	—
I	Cleveland	z. 28·5	16	i 5 49a	− 2	—	—	—	—	—
II		z. 28·5	16	i 5 50a	− 1	—	—	—	—	—
IV	Philadelphia	29·4	28	—	—	e 11 30	+43	—	—	e 16·8
V		29·4	28	—	—	e 11 9	+22	—	—	e 12·6
I	Pierce Ferry	29·5	322	i 6 1	+ 1	—	—	—	—	—
II		29·5	322	i 6 0	0	—	—	—	—	—
III		29·5	322	i 6 0	0	—	—	—	—	—
IV		29·5	322	i 6 1	+ 1	—	—	—	—	—
V		29·5	322	i 6 0	0	—	—	—	—	—
II	Fort de France	29·6	85	—	—	e 10 5	−45	—	—	e 16·6
IV		29·6	85	—	—	e 12 7	SS	—	—	e 14·1
I	Palomar	29·7	315	i 6 1	− 1	—	—	—	—	—
II		29·7	315	i 6 1a	− 1	—	—	—	—	—
III		29·7	315	i 6 0a	− 2	—	—	i 6 20	pP	—
IV		29·7	315	i 6 2a	0	—	—	—	—	—
V		29·7	315	i 6 1	− 1	—	—	—	—	—

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Boulder City		29·9	321	i 6 5	+ 1	—	—	—	—	—
II			29·9	321	i 6 4	0	—	—	—	—	e 15·8
III			29·9	321	i 6 4	0	—	—	—	—	—
IV			29·9	321	i 6 5	+ 1	—	—	—	—	—
V			29·9	321	i 6 4	0	—	—	—	—	—
I	Overton	z.	30·0	322	i 5 33	−32	e 11 15	+18	—	—	—
II		z.	30·0	322	i 6 5	0	—	—	—	—	—
III		z.	30·0	322	e 6 6	+ 1	—	—	—	—	—
IV		z.	30·0	322	e 6 5	0	—	—	—	—	—
V		z.	30·0	322	i 6 5	0	—	—	—	—	—
II	Bermuda		30·4	49	e 6 7	− 1	—	—	e 6 37	pP	e 13·1
I	Riverside	z.	30·4	315	i 6 6	− 2	—	—	—	—	—
II		z.	30·4	315	i 6 5	− 3	—	—	—	—	—
III		z.	30·4	315	i 6 5	− 3	—	—	—	—	—
IV		z.	30·4	315	i 6 7	− 1	—	—	—	—	—
V		z.	30·4	315	i 6 6	− 2	—	—	—	—	—
II	Huancayo		30·8	147	e 6 14	+ 2	—	—	—	—	—
III			30·8	147	e 6 22	+10	—	—	—	—	—
IV			30·8	147	e 6 8	− 4	—	—	—	—	—
V			30·8	147	e 6 21	+ 9	e 11 25	+16	—	—	—
I	Palisades		30·8	27	i 6 13	+ 1	—	—	—	—	—
II			30·8	27	i 6 13	+ 1	—	—	—	—	—
IV			30·8	27	e 6 5	− 7	—	—	—	—	e 17·4
V			30·8	27	—	—	e 11 27	+18	—	—	e 17·6
I	Pasadena		31·1	315	i 6 13	− 1	—	—	e 9 7	P_cP	—
II			31·1	315	i 6 12a	− 2	—	—	i 9 6	P_cP	e 14·0
III		z.	31·1	315	i 6 12	− 2	—	—	—	—	—
IV		z.	31·1	315	e 6 12	− 2	—	—	—	—	—
V		z.	31·1	315	i 6 13	− 1	—	—	—	—	—
II	Rapid City	E.	31·3	345	e 6 21	+ 5	—	—	—	—	e 12·9
II	Salt Lake City		31·7	330	e 6 20	0	e 11 32	+ 9	—	—	e 14·4
I	Haiwee	z.	32·0	320	i 6 21	− 1	—	—	—	—	—
II		z.	32·0	320	i 6 20	− 2	—	—	—	—	—
III		z.	32·0	320	i 6 22	0	—	—	—	—	—
IV		z.	32·0	320	e 6 22	0	—	—	—	—	—
I	Logan		32·4	333	i 6 14	−12	—	—	—	—	—
II			32·4	333	i 6 13	−13	e 11 24	−10	—	—	—
III			32·4	333	i 6 14	−12	—	—	—	—	—
IV			32·4	333	e 6 14	−12	—	—	—	—	—
V			32·4	333	e 11 41	S	(e 11 41)	+ 7	—	—	e 19·4
I	Tinemaha		32·8	320	i 6 29a	0	—	—	i 9 12	P_cP	—
II			32·8	320	i 6 28a	− 1	e 13 2	P_cS	i 9 17	P_cP	—
III			32·8	320	i 6 28	− 1	—	—	—	—	—
IV		z.	32·8	320	e 6 29	0	—	—	e 9 15	P_cP	—
I	Harvard		33·0	28	i 6 32	+ 1	—	—	—	—	—
II			33·0	28	i 6 32	+ 1	e 11 48	+ 4	—	—	—
IV			33·0	28	i 6 30	− 1	—	—	—	—	e 19·1
I	Weston		33·1	28	i 6 30	− 2	—	—	—	—	—
II			33·1	28	e 6 30	− 2	—	—	—	—	—
IV			33·1	28	i 6 31	− 1	—	—	—	—	—
I	Fresno	z.	33·6	318	e 6 35a	− 1	—	—	e 7 55	PP	—
II			33·6	318	e 6 34a	− 2	e 12 7	+14	e 9 48	?	—
III		z.	33·6	318	e 6 35	− 1	—	—	e 5 44	?	—
I	Ottawa	z.	33·8	20	i 6 38a	0	—	—	—	—	—
II			33·8	20	i 6 38a	0	12 4	+ 8	14 29	SSS	—
IV		z.	33·8	20	e 6 36	− 2	—	—	—	—	—
V		z.	33·8	20	e 6 40	+ 2	—	—	—	—	—
I	Lick	z.	35·1	317	e 6 49a	0	—	—	—	—	—
II		z.	35·1	317	e 6 48a	− 1	—	—	e 9 23	P_cP	—
III		z.	35·1	317	e 6 48a	− 1	—	—	e 7 9	pP	—
IV		z.	35·1	317	e 6 48k	− 1	—	—	—	—	—
V		z.	35·1	317	e 6 48a	− 1	—	—	e 7 17	sP	—
I	Reno		35·2	323	e 6 51	+ 1	—	—	—	—	—
II			35·2	323	e 6 50	0	e 12 27	+ 9	e 7 0	pP	—
III			35·2	323	e 6 51	+ 1	—	—	—	—	—
V		z.	35·2	323	e 6 50	0	—	—	—	—	—

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
II	Bozeman		35·3	337	e 6 46	− 5	e 11 56	−23	—	—	e 15·6
I	Berkeley	z.	35·8	317	i 6 55a	0	—	—	i 9 22	PcP	—
II		z.	35·8	317	i 6 55a	0	—	—	e 9 21	PcP	—
III		z.	35·8	317	i 6 51a	− 4	—	—	e 9 22	PcP	—
V			35·8	317	—	—	i 12 11	−16	—	—	e 18·8
II	Butte	N.	36·2	338	e 7 11	pP	e 13 9	sS	—	—	e 14·9
I	Mineral	z.	36·8	322	e 7 3	0	—	—	e 7 25	pP	—
II			36·8	322	e 7 3	0	—	—	—	—	e 19·8
I	Shasta Dam		37·5	322	i 7 8	− 1	—	—	i 9 26	PcP	—
II			37·5	322	i 7 7	− 2	—	—	e 9 25	PcP	—
III			37·5	322	i 7 7	− 2	—	—	—	—	—
IV			37·5	322	e 9 23	PcP	—	—	—	—	—
V			37·5	322	e 7 6	− 3	—	—	—	—	—
I	La Paz		38·4	141	7 30?	+13	—	—	—	—	—
II			38·4	141	7 22	+ 5	—	—	—	—	—
I	Hungry Horse		38·6	337	i 7 19	+ 1	—	—	—	—	—
II			38·6	337	i 7 18	0	—	—	—	—	—
III			38·6	337	i 7 19	+ 1	—	—	—	—	—
IV			38·6	337	i 7 19	+ 1	—	—	—	—	—
V			38·6	337	i 7 19	+ 1	—	—	—	—	—
I	Arcata	z.	38·7	320	e 7 27a	+ 8	—	—	—	—	—
II			38·7	320	e 7 26a	+ 7	e 13 22	+11	e 8 35	PP	e 20·8
III		z.	38·7	320	e 7 26a	+ 7	—	—	e 7 49	pP	—
I	Seattle		41·9	330	i 7 46a	0	—	—	i 8 3	pP	—
II			41·9	330	e 7 48	+ 2	—	—	i 9 29	PP	—
III			41·9	330	i 7 46k	0	—	—	—	—	—
I	Victoria	z.	42·9	330	i 7 54	0	—	—	—	—	—
II			42·9	330	i 7 54a	0	14 23	+10	—	—	—
III		z.	42·9	330	e 7 53a	− 1	—	—	e 9 58	PcP	—
IV		z.	42·9	330	e 7 55	+ 1	—	—	—	—	—
V		z.	42·9	330	e 7 54	0	—	—	—	—	—
II	Resolute Bay		60·4	359	e 10 6	+ 1	—	—	—	—	—
I	College		63·1	337	i 10 21	− 2	—	—	i 10 58	PcP	—
II			63·1	337	i 10 21	− 2	e 19 32	sS	i 10 59	PcP	e 29·7
III			63·1	337	i 10 21	− 2	—	—	i 12 24	PP	—
IV			63·1	337	i 10 21	− 2	—	—	i 10 58	PcP	—
V			63·1	337	e 10 22	− 1	—	—	e 14 34	PPP	—
II	Aberdeen		77·9	34	e 11 15	−37	i 21 2	−37	i 15 9	PP	—
III			77·9	34	i 14 47	PP	i 23 4	PPS	—	—	33·2
II	Kew	z.	79·8	39	i 12 3	0	—	—	—	—	—
I	Granada		80·0	54	i 11 30a	−34	—	—	—	—	—
II			80·0	54	i 12 41k	+37	—	—	—	—	—
III			80·0	54	i 12 12k	+ 8	—	—	—	—	—
I	Paris		82·1	42	i 12 14	− 1	—	—	—	—	—
II			82·1	42	i 12 16	+ 1	—	—	i 12 34	pP	—
I	Besançon		84·8	43	e 12 28	− 1	—	—	—	—	—
II			84·8	43	e 12 27	− 2	—	—	e 16 6	PP	—
III			84·8	43	e 12 27	− 2	—	—	e 12 58	pP	—
I	Algiers Univ.	z.	85·3	54	12 59	pP	—	—	—	—	—
I	Strasbourg		85·5	41	e 12 33	+ 1	—	—	e 13 3	pP	—
II			85·5	41	e 12 33a	+ 1	i 23 6	+ 9	e 16 20	pPP	—
III			85·5	41	e 12 32	0	—	—	e 14 48	?	—
I	Copenhagen		86·1	33	e 12 36	+ 1	—	—	—	—	—
II			86·1	33	e 12 35	0	—	—	—	—	—
I	Stuttgart	z.	86·4	40	e 12 36	0	—	—	e 15 58?	PP	—
II		z.	86·4	40	e 12 37	+ 1	—	—	e 13 15	?	—
III		z.	86·4	40	e 12 37	+ 1	—	—	—	—	—
IV		z.	86·4	40	e 12 34	− 2	—	—	—	—	—
V		z.	86·4	40	e 12 37	+ 1	—	—	—	—	—
II	Jena		87·2	39	e 12 43	+ 3	—	—	e 16 19	PP	—
II	Collmberg	z.	87·9	38	e 12 45	+ 1	—	—	—	—	—
II	Prague		89·2	38	e 14 13	?	—	—	e 16 5	PP	—
II	Belgrade		95·0	42	—	—	e 23 48	[+ 3]	—	—	e 47·7
III			95·0	42	e 13 48	pP	—	—	e 18 50	PPP	—
I	Brisbane	E.	118·7	247	e 23 59	?	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
II Grahamstown	z.	121·2	119	e 18 17	[−28]	—	—	—	—	—
II Pretoria	z.	122·8	110	i 18 22	[−27]	—	—	—	—	—
I Poona	z.	144·4	23	i 20 30	[+61]	—	—	—	—	—
II	z.	144·4	23	i 19 30	[+ 1]	—	—	—	—	—
III	z.	144·4	23	i 19 31	[+ 2]	—	—	i 21 34	?	—
IV	z.	144·4	23	i 19 27	[− 2]	—	—	—	—	—
V	z.	144·4	23	i 19 25	[− 4]	—	—	—	—	—

Additional readings :—
Tucson V ePP =6m.32s.
Palomar III iZ =6m.9s.
Fresno I eZ =10m.34s., III eZ =8m.24s.
Berkeley I eZ =7m.48s.
Mineral II eZ =7m.37s. and 8m.37s.
Arcata II eEN =13m.35s.
Seattle I i =7m.55s. and 8m.36s., e =10m.20s., II i =10m.30s. and 11m.39s., III i =8m.43s. and 9m.1s.
Paris II i =12m.56s. and 13m.21s.
Besançon II e =12m.34s. and 14m.3s.
Strasbourg II e =12m.54s., 16m.46s., and 17m.15s., ePPP =17m.58s.
Jena II ePN =12m.46s., eE =13m.18s., eN =13m.46s.
Prague II e =17m.48s.
Long waves only to one or more of these shocks were recorded at Guadalajara, Manzanillo, Bermuda, Bozeman, Butte, Salt Lake City, Ukiah, Seattle, Resolute Bay, Prague, and Potsdam.

Oct. 23d. 23h. 38m. 43s. Epicentre 14°·3N. 91°·7W. (as at 21h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		5·5	299	1 26	+ 1	2 38	+ 8	—	—	—
Vera Cruz		6·5	319	1 43	+ 4	3 4	+ 9	—	—	—
Puebla		7·8	309	1 59	+ 1	3 34	+ 6	—	—	—
Tacubaya		8·8	306	i 2 12	+ 1	3 59	+ 6	—	—	—
Guadalajara		12·8	301	i 4 19	?	—	—	—	—	6·6
Balboa Heights		13·0	113	e 3 20	+11	—	—	—	—	—
Chinchina		18·2	119	i 4 20	+ 4	i 7 57	+20	—	—	—
Bogota		19·9	118	i 4 39	+ 3	i 8 31	+16	—	—	—
Columbia		21·9	23	e 4 57	0	e 9 11	+17	—	—	e 11·8
San Juan		24·9	76	e 5 32	+ 6	—	—	e 6 1	PP	e 10·7
Tucson		25·0	320	i 5 26	− 1	e 9 46	− 3	e 6 24	PPP	e 12·8
Chicago		27·7	6	—	—	e 10 32	− 1	—	—	e 16·7
Washington		27·7	28	e 6 27	PP	—	—	—	—	e 15·0
Pittsburgh		28·0	21	—	—	i 12 34	SSS	—	—	—
Cleveland		28·5	16	i 6 0a	+ 1	e 11 14	+28	—	—	—
Philadelphia		29·4	28	e 6 45	PP	e 11 4	+ 3	e 7 34	PPP	e 12·4
Pierce Ferry		29·5	322	i 6 8	0	—	—	—	—	—
Fort de France		29·6	85	e 7 6	PP	e 12 11	?	—	—	—
Palomar		29·7	315	i 6 8a	− 2	—	—	—	—	—
Boulder City		29·9	321	i 6 11	− 1	—	—	—	—	—
Overton	z.	30·0	322	i 6 13	+ 1	—	—	—	—	—
Bermuda		30·4	49	e 6 25	+ 9	e 11 25	+ 9	—	—	e 12·4
Riverside	z.	30·4	315	i 6 15	− 1	—	—	i 9 12	P_cP	—
Huancayo		30·8	147	e 6 19	− 1	e 11 26	+ 3	—	—	—
Palisades		30·8	27	i 6 21	+ 1	e 11 35	+12	—	—	e 14·8
Pasadena		31·1	315	e 6 21	− 1	—	—	—	—	e 14·3
Salt Lake City		31·7	330	e 6 28	+ 1	e 11 26	−11	—	—	e 13·8
Haiwee	z.	32·0	320	i 6 29	− 1	—	—	—	—	—
Logan		32·4	333	e 6 21	−13	e 11 36	−12	—	—	e 14·3
Tinemaha	z.	32·8	320	i 6 35	− 2	—	—	i 9 20	P_cP	—
Harvard		33·0	28	i 6 40	+ 1	—	—	—	—	e 18·0
Weston		33·1	28	i 6 38	− 2	—	—	—	—	—
Fresno	z.	33·6	318	e 6 41a	− 3	—	—	e 7 54	PP	—
Ottawa	z.	33·8	20	e 6 46	0	—	—	—	—	—
Lick	z.	35·1	317	e 6 56a	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno	z.	35·2	323	e 6 58	0	—	—	—	—	—
Bozeman		35·3	337	—	—	e 12 37	+ 4	—	—	e 16·2
Santa Clara	E.	35·3	317	—	—	—	—	e 17 28	Q	e 19·6
Berkeley		35·8	317	e 7 2a	− 1	e 12 45	+ 4	e 9 29	PcP	e 19·1
Shasta Dam		37·5	322	e 7 14	− 3	—	—	e 9 32	PcP	—
La Paz		38·4	141	i 7 27	+ 2	i 13 24	+ 4	9 9	PP	18·5
Hungry Horse		38·6	337	i 7 26	0	—	—	—	—	—
Arcata	z.	38·7	320	e 7 21a	− 6	—	—	e 9 12	PP	—
Seattle		41·9	330	e 7 53	− 1	—	—	—	—	e 23·3
Victoria	z.	42·9	330	e 8 2a	0	—	—	—	—	—
Sitka		53·9	333	—	—	e 22 57	SSS	—	—	e 31·6
Resolute Bay		60·4	359	e 14 8	PPP	e 18 43	+15	—	—	29·4
College		63·1	337	i 10 29	− 3	—	—	i 11 6	PcP	—
Rathfarnham Castle		75·9	38	e 11 49	− 1	—	—	—	—	e 38·3
Malaga	z.	79·5	55	i 12 12k	+ 2	i 22 6	− 5	i 15 20	PP	38·3
Granada		80·0	54	i 12 17k	+ 4	—	—	—	—	40·2
Paris		82·1	42	e 12 22	− 2	—	—	—	—	—
Alicante		82·2	53	12 22	− 2	22 56	+17	17 35	PPP	e 41·1
De Bilt		83·0	38	e 12 31	+ 3	e 23 47	PS	—	—	e 39·3
Besançon		84·8	43	e 12 39	+ 2	—	—	—	—	—
Strasbourg		85·5	41	e 12 41	0	—	—	e 36 26	Q	e 40·3
Copenhagen		86·1	33	—	—	24 29	PS	—	—	44·3
Stuttgart		86·4	40	e 12 45	0	e 24 29	PS	e 16 9	PP	e 44·3
Potsdam		87·6	37	e 12 53	+ 2	e 24 47	PS	—	—	e 43·3
Collmberg	z.	87·9	38	e 12 54	+ 1	—	—	—	—	—
Florence Xim		89·3	45	i 13 25	+26	—	—	—	—	e 44·6
Triest		90·4	43	e 13 7	+ 3	e 23 35	[0]	e 24 3	S	e 45·3
Rome	N.	90·8	46	—	—	e 23 43	[+ 5]	—	—	—
Tamanrasset	z.	91·2	65	e 13 7	− 1	—	—	—	—	—
Messina		94·3	48	—	—	e 23 18	?	e 30 3	?	—
Ksara		110·9	46	e 13 49	P	—	—	e 17 19	?	—
Poona	z.	144·4	23	i 19 39	[+ 1]	—	—	—	—	—

Additional readings :—
Tucson i =5m.35s.
Fresno eZ =7m.7s., eE =9m.33s.
Berkeley eN =15m.25s., eEN =17m.29s.
La Paz SS =16m.5s.
Seattle i =9m.4s. and 10m.5s.
Alicante PPS =24m.14s., SS =28m.28s., Q =34m.56s.
Strasbourg e =19m.22s.
Triest eZ =13m.22s.
Long waves were also recorded at Lincoln, Rapid City, Ukiah, Scoresby Sund, Aberdeen, Kew, and Warsaw.

Oct. 23d. 23h. 49m. 10s. Epicentre 14°·3N. 91°·7W. Depth of focus 0·005.
(as at 23h. 38m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m. s.		
Puebla		7·8	309	e 1 59	+ 6	—	—	—	—	
Tacubaya		8·8	306	e 2 13	+ 6	—	—	—	—	
Tucson		25·0	320	e 5 17	− 2	—	—	—	—	
Philadelphia		29·4	28	—	—	e 10 0	−47	—	—	
Pierce Ferry		29·5	322	i 5 59	− 1	—	—	—	—	
Palomar		29·7	315	i 5 59a	− 3	—	—	—	—	
Boulder City		29·9	321	i 6 2	− 2	—	—	—	—	
Overton	z.	30·0	322	i 6 4	− 1	—	—	—	—	
Riverside	z.	30·4	315	e 6 7	− 1	—	—	—	—	
Huancayo		30·8	147	—	—	e 13 20	SSS	—	—	
Pasadena	z.	31·1	315	i 6 11	− 3	—	—	—	—	
Lick	z.	35·1	317	e 6 47a	− 2	—	—	e 7 8	?	
Reno	z.	35·2	323	e 6 56	+ 6	—	—	—	—	
Hungry Horse		38·6	337	i 7 18	0	—	—	—	—	
Victoria	z.	42·9	330	e 7 53	− 1	—	—	—	—	
College		63·1	337	e 10 21	− 2	—	—	—	—	
Stuttgart	z.	86·4	40	e 12 37	+ 1	—	—	—	—	
Poona	z.	144·4	23	i 19 30	[+ 1]	—	—	—	—	

Oct. 23d. Readings also at 1h. (Tuai, Wellington, Christchurch, Kaimata, Overton, and Pierce Ferry (2)), 2h. (near Manila, near Chinchina, and Bogota). 5h. (near Victoria), 8h. (Overton (2)), 10h. (Pasadena, Riverside, Palomar, Tinemaha, College, Hungry Horse, Boulder City, Overton, and Pierce Ferry), 12h. (Brisbane), 13h. (near Mizusawa), 14h. (Vera Cruz, Merida, Puebla, Tacubaya, and near Ashkabad), 15h. (Basle, Zürich, Rome, Bogota, Puebla, Tacubaya, Tucson (2), Pierce Ferry (2), Palomar (2), Boulder City (2), Overton (2), Riverside, Haiwee (2), Tinemaha (2), Lick (2), Shasta Dam, Hungry Horse, Victoria (2), College (2), and near Poona), 16h. (Brisbane, College (2), Pierce Ferry (2), Victoria (3), Palomar, Tinemaha, Puebla (2), Oaxaca, Besançou, and near Algiers Univ.), 17h. (Oaxaca, Vera Cruz, Puebla, Tacubaya, Tucson, Pierce Ferry (2), Palomar (2), Boulder City (2), Overton, Tinemaha (2), Berkeley, Victoria (2), College (4), Stuttgart, Collmberg, near Kulyab, Fergana, Stalinabad, Lunacharskoe, Samarkand, and Tchimkent), 18h. (Tacubaya (2), Puebla, and Pierce Ferry), 19h. (Puebla, Tacubaya (4), Pierce Ferry, and Victoria), 20h. (Puebla, Vera Cruz, Tacubaya, Pierce Ferry (2), Overton (2), Shasta Dam, College, and Victoria), 21h. (Brisbane, Bogota, La Paz, Santa Clara, and Granada), 22h. (Tucson and Tacubaya).

Oct. 24d. 0h. 23m. 29s. Epicentre 14°·3N. 91°·7W. (as on 23d.). Depth of focus 0·005.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz		6·5	319	1 43	+ 8	3 7	+18	—	—	—
Puebla		7·8	309	2 3	+10	3 37	+16	—	—	—
Tacubaya		8·8	306	i 2 14	+ 7	4 0	+14	—	—	—
San Juan		24·9	76	e 7 23	?	e 9 1	−33	—	—	e 10·1
Tucson		25·0	320	e 5 18	− 1	—	—	e 8 6	P_cP	e 13·4
Pierce Ferry		29·5	322	i 6 0	0	—	—	i 8 53	P_cP	—
Palomar		29·7	315	i 6 0	− 2	—	—	—	—	—
Boulder City		29·9	321	i 6 9	+ 5	—	—	—	—	—
Overton	z.	30·0	322	i 6 5	0	—	—	e 8 58	P_cP	—
Riverside	z.	30·4	315	e 6 5	− 3	—	—	—	—	—
Mount Wilson	z.	31·1	315	e 6 11	− 3	—	—	—	—	—
Logan		32·4	333	e 6 14	−12	—	—	—	—	—
Tinemaha	z.	32·8	320	e 6 27	− 2	—	—	—	—	—
Weston		33·1	28	e 6 29	− 3	—	—	—	—	—
Lick	z.	35·1	317	e 6 48k	− 1	—	—	—	—	—
Santa Clara	E.	35·3	317	—	—	e 11 11	?	—	—	e 21·0
Hungry Horse		38·6	337	e 7 18	0	—	—	—	—	—
Victoria	z.	42·9	330	e 7 53	− 1	—	—	e 10 46	PP	—
College		63·1	337	e 10 20	− 3	—	—	e 13 14	PP	—

Long waves were also recorded at Guadalajara and Ukiah.

Oct. 24d. 0h. 52m. 9s. Epicentre 14°·3N. 91°·7W. Depth of focus 0·005 (as at 0h. 23m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		5·5	299	—	—	e 2 30	+ 6	—	—	—
Vera Cruz		6·5	319	1 35	0	2 59	+10	—	—	—
Puebla		7·8	309	1 50	− 3	3 27	+ 6	—	—	—
Tacubaya		8·8	306	i 2 0	− 7	i 3 46	0	—	—	—
Guadalajara		12·8	301	2 57	− 4	—	—	—	—	6·4
Balboa Heights		13·0	113	e 3 11	+ 7	—	—	—	—	—
Mazanillo		13·0	294	—	—	e 6 4	SS	—	—	—
Bogota		19·9	118	i 4 31	+ 2	i 8 19	+15	—	—	—
Columbia		21·9	23	e 4 49	0	e 9 7	+25	—	—	e 12·0
San Juan		24·9	76	e 5 21	+ 3	(e 10 15)	SS	e 5 51	PP	e 10·2
Tucson		25·0	320	i 5 16	− 3	i 9 54	+18	i 6 13	PP	i 11·8
Lincoln	E.	26·8	355	e 6 30	PP	—	—	—	—	e 11·3
Chicago		27·7	6	e 5 34	−10	e 10 28	+ 8	—	—	e 15·6
Washington		27·7	28	e 6 3	+19	—	—	—	—	e 12·0
Pittsburgh		28·0	21	—	—	i 11 25	+60	—	—	—
Cleveland		28·5	16	i 5 53	+ 2	e 11 8	+35	—	—	—
Philadelphia		29·4	28	e 5 0	−59	e 10 23	−24	—	—	e 15·9
Pierce Ferry		29·5	322	i 5 57	− 3	—	—	—	—	—
Palomar	z.	29·7	315	i 5 57	− 5	—	—	—	—	—
Boulder City		29·9	321	e 6 1	− 3	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Overton	Z.	30·0	322	e 6 20	+15	—	—	—	—	—
Bermuda		30·4	49	e 6 19	+11	—	—	—	—	e 12·1
Riverside	Z.	30·4	315	e 6 3	− 5	—	—	—	—	—
Huancayo		30·8	147	e 6 18	+ 6	e 11 17	+ 8	—	—	e 13·1
Palisades		30·8	27	e 6 13	+ 1	i 11 27	+18	—	—	e 16·6
Pasadena		31·1	315	e 6 11	− 3	—	—	—	—	e 12·8
Rapid City	E.	31·3	345	e 6 20	+ 4	e 12 30	+73	—	—	e 13·8
Salt Lake City		31·7	330	e 6 20	0	e 11 31	+ 8	—	—	e 14·0
Haiwee	Z.	32·0	320	e 6 19	− 3	—	—	—	—	—
Logan		32·4	333	e 6 12	−14	i 11 37	+ 3	i 6 32	pP	e 16·0
Tinemaha	Z.	32·8	320	e 6 21	− 8	—	—	—	—	—
Harvard		33·0	28	e 6 12	−19	—	—	—	—	e 14·6
Fresno	Z.	33·6	318	e 6 33	− 3	—	—	e 7 47	PP	e 16·0
Ottawa		33·8	20	e 6 38	0	e 12 11	+15	—	—	—
Lick	Z.	35·1	317	e 6 45a	− 4	—	—	e 9 15	PcP	e 22·4
Reno	Z.	35·2	323	e 6 50	0	—	—	—	—	—
Bozeman		35·3	337	e 6 47	− 4	e 12 31	+12	—	—	e 15·6
Berkeley		35·8	317	e 6 53k	− 2	e 12 6	−21	e 8 26	PPP	e 18·8
Butte	N.	36·2	338	e 6 57	− 1	e 12 41	+ 8	—	—	e 16·1
Mineral	Z.	36·8	322	e 6 59	− 4	—	—	—	—	e 21·8
Seven Falls	E.	37·1	33	e 9 39	PcP	—	—	—	—	—
Ukiah		37·1	318	e 6 55	−11	e 12 59	+12	—	—	e 17·4
Shasta Dam		37·5	322	e 7 4	− 5	—	—	—	—	—
La Paz		38·4	141	i 7 19	+ 2	i 13 10	+ 3	i 8 49	PP	18·6
Hungry Horse		38·6	337	i 7 16	− 2	—	—	—	—	—
Arcata	Z.	38·7	320	e 7 26k	+ 7	—	—	—	—	e 25·6
Seattle		41·9	330	e 7 47	+ 1	e 9 47	PcP	e 8 9	pP	e 22·8
Victoria		42·9	330	e 7 52	− 2	15 24	+71	—	—	—
Sitka		53·9	333	—	—	e 17 1	+13	—	—	e 30·7
Resolute Bay		60·4	359	—	—	e 18 30	+17	—	—	32·9
College		63·1	337	e 10 20	− 3	—	—	—	—	—
Rathfarnham C.	Z.	75·9	38	e 12 16	pP	e 25 1	SS	—	—	—
Malaga	Z.	79·5	55	e 12 2	+ 1	e 22 0	+ 4	e 15 10	PP	37·6
Kew		79·8	39	e 12 1	− 2	e 23 17	PPS	—	—	e 32·8
Granada		80·0	54	i 12 14a	+10	—	—	—	—	40·4
Alicante		82·2	53	12 10	− 5	e 22 37	+13	15 20	PP	e 40·6
De Bilt		83·0	38	e 12 17	− 3	e 22 46	+14	—	—	e 39·8
Clermont-Ferrand		83·2	45	—	—	e 22 41	+ 7	—	—	—
Strasbourg		85·5	41	e 12 34	+ 2	e 22 54	− 3	e 15 56	PP	e 41·8
Copenhagen		86·1	33	—	—	22 34	[−18]	23 6	S	41·8
Stuttgart		86·4	40	e 12 36	0	e 23 11	+ 6	e 24 20	PS	e 44·8
Potsdam		87·6	37	i 12 44k	+ 2	i 23 15	− 2	i 16 8	PP	e 38·8
Florence, Xim.		89·3	45	e 13 3	+13	i 23 27	− 6	25 37	PPS	—
Triest		90·4	43	e 12 55	0	i 23 53	+10	e 23 30	SKS	—
Rome		90·8	46	e 12 58	+ 1	e 23 36	−10	e 16 35	PP	—
Tamanrasset	Z.	91·2	65	e 12 59	0	23 51?	+ 1	16 51?	PP	42·8
Warsaw		91·5	35	—	—	23 0	?	—	—	e 46·8
Ksara		110·9	46	e 19 9	PP	e 29 12	PPS	—	—	—
Poona	Z.	144·4	23	i 19 30	[+ 1]	—	—	—	—	—

Additional readings :—
San Juan i =6m.15s.
Tucson i =5m.33s., 5m.50m., and 6m.22s.
Cleveland eE =11m.57s.
Logan i =6m.57s.
Fresno eN =9m.33s., eZ =10m.48s.
La Paz iSS =15m.57s.
Seattle e =10m.20s.
Resolute Bay e =19m.57s.
Malaga PPPZ =16m.54s., iPSZ =22m.56s.
Alicante PPP =17m.26s., PS =24m.37s., SSS =32m.16s.. Q =34m.32s.
Strasbourg e =25m.27s.
Stuttgart e =25m.31s.
Potsdam ePSE =24m.27s., eSSSZ =32m.51s.
Triest ePP?Z =14m.12s.
Rome eSSN =29m.35s.
Long waves were also recorded at La Plata, Weston, Scoresby Sund, and Aberdeen.

Oct. 24d. 1h. 45m. 23s. Epicentre 32°·8S. 178°·1W. (as on 19d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	7·1	233	i 1 47	− 1	—	—	—	—	—
Tuai	N.	7·1	211	e 1 37	−11	i 2 47	−23	—	—	—
New Plymouth	E.	8·9	223	—	—	e 3 54	− 1	—	—	e 4·6
Wellington		10·2	212	e 2 23	− 8	i 3 55	?	e 2 54	P_g	—
Kaimata	N.E.	12·8	217	e 3 2	− 4	4 56	−34	—	—	—
Christchurch		13·0	212	e 3 7	− 2	e 4 58	−37	—	—	—
Apia		19·8	20	4 40	+ 5	e 8 20	+ 7	—	—	—
Brisbane		25·5	274	i 5 28k	− 4	—	—	—	—	—
Riverview		25·7	258	i 5 32k	− 1	e 10 17	+16	—	—	e 12·5
Pasadena	Z.	87·2	46	i 12 48a	− 1	—	—	—	—	—
Berkeley		87·4	41	e 12 50k	0	e 23 48	+18	—	—	—
Lick	Z.	87·4	41	e 12 50a	0	—	—	—	—	—
Palomar	Z.	87·5	47	i 12 43	− 8	—	—	—	—	—
Riverside	Z.	87·6	46	i 12 48	− 3	—	—	—	—	—
Fresno	Z.	88·0	43	e 12 53a	0	—	—	—	—	—
Haiwee	Z.	88·7	44	i 12 55	− 2	—	—	—	—	—
Tinemaha	Z.	89·2	44	i 12 57	− 2	—	—	—	—	—
Shasta Dam		89·4	39	i 12 56	− 4	—	—	—	—	—
Mineral	Z.	89·6	40	e 12 59	− 2	—	—	—	—	—
Reno	Z.	90·0	41	e 13 2	− 1	—	—	—	—	—
Boulder City		90·5	47	i 12 46	−19	—	—	—	—	—
Tucson		90·6	51	e 12 1	?	e 16 2	?	i 12 48	?	e 20·3
Overton	Z.	91·1	46	i 12 47	−21	—	—	—	—	—
Pierce Ferry		91·1	47	i 12 43	−25	—	—	—	—	—
Logan		96·0	43	e 12 58	−32	(e 24 58)	+11	—	—	e 25·0
College		100·2	12	e 13 53	+ 4	—	—	—	—	—
Poona	Z.	114·7	276	—	—	i 26 14	{−24}	—	—	—
Philadelphia		119·3	59	—	—	—	—	(e 22 24)	PKS	e 22·4
Ksara		151·7	281	e 20 1	[+11]	—	—	e 23 41	PP	—
Collmberg	Z.	159·8	339	e 20 38	PKP_3	—	—	—	—	—
Stuttgart	Z.	163·1	344	e 20 51	PKP_3	—	—	—	—	—
Strasbourg		163·6	346	e 20 56	PKP_3	—	—	—	—	—
Besançon		165·2	349	e 21 1	PKP_3	—	—	—	—	—

Additional readings :—
Auckland iN = 1m.52s., 2m.4s., and 2m.19s.
Tuai iN = 1m.49s.
Apia e = 14m.5s., 14m.31s., and 17m.14s.
Berkeley eZ = 13m.11s.
Lick eZ = 13m.29s.
Fresno eZ = 13m.13s.
Tucson i = 12m.17s. and 13m.2s.
Overton iZ = 13m.6s.
Besançon e = 21m.13s.

Oct. 24d. 5h. 50m. 24s. Epicentre 14°·3N. 91°·7W. (as at 0h.). Depth of focus 0·005.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		5·5	299	—	—	e 2 37	+13	—	—	—
Vera Cruz		6·5	319	1 34	− 1	2 58	+ 9	—	—	—
Puebla		7·8	309	1 54	+ 1	3 31	+10	—	—	—
Tacubaya		8·8	306	2 5	− 2	3 45	− 1	—	—	—
Bogota	Z.	19·9	118	i 4 30	+ 1	—	—	—	—	—
San Juan		24·9	76	e 5 50	PP	—	—	—	—	e 10·2
Tucson		25·0	320	i 5 18	− 1	e 9 57	sS	i 6 25	PP	e 10·7
Cleveland	Z.	28·5	16	i 5 53k	+ 2	—	—	—	—	—
Pierce Ferry		29·5	322	i 6 0	0	—	—	—	—	—
Fort de France		29·6	85	—	—	12 39	SS	—	—	—
Palomar		29·7	315	i 6 0a	− 2	—	—	—	—	—
Boulder City		29·9	321	i 6 3	− 1	—	—	—	—	—
Overton	Z.	30·0	322	i 6 5	0	—	—	—	—	—
Riverside	Z.	30·4	315	i 6 6	− 2	—	—	—	—	—
Huancayo		30·8	147	e 6 10	− 2	e 11 14	+ 5	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena	z.	31·1	315	e 6 12	− 2	—	—	—	—	—
Haiwee	z.	32·0	320	e 6 21	− 1	—	—	—	—	—
Logan		32·4	333	e 6 13	−13	—	—	—	—	—
Tinemaha	z.	32·8	320	i 6 28	− 1	—	—	—	—	—
Harvard		33·0	28	e 6 42	+11	—	—	—	—	e 19·4
Ottawa	z.	33·8	20	e 6 39	+ 1	—	—	—	—	—
Lick	z.	35·1	317	e 6 48a	− 1	—	—	—	—	—
Reno	z.	35·2	323	e 6 51	+ 1	—	—	—	—	—
Berkeley		35·8	317	i 6 52k	− 3	e 12 31	+ 4	—	—	e 18·9
Mineral	z.	36·8	322	e 7 3	0	—	—	e 8 4	PP	—
Shasta Dam		37·5	322	i 7 6	− 3	—	—	i 9 25	PcP	—
La Paz		38·4	141	e 7 20	+ 3	e 13 16	+ 9	—	—	—
Hungry Horse		38·6	337	i 7 19	+ 1	—	—	—	—	—
Victoria	z.	42·9	330	e 7 52a	− 2	—	—	—	—	—
Resolute Bay		60·4	359	—	—	e 19 36	?	—	—	31·1
College		63·1	337	e 10 21	− 2	—	—	i 10 58	PcP	—
Granada		80·0	54	i 12 24a	pP	—	—	—	—	—
Stuttgart		86·4	40	e 12 38	+ 2	—	—	—	—	e 45·6
Ksara		110·9	46	e 16 34	P	e 25 56	SKKS	—	—	—

Additional readings :—
Tucson i = 5m.35s., e = 9m.3s.
Long waves were also recorded at Scoresby Sund and other American and European stations.

Oct. 24d. 6h. 16m. 48s. I
9h. 28m. 57s. II
15h. 55m. 14s. III
} Epicentre 14°·3N. 91°·7W. Depth of focus 0·005. (as at 5h.).

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Oaxaca	5·5	299	—	—	c 2 31	+ 7	—	—	—
II Vera Cruz	6·5	319	1 41	+ 6	3 5	+16	—	—	—
III Merida	6·9	17	2 1	?	3 23	?	—	—	—
I Puebla	7·8	309	—	—	3 32	+11	—	—	—
II	7·8	309	1 59	+ 6	3 34	+13	—	—	—
III	7·8	309	2 7	+14	3 37	+16	—	—	—
I Tacubaya	8·8	306	2 9	+ 2	3 53	+ 7	—	—	—
II	8·8	306	2 11	+ 4	3 54	+ 8	—	—	—
III	8·8	306	2 17	+10	3 58	+12	—	—	—
II Balboa Heights	13·0	113	e 3 13	+ 9	—	—	—	—	—
III Chihuahua	19·5	320	e 5 14	PP	—	—	—	—	—
I Bogota	19·9	118	i 4 23	− 6	—	—	—	—	—
II z.	19·9	118	i 4 23	− 6	—	—	—	—	—
III	19·9	118	i 4 25	− 4	i 8 16	+12	—	—	—
II San Juan	24·9	76	e 5 57	PP	—	—	e 6 56	PPP	e 10·6
I Tucson	25·0	320	e 5 18	− 1	—	—	e 6 28	PP	—
II	25·0	320	e 5 18	− 1	e 9 50	+14	e 6 21	PP	e 13·2
III	25·0	320	e 5 18	− 1	i 9 37	+ 1	i 6 24	PP	e 10·0
I Pierce Ferry	29·5	322	e 6 0	0	—	—	—	—	—
II	29·5	322	i 6 0	0	—	—	—	—	—
III	29·5	322	i 6 0	0	—	—	—	—	—
I Palomar z.	29·7	315	e 6 1	− 1	—	—	—	—	—
II	29·7	315	e 6 1	− 1	—	—	—	—	—
III z.	29·7	315	i 6 0	− 2	—	—	—	—	—
I Boulder City	29·9	321	i 6 3	− 1	—	—	—	—	—
II	29·9	321	i 6 4	0	—	—	—	—	—
III	29·9	321	i 6 3	− 1	—	—	—	—	—
I Overton z.	30·0	322	i 6 5	0	—	—	—	—	—
II z.	30·0	322	i 6 5	0	—	—	—	—	—
III z.	30·0	322	i 6 5	0	—	—	—	—	—
III Huancayo	30·8	147	e 6 7	− 5	—	—	—	—	—
III Palisades	30·8	27	—	—	—	—	e 13 54	Q	e 19·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Haiwee	z.	32·0	320	e 6 21	− 1	—	—	—	—	—
II	z.	32·0	320	e 6 21	− 1	—	—	—	—	—
II Logan		32·4	333	e 5 13	−73	—	—	—	—	—
III		32·4	333	e 6 12	−14	—	—	—	—	—
II Tinemaha	z.	32·8	320	e 6 27	− 2	—	—	—	—	—
III	z.	32·8	320	e 6 28	− 1	—	—	—	—	—
III Harvard		33·0	28	e 6 28	− 3	—	—	—	—	e 19·7
III Weston		33·1	28	i 6 30	− 1	—	—	—	—	—
II Ottawa	z.	33·8	20	e 6 37	− 1	—	—	—	—	—
III	z.	33·8	20	e 6 34	− 4	—	—	—	—	—
I Lick	z.	35·1	317	e 6 52a	+ 3	—	—	—	—	—
II	z.	35·1	317	e 5 48k	− 1	—	—	—	—	—
III	z.	35·1	317	e 6 48a	− 1	—	—	—	—	—
III Reno	z.	35·2	323	e 6 50	0	—	—	—	—	—
I Mineral	z.	36·8	322	e 7 3	0	—	—	—	—	—
III Shasta Dam		37·5	322	e 7 5	− 4	—	—	—	—	—
I Hungry Horse		38·6	337	i 7 28	+10	—	—	—	—	—
II		38·6	337	i 7 18	0	—	—	—	—	—
III		38·6	337	i 7 18	0	—	—	—	—	—
I Victoria	z.	42·9	330	e 7 54	0	—	—	—	—	—
II	z.	42·9	330	e 7 53	− 1	—	—	—	—	—
III	z.	42·9	330	e 7 52	− 2	—	—	—	—	—
I College		63·1	337	e 10 20	− 3	—	—	—	—	—
II		63·1	337	e 10 22	− 1	—	—	—	—	—
III		63·1	337	i 10 19	− 4	—	—	i 10 56	P_cP	—
III Granada		80·0	54	i 15 34a	PP	—	—	—	—	—

Additional readings :—
Tucson I e =5m.33s., II i =5m.34s.
Victoria III e =8m.1s.
Long waves were also recorded for shock II at Bozeman, Harvard, Weston, Salt Lake City, Berkeley, Seattle, Philadelphia, Palisades, Resolute Bay, Scoresby Sund, and De Bilt ; shock III at San Juan, Philadelphia, Resolute Bay, Scoresby Sund, De Bilt, Potsdam, and Strasbourg.

Oct. 24d. 11h. 47m. 53s. Epicentre 47°·2N. 14°·5E. (as on 18d.).

Slight damage at St. Peter, Reichenfels, St. Leonard (Carinthia), and Obdach (Steiermark). Epicentre 47°N. 14°·8E. Macroseismic area 10,000 sq. km.

Makroseismische Beobachtungen, 1950, Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, Jahrgang, 1950, Neue Folge, 87. Band, Vienna, 1951, pp. E1, E2, with macroseismic chart.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	1·6	198	e 0 28	− 2	i 0 49	− 2	—	—	—
Ogyalla	2·6	75	e 0 44	0	—	—	e 0 53	P_g	—
Prague	2·9	359	e 0 48	0	e 1 25	+ 1	i 0 57	P_g	—
Budapest	3·1	83	e 1 7	P_g	i 1 46	S_g	—	—	i 1·8
Cheb	3·2	334	e 0 50	− 2	e 1 35	+ 3	e 1 4	P_g	—
Salo	3·2	240	e 1 0	P*	e 1 36	+ 4	e 1 11	P_g	—
Chur	3·4	266	e 0 56k	+ 1	1 51	S_g	i 1 4	P*	—
Ravensburg	3·4	282	e 0 56?	+ 1	e 1 52	S_g	e 1 11	P_g	—
Bologna	3·5	220	e 1 9	P_g	e 1 35	− 5	e 1 53	S_g	—
Stuttgart z.	3·9	296	e 1 1	− 1	i 1 51	+ 1	i 1 19	P_g	—
Zürich	4·0	275	i 1 4a	0	e 2 13	S_g	e 1 16	P_g	—
Collmberg z.	4·2	347	e 1 7	0	e 1 57	0	e 1 23	P_g	—
Jena	4·2	334	e 1 8	+ 1	e 1 52	− 5	e 1 27	P_g	—
Pavia	4·2	244	e 1 10	+ 3	—	—	i 1 14	P*	—
Skalnate Pleso	4·3	61	e 1 31	P_g	e 1 57	− 3	e 2 18	S_g	—
Karlsruhe	4·5	296	1 19	P*	e 2 21	S*	—	—	—
Basle	4·7	277	e 1 22	P*	—	—	e 2 32	S_g	—
Strasbourg	4·7	290	e 1 32k	P_g	e 2 15	+ 5	i 2 43	S_g	i 2·8
Neuchatel	5·2	271	e 1 19	− 2	e 2 48	S_g	—	—	—
Potsdam	5·3	351	—	—	e 2 51	S_g	—	—	i 3·0
Besançon	5·8	274	e 1 32	+ 3	e 2 33	− 5	i 1 49	P_g	—
Warsaw	6·6	38	—	—	e 3 7?	+ 9	—	—	e 4·1
Ksara	21·0	122	e 4 21	−26	e 7 51	−46	—	—	—

For Notes see next page.

NOTES TO OCTOBER 24d. 11h. 47m. 53s.

Additional readings :—
Ogyalla eP*E =49s.
Prague iP* =54s., e =1m.7s., 1m.12s., 1m.15s., and 1m.28s., eS* =1m.32s., eS$_g$ =1m.36s.
Cheb eS* =1m.39s., eS$_g$ =1m.44s.
Salo eN =1m.18s., iSEN =1m.43s.
Ravensburg eZ =1m.5s., eS$_g$? =1m.59s. and 2m.4s.
Stuttgart ePZ =1m.4s., eZ =1m.8s., eP*Z =1m.11s., eZ =1m.15s. and 1m.27s., eSZ = 1m.45s., iZ =2m.5s., iS*Z =2m.9s., iZ =2m.12s. and 2m.15s., iS$_g$Z =2m.17s. and 2m.20s., iZ =2m.27s.
Collmberg eSZ =1m.41s., iS$_g$ =2m.16s.
Jena eE =1m.17s. and 1m.41s., eN =1m.45s., eEN =2m.0s., iN =2m.8s., iSEN = 2m.11s., iN =2m.15s., iS$_g$EN =2m.20s.
Pavia e =1m.37s.
Skalnate Pleso e =2m.25s. and 2m.47s.
Strasbourg i =1m.48s., 1m.56s., and 2m.7s., iS* =2m.35s.
Besançon iS$_g$ =3m.10s.

Oct. 24d. 16h. 18m. 14s. Epicentre 47°·2N. 10°·8E. (as on 1949, December 7d.).

Intensity IV-V to the east of Ried, Tyrol. Macroseismic epicentre 47°N. 10°·6E., area 1000 sq. km.

Makroseismische Beobachtungen, 1950. Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, Jahrgang, 1950, Neue Folge, 87. Band, Vienna, 1951, pp. E1, E3, with macroseismic chart.

A = +·6698, B = +·1278, C = +·7314 ; δ = −9 ; h = −4 ;
D = +·187, E = −·982 ; G = +·718, H = +·137, K = −·682.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chur		0·9	248	i 0 17$_s$	− 3	e 0 29	− 5	—	—	—
Ravensburg	z.	1·0	306	e 0 19?	− 2	e 0 35	− 1	e 0 22	P$_g$	—
Zürich		1·5	276	e 0 30k	+ 2	e 0 50	+ 1	—	—	—
Stuttgart	z.	1·9	326	e 0 36	+ 2	e 1 0	+ 1	e 0 42	P$_g$	—
Basle		2·2	279	e 0 44	P$_g$	e 1 12	S$_g$	—	—	—
Strasbourg		2·5	304	i 0 50k	P$_g$	i 1 18	P*	i 1 28	S$_g$	—
Neuchatel		2·6	266	e 0 50	P$_g$	e 1 23	P*	—	—	—
Besançon		3·3	271	—	—	e 1 46	S$_g$	—	—	e 2·0
Jena		3·8	8	e 1 29	P$_g$	e 1 47	0	e 2 8	S$_g$	—
Prague		3·8	39	e 1 16	P$_g$	e 1 47	0	e 2 7	S$_g$	—
Collmberg	z.	4·4	19	e 1 10	0	e 1 53	− 9	e 1 29	P$_g$	—
Ksara		23·2	116	e 4 22	−47	e 7 20	?	—	—	—

Additional readings :—
Chur i =32s.
Ravensburg eS$_g$Z =39s.
Stuttgart eP*Z =40s., eZ =1m.3s., eS*Z =1m.5s., eS$_g$Z =1m.11s., eZ =1m.14s.
Strasbourg i =1m.7s.
Jena eN =1m.50s., eEN =2m.2s. and 2m.6s.
Prague eS$_g$ =2m.15s.
Collmberg eZ =1m.17s., eS$_g$Z =2m.27s., eZ =2m.33s.

Oct. 24d. 22h. 18m. 42s. Epicentre 43°·7N. 147°·6E. (as on 1948, September 23d.).

A = −·6124, B = +·3886, C = +·6884 ; δ = −6 ; h = −3 ;
D = +·536, E = +·844 ; G = −·581, H = +·369, K = −·725.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Mizusawa	E.	6·7	229	1 41	− 1	2 47	−13	—	—
College		40·9	35	i 7 48	+ 2	—	—	—	—
Shasta Dam		63·4	58	e 10 33	− 1	—	—	—	—
Hungry Horse		63·7	47	i 10 36	0	—	—	—	—
Lick	z.	65·9	61	e 11 1k	+11	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tinemaha	z.	68·2	59	e 10 51	−13	—	—	—	—
Pasadena	z.	70·1	61	e 11 16	0	—	—	—	—
Riverside	z.	70·7	61	e 11 30	+10	—	—	—	—
Overton	z.	70·9	57	i 11 24	+ 3	—	—	—	—
Boulder City		71·0	58	e 11 21	− 1	—	—	—	—
Palomar	z.	71·4	62	e 11 35	+11	—	—	—	—
Pierce Ferry		71·4	57	i 11 26	+ 2	—	—	—	—
Potsdam	z.	76·6	334	e 11 53	− 1	—	—	—	—
Collmberg	z.	77·5	331	e 11 58	− 1	—	—	—	—
Prague		78·1	332	e 11 58	− 4	e 21 53	− 3	—	—
Ksara		80·9	307	e 12 18	+ 1	24 50	PS	—	—
Stuttgart	z.	80·9	333	e 12 18	+ 1	—	—	—	—
Strasbourg		81·6	334	e 12 21	0	—	—	—	—
Paris		82·9	337	e 12 30	+ 2	—	—	i 12 40	PeP
Besançon		83·3	335	e 12 28	− 2	—	—	—	—
Tamanrasset	z.	105·2	324	e 11 55	?	—	—	—	—

Additional readings :—
Mizusawa P?N =1m.47s.
Collmberg eZ =12m.26s.
Stuttgart eZ =12m.28s.
Strasbourg i =12m.26s., e =12m.31s.
Besançon e =12m.39s.
Long waves were also recorded at Copenhagen, Warsaw, De Bilt, and Rome.

Oct. 24d. Readings also at 1h. (Puebla, Tacubaya, Vera Cruz, Lunacharskoe, near Andijan, Fergana, Kulyab, and Obi-garm), 2h. (College and Seattle), 3h. (Potsdam), 4h. (Brisbane, Chinchina, Tucson, Overton, Pierce Ferry, and College (2)), 5h. (Puebla, Tacubaya (2), Vera Cruz, Palomar, Tucson (2), Boulder City (2), Overton (2), Pierce Ferry (2), Victoria (2), and College (2)), 6h. (Victoria and near Istanbul), 8h. (Tacubaya), 11h. (near Alicante (2)), 12h. (Tacubaya, Palomar, Tinemaha, Boulder City, Overton, Pierce Ferry, Hungry Horse, Victoria, College, and near Klyuchi), 13h. (Rathfarnham Castle), 14h. (Lunacharskoe, near Andijan, Fergana, and Obi-garm), 16h. (Stuttgart), 17h. (Tacubaya and College), 19h. (Tacubaya, Palomar, College, Tucson, Overton, and Pierce Ferry), 20h. (Wellington, near Irkutsk, and near Andijan), 21h. (Palisades (2) and Rome), 22h. (Brisbane, Riverview, Christchurch, Kaimata, Wellington, Pierce Ferry, Overton, Shasta Dam, College, Collmberg, Potsdam, Besançon, Paris, Strasbourg, Stuttgart, and near Yalta).

Oct. 25d. 5h. 5m. 8s. Epicentre 14°·3N. 91°·7W. Depth of focus 0·005 (as on 24d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Puebla		7·8	309	1 55	+ 5	3 27	+ 6	—	—	—
Tacubaya		8·8	306	2 8	+ 1	3 50	+ 4	—	—	—
Bogota		19·9	118	e 4 35	+ 6	e 7 30	−34	—	—	—
San Juan		24·9	76	e 6 5	PP	—	—	—	—	e 11·7
Tucson		25·0	320	i 5 17	− 2	e 9 56	+20	e 5 42	pP	e 10·4
Pierce Ferry		29·5	322	i 5 59	− 1	—	—	—	—	—
Palomar		29·7	315	i 6 0	− 2	—	—	—	—	—
Boulder City		29·9	321	e 6 2	− 2	—	—	—	—	—
Overton	z.	30·0	322	i 6 4	− 1	—	—	—	—	—
Riverside	z.	30·4	315	e 6 6	− 2	—	—	—	—	—
Palisades		30·8	27	i 6 13	+ 1	—	—	—	—	e 17·9
Pasadena	z.	31·1	315	e 6 11	− 3	—	—	—	—	—
Tinemaha	z.	32·8	320	e 6 28	− 1	—	—	—	—	—
Weston		33·1	28	e 6 31	− 1	—	—	—	—	—
Ottawa	z.	33·8	20	e 6 40	+ 2	—	—	—	—	—
Lick	z.	35·1	317	e 6 47a	− 2	—	—	—	—	—
Hungry Horse		38·6	337	i 7 19	+ 1	—	—	—	—	—

Long waves were also recorded at Berkeley and Philadelphia.

Oct. 25d. 7h. 3m. 23s. Epicentre 26°·3N. 126°·2E. Depth of focus 0·015.
(as on 1938, July 8d.).

$A = -·5302$, $B = +·7244$, $C = +·4407$; $\delta = +8$; $h = +3$;
$D = +·807$, $E = +·591$; $G = -·260$, $H = +·356$, $K = -·898$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		6·4	321	i 1 33	0	2 52	+ 7	—	—	—
Nanking	E.	8·6	313	i 2 2k	− 1	e 3 17	−22	—	—	i 3·5
Vladivostok		17·4	14	e 4 1	+ 5	i 7 22	+19	i 4 27	pP	—
Mizusawa	E.	17·9	39	4 24	PP	7 45	SS	—	—	—
Irkutsk		30·7	332	6 6	+ 1	—	—	—	—	—
Calcutta	E.	34·6	273	e 6 33	− 5	i 11 51	− 6	7 42	PP	15·6
Djakarta	Z.	37·4	213	i 6 57	− 5	—	—	—	—	—
Bandong		37·6	211	i 7 34	+30	—	—	—	—	—
Almata		43·2	307	i 7 50	0	—	—	—	—	—
New Dehli		43·3	285	e 7 48	− 3	i 13 58	−10	17 36	SSS	i 17·1
Naryn		43·7	304	i 7 52	− 2	e 14 8	− 6	—	—	—
Frunse		44·9	306	i 8 1	− 2	i 14 29	− 2	—	—	—
Hyderabad	E.	45·0	269	—	—	14 24	− 8	—	—	—
Andijan		46·4	302	8 15	0	e 14 52	0	—	—	—
Fergana		46·9	302	i 8 17	− 2	—	—	—	—	—
Obi-garm		48·5	300	i 8 32	0	i 15 22	0	—	—	—
Tchimkent		48·5	305	i 8 29	− 3	i 15 17	− 5	—	—	—
Poona		48·7	273	i 8 31	− 2	i 15 19	− 6	8 51	pP	22·3
Luncharskoe		48·8	303	i 8 39	+ 5	—	—	—	—	—
Tashkent		48·8	303	i 8 33	− 1	i 15 22	− 4	e 9 2	pP	—
Bombay		49·5	274	e 9 3	pP	i 15 27	− 9	—	—	—
Samarkand		50·6	301	e 8 45	− 3	—	—	—	—	—
Mary		54·8	299	i 9 17	− 2	—	—	—	—	—
Sverdlovsk		55·1	322	i 9 22	+ 1	i 16 52	0	i 9 50	pP	—
Ashkabad		57·5	300	i 9 39	+ 1	—	—	—	—	—
Brisbane	Z.	59·4	152	i 9 52a	+ 1	—	—	—	—	—
Baku		63·5	304	—	—	e 18 44	+ 4	—	—	—
Riverview		64·3	157	i 10 26a	+ 2	e 18 58	+ 8	e 10 54	pP	e 33·2
College		64·8	27	i 10 32	+ 5	e 19 9	+13	i 10 45	pP	e 32·3
Leninakan		67·8	306	e 10 48	+ 2	—	—	—	—	—
Moscow		67·9	322	e 10 45	− 2	e 19 32	− 1	11 15	pP	—
Pulkovo		70·5	328	i 11 1	− 2	20 3	− 1	e 20 52	sS	—
Helsinki		72·9	330	—	—	e 21 14	PS	—	—	e 30·6
Resolute Bay		75·8	11	i 11 38	+ 5	21 10	+ 7	21 47	PS	—
Ksara		76·1	330	i 11 37	+ 2	e 21 49	PS	14 31	PP	—
Lwow		77·7	320	i 11 45	+ 1	i 21 23	− 1	12 16	pP	—
Istanbul		78·2	310	e 11 46	− 1	e 21 50	+21	—	—	—
Warsaw		78·3	323	—	—	21 33	+ 3	22 23	PS	e 31·6
Skalnate Pleso		80·2	320	—	—	e 22 25?	PS	—	—	—
Kaimata	N.E.	80·2	147	e 12 0	+ 2	—	—	—	—	—
Wellington		80·9	145	e 11 58	− 3	e 21 37?	−21	—	—	—
Copenhagen		80·9	328	e 12 3	+ 2	i 22 0	+ 2	—	—	—
Scoresby Sund		80·9	350	i 12 3	+ 2	e 22 7	+ 9	i 15 10	PP	38·6
Helwan		81·2	299	e 12 3	0	22 10	+ 9	—	—	—
Christchurch		81·5	147	12 7	+ 3	(e 22 12)	+ 8	e 15 7	PP	e 22·2
Potsdam		82·4	325	i 12 10	+ 1	e 22 13	0	e 12 31	pP	e 42·6
Prague		83·0	323	e 12 12	0	e 22 17	− 2	e 12 53	sP	—
Victoria	Z.	83·0	39	e 12 20	+ 8	—	—	—	—	—
Collmberg	Z.	83·1	324	e 12 13	0	—	—	e 12 47	pP	—
Jena		84·0	325	e 12 18	+ 1	e 15 15	PP	e 12 40	pP	—
Seattle		84·1	39	i 12 27a	+ 9	e 22 37	+ 7	i 12 58	pP	—
De Bilt		86·5	328	i 12 32	+ 2	e 22 48	− 5	—	—	e 41·6
Stuttgart	Z.	86·5	323	i 12 31k	+ 1	e 22 46	− 7	e 13 4	pP	e 39·6
Karlsruhe		86·8	325	i 12 29	− 2	—	—	—	—	—
Strasbourg		87·4	323	e 12 35	+ 1	e 22 51	−11	e 13 7	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam		87·9	45	e 12 42	+ 6	e 22 42	−24	i 13 12	pP	—
Basle		88·1	323	e 12 38	+ 1	e 21 31	?	e 15 22	PP	—
Hungry Horse		88·2	35	i 12 45	+ 7	i 23 2	− 7	i 13 16	pP	—
Mineral	z.	88·6	45	e 12 46a	+ 6	—	—	e 13 17	pP	—
Rome		88·6	317	e 12 41	+ 1	i 22 57	[+ 2]	e 16 7	PP	—
Besançon		89·2	324	e 12 44	+ 2	—	—	e 13 19	pP	—
Saskatoon		89·3	29	—	—	e 23 10	− 9	e 23 35	pS	—
Kew		89·4	330	e 11 39	− 4	e 22 26	−54	—	—	e 41·6
Berkeley		89·5	47	i 12 48a	+ 4	e 23 11	−10	e 13 19	pP	—
Paris		89·9	327	e 16 23	PP	e 23 7	−18	e 24 56	PS	—
Lick	z.	90·2	47	e 12 54k	+ 7	—	—	e 13 22	pP	—
Reno	z.	90·2	45	e 12 55	+ 8	—	—	e 13 25	pP	—
Butte	N.	90·5	36	—	—	e 23 45	+15	—	—	—
Rathfarnham Castle		90·7	334	e 13 16	P_cP	e 21 53	?	—	—	—
Bozeman		91·5	36	—	—	i 23 49	+10	e 23 14	SKS	—
Fresno	z.	91·8	47	e 13 1a	+ 7	e 16 40	PP	e 13 31	pP	—
Tinemaha	z.	92·6	47	i 13 5	+ 7	e 16 39	PP	i 13 36	pP	—
Haiwee	z.	93·3	47	i 13 9	+ 8	e 16 54	PP	e 13 40	pP	—
Logan		93·6	39	e 12 56	− 7	—	—	e 13 28	pP	e 32·2
Pasadena		94·3	48	i 13 12	+ 6	e 16 57	PP	e 13 45	pP	—
Riverside	z.	95·0	48	e 13 16	+ 7	e 17 0	PP	e 13 46	pP	—
Overton	z.	95·4	45	e 13 18	+ 7	i 17 13	PP	i 13 51	pP	—
Boulder City		95·5	46	e 13 19	+ 8	—	—	—	—	—
Palomar		95·7	48	i 13 19	+ 7	i 16 59	PP	i 13 50	pP	—
Pierce Ferry		95·9	45	e 13 21	+ 8	—	—	—	—	—
Tucson		100·4	46	e 13 42	+ 8	e 24 23	[+24]	e 14 13	pP	—
St. Louis		107·0	29	e 18 36	PP	i 24 38	[+ 9]	e 26 3	S	—
Weston		109·8	13	e 18 56	PP	—	—	—	—	—
Palisades		110·5	15	—	—	e 24 53	[+ 9]	—	—	—
San Juan		134·0	16	e 21 34	PP	e 41 8	SS	22 19	pPP	—
Bogota		143·5	35	e 19 23	[+ 3]	e 22 49	PKS	e 40 17?	SS	—
Huancayo		155·3	59	e 19 46	[+ 8]	e 43 43	SS	e 34 46	PS	—
La Paz		163·5	56	19 54	[+ 7]	26 51	[+ 14]	20 55	PKP_3	—

Additional readings :—
Calcutta PPPE =8m.4s., P_cPE =9m.19s., P_cSE =13m.4s., SSSE =14m.10s., S_cSE = 17m.2s.
New Delhi iEN =14m.48s.
Poona sPEZ =9m.4s., PPPE =11m.7s., PSE =15m.27s., PPSE =15m.35s., sSE = 15m.57s.?, S_cSE =18m.7s., SSE =18m.34s., SSSE =19m.47s.
Sverdlovsk sS =17m.38s.
Riverview isSE =19m.49s., eSKSN =19m.56s., iS_cSN =20m.13s.
College ePKP,PKP =38m.59s.
Moscow esS =20m.18s.
Resolute Bay e =12m.20s. and 21m.35s., PPS =22m.30s., SSS =29m.13s.
Scoresby Sund e =15m.38s.
Potsdam ePPE =15m.24s., iSE =22m.16s., ePSZ =23m.24s., ePSE =23m.29s.
Prague e =13m.1s., 13m.21s., and 13m.48s.
Collmberg eZ =12m.25s.
Jena eE =14m.6s. and 14m.29s.
Seattle i =13m.23s.
De Bilt e =22m.57s.
Stuttgart eZ =12m.43s. and 14m.20s., iZ =14m.24s., eZ =14m.48s., ePPZ =15m.48s., ePS =23m.47s., e =35m.25s.
Strasbourg e =13m.43s., ePP =16m.1s., epPP =16m.24s., e =16m.52s., 21m.55s., and 23m.27s., esS =23m.45s., e =26m.37s.
Shasta Dam e =26m.17s.
Rome eSS?N =28m.45s.
Besançon e? =12m.24s., e =15m.50s., ePP =16m.14s., epPP =16m.38s.
Kew eSKS? =22m.3s.
Berkeley iN =23m.36s.
Rathfarnham Castle eZ =14m.22s. and 35m.17s.
Tinemaha iZ =13m.21s.
Pasadena eZ =13m.28s.
Riverside eZ =13m.31s.
Palomar iZ =13m.35s., iEN =13m.53s., iE =14m.31s., i =17m.12s., iEN =17m.27s.
Tucson ePP =17m.48s., ePKKP =30m.12s.
San Juan e =28m.22s.
La Paz PPZ =24m.45s., iSKKS =31m.17s., i =35m.17s., ePS =37m.43s., SS =44m.55s.

Oct. 25d. 8h. 44m. 6s. Epicentre 6°·2S. 154°·8E. (as on 1949, Oct. 5d.).

$A = -\cdot8996$, $B = +\cdot4233$, $C = -\cdot1073$; $\delta = -2$; $h = +7$;
$D = +\cdot426$, $E = +\cdot905$; $G = +\cdot097$, $H = -\cdot046$, $K = -\cdot994$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		21·2	184	i 4 48k	− 1	—	—	—	—	—
Tuai	N.	38·2	152	e 7 22	− 1	—	—	—	—	—
Kaimata	N.E.	39·1	161	e 6 33	−58	—	—	—	—	—
Wellington		39·2	156	e 7 30	− 1	e 13 17	−15	—	—	19·7
College		82·4	21	e 12 25	0	e 22 44	+ 3	e 29 31	PKKP	—
Berkeley		88·2	53	e 12 56	+ 2	—	—	—	—	e 41·2
Lick	Z.	88·6	52	e 12 58a	+ 2	—	—	—	—	—
Shasta Dam		88·6	49	i 12 56	0	—	—	—	—	—
Mineral	Z.	89·1	50	e 13 0	+ 2	—	—	—	—	—
Fresno	Z.	90·0	53	e 13 4k	+ 1	—	—	e 16 56	PP	—
Reno	Z.	90·4	51	e 13 7	+ 3	—	—	—	—	—
Pasadena		91·0	56	e 13 9a	+ 2	—	—	—	—	—
Tinemaha	Z.	91·3	53	i 13 10a	+ 1	—	—	—	—	—
Haiwee	Z.	91·4	54	i 13 11	+ 2	—	—	—	—	—
Riverside		91·6	56	i 13 12a	+ 2	—	—	—	—	—
Palomar		92·0	57	i 13 14a	+ 2	—	—	—	—	—
Boulder City		93·9	55	e 13 23	+ 2	—	—	—	—	—
Overton	Z.	94·3	54	i 13 25	+ 2	—	—	e 17 10	PP	—
Pierce Ferry		94·6	55	i 13 22	− 2	—	—	—	—	—
Hungry Horse		95·4	42	e 13 28	0	—	—	e 30 21	PKKP	—
Tucson		97·0	58	e 13 37	+ 2	e 30 18	PKKP	e 17 30	PP	e 46·2
Ottawa	Z.	121·4	39	i 18 57	[+ 2]	—	—	—	—	—
Palisades		124·5	43	i 19 3	[+ 2]	—	—	—	—	—
Harvard		125·4	40	i 19 5	[+ 2]	—	—	—	—	62·7
Weston		125·6	40	i 19 6	[+ 2]	—	—	—	—	e 62·2
Stuttgart	Z.	128·6	332	e 19 12	[+ 3]	—	—	—	—	—
Strasbourg		129·4	332	e 19 13k	[+ 2]	—	—	—	—	—
Besançon		131·1	332	e 19 17	[+ 3]	—	—	—	—	—
La Paz		131·9	118	i 19 18	[+ 2]	28 12	{−19}	21 34	PP	—
Tamanrasset	Z.	146·1	303	i 19 44k	[+ 3]	—	—	i 23 4	PP	—

Additional readings :—
Brisbane ePE =4m.54s.
Kaimata eNE =6m.36s.
College i =13m.11s., e =30m.20s.
Fresno eZ =15m.40s.
Reno eZ =13m.26s. and 13m.37s.
Pasadena iZ =13m.20s.
Tamanrasset iZ =20m.0s. and 21m.2s.
Long waves were also recorded at Prague, Bozeman, and Philadelphia.

Oct. 25d. Readings also at 0h. (Apia, College (2), Puebla, Tacubaya, and Collmberg), 1h. (near Obi-garm), 2h. (Brisbane, Riverview, Huancayo, Sverdlovsk, and Tamanrasset), 3h. (Prague and near Andijan), 5h. (Overton), 6h. (Alicante and near Istanbul), 7h. (Poona), 9h. (Ashkabad), 10h. (Ksara and College), 11h. (Brisbane, Overton (2), and Pierce Ferry), 13h. (College), 14h. (Puebla, Tacubaya, Palisades, Tucson (2), Overton (2), Pierce Ferry (2), Berkeley, Hungry Horse, College, Collmberg, and Prague), 15h. (Overton, Hungry Horse, College, near Andijan, and near Mizusawa), 16h. (Apia, Overton, Pierce Ferry, and College (3)), 17h. and 18h. (College), 20h. (Wellington, near Fergana, Andijan (2), Murgab, and Tchimkent), 21h. (Palisade, Weston, and near Ottawa).

Oct. 26d. 3h. 49m. 53s. Epicentre 32°·8S. 178°·1W. (as on 24d.).

$A = -·8418$, $B = -·0279$, $C = -·5391$; $\delta = +3$; $h = +1$;
$D = -·033$, $E = +·999$; $G = +·539$, $H = +·018$, $K = -·842$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	7·1	233	e 1 54	+ 6	i 3 34	S*	i 2 2	P*	—
Tuai	N.	7·1	211	e 1 7?	?	—	—	—	—	—
New Plymouth	E.	8·9	223	e 3 7?	?	—	—	—	—	—
Wellington		10·2	212	e 2 41	+10	4 24	− 3	e 2 52	PP	—
Kaimata	N.E.	12·8	217	e 2 25	−41	e 4 23	−67	—	—	—
Christchurch		13·0	212	e 3 22	+13	e 5 27	− 8	—	—	—
Apia		19·8	20	e 4 23	−12	e 7 59	−14	—	—	—
Brisbane	E.	25·5	274	i 5 32	0	e 10 7	+10	—	—	—
Riverview		25·7	258	i 5 35a	+ 2	e 10 24	+23	—	—	e 12·5
Honolulu		57·2	23	—	—	e 19 30	?	e 24 32	Q	e 31·4
Pasadena		87·2	46	i 12 46	− 3	e 23 13	[− 2]	—	—	e 42·8
Santa Clara	E.	87·2	41	—	—	e 23 34	+ 6	—	—	e 36·1
Berkeley		87·4	41	e 12 49k	− 1	e 23 29	− 1	e 23 9	SKS	e 31·8
Lick	Z.	87·4	41	e 12 47a	− 3	—	—	—	—	—
Palomar		87·5	47	i 12 45	− 6	—	—	—	—	—
Riverside	Z.	87·6	46	i 12 48	− 3	—	—	—	—	—
Fresno	E.	88·0	43	e 12 49	− 4	—	—	—	—	—
Vladivostok		88·3	326	i 12 49	− 6	e 23 20	[− 2]	—	—	—
Tinemaha	Z.	89·2	44	i 12 57	− 2	—	—	—	—	—
Shasta Dam		89·4	39	e 12 53	− 7	—	—	—	—	—
Mineral	Z.	89·6	40	e 12 59	− 2	—	—	—	—	—
Reno	Z.	90·0	41	e 13 2	− 1	—	—	—	—	—
Boulder City		90·5	47	e 13 2	− 3	—	—	—	—	—
Tucson		90·6	51	e 13 3	− 2	e 23 58	− 2	e 23 31	SKS	e 41·0
Overton	Z.	91·1	46	e 13 4	− 4	—	—	—	—	—
Pierce Ferry		91·1	47	e 13 5	− 3	—	—	—	—	—
La Plata	E.	92·3	135	—	—	23 37	[− 9]	—	—	46·1
Huancayo		94·1	107	e 13 23?	+ 1	24 37	+ 6	e 23 59	SKS	e 40·1
Salt Lake City		95·3	44	—	—	e 24 36	− 5	—	—	e 51·3
Logan		96·0	43	—	—	e 42 9	Q	—	—	e 47·6
La Paz		97·1	115	13 23	−12	i 24 15	[+ 3]	17 37	PP	50·1
College		100·2	12	e 13 46	− 3	e 24 27	[− 1]	—	—	e 44·7
Colombo	E.	103·8	269	19 12	PP	—	—	—	—	59·1
Bogota		104·3	93	—	—	e 25 3	[+16]	e 29 3	PPS	—
Kodaikanal	E.	107·6	271	—	—	e 25 1	[− 1]	—	—	—
Florissant		108·1	55	—	—	e 26 33	S	e 34 5	SS	—
St. Louis		108·1	55	—	—	e 25 2	[− 2]	e 26 35	S	—
Poona	E.	114·7	276	—	—	e 25 22	[− 9]	e 29 16	PS	—
Cleveland		115·4	55	—	—	i 25 28	[− 5]	e 29 26	PS	e 52·0
Bombay		115·7	276	e 19 7?	[+23]	—	—	—	—	—
Pennsylvania		117·7	57	—	—	e 25 33	[− 9]	i 36 10	SS	—
San Juan		117·9	85	—	—	e 25 32	[−11]	e 29 10	PKKP	e 59·0
Resolute Bay		119·6	17	—	—	e 28 10	?	e 29 56	PS	—
Palisades		120·6	58	e 20 12	PP	e 25 49	[− 3]	e 27 16	SKKS	e 60·7
Ottawa	Z.	120·7	52	e 18 58	[+ 4]	—	—	—	—	—
Weston		122·8	57	e 19 13	[+15]	—	—	—	—	e 64·0
Bermuda		124·8	70	—	—	e 31 23	PS	e 37 13	SS	e 61·2
Sverdlovsk		133·7	319	i 17 46	?	—	—	—	—	—
Moscow		146·2	323	e 19 39	[− 2]	—	—	—	—	—
Pulkovo		147·1	334	i 19 43	[0]	—	—	—	—	—
Ksara		151·7	281	e 19 47	[− 3]	36 47	PPS	23 35	PP	—
Helwan	Z.	154·7	271	19 52	[− 2]	e 27 40	[+41]	20 13	PKP_2	—
Potsdam		158·8	342	e 20 41	[+42]	—	—	—	—	e 85·1
Collmberg	Z.	159·8	339	e 20 25	PKP_2	—	—	—	—	—
Kew		161·3	4	—	—	e 48 7?	SS	—	—	e 80·1
Stuttgart	Z.	163·1	344	e 20 9?	[+ 5]	—	—	e 20 57	PKP_2	—
Strasbourg		163·6	346	e 21 0	PKP_2	—	—	—	—	e 86·1
Rome		167·6	321	e 24 57?	PP	e 31 35	{−16}	35 35	PSKS	—
Tamanrasset	Z.	169·5	194	e 20 9	[0]	i 32 26	{+26}	i 21 25	PKP_2	—
Toledo	E.	171·5	—	—	—	e 34 44	?	—	—	e 101·7

For Notes see next page.

NOTES TO OCTOBER 26d. 3h. 49m. 53s.

Additional readings :—
Auckland iN =2m.8s., 2m.41s., and 3m.27s.
Christchurch eS =5m.20s.
Brisbane eSE =10m.10s., eEN =10m.14s.
Riverview iZ =6m.33s., iE =6m.37s., iN =10m.31s., iE =11m.11s., iN =11m.48s.
Berkeley eZ =21m.48s.
Fresno eZ =12m.54s.
Reno eZ =13m.20s.
Huancayo ePS =25m.37s., e =31m.9s.
La Paz iPS =26m.30s., eSS =31m.27s., SSS =35m.23s., Q =47·4m.
St. Louis eSS =34m.4s.
Cleveland eSSN =35m.33s., eE =44m.41s.
San Juan ePS =29m.49s.
Resolute Bay e =28m.43s., 31m.2s., 33m.40s., 34m.31s., and 36m.29s.
Palisades eSS =36m.40s.
Collmberg eZ =20m.34s.
Rome eSSN =47m.15s.
Tamanrasset eZ =20m.19s., iPPZ =25m.16s., ePPPZ =29m.22s.
Long waves were also recorded at Perth, Fort de France, Scoresby Sund, and other American and European stations.

Oct. 26d. 7h. 10m. 50s. Epicentre 21°·8S. 170°·8E. Depth of focus 0·005.
(as on 1950, June 4d.).

A = −·9173, B = +·1486, C = −·3693 ; δ = −10 ; h = +4 ;
D = +·160, E = +·987 ; G = +·365, H = −·059, K = −·929.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	15·4	168	i 3 39	+ 4	—	—	—	—	—
Brisbane		17·1	247	i 3 56a	0	e 7 8	+ 5	—	—	—
Tuai	N.	17·8	165	e 4 3	− 2	e 7 54	+36	—	—	—
Apia		18·4	68	e 4 13	+ 1	e 7 40?	+ 8	—	—	—
Wellington		19·7	172	i 4 25	− 2	i 8 6	+ 6	—	—	—
Kaimata	N.E.	20·7	180	e 4 10?	−27	—	—	—	—	—
Riverview		21·0	230	e 4 40	0	i 8 30	+ 5	i 5 0	pP	—
Christchurch		21·7	176	4 45	− 2	8 46	+ 8	i 5 6	pP	e 11·2
Lick	Z.	86·6	47	e 12 36a	− 1	—	—	e 12 57	pP	—
Pasadena	Z.	87·5	52	i 12 40	− 2	—	—	i 13 9	pP	—
Shasta Dam		87·8	44	i 12 43	0	—	—	—	—	—
Riverside	Z.	88·0	52	i 12 43	− 1	—	—	e 13 4	pP	—
Palomar	Z.	88·1	53	i 12 42	− 3	—	—	i 13 5	pP	—
Haiwee	Z.	88·6	50	e 12 48	+ 1	—	—	—	—	—
Tinemaha	Z.	88·8	50	i 12 46	− 2	—	—	e 13 4	pP	—
Boulder City		90·7	51	e 12 56	− 1	—	—	—	—	—
Overton	Z.	91·3	51	e 13 24	pP	—	—	—	—	—
Pierce Ferry		91·4	52	i 12 59	− 1	—	—	—	—	—
College		92·1	17	e 12 59	− 4	—	—	—	—	—
Tucson		92·1	56	e 13 3	0	—	—	—	—	—
Ottawa	Z.	121·5	49	e 18 43	[− 3]	—	—	—	—	—
Potsdam	Z.	145·0	338	e 19 48	[+18]	—	—	—	—	—
Collmberg	Z.	145·8	335	i 19 30	[− 1]	—	—	e 19 51	pPKP	—
Prague		146·2	333	e 19 26	[− 6]	e 22 46	PP	e 19 50	pPKP	—
Stuttgart	Z.	149·4	337	e 19 36	[− 1]	—	—	e 20 3	pPKP	—
Strasbourg		150·0	338	e 19 41	[+ 3]	—	—	e 20 23	PKP_3	—
Zürich		150·7	336	e 19 41	[+ 2]	—	—	—	—	—
Besançon		151·8	337	20 10	pPKP	—	—	—	—	—
Tamanrasset	Z.	166·3	277	e 19 58	[0]	e 24 47	PP	e 20 59	PKP_3	—

Additional readings :—
Wellington e =8m.12s.
Riverview iE =4m.55s., iPPEZ =5m.8s., iP_cPEZ =8m.34s., isSN =9m.6s.
Christchurch sPZ =5m.52s., eZ =7m.50s., eS_cS?Z =15m.14s.
Lick eZ =13m.19s.
Riverside iZ =13m.10s.
Prague e =20m.20s. and 21m.13s.
Stuttgart eZ =19m.40s.
Strasbourg e =21m.38s.
Tamanrasset eZ =20m.25s. and 21m.20s.

Oct. 26d. 11h. 46m. 19s. Epicentre 37°·8N. 141°·4E. (as on 1950, June 27d.).

Intensity IV at Sendai and Hukusima; II-III at Onahama, Isinomaki, Mizusawa, Inawashiro, Morioka, Miyako, Hatinohe, and Shirakawa. Epicentre as adopted shallow. Macroseismic radius 200-300km.

Seismo. Bull, Cent. Met. Obs., Japan, 1950, Tokyo, 1952, pp. 44 and 45, with macroseismic chart.

$A = -\cdot6191$, $B = +\cdot4942$, $C = +\cdot6103$; $\delta = -2$; $h = -1$;
$D = +\cdot624$, $E = +\cdot782$; $G = -\cdot477$, $H = +\cdot381$, $K = -\cdot792$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Sendai		0·6	320	0 15	0	0 31	+ 5
Hukusima		0·7	266	0 20k	+ 3	0 31	+ 3
Mizusawa		1·4	351	0 24	− 3	0 36	−10
Mito		1·6	208	0 36	+ 6	0 59	+ 8
Utunomiya		1·8	224	0 36	+ 4	0 59	+ 3
Miyako		1·9	14	0 32	− 2	0 52	− 7
Morioka		1·9	355	0 30	− 4	0 48	−11
Tukubasan		1·9	213	0 39	+ 5	—	—
Akita		2·2	332	0 33	− 5	0 54	−12
Kumagaya		2·3	224	0 48	+ 8	1 13	+ 4
Macbasi		2·3	233	0 44	+ 4	1 4	−·5
Aikawa		2·5	275	0 37	− 6	1 5	− 9
Hatinohe		2·7	2	0 42	− 3	1 9	−10
Yokohama		2·7	211	1 3	P_g	1 37	S_g
Matusiro		2·8	244	1 39	S	(1 39)	S_g
Nagano		2·8	246	1 5	P_g	1 47	S_g
Aomori		3·0	355	0 49	− 1	1 21	− 6
Hunatu		3·1	223	0 55	+ 4	1 36	+ 7
Mera		3·1	204	1 16	P_g	2 5	S_g
Misima		3·3	216	1 9	P_g	—	—
Osima		3·4	208	0 57	+ 2	1 41	+ 4
Toyama		3·5	253	1 15	P_g	—	—
Gihu		4·4	239	1 38	P_g	2 33	S_g
Nagoya		4·4	235	2 27	S_g	—	—
Sapporo		5·3	359	1 3	−19	—	—
Owase		5·6	230	2 1	P_g	—	—
Nemuro		6·4	29	2 33	P_g	3 25	S_g
College		48·5	33	e 8 38	− 8	—	—
Brisbane	z.	65·8	169	i 13 3a	PP	—	—
Shasta Dam		70·7	53	e 11 12	− 8	—	—
Hungry Horse		71·2	43	i 11 15	− 8	—	—
Lick	z.	73·0	56	e 11 58a	+25	—	—
Tucson		83·1	55	e 12 22	− 7	—	—

Oct. 26d. 15h. 38m. 42s. Epicentre 32°·8S. 178°·1W. (as at 3h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	7·1	233	e 1 54	+ 6	i 3 29	S_g	i 2 8	P*	i 3·6
Tuai	N.	7·1	211	e 1 18?	?	—	—	—	—	—
New Plymouth	E.	8·9	223	i 2 34	P*	i 4 16	+21	—	—	—
Wellington		10·2	212	e 2 39	+ 8	i 4 25	− 2	—	—	—
Kaimata	N.E.	12·8	217	e 2 14	−52	e 4 24	−66	—	—	—
Christchurch		13·0	212	e 3 26	+17	5 31	− 4	—	—	6·6
Apia		19·8	20	e 4 25	−10	e 8 1	−12	—	—	—
Brisbane		25·5	274	i 5 33k	+ 1	i 10 11	+14	—	—	—
Riverview		25·7	258	i 5 41k	+ 8	i 10 29	+28	i 6 19	PP	e 13·2
Perth		54·9	252	e 11 46	PP	i 22 48	SSS	—	—	—
Pasadena		87·2	46	e 12 45	− 4	e 23 18	[+ 3]	—	—	e 35·9
Berkeley		87·4	41	e 12 50a	0	e 23 37	+ 7	e 33 36	SSS	—
Lick	z.	87·4	41	e 12 46a	− 4	—	—	—	—	—
Palomar	z.	87·5	47	e 12 48	− 3	—	—	—	—	—
Riverside	z.	87·6	46	e 12 45	− 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ukiah		87·8	39	—	—	e 22 57	[−22]	e 31 23	SSS	e 37·6
Vladivostok		88·3	326	i 12 52	− 3	i 23 20	[− 2]	i 12 54	P_cP	—
Haiwee	z.	88·7	44	e 12 49	− 8	—	—	—	—	—
Tinemaha		89·2	44	e 12 55	− 4	—	—	—	—	—
Shasta Dam		89·4	39	e 12 52	− 8	—	—	—	—	—
Reno	z.	90·0	41	e 13 4	+ 1	—	—	—	—	—
Boulder City		90·5	47	e 13 3	− 2	e 23 49	−10	—	—	—
Tucson		90·6	51	e 13 2	− 3	e 23 33	[− 3]	—	—	e 37·2
Overton	z.	91·1	46	i 13 5	− 3	—	—	—	—	—
Pierce Ferry		91·1	47	i 13 4	− 4	—	—	—	—	—
Tacubaya		91·4	68	i 13 47	+38	—	—	e 18 46	PP	—
Huancayo		94·1	107	e 13 20	− 2	e 24 42	+11	e 23 54	SKS	e 43·4
Sitka		96·5	22	—	—	e 31 26	SS	—	—	e 42·6
La Paz		97·1	115	i 13 24k	−11	i 24 19	[+ 7]	17 38	PP	46·4
College		100·2	12	—	—	e 24 38	[+10]	—	—	e 42·2
Colombo	E.	103·8	269	18 48	PP	—	—	—	—	51·8
Bogota		104·3	93	—	—	i 24 46	[− 1]	e 27 48	PS	—
Calcutta	E.	104·7	287	e 18 22	PP	e 24 47	[− 2]	e 27 48	PS	—
Lincoln	E.	104·8	50	—	—	e 26 56	PS	—	—	e 46·7
Galerazamba	E.	106·5	87	—	—	e 26 0	−15	—	—	—
Kodaikanal	E.	107·6	271	—	—	e 25 2	[0]	—	—	—
St. Louis		108·1	55	e 23 29	?	e 25 4	[0]	e 26 36	S	—
Irkutsk		108·3	321	—	—	25 8	[+ 3]	—	—	—
Chicago		111·3	52	—	—	e 28 50	PS	—	—	e 49·9
Poona	E.	114·7	276	—	—	e 25 30	[− 1]	e 29 21	PS	—
Cleveland		115·4	55	—	—	i 25 36	[+ 3]	i 29 28	PS	—
Bombay		115·7	276	e 18 37	[− 7]	e 25 40	[+ 5]	e 29 39	PS	—
Pennsylvania	E.	117·7	57	—	-	e 25 40	[− 2]	i 29 56	PS	—
Resolute Bay		119·6	17	—	—	e 27 13	{+ 2}	e 29 54	PS	—
Fordham		120·5	58	e 20 28	PP	e 36 48	SS	—	—	62·3
Palisades		120·6	58	i 20 23	PP	i 25 53	[+ 1]	i 23 7	PPP	e 60·8
Andijan		124·4	299	e 19 1	[0]	e 26 9	[+ 5]	—	—	—
Fergana		124·7	299	e 19 2	[0]	e 26 6	[+ 1]	—	—	—
Bermuda		124·8	70	—	—	e 30 38	PS	e 38 18	SS	e 58·6
Tashkent		126·8	300	e 19 8	[+ 2]	i 26 17	[+ 6]	e 20 56	PP	—
Tchimkent		126·8	301	e 19 3	[− 3]	—	—	—	—	—
Sverdlovsk		133·7	319	19 20	[+ 1]	26 35	[+ 6]	i 22 48?	PKS	—
Baku		141·1	295	e 19 15	[−17]	—	—	e 22 49	PKS	—
Tiflis		145·0	297	e 19 38	[− 1]	—	—	—	—	—
Leninakan		145·7	295	e 20 0?	[+20]	—	—	—	—	—
Moscow		146·2	323	e 19 42	[+ 1]	—	—	—	—	—
Pulkovo		147·1	334	e 19 44	[+ 1]	—	—	—	—	—
Zugdidi		147·1	299	e 19 49	[+ 6]	—	—	—	—	—
Sotchi		148·6	301	e 19 48	[+ 3]	—	—	—	—	—
Ksara		151·7	281	i 19 55k	[+ 5]	—	—	23 40	PP	—
Helwan	z.	154·7	271	19 55	[+ 1]	—	—	20 22	PKP_3	—
Istanbul		156·8	299	e 20 0	[+ 3]	—	—	e 24 5	PP	—
Potsdam		158·8	342	i 20 35a	PKP_3	e 44 40	SSP	i 24 12	PP	e 80·3
Collmberg	z.	159·8	339	e 20 6?	[+ 6]	—	—	e 20 38	PKP_3	—
Prague		160·4	336	e 20 36	PKP_3	e 27 18	[+13]	e 24 22	PP	—
Jena		160·5	340	e 20 12?	[+11]	—	—	e 20 43	PKP_3	—
De Bilt		160·6	354	—	—	e 44 18?	SS	—	—	e 85·3
Stuttgart		163·1	344	e 20 3	[− 1]	e 31 29	{ 0}	e 20 51	PKP_3	e 87·3
Strasbourg		163·6	346	e 20 56	PKP_3	e 31 27	{− 4}	e 38 23	PPS	e 83·3
Paris		164·0	359	e 20 9	[+ 4]	—	—	—	—	e 88·3
Besançon		165·2	349	e 20 57	PKP_2	—	—	e 24 52	PP	—
Rome		167·6	321	e 21 10	PKP_3	e 31 58	{+ 7}	e 24 57	PP	—
Tamanrasset	z.	169·5	194	e 20 10	[+ 1]	e 32 23	{+22}	e 21 23	PKP_3	82·3
Toledo		171·5	—	e 20 13	[+ 3]	—	—	e 25 17	PP	91·1
Malaga	z.	173·5	—	i 20 33a	[+22]	32 21	{+ 1}	i 21 37	PKP_3	79·9
Granada		173·7	—	—	—	30 13	PPP	i 47 32	SSP	92·4
Alicante		174·1	—	19 59	[−12]	31 30	−52}	24 37	PP	e 79·0

For Notes see next page.

NOTES TO OCTOBER 26d. 15h. 38m. 42s.

Additional readings :—
Auckland iN = 2m.38s.
Christchurch eS = 5m.28s.
Brisbane iZ = 5m.46s.
Riverview iZ = 6m.5s., iEN = 10m.35s., iE = 11m.18s.
Pasadena i = 12m.53s.
Palomar i = 12m.52s.
Reno eZ = 13m.14s. and 13m.30s.
Tacubaya i = 14m.1s.
Huancayo eSS = 31m.11s.
La Paz iPPS = 26m.18s.
St. Louis ePS = 28m.16s., iSS = 34m.1s.
Cleveland iSSN = 35m.43s.
Pennsylvania eE = 26m.52s., eSSE = 36m.23s.
Resolute Bay e = 28m.15s., 30m.33s., 35m.42s., and 36m.1s., eN = 39m.8s.
Palisades eSKKS = 27m.21s., ePS = 30m.7s., ePPS = 31m.31s., eSS = 36m.43s.
Bermuda eSSS = 42m.46s.
Tashkent eSKKS = 27m.52s.
Sverdlovsk eSKKS = 28m.36s.
Collmberg ePP?Z = 20m.52s.
Prague i = 20m.43s., e = 20m.51s., 21m.18s., and 22m.20s., ePPS = 38m.0s., eSS = 44m.18s., eSSS = 50m.30s.
Jena eN = 20m.54s., eEN = 21m.3s.
Stuttgart eZ = 21m.23s., ePPZ = 24m.34s., eZ = 25m.28s., ePS? = 36m.0s., ePPS = 38m.18s., eSS = 45m.0s.
Strasbourg eSKKS = 31m.34s., e = 33m.28s., eSS = 45m.6s., e = 47m.48s., and 48m.42s., eSSS = 51m.36s., e = 61m.54s.
Besançon e = 21m.58s.
Rome eSSN = 46m.7s.?.
Tamanrasset iSKPZ = 23m.45s., iPPZ = 25m.19s., ePPPZ = 29m.24s., eZ = 31m.36s and 37m.21s.
Malaga iPPZ = 25m.33s., iSKSZ = 27m.29s., iPPPZ = 28m.27s.
Alicante PPP = 28m.31s., PPS = 38m.39s., SS = 46m.15s., SSP = 47m.19s., SSS = 53m.4s., Q = 69m.59s.
Long waves were also recorded at Honolulu, La Plata, Fort de France, San Juan, Ivigtut, Scoresby Sund, and other American and European stations.

Oct. 26d. Readings also at 1h. (Puebla, Tacubaya, Bogota, Logan, San Juan, Palisades, Philadelphia, Harvard, Weston, Palomar, Overton, Pierce Ferry, Tucson, and College), 2h. (Puebla (2), Tacubaya (2), Palomar, Tucson, Boulder City, Pierce Ferry, College, Harvard, and Ottawa), 3h. (Tacubaya and Palisades), 4h. (Fergana, Tashkent, near Andijan, Obi-garm, Samarkand, and Tchimkent), 5h. (College), 6h. (Frunse, Tchimkent, near Andijan, Fergana, Naryn, and Obi-garm), 9h. (Bogota, Chinchina, San Juan, Palomar (2), Pasadena (2), Riverside (2), Tinemaha (2), Tucson (2), Boulder City, Overton (2), Pierce Ferry (2), Shasta Dam, Hungry Horse, Ottawa, La Paz, Tamanrasset (2), Helwan, and Ksara), 11h. (Boulder City, Overton, Pierce Ferry, and Shasta Dam), 14h. (San Juan and near Sotchi (2)), 19h. (Nanking), 20h. (Bogota, Huancayo, near La Paz, College, and Tamanrasset), 21h. (Ashkabad, Strasbourg, and Stuttgart), 22h. (Bogota and near Galerazamba).

Oct. 27d. 5h. 59m. 16s. Epicentre 11°·0N. 140°·0E.

Approximate

$A = -\cdot7522$, $B = +\cdot6311$, $C = +\cdot1896$; $\delta = +4$; $h = +6$;
$D = +\cdot643$, $E = +\cdot766$; $G = -\cdot145$, $H = +\cdot120$, $K = -\cdot982$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Vladivostok		32·8	349	i 7 51	PP	—	—	—	—	—
Brisbane	z.	40·3	162	i 7 43k	+ 3	—	—	—	—	—
Irkutsk		50·2	332	8 49	−11	e 16 44	sS	—	—	—
Almata		63·0	313	e 10 33	+ 2	—	—	—	—	—
Andijan		66·0	309	e 10 53	+ 3	—	—	—	—	—
Fergana		66·4	309	e 10 56	+ 3	—	—	—	—	—
Tchimkent		68·2	312	i 11 6	+ 2	—	—	—	—	—
Tashkent		68·4	310	e 11 6	0	e 20 12?	+ 5	—	—	—
College		72·6	25	i 12 24	+53	e 26 12	SS	—	—	e 33·1
Mary		74·0	306	i 11 44	+ 5	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		75·1	326	i 11 47	+ 1	—	—	—	—	—
Hungry Horse		92·2	40	e 13 9	− 4	—	—	—	—	—
Pasadena	z.	93·5	54	i 13 16	− 3	—	—	e 14 28	?	—
Riverside	z.	94·2	54	i 13 18	− 4	—	—	—	—	—
Palomar	z.	94·8	55	i 13 23	− 2	—	—	—	—	—
Overton	z.	95·8	51	e 13 25	− 4	—	—	—	—	—
Pierce Ferry		96·2	51	i 13 29	− 2	—	—	—	—	—
Tucson		99·9	54	e 13 45	− 3	—	—	e 17 46	PP	—
Tamanrasset	z.	124·2	307	i 19 5	[+ 4]	—	—	—	—	—
Huancayo		143·9	95	e 19 42	[+ 5]	—	—	—	—	—
La Paz	z.	152·2	103	19 56	[+ 5]	e 23 47	PP	20 16	PKP_2	—

Long waves were also recorded at Wellington and Ksara.

Oct. 27d. 21h. 28m. 42s. Epicentre 15°·5S. 167°·1E. (as on 1950, April 29d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		17·7	225	i 4 12k	+ 2	i 7 35	+ 9	i 4 23	PP	—
Apia		20·5	89	e 4 42	0	e 8 45	+18	—	—	—
Auckland	N.	22·3	164	i 5 0	− 1	—	—	i 5 19	PP	—
Riverview		23·2	216	i 5 12a	+ 3	i 9 22	+ 4	i 5 22	PP	e 11·0
New Plymouth	N.	24·3	166	e 5 22	+ 2	—	—	—	—	—
Wellington		26·5	168	i 5 38	− 3	e 10 23	+ 9	—	—	e 13·8
Kaimata	N.E.	27·2	173	5 45	− 2	—	—	—	—	—
Christchurch		28·3	172	i 5 55	− 2	e 10 43	0	e 6 40	PP	14·5
Djakarta		59·7	273	e 10 3	− 6	—	—	—	—	—
Lick	Z.	85·0	50	e 12 41a	+ 3	—	—	—	—	—
Calcutta	E.	85·8	295	—	—	e 23 8	[+ 2]	—	—	—
Shasta Dam		85·9	46	e 12 23	−20	—	—	—	—	—
Pasadena	Z.	86·4	54	e 12 45	0	—	—	—	—	—
Riverside		87·0	54	e 12 48	0	—	—	i 13 3	P_cP	—
College		87·1	18	e 12 46	− 3	e 23 44	+16	—	—	e 39·2
Palomar		87·2	55	i 12 49	0	—	—	i 13 6	P_cP	—
Tinemaha	z.	87·4	51	i 12 52	+ 2	—	—	i 13 6	P_cP	—
Boulder City		89·6	53	e 13 3	+ 2	—	—	—	—	—
Overton	z.	90·1	52	e 13 9	+ 6	—	—	—	—	—
Pierce Ferry		90·3	53	e 13 1	− 3	—	—	—	—	—
Tucson		91·6	57	e 13 7	− 3	—	—	e 16 34	PP	—
Hungry Horse		94·2	42	e 13 33?	+11	—	—	—	—	—
Poona	z.	97·8	287	i 13 38	0	—	—	i 13 47	P_cP	—
Bombay		98·8	287	16 18?	?	e 24 21	[0]	—	—	—
Huancayo		112·4	111	—	—	e 36 5	SS	—	—	e 45·7
Ottawa	z.	119·9	46	e 18 51	[− 2]	—	—	—	—	—
Harvard		123·3	49	e 19 7	[+ 8]	—	—	—	—	e 62·3
Scoresby Sund		124·8	4	e 19 9	[+ 7]	—	—	—	—	—
Ksara		132·5	302	i 19 19	[+ 2]	23 5	PKS	—	—	—
Helwan	z.	137·0	298	19 24	[− 1]	—	—	i 22 12	PP	—
Collmberg	z.	138·7	336	e 19 22	[− 6]	e 23 19?	PKS	e 22 28	PP	—
Prague		139·0	334	e 19 45	[+16]	—	—	—	—	—
Stuttgart	z.	142·2	336	e 19 32	[− 2]	e 23 21	SKP	—	—	—
Strasbourg		142·9	338	e 19 35	[− 1]	—	—	e 22 10	PP	—
Zürich		143·6	336	e 19 33	[− 4]	—	—	—	—	—
Basle		143·8	337	e 19 36	[− 1]	—	—	—	—	—
Paris		144·5	343	i 19 36	[− 2]	—	—	—	—	—
Besançon		144·7	337	e 19 38	[− 1]	—	—	—	—	—
Pavia		145·0	333	e 19 40	[+ 1]	—	—	—	—	—
Rome	z.	145·8	326	e 19 41	[0]	—	—	—	—	—
Granada		156·9	342	19 18k	[−39]	—	—	—	—	—
Tamanrasset	z.	161·2	295	e 20 2	[0]	—	—	i 24 32	PP	—

For Notes see next page.

NOTES TO OCTOBER 27d. 21h. 28m. 42s.

Additional readings :—
Brisbane iPPP?N =4m.31s.
Auckland iN =5m.12s.
Riverview iZ =5m.31s., iPPN =5m.48s., iSE =9m.25s., iNZ =9m.30s. and 9m.43s.
Christchurch eZ =6m.30s., eQE =11m.48s.
Djakarta eE =16m.57s.
Lick eZ =12m.50s.
Riverside eZ =12m.57s.
College iP =12m.54s.
Helwan iZ =19m.35s. and 22m.20s.
Collmberg eZ =19m.37s.
Prague e =21m.49s.
Stuttgart eZ =19m.44s. and 19m.55s.
Strasbourg i =19m.45s., e =20m.4s. and 20m.26s.
Basle e =31m.16s.
Paris i =19m.45s. and 20m.12s.
Besançon e =19m.47s. and 20m.45s.
Pavia eZ =19m.49s., e =19m.54s.
Tamanrasset iZ =20m.12s., iPKP$_2$Z =20m.45s., eZ =20m.55s. and 24m.15s., ePPPZ = 28m.14s.

Oct. 27d. 22h. South-west Pacific.

Apia eP?EN =26m.49s., SEN =27m.38s.
Brisbane iPZ =30m.42s.a.
Lick iPZ =37m.1s.k.
Pasadena iPZ =37m.1s.
Fresno iPZ =37m.5s.a.
Palomar iP =37m.5s.a, iZ =37m.18s.
Riverside iPZ =37m.5s., iZ =37m.18s.
Haiwee iPZ =37m.10s.
Shasta Dam iP =37m.10s.
Tinemaha iPZ =37m.13s., iZ =37m.32s.
Reno ePZ =37m.16s.
Boulder City eP =37m.22s.
Overton iPZ =37m.25s.
Pierce Ferry iP =37m.25s.
Tucson iP =37m.26s.
Hungry Horse iP =37m.58s.
College iP =37m.58s., i =38m.21s.
La Paz ePZ =38m.28s., PPZ =42m.48s., SKS =49m.30s.
Stuttgart ePKPZ =45m.3s., eZ =45m.11s. and 45m.33s.
Jena ePKP?E =45m.5s., eEN =45m.23s.
Paris iPKP$_2$ =45m.9s., i =45m.21s., e =45m.57s.
Prague ePKP =45m.9s., ePP =48m.23s.
Strasbourg iPKP$_2$ =45m.12s.k.
Besançon ePKP$_2$ =45m.22s.
Tamanrasset ePKP?Z =45m.31s., eZ =45m.51s., ePKP$_2$?Z =47m.11s., ePPZ =51m.1s., ePPP?Z =54m.24s.
Collmberg eZ =45m.46s.
Long waves were also recorded at La Plata.

Oct. 27d. Readings also at 1h. (Hungry Horse, Collmberg, Stuttgart, Istanbul, Tamanrasset, near Athens, near Ashkabad, near Alicante, and near Resolute Bay), 2h. (Tucson, Pierce Ferry, Istanbul, Sofia, and near Kulyab), 3h. (Ashkabad), 6h. (Tamanrasset and College), 7h. (Alicante), 8h. (Auckland), 9h. (Ashkabad, Kaimata, Tuai, and Wellington), 10h. (College), 12h. (Ashkabad and near Istanbul), 15h. (Tamanrasset and near Zürich), 16h. (Calcutta, Poona, and Nanking), 17h. (College (2), New Delhi, Almata, Frunse, Naryn, near Andijan, Fergana, Kulyab, Lunacharskoe, Samarkand, Stalinabad, Tashkent, and Tchimkent), 18h. (Tamanrasset, Fergana, Frunse, near Andijan, Naryn, and near Tacubaya), 21h. (near Kulyab), 22h. (near Galerazamba), 23h. (College and Tamanrasset).

Oct. 28d. 9h. 5m. 40s. Epicentre 32°·8S. 178°·1W. (as on 26d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	7·1	233	i 2 6	+18	i 2 57	−13	—	—	—
Tuai	N.	7·1	211	i 2 20?	?	—	—	—	—	—
New Plymouth	E.	8·9	223	e 2 20?	+ 8	—	—	—	—	—
Wellington		10·2	212	3 20?	?	—	—	—	—	—
Kaimata	N.E.	12·8	217	3 20?	+14	—	—	—	—	—
Christchurch		13·0	212	e 3 40	+31	5 28	− 7	—	—	—
Apia		19·8	20	e 4 27	− 8	e 7 31	−42	—	—	—
Brisbane	E.	25·5	274	i 5 31k	− 1	e 9 56	− 1	—	—	—
Riverview		25·7	258	i 5 33a	0	i 10 6	+ 5	i 5 42	pP	e 13·6
Pasadena	Z.	87·2	46	e 12 44	− 5	—	—	—	—	—
Berkeley	Z.	87·4	41	e 12 58k	+ 8	—	—	—	—	—
Lick	Z.	87·4	41	e 12 42k	− 8	—	—	—	—	—
Palomar	Z.	87·5	47	i 12 46	− 5	—	—	—	—	—
Riverside	Z.	87·6	46	e 12 42	− 9	—	—	—	—	—
Vladivostok		88·3	326	e 12 50	− 5	i 23 17	[− 5]	—	—	—
Haiwee	Z.	88·7	44	e 12 49	− 8	—	—	—	—	—
Tinemaha	Z.	89·2	44	e 12 51	− 8	—	—	—	—	—
Shasta Dam		89·4	39	e 12 48	−12	—	—	—	—	—
Reno	Z.	90·0	41	e 12 45a	−18	—	—	—	—	—
Boulder City		90·5	47	e 12 58	− 7	—	—	—	—	—
Tucson		90·6	51	i 12 58	− 7	—	—	—	—	—
Overton	Z.	91·1	46	i 13 2	− 6	—	—	—	—	—
Pierce Ferry		91·1	47	i 13 2	− 6	—	—	—	—	—
Huancayo		94·1	107	e 13 22	0	e 24 37	+ 6	e 23 59	SKS	e 43·7
College		100·2	12	e 13 42	− 7	—	—	(e 33 20)	SS	e 33·3
Irkutsk		108·3	321	—	—	e 26 1	{+ 8}	29 20	PS	—
Bombay		115·7	276	—	—	e 25 34	?	—	—	—
Tashkent		126·8	300	e 20 45	PP	26 11	[0]	22 19	PKS	—
Sverdlovsk		133·7	319	i 22 45	PKS	e 26 26	[− 3]	e 28 38	SKKS	—
Ksara		151·7	281	i 19 53	[+ 3]	—	—	23 35?	PP	—
Helwan	Z.	154·7	271	20 4	[+10]	—	—	—	—	—
Istanbul		156·8	299	e 19 53	[− 4]	—	—	e 23 26	PKS	—
Collmberg	Z.	159·8	339	e 20 33	PKP_2	—	—	—	—	—
Stuttgart	Z.	163·1	344	e 20 15?	[+11]	—	—	e 20 49	PKP_2	—
Tamanrasset	Z.	169·5	194	e 20 10a	[+ 1]	i 25 14	PP	e 21 23	PKP_2	—

Additional readings :—
Auckland iN = 2m.23s. and 3m.44s.
Brisbane eSEN = 10m.1s.
Riverview iE = 5m.56s., iZ = 6m.0s., ePPEZ = 6m.19s., iE = 10m.27s., iNZ = 10m.31s., iSSE = 11m.17s.
Lick eZ = 12m.49s.
Palomar iZ = 12m.56s.
Huancayo eSS = 31m.4s.
Tashkent SKKS = 27m.56s.
Helwan iZ = 20m.13s., eZ = 20m.33s.
Collmberg eZ = 20m.47s.
Long waves were also recorded at Bogota, Harvard, Palisades, and Kew.

Oct. 28d. 22h. 15m. 47s. Epicentre 14°·3N. 91°·7W. Depth of focus 0·005. (as on 25d.).

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	5·5	299	1 19	− 2	2 20	− 4	—	—	—
Vera Cruz	6·5	319	1 30	− 5	2 42	− 7	—	—	—
Puebla	7·8	309	1 45	− 8	3 9	−12	—	—	—
Swan Island	8·1	67	e 2 32	?	—	—	—	—	—
Tacubaya	8·8	306	2 5	− 2	3 40	− 6	—	—	—
Guadalajara	12·8	301	e 3 2	+ 1	—	—	—	—	i 6·4
Miami	15·7	41	e 3 44	+ 6	—	—	—	—	—
Galerazamba	16·4	100	i 3 52	+ 5	i 8 15	P_cP	—	—	—
Guantanamo Bay	16·8	68	i 3 55	+ 3	—	—	—	—	—
Chinchina	18·2	119	i 4 19	+ 9	i 7 58	sS	i 4 37	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		19·9	118	i 4 30	+ 1	i 8 20	sS	e 4 37	pP	10·4
Lubbock		21·3	337	4 44	+ 1	—	—	—	—	—
St. Louis		24·3	3	i 5 13	+ 1	i 9 32	+ 8	i 5 33	pP	—
San Juan		24·9	76	e 5 27	+ 9	e 10 3	+29	e 5 49	pP	e 11·2
Tucson		25·0	320	i 5 19	0	e 9 59	+23	i 5 27	pP	e 12·8
Roosevelt Roads		25·3	75	i 5 26	+ 4	—	—	—	—	—
Georgetown		27·7	28	i 6 1	pP	e 11 31	SS	—	—	e 15·4
Washington		27·7	28	i 6 1	pP	e 11 31	SS	i 6 43	PP	e 12·9
Cleveland		28·5	16	i 5 51k	0	e 11 21	SS	i 6 42	PP	—
Pennsylvania		29·0	23	e 5 57	+ 1	e 10 38	− 3	e 8 56	P_cP	—
Philadelphia		29·4	28	(e 6 52)	+53	(e 11 1)	+14	(e 11 37)	sS	(e 12·7)
Pierce Ferry		29·5	322	i 6 1	+ 1	—	—	—	—	e 15·6
Palomar	z.	29·7	315	i 6 1k	− 1	—	—	i 6 20	pP	—
Boulder City		29·9	321	e 6 4	0	e 11 13	+18	i 9 6	P_cP	—
Overton	z.	30·0	322	i 6 5	0	—	—	e 9 41	P_cP	—
Riverside	z.	30·4	315	i 6 7k	− 1	e 12 56	S_cP	i 6 28	pP	—
Huancayo		30·8	147	i 6 12	0	e 11 18	+ 9	—	—	e 13·4
Palisades		30·8	27	e 6 11	− 1	e 11 53	SS	—	—	e 15·4
Pasadena	z.	31·1	315	i 6 13	− 1	—	—	i 8 38	P_cP	—
Rapid City	E.	31·3	345	e 6 23	+ 7	e 12 21	SS	e 7 31	PP	e 14·7
Salt Lake City		31·7	330	e 6 19	− 1	—	—	—	—	e 18·2
Haiwee	z.	32·0	320	i 6 20	− 2	—	—	—	—	—
Logan		32·4	333	i 6 26	0	—	—	—	—	e 17·7
Tinemaha	z.	32·8	320	i 6 30k	+ 1	—	—	i 9 13	P_cP	—
Harvard		33·0	28	i 6 42	+11	—	—	—	—	e 18·6
Weston		33·1	28	i 6 27	− 5	—	—	—	—	—
Fresno	z.	33·6	318	e 6 34k	− 2	—	—	e 7 9	sP	—
Ottawa		33·8	20	e 6 38k	0	—	—	i 9 15	P_cP	e 15·0
Lick	z.	35·1	317	e 6 49k	0	—	—	e 9 18	P_cP	—
Reno		35·2	323	e 6 51	+ 1	—	—	e 7 13	pP	—
Mineral	z.	36·8	322	e 7 1	− 2	—	—	e 7 42	pP	—
Shasta Dam		37·5	322	i 7 0	− 9	—	—	i 9 33	P_cP	—
La Paz		38·4	141	i 7 17k	0	e 13 7	0	i 7 41	pP	20·6
Hungry Horse		38·6	337	e 7 19	+ 1	i 13 19	+ 9	i 9 30	P_cP	—
Resolute Bay		60·4	359	10 0	− 5	18 25	+12	10 51	P_cP	—
College		63·1	337	i 10 21	− 2	—	—	i 10 59	pP	e 29·5
Rathfarnham Castle		75·9	38	e 11 46	+ 5	—	—	—	—	e 41·2
Granada		80·0	54	11 58k	− 6	—	—	—	—	40·4
Paris		82·1	42	i 12 15	0	—	—	e 12 29	pP	—
Besançon		84·8	43	e 12 28	− 1	—	—	e 12 36	pP	—
Strasbourg		85·5	41	e 12 32	0	—	—	—	—	e 42·2
Stuttgart		86·4	40	e 12 37	+ 1	—	—	—	—	e 45·2
Jena	E.	87·2	39	e 12 42?	+ 2	—	—	—	—	—
Collmberg	z.	87·9	38	e 12 44	0	—	—	—	—	—
Tamanrasset	z.	91·2	65	e 12 59	0	—	—	—	—	—
Ksara		110·9	46	e 6 6	?	e 22 58	?	—	—	—
Tananarive		140·7	101	e 38 55	P′P′	e 44 23	SSS	—	—	—
Poona	z.	144·4	23	i 19 29	[0]	—	—	—	—	—

Additional readings :—
Chinchina iSS = 8m.58s.
St. Louis esS = 9m.56s., eSS = 10m.40s., esSS = 11m.12s.
Tucson iPP = 6m.1s.
Cleveland esSSE = 12m.50s.
Pennsylvania esSEN = 11m.27s., iP_cSEN = 12m.33s.
Philadelphia readings have been reduced by 10 minutes.
Palomar iZ = 6m.43s.
Riverside iP_cPZ = 9m.5s.
Fresno eZ = 8m.13s.
Lick eZ = 7m.29s.
Mineral eZ = 8m.43s.
La Paz iPPZ = 8m.57s., P_cPZ = 9m.33s., iSS = 15m.57s., iSSS = 16m.31s.
Resolute Bay S_cS = 19m.59s., e = 24m.51s.
College e = 16m.21s.
Strasbourg i = 12m.37s.
Jena eE = 13m.33s.
Long waves were also recorded at Scoresby Sund, Bermuda, and other American and European stations.

Oct. 28d. Readings also at 5h. (Ashkabad, Ksara, and Tamanrasset (2)), 6h. (Ashkabad and Ottawa), 8h. (College, near Kulyab, Obi-garm, and Stalinabad), 12h. (Galera-zamba and Overton), 14h. (College (2)), 16h. (Hungry Horse, College, Tamanrasset, Almata, Ashkabad, Frunse, Mary, Obi-garm, Przhevalsk, Samarkand, Sverdlovsk, and near Semipalatinsk), 17h. (Brisbane, College, and Tamanrasset), 18h. (Brisbane, College, near Kulyab, Obi-garm, and Stalinabad), 19h. (College), 23h. (near Mizusawa and near Balboa Heights (2)).

Oct. 29d. 0h. 59m. 51s. Epicentre 14°·7N. 123°·8E.

Intensity V at Aurora ; IV at Daet ; III at Laguna ; II at Manila. Epicentre 14°40′N. 123°45′E.

Monthly Seismological Bulletin, Manila, October, 1950.

$A = -·5383$, $B = +·8041$, $C = +·2522$; $\delta = -5$; $h = +6$;
$D = +·831$, $E = +·556$; $G = -·140$, $H = +·210$, $K = -·968$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Manila		2·7	268	i 0 34	−11	i 1 0	−19	—
Nanking		17·9	344	4 20a	+ 8	e 7 51	+21	e 9·0
Djakarta		26·7	220	6 17	PP	—	—	—
Frunse		50·5	314	e 9 19	+17	e 16 59	+43	—
Fergana		51·9	311	e 9 9	− 3	—	—	—
Tashkent		53·9	311	e 9 27?	0	—	—	—
Samarkand		55·3	308	e 9 38	0	—	—	—
Ashkabad		61·8	306	e 10 23	0	—	—	—
Sverdlovsk		63·2	327	i 10 32	0	19 18	+15	—
Ksara		80·3	302	i 12 18	+ 4	e 24 0	?	—
Istanbul		84·0	311	e 12 34	+ 1	—	—	—
Helwan		84·9	299	12 39	+ 1	23 3	− 3	—

Long waves were also recorded at Puebla, Tacubaya, Vera Cruz, and other European stations.

Oct. 29d. 6h. 2m. 20s. Epicentre 27°·5N. 96°·4E. (as on Oct. 16d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	8·8	237	e 2 8	− 3	e 3 40	−13	8 59	PcP	—
New Delhi		17·0	278	e 3 47	−14	i 6 45	−25	7 1	SS	7·4
Hyderabad	N.	19·3	242	—	—	e 7 42	−20	i 9 48	Q	e 10·2
Nanking		20·0	71	4 55a	+18	e 8 36	+19	—	—	e 10·2
Naryn		21·7	315	e 5 3	+ 8	—	—	—	—	—
Almata		22·3	320	i 5 2	+ 1	e 9 3	+ 1	—	—	—
Poona		22·5	252	i 3 58	−64	e 8 55	−10	5 37	PP	10·4
Bombay		23·3	253	e 5 8	− 2	e 9 9	−11	—	—	—
Frunse		23·4	316	e 5 10	− 1	i 9 25	+ 4	—	—	—
Andijan		23·8	309	e 5 16	+ 1	9 28	0	—	—	—
Fergana		24·0	309	e 5 16	− 1	e 9 28	− 4	—	—	—
Kulyab		24·6	302	e 5 23	0	—	—	—	—	—
Kodaikanal	E.	24·8	230	—	—	e 9 43	− 3	—	—	—
Obi-garm		24·9	304	i 5 23	− 3	—	—	—	—	—
Stalinabad		25·6	303	e 5 34	+ 2	—	—	—	—	—
Lunacharskoe		26·1	309	e 5 40	+ 3	—	—	—	—	—
Tashkent		26·1	309	e 5 37	0	—	—	—	—	—
Tchimkent		26·3	310	i 5 39	0	—	—	—	—	—
Samarkand		27·2	304	e 5 52	+ 5	—	—	—	—	—
Mary		30·6	298	e 6 11	− 7	—	—	—	—	—
Ashkabad		33·5	298	e 6 45	+ 2	—	—	—	—	—
Sverdlovsk		38·7	329	i 7 34	+ 7	13 27	+ 2	—	—	—
Ksara		51·8	293	e 9 38?	+26	—	—	e 20 53	SS	—
Collmberg	Z.	65·1	316	e 10 49	+ 4	—	—	—	—	—
Stuttgart		68·1	315	e 11 4	0	—	—	—	—	e 37·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		69·1	315	11 35	P_cP	—	—	e 13 48	PP	—
Besançon		70·6	314	e 11 24	+ 5	—	—	—	—	—
Paris		72·3	316	i 11 33	+ 4	—	—	—	—	—
College		75·5	23	e 11 57	+ 9	e 22 41	PPS	—	—	e 41·1
Tamanrasset	z.	80·5	291	e 12 16	+ 1	—	—	e 16 2	PP	—
Hungry Horse		99·7	20	e 14 6	+19	—	—	—	—	—
San Juan		131·3	337	e 21 15	PP	e 21 37	?	—	—	—
Bogota	z.	146·8	342	e 30 34	PKKP	—	—	—	—	—

Additional readings :—
Calcutta SSE =3m.51s., SSSE =4m.1s.
New Delhi ePN =3m.50s., QN =6m.42s., SSSN =7m.16s.
Poona P_cPE =8m.47s., QE =9m.3s., SSE =9m.39s., SSSE =9m.59s.?.
Stuttgart eZ =11m.9s.
Strasbourg e =12m.0s. and 12m.51s.
Paris i =11m.44s.
Tamanrasset eZ =13m.5s. and 13m.45s.
Long waves were also recorded at Bandong, Djakarta, and other European stations.

Oct. 29d. Readings also at 2h. (Victoria and near Huancayo), 3h. (Tucson, Pierce Ferry, and College), 4h. (Puebla, Tacubaya, Vera Cruz, Overton, Pierce Ferry, Hungry Horse, and College), 5h. (near Ottawa), 6h. (Stuttgart, New Delhi, and near Ashkabad), 7h. (Obi-garm, near Kulyab, and near Mizusawa), 9h. (near Alicante), 10h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Overton, Hungry Horse, near College, and near Alicante), 12h. (near Andijan), 13h. (Fergana, Frunse, Lunacharskoe, Tashkent, near Naryn, and Przhevalsk), 15h. (Collmberg, near Gori, Leninakan, Tiflis, and Zugdidi), 16h. (Huancayo), 19h. (Aberdeen, College, Hungry Horse, near Andijan, Fergana, Obi-garm, Samarkand, and near San Juan), 22h. (near Ashkabad, and near Prague), 23h. (Pierce Ferry, Prague, Strasbourg, Stuttgart, Bologna, Zürich, near Chur, and Pavia).

Oct. 30d. 1h. 29m. 14s. Epicentre 44°·8N. 9°·2E. (as on 1945, June 29d.).

A = +·7027, B = +·1138, C = +·7023 ; δ = −4 , h = −3 ;
D = +·160, E = −·987 ; G = +·693, H = +·112, K = −·712.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pavia		0·4	357	e 0 14	+ 1	i 0 24	+ 3	—	—	—
Salo	z.	1·2	49	i 0 24	0	i 0 41	0	—	—	—
Bologna		1·6	101	e 0 29	− 1	i 0 52	+ 1	—	—	—
Prato		1·7	124	i 0 30	− 1	i 0 53	− 1	—	—	—
Florence, Xim.		1·8	125	e 0 33	+ 1	i 0 57	+ 1	—	—	—
Padova		1·9	99	—	—	e 0 56	− 3	—	—	—
Chur		2·1	9	e 0 38	+ 1	e 1 2	− 2	—	—	—
Zürich		2·6	348	e 0 47 a	+ 3	e 1 20	+ 3	—	—	—
Basle		3·0	338	e 0 57	P_g	e 1 32	S*	—	—	—
Besançon		3·3	319	e 1 15	?	e 1 35	0	e 1 50	S_g	e 2·0
Strasbourg		3·9	347	e 1 4	+ 2	e 1 53	+ 3	e 2 2	S*	e 2·3
Stuttgart	z.	4·0	0	e 1 3	− 1	e 1 51	− 1	e 1 25	P_g	—
Paris		6·1	313	—	—	e 2 48	+ 3	—	—	—
Jena		6·3	13	e 2 10	P_g	e 2 41	− 9	e 3 25	S_g	—
Prague		6·4	32	e 1 42	+ 4	e 2 49	− 4	e 2 5	P_g	—
Collmberg	z.	7·0	20	e 2 18	P_g	e 3 3	− 5	e 3 59	S_g	—

Additional readings :—
Pavia e =37s.
Salo iEN =31s.
Padova e =1m.25s.
Strasbourg e =1m.36s.
Stuttgart eP*Z =1m.18s., eZ =1m.38s., eS*Z =2m.14s., eS_gZ =2m.26s.
Jena eE =3m.2s., eN =3m.15s., eE =3m.18s.
Prague e =3m.4s., eS* =3m.17s., e =3m.25s., eS_g =3m.34s.
Long waves were also recorded at Wellington.

Oct. 30d. 2h. 26m. 12s. Epicentre 12°·9S. 172°·7W. (as on 1947, Nov. 6d.).

Intensity III at Apia. Similar strength at Tuasivi and Piula. Suggested depth 100km. Prelim. Bull., Apia Seismo. Obs., Western Samoa, Oct.-Dec., 1950, p.5.

A = −·9672, B = −·1239, C = −·2218; δ = +2; h = +7;
D = −·127, E = +·992; G = +·220, H = +·028, K = −·975.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		1·3	135	i 0 25a	0	0 45	+ 1	—	—	—
Riverview		38·9	232	i 8 48	PP	—	—	e 15 54	Q	e 18·0
Lick	z.	69·2	41	i 11 12a	+ 2	—	—	—	—	—
Pasadena		69·8	46	i 11 14	0	—	—	—	—	e 31·8
Mount Wilson	z.	69·9	46	i 11 14	− 1	—	—	i 11 26	?	—
Fresno	z.	70·1	43	e 11 18a	+ 2	—	—	e 11 28	pP	—
Riverside	z.	70·3	46	i 11 17	0	—	—	i 11 29	pP	—
Palomar	z.	70·3	47	i 11 18	+ 1	—	—	—	—	—
Shasta Dam		70·8	38	i 11 22	+ 2	—	—	i 11 31	pP	—
Haiwee	z.	71·0	45	i 11 22	0	—	—	e 11 33	pP	—
Reno	z.	71·7	41	e 11 27k	+ 1	—	—	—	—	—
Boulder City		73·1	46	e 11 35	+ 1	—	—	—	—	—
Overton	z.	73·6	46	i 11 38	+ 1	—	—	—	—	—
Pierce Ferry		73·7	47	i 11 38	0	—	—	—	—	—
Tucson		74·2	51	e 11 39	− 1	—	—	—	—	—
College		79·8	11	e 12 10	− 2	e 22 21?	+ 7	—	—	37·5
Hungry Horse		80·0	36	e 12 12	− 1	—	—	e 12 21	pP	—
Collmberg	z.	141·4	354	e 19 22	[−11]	—	—	—	—	—
Prague		142·5	353	i 19 39	[+ 4]	—	—	—	—	—
Paris		144·0	6	e 19 30	[− 7]	—	—	i 19 44	pPKP?	—
Stuttgart		144·2	358	e 19 30	[− 8]	—	—	i 19 45	pPKP	—
Strasbourg		144·4	359	e 19 36k	[− 2]	e 42 48	SS	i 19 45	pPKP	—
Besançon		145·7	1	i 19 48	[+ 8]	—	—	—	—	—
Ksara		146·7	314	e 19 38	[− 4]	—	—	23 22	PP	—
Tamanrasset	z.	170·0	—	i 20 0a	[− 9]	—	—	e 20 23	pPKP	—

Additional readings :—
Lick iZ = 11m.24s. and 11m.36s.
Pasadena iZ = 11m.34s. and 11m.47s.
Reno eZ = 11m.43s.
Prague eN = 19m.51s., e = 20m.42s., eN = 21m.8s., e = 21m.29s., ePP? = 21m.53s.
Paris i = 20m.37s.
Strasbourg i = 19m.51s., e = 19m.58s. and 21m.6s.
Besançon e = 20m.48s.
Tamanrasset ePKP$_2$Z = 21m.35s., epPKP$_2$Z = 22m.5s., ePPZ = 25m.3s.
Long waves were also recorded at Wellington, Resolute Bay, Palisades, Harvard, Weston, Rathfarnham Castle, and Kew.

Oct. 30d. 9h. 4m. 50s. Epicentre 25°·9N. 96°·8E. (as on 1950, Sept. 8d.).

A = −·1066, B = +·8944, C = +·4344; δ = +2; h = +3;
D = +·993, E = +·118; G = −·051, H = +·431, K = −·901.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	8·4	248	e 2 5	− 1	e 3 43	0	3 54	SS	3·4
New Delhi		17·6	283	e 4 9	+ 1	e 7 8	−15	7 23	SS	7·1
Hyderabad		19·0	246	e 4 29	+ 3	8 14	+19	—	—	—
Nanking		20·3	67	e 4 39	− 1	e 8 21	− 2	—	—	e 10·2
Poona		22·4	225	5 6	+ 4	i 9 10	+ 6	5 33	PP	10·7
Naryn		23·1	317	e 5 5	− 3	e 9 16	0	—	—	—
Bombay		23·2	256	e 5 17	+ 8	e 9 24	+ 6	—	—	—
Almata		23·7	322	i 5 12	− 2	e 9 25?	− 2	—	—	—
Frunse		24·8	317	e 5 22	− 3	e 9 50	+ 4	—	—	—
Fergana		25·3	310	e 5 35	+ 5	—	—	—	—	—
Obi-garm		26·1	306	i 5 35	− 2	e 10 8	+ 1	—	—	—
Stalinabad		26·8	306	e 5 41	− 3	e 10 19	0	—	—	—
Irkutsk		26·9	10	e 5 43	− 2	e 10 23	+ 3	—	—	—
Tashkent		27·4	310	e 5 48	− 1	i 10 36	+ 8	—	—	—
Sverdlovsk		40·3	330	—	—	13 45	− 4	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tiflis		45·3	303	e 8 27	+ 6	—	—	—	—	—
Zugdidi		47·5	305	e 8 34	− 4	—	—	—	—	—
Collmberg	z.	66·5	316	e 10 51	− 3	—	—	—	—	—
Stuttgart		69·5	315	e 11 11	− 1	—	—	—	—	—
Strasbourg		70·3	315	e 11 16	− 1	—	—	—	—	—
Besançon		72·0	314	e 11 25	− 3	—	—	—	—	—
College		76·8	23	e 11 53	− 2	—	—	—	—	—
Tamanrasset	z.	81·4	291	i 12 21 s	+ 1	—	—	—	—	—
Hungry Horse		101·1	20	e 13 53	0	—	—	—	—	—

Additional readings :—
Calcutta SSSE = 4m.10s.
New Delhi SSSEN = 7m.48s.
Poona PPPE = 5m.47s., P_cPE = 8m.42s., QE = 9m.35s., SSE = 9m.53s., SSSE = 10m.5s., S_cPE = 12m.14s.
Long waves were also recorded at Potsdam.

Oct. 30d. 10h. 22m. 48s. Epicentre 17°·4S. 71°·0W. Depth of focus 0·025.
(as on 1950, August 14d.).

A = +·3109, B = −·9028, C = −·2972 ; δ = +3 ; h = +5 ;
D = −·946, E = −·326 ; G = −·097, H = +·281, K = −·955.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		2·9	72	i 1 1k	+12	i 1 39	+13	—	—	—
Huancayo		6·8	321	i 1 28	−10	i 2 35	−20	i 1 47	PP	e 3·5
Bogota		22·1	352	e 4 29	−11	e 8 9	−17	e 8 40	pS	—
Chinchina		22·6	350	e 4 35	−10	e 8 16	−19	—	—	—
Tacubaya		45·9	322	e 8 8	+ 3	—	—	—	—	—
Weston		59·5	0	i 9 38	− 7	—	—	—	—	—
Harvard		59·6	0	i 9 40	− 6	—	—	—	—	—
Tucson		62·4	322	i 10 4	− 1	—	—	—	—	—
Ottawa	z.	62·6	356	e 10 0	− 6	—	—	—	—	—
Palomar	z.	66·8	319	i 10 33	0	—	—	e 11 17	pS	—
Pierce Ferry		67·0	323	i 10 35	+ 1	—	—	—	—	—
Boulder City		67·4	322	e 10 40	+ 3	—	—	—	—	—
Overton	z.	67·5	323	i 10 38	+ 1	—	—	i 11 22	pP	—
Riverside	z.	67·5	319	i 10 39	+ 2	—	—	i 11 22	pP	—
Pasadena	z.	68·1	319	i 10 43	+ 2	—	—	i 11 26	pP	—
Shasta Dam		74·9	322	i 11 21	0	—	—	—	—	—
Hungry Horse		75·9	332	i 11 27	0	—	—	e 12 12	pP	—
Tamanrasset	z.	84·8	64	i 13 11	sP	—	—	—	—	—
College		100·1	335	e 13 27	+ 2	—	—	e 14 16	pP	—

Additional readings :—
La Paz i = 1m.48s.
Huancayo e = 2m.21s.
Bogota eEN = 5m.25s.

Oct. 30d. 23h. 13m. 47s. Epicentre 32°·0N. 97°·0E.
(from Seismological Bulletin of U.S.S.R.).

A = −·1035, B = +·8433, C = +·5273 ; δ = −9 ; h = +1 ;
D = +·993, E = +·122 ; G = −·064, H = +·523, K = −·850.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta		12·2	222	e 4 48	?	e 6 51	?	7 3	SS	6·7
New Delhi	N.	17·4	293	e 4 4	− 2	i 7 17	− 2	7 34	SS	8·1
Naryn		19·3	306	i 4 22	− 7	i 7 47	−15	—	—	—
Almata		19·4	312	i 4 25	− 5	i 7 50	−14	—	—	—
Frunse		20·8	307	i 4 41	− 4	i 8 22	−11	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		21·0	13	4 57?	+10	e 8 41?	+ 4	—	—	—
Andijan		21·6	300	4 52	− 2	8 39	−10	—	—	—
Fergana		21·9	300	e 4 54	− 3	e 8 42	−12	—	—	—
Hyderabad	E.	22·2	233	e 5 14	+14	e 9 15	+15	—	—	—
Obi-garm		23·2	295	i 5 8	− 1	i 9 9	− 9	—	—	—
Stalinabad		23·9	295	i 5 16	0	9 22	− 8	—	—	—
Tashkent		24·0	301	e 5 16	− 1	i 9 26	− 6	—	—	—
Poona		24·8	242	i 5 34	+ 9	i 9 59	+13	12 28	S_cP	12·1
Bombay		25·4	244	e 5 13?	−18	i 10 13	+17	—	—	—
Mary		29·3	292	e 6 8	+ 2	—	—	—	—	—
Sverdlovsk		35·3	326	i 7 0	+ 1	12 22	−11	—	—	—
Tiflis		42·3	298	e 8 2	+ 5	—	—	—	—	—
Borzhomi		43·4	298	e 8 6	0	—	—	—	—	—
Ksara		50·7	289	i 11 7	PP	e 17 12	?	—	—	—
Collmberg	Z.	62·2	315	e 10 29	+ 3	—	—	—	—	—
Stuttgart		65·4	313	e 10 50	+ 3	—	—	—	—	e 34·7
College		71·2	24	e 11 35	+12	—	—	—	—	—
Tamanrasset	Z.	79·5	290	e 12 20	+10	—	—	—	—	—
Hungry Horse		95·3	20	i 13 45	+18	—	—	—	—	—

Additional readings :—
Calcutta SSS =7m.11s.
Poona PPPE =6m.24s., QE =10m.37s., SSE =10m.57s., SSSE =11m.19s.
College i =11m.40s.
Long waves were also recorded at Nanking, Copenhagen, De Bilt, Granada, Helsinki, Istanbul, Kew, Pavia, Potsdam, Rathfarnham Castle, Upsala, and Warsaw.

Oct. 30d. Readings also at 1h. (Harvard, Weston, Overton, Hungry Horse, Mizusawa, Mary, Frunse, near Andijan, Fergana, Lunacharskoe, Naryn, Obi-garm, Samarkand, Stalinabad, and Tchimkent), 2h. (College), 3h. (Tamanrasset and near Algiers Univ.), 4h. (near Algiers Univ.), 5h. (Tacubaya, Victoria, and College), 6h. (College and Tuai), 7h. (Brisbane, Overton, Pierce Ferry, College (2), and Prague), 8h. (Huancayo), 9h. (near Andijan and Fergana), 10h. (Balboa Heights), 13h. (Brisbane), 14h. (Riverview, Mount Wilson, Palomar, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, and Tamanrasset), 18h. (Huancayo), 19h. (La Plata), 21h. (Palisades, Gori, near Borzhomi, and Tiflis), 23h. (College).

Oct. 31d. 1h. 10m. 51s. Epicentre 47°·5N. 8°·9E. (as on 1948, Nov. 23d.).

Intensity IV in the neighbourhood of St. Gallen.
Intensity III-IV in the whole region between the lakes of Zürich and Constance and the Shaffhouse canton. Macroseismic radius 35km.

Dr. E. Wanner.
Jähresbericht der Erdbebendienstes der Schweiz im Jahre, 1950, Zürich, 1951, p. 3, with macroseismic chart, fig. 1.

$A = +·6699$, $B = +·1049$, $C = +·7350$; $\delta = 0$; $h = -4$;
$D = +·155$, $E = -·988$; $G = +·726$, $H = +·114$, $K = -·678$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zürich		0·2	238	i 0 9a	− 1	i 0 14	− 2	—	—	—
Ravensburg		0·6	60	i 0 12a	− 3	i 0 21	− 5	i 0 13	P_g	—
Ebingen		0·7	4	e 0 15?	− 2	e 0 23	− 5	i 0 20	S_g	—
Chur		0·8	147	i 0 17k	− 1	i 0 28	− 3	—	—	—
Basle		0·9	273	e 0 21	+ 1	e 0 31	− 3	—	—	—
Strasbourg		1·3	325	i 0 29k	+ 4	e 0 44	0	—	—	—
Stuttgart	Z.	1·3	9	e 0 27	+ 2	i 0 47	+ 3	i 0 44	S*	—
Neuchatel		1·4	249	i 0 29	+ 2	e 0 48	+ 2	—	—	—
Besançon		2·0	263	e 0 41	+ 6	e 1 8	+ 6	—	—	e 1·3
Jena		3·8	26	e 1 20?	P_g	e 2 7	S_g	—	—	—
Prague		4·5	53	e 1 19	P*	—	—	e 1 29	P_g	e 2·3
Collmberg	Z.	4·6	34	e 1 35	P_g	e 2 27	S_g	e 2 37	S_g	—

Additional readings :—
Strasbourg i =31s., i =50s.
Stuttgart ePZ =23s., eSZ =37s., iS_gZ =48s.
Jena eE =1m.43s., eN =1m.47s., eE =2m.1s. and 2m.4s.

Oct. 31d. 19h. 15m. 20s. Epicentre 1°·0N. 26°·0W.

A = +·8987, B = −·4383, C = +·0173; δ = +7; h = +7;
D = −·438, E = −·899; G = +·016, H = −·008, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lome		27·6	77	—	—	e 10 29	− 3	e 12 48	PcS	e 13·0
Fort de France		37·3	293	e 7 12	− 4	e 13 4	0	—	—	—
Tamanrasset	z.	37·5	52	i 7 10k	− 7	i 15 48	SSS	e 8 48	PPP	—
Granada		41·5	27	i 7 50k	0	i 14 7	0	i 17 7	SS	i 22·1
Toledo		43·6	25	i 8 4	− 4	e 17 57	SS	e 9 45	PP	24·3
Alicante		43·9	29	8 6	− 4	14 26	−16	—	—	e 18·3
Algiers Univ.	z.	44·6	34	e 8 8	− 8	—	—	e 9 50	PP	—
La Paz		45·1	246	8 24	+ 4	e 14 52	− 7	i 10 13	PP	21·7
Tortosa		46·3	28	8 12	−17	—	—	—	—	e 23·7
Bogota		48·1	276	e 9 6	+23	e 15 52	+10	e 19 26	SS	—
Galerazamba		49·9	284	—	—	e 16 14	+ 7	—	—	e 20·7
Huancayo		50·7	254	e 9 1	− 2	e 16 9	PS	—	—	e 22·8
Clermont-Ferrand		51·4	26	—	—	e 16 31	+ 3	—	—	e 26·5
Rome		53·4	35	e 9 7	−17	i 17 0	+ 5	e 20 54	SS	e 26·6
Paris		53·7	23	e 9 23	− 3	e 16 57	− 2	e 22 9	SSS	e 29·0
Besançon		53·8	27	e 9 39	+13	—	—	e 11 38	PP	—
Pavia		53·8	30	e 12 21	PPP	e 16 58	PPS	e 20 39	SS	e 25·7
Florence Xim		54·0	33	e 15 6	?	21 13	SS	i 23 33	SSS	i 26·5
Rathfarnham Castle		54·6	14	e 10 57	?	—	—	—	—	e 22·7
Kew		54·8	19	e 12 2	PP	e 17 11	− 3	—	—	e 22·7
Padova		54·8	32	e 9 42	+ 8	—	—	—	—	—
Basle		54·8	28	e 9 28	− 6	—	—	e 12 33	PPP	—
Strasbourg		55·6	27	e 9 39	− 1	i 17 14	−11	e 13 1	PPP	e 22·7
Stuttgart		56·4	27	e 9 42	− 3	e 17 30	− 6	e 13 10	PPP	e 23·7
Triest		56·5	32	e 9 34	−12	e 17 29	− 8	e 21 23	SS	—
Durham		57·2	17	—	—	i 17 51	+ 5	—	—	—
De Bilt		57·2	22	—	—	e 17 40?	− 6	—	—	e 24·7
Harvard		58·0	322	i 9 53	− 4	—	—	—	—	e 25·8
Jena		58·5	27	e 10 16	+16	—	—	e 10 51	PcP	—
Pretoria	z.	58·7	121	e 9 53	− 9	—	—	—	—	—
Palisades		58·8	320	e 10 4	+ 2	e 18 13	+ 6	—	—	e 27·0
Philadelphia		59·1	318	—	—	e 18 17	+ 6	—	—	e 24·9
Aberdeen	N.	59·2	15	—	—	e 18 10	− 2	—	—	e 25·8
Collmberg	z.	59·9	28	e 10 3	− 7	—	—	—	—	—
Grahamstown	z.	60·0	129	e 10 4	− 7	—	—	—	—	—
Vermont		60·1	323	—	—	e 19 35	ScS	—	—	e 24·8
Potsdam		60·7	26	e 10 11	− 4	e 18 28	− 4	e 13 58	PPP	e 21·7
Pennsylvania		61·3	318	—	—	e 18 43	+ 4	i 22 27	SS	e 28·7
Helwan	z.	61·5	57	e 10 18	− 3	—	—	—	—	—
Copenhagen		62·8	23	—	—	18 58	0	—	—	24·7
Istanbul		63·6	44	e 10 24	−11	e 18 52	−16	—	—	—
Warsaw		64·4	29	—	—	19 24	+ 6	—	—	e 30·7
Ksara		66·3	54	e 10 49	− 3	e 20 17	PPS	11 20	pP	—
Resolute Bay		83·6	345	12 31	0	22 47	− 6	—	—	—
Tucson		85·1	302	e 12 41	+ 2	—	—	—	—	—
Logan		86·2	312	e 12 42	− 2	24 6	PS	—	—	—
Sverdlovsk		87·3	33	e 12 50	0	24 19	PS	—	—	—
Pierce Ferry		87·8	306	e 12 56	+ 4	—	—	—	—	—
Hungry Horse		87·9	318	e 12 53	0	—	—	—	—	—
Overton	z.	88·2	307	e 12 47	− 7	—	—	—	—	—
Boulder City		88·5	306	e 12 59	+ 3	—	—	—	—	—
Palomar	z.	90·2	303	e 13 22	+18	—	—	—	—	—
Riverside	z.	90·4	304	e 13 4	0	—	—	—	—	—
Tashkent		93·3	49	i 17 2?	PP	—	—	—	—	—
Mineral	z.	93·6	311	e 13 24	+ 5	—	—	—	—	—
Shasta Dam		94·2	311	i 11 54	?	—	—	—	—	—

Additional readings :—
Lome iSS = 11m.23s., i = 11m.56s., e = 12m.33s.
Tamanrasset eP?Z = 7m.3s., ePPZ = 8m.27s., eZ = 8m.33s., iZ = 9m.5s., eZ = 14m.31s.
Granada iPP = 9m.37s., PPP = 10m.28s.
Algiers Univ. ePPPZ = 10m.27s.

Continued on next page.

La Paz iSE =15m.10s., SS =18m.20s.
Rome eZ =9m.17s., ePPZ =11m.15s., eE =19m.57s., eN =21m.37s.
Paris e =9m.30s., 9m.39s., 10m.11s., 13m.5s., and 22m.57s.
Besançon e =10m.22s.
Strasbourg ePP =11m.34s., eSS =21m.20s.
Stuttgart ePPZ =11m.43s., ePS? =17m.49s.
Triest ePP =11m.20s., eSP =18m.14s.
Grahamstown eZ =10m.20s.
Resolute Bay e =25m.55s. and 27m.32s.
Overton iZ =12m.59s.
Long waves were also recorded at Upsala, Helsinki, Budapest, Bombay, Bermuda, and other American stations.

Oct. 31d. 19h. 35m. 11s. Epicentre 23°·0N. 109°·0W, (as ou 1941, Feb. 13d.).

A = −·3000, B = −·8712, C = +·3885 ; δ = −8 ; h = +4 ;
D = −·946, E = +·326 ; G = −·126, H = −·367, K = −·921.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guadalajara		5·8	113	—	—	e 2 51	+13	—	—	—
Tucson		9·4	350	e 2 17	− 1	e 4 9	+ 2	—	—	e 4·9
Tacubaya		9·8	109	—	—	i 4 38	+21	—	—	e 5·7
Riverside	z.	13·2	328	e 3 8	− 3	—	—	—	—	—
Mount Wilson	z.	13·7	327	e 3 32	PP	—	—	—	—	—
Pierce Ferry		13·8	343	i 3 19	0	—	—	—	—	e 7·7
Boulder City		13·9	340	e 3 22	+ 1	—	—	—	—	—
Overton	z.	14·3	342	e 3 27	+ 1	—	—	i 3 31	PP	—
Tinemaha	z.	16·2	332	i 4 20	+30	—	—	—	—	—
Fresno		16·6	328	e 3 56a	0	e 5 57	−63	—	—	—
Berkeley		18·7	325	e 4 24	+ 2	—	—	e 8 4	SS	e 9·2
Reno		18·9	335	e 4 27	+ 3	—	—	e 4 55	PPP	—
Mineral	z.	20·3	332	e 4 41	+ 1	—	—	—	—	—
Shasta Dam		21·0	332	e 4 49	+ 2	—	—	—	—	—
Rapid City		21·6	12	e 4 53	− 1	e 8 44	− 5	—	—	e 11·4
Hungry Horse		25·6	353	e 5 29	− 3	—	—	—	—	—
Ottawa	z.	35·0	41	—	—	—	—	9 11	P_cP	18·3
Kew		83·2	37	e 15 35	?	—	—	—	—	—

Long waves were also recorded at Puebla, Vera Cruz, and at other American stations.

Oct. 31d. 20h. 22m. 28s. Epicentre 23°·0N. 109°·0W. (as at 19h.).

A = −·3000, B = −·8712, C = +·3885 ; δ = −8 ; h = +4 ;
D = −·946, E = +·326 ; G = −·126, H = −·367, K = −·921.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guadalajara		5·8	113	1 20?	− 9	i 2 48	+10	—	—	—
Manzanillo		5·9	131	1 9	−22	2 27	−13	—	—	2·7
Tucson		9·4	350	e 2 14	− 4	3 48	−19	i 2 20	PP	4·4
Tacubaya		9·8	109	e 2 19	− 5	i 4 37	SS	i 4 56	SSS	—
Puebla		10·8	109	e 2 33	− 6	e 4 59	+17	—	—	—
Lubbock		12·3	29	2 52	− 7	—	—	—	—	7·3
Palomar		12·4	328	i 3 2	+ 1	—	—	—	—	—
Vera Cruz		12·6	104	e 2 56	− 7	e 5 40	+14	—	—	e 6·6
Riverside	z.	13·2	328	e 3 13	+ 2	—	—	—	—	—
Pasadena		13·7	327	e 3 12	− 6	—	—	—	—	5·9
Pierce Ferry		13·8	343	e 3 16	− 3	—	—	—	—	7·5
Boulder City		13·9	340	e 3 20	− 1	—	—	—	—	8·2
Overton	z.	14·3	342	e 3 25	− 1	—	—	—	—	6·6
Haiwee	z.	15·2	331	e 3 40	+ 2	—	—	—	—	—
Tinemaha	z.	16·2	332	i 3 51	+ 1	—	—	—	—	—
Fresno		16·6	328	e 3 56k	0	—	—	—	—	11·0
Lick	z.	18·0	325	e 4 15a	+ 2	—	—	—	—	—
Santa Clara	E.	18·1	325	e 5 1	+47	i 7 52	SS	—	—	e 9·2
Berkeley		18·7	325	i 4 23a	+ 1	i 8 0	SS	—	—	e 8·8
Logan		18·8	354	e 4 19	− 4	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno		18·9	335	e 4 24	0	e 8 18	SS	—	—	e 10·9
Ukiah		20·1	326	e 4 51	+13	e 8 35	+16	—	—	e 9·6
Mineral		20·3	332	e 4 40	0	—	—	—	—	e 12·4
Lincoln	E.	20·6	27	e 4 48	+ 5	i 8 27	− 2	—	—	e 10·7
Rapid City	E.	21·6	12	e 4 58	+ 4	i 8 56	+ 7	—	—	e 10·9
St. Louis		22·4	40	i 5 1	− 1	i 9 0	− 4	—	—	i 11·5
Bozeman		22·7	356	e 5 5	+ 1	i 9 16	+ 7	e 5 44	PPP	e 11·6
Butte	N.	23·1	354	e 5 8	0	e 9 15	− 1	e 5 52	PPP	e 12·6
Swan Island		24·2	98	e 5 3	−16	—	—	—	—	—
Hungry Horse		25·6	353	e 5 31	− 1	—	—	—	—	e 13·9
Chicago		26·0	36	e 5 31	− 5	e 10 0	− 6	e 6 19	PP	e 12·6
Miami		26·3	76	i 5 30	− 9	—	—	—	—	—
Columbia		26·8	58	—	—	e 10 12	− 7	—	—	e 14·2
Victoria	Z.	27·8	339	—	—	e 10 44	+ 9	—	—	—
Cleveland		29·5	45	e 6 11	+ 3	e 10 52	−10	—	—	e 14·5
Washington		31·4	52	—	—	e 11 47	+15	—	—	e 17·8
Pennsylvania	N.	31·6	48	—	—	e 11 26	− 9	—	—	—
Buffalo		31·9	44	e 11 31	S	(e 11 31)	− 9	—	—	e 16·4
Philadelphia		33·2	51	—	—	i 11 54	− 6	—	—	e 13·9
Fordham		34·4	50	—	—	e 12 13	− 6	—	—	—
Palisades		34·5	50	—	—	i 12 15	− 5	—	—	18·3
Ottawa		35·0	41	e 6 55	− 1	—	—	e 6 49	P	e 17·9
Vermont		36·3	44	—	—	e 12 37	−11	(e 15 2)	SS	e 15·0
Harvard		36·6	48	e 7 1	− 9	e 12 49	− 4	—	—	i 19·2
Weston		36·8	48	i 7 6	− 5	—	—	—	—	e 18·2
Chinchina		36·9	113	e 6 14	−58	e 11 55	−63	—	—	—
Bogota		38·4	113	e 7 22	− 3	i 13 20	0	i 16 20	SSS	—
Sitka		39·0	337	—	—	13 36	+ 7	(e 16 40)	SSS	e 16·7
Bermuda		40·0	66	e 8 2	+24	—	—	—	—	18·6
San Juan		40·3	88	e 8 8	+28	e 13 36	−13	e 9 5	PP	15·0
Fort de France		45·9	92	e 7 56	−30	e 14 56	−15	—	—	—
Huancayo		48·0	133	e 8 50	+ 7	e 15 40	− 1	e 19 26	SS	e 23·8
College		48·9	339	e 8 49	− 1	e 15 57	+ 4	—	—	e 22·8
Resolute Bay		52·3	5	i 7 3	?	—	—	16 36	Q	e 20·3
La Paz		56·0	130	i 9 42	− 1	i 16 49	−41	e 17 47	PPS	27·2
Rathfarnham Castle		79·1	36	e 14 19	?	—	—	—	—	e 37·5
De Bilt		85·8	34	—	—	e 23 8	[+ 2]	—	—	e 36·5
Granada		87·8	50	i 13 18k	+26	22 47	[−32]	e 17 44	PP	43·8
Rome		95·8	40	e 13 38	+ 9	—	—	e 17 45	PP	—

Additional readings :—
Tacubaya i = 2m.42s.
Fresno eZ = 5m.27s., eN = 6m.24s.
Lick iZ = 4m.22s., eE = 9m.55s., eNZ = 10m.56s.
Berkeley eZ = 6m.35s.
Mineral eZ = 5m.26s.
Rapid City iPE = 5m.2s.
Butte eSN = 9m.34s.
Chicago iS? = 10m.10s.
Washington e = 16m.40s.
Pennsylvania eSE = 11m.32s.
Palisades e = 13m.59s., i = 17m.44s.
Ottawa e = 7m.17s.
Bermuda e = 11m.48s.
Rome eSSN = 33m.26s.?.
Long waves were also recorded at Oaxaca, Halifax, Seattle, Saskatoon, Scoresby Sund, Ivigtut, Ksara, and at other European stations.

Oct. 31d. Readings also at 0h. (College, Gori, Tiflis, and near Borzhomi), 1h. (College and near Zürich), 2h. (near Askhabad and near Tananarive), 3h. (College, Collmberg, Copenhagen, Helsinki, Potsdam, Stuttgart, Bombay, near Fergana, Obi-garm (2), and Stalinabad), 4h. (Mount Wilson, Palomar, Riverside, Tucson, Lick, Hungry Horse, and College), 5h. (Bogota, Puebla, Tacubaya, Vera Cruz, Cleveland, Palisades, Philadelphia, Harvard, Palomar, Pierce Ferry, College (2), Andijan, Frunse, Irkutsk, Almata, Naryn, Stalinabad, near Przhevalsk, and near Zugdidi), 8h. (near Mizusawa), 9h. and 10h. (College), 11h. (Ottawa, Tucson, Lick, Mineral (2), Hungry Horse (2), and near College (2)), 12h. (Tucson, Overton, and Pierce Ferry), 16h. (Brisbane and Ottawa), 17h. (Brisbane, Hungry Horse), 19h. (near Naryn), 20h. (Palisades), 21h. (Overton, near Andijan, Fergana, and Stalinabad), 22h. (Hungry Horse, Besançon, Collmberg, Paris, Strasbourg, Stuttgart, Tamanrasset, and near Athens), 23h. (Pierce Ferry, Gori, near Tiflis, and Zugdidi).

Nov. 1d. 12h. 45m. 43s. Epicentre 10°·4N. 85°·7W. Depth of focus 0·015.
(as on 1950 October 17d.)

$A = +·0738$, $B = -·9810$, $C = +·1794$; $\delta = -1$; $h = +6$;
$D = -·997$, $E = -·075$; $G = +·013$, $H = -·179$, $K = -·984$.

		△	Az.	P.	O—C.	S.	O—C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		6·2	104	i 0 58	?	i 2 33	− 8	—	—	—
Swan Island		7·2	14	e 1 53	+ 9	—	—	—	—	—
Galerazamba		10·3	87	e 2 29	+ 4	e 4 25	+ 6	—	—	5·3
Chinchina		11·3	118	e 1 15	?	—	—	e 3 25	?	—
Bogota		12·9	116	e 3 1	+ 1	e 5 13	− 8	—	—	—
Vera Cruz		13·4	312	e 4 23	?	—	—	—	—	—
Guantanamo Bay		14·0	46	i 3 7	− 7	—	—	—	—	—
Puebla		14·8	307	e 3 25	+ 1	—	—	—	—	—
Tacubaya		15·8	305	e 3 40	+ 4	e 7 6	+38	—	—	—
Miami		16·2	18	e 2 45	−56	—	—	—	—	—
San Juan		20·5	66	e 4 31	+ 1	e 8 24	+17	e 5 35	PP	e 10·7
Roosevelt Roads		20·9	64	e 4 6	−28	—	—	—	—	—
Columbia		23·0	9	e 4 59	+ 5	e 9 40	+49	—	—	e 12·6
Fort de France		24·3	78	e 4 55	−12	e 9 35	+22	—	—	—
Huancayo		24·6	157	e 5 2	− 8	i 9 29	+11	e 5 39	PP	—
St. Louis		28·4	353	i 5 41	− 3	e 10 37	+17	e 6 38	PP	—
Washington		29·4	15	i 6 32	pP	—	—	—	—	e 11·9
Philadelphia		30·9	17	—	—	—	—	e 16 29	S_cS	e 14·7
Cleveland	z.	31·2	6	i 6 13	+ 4	—	—	—	—	—
Tucson		31·8	317	i 6 15	+ 1	e 7 33	PP	i 6 30	pP	e 17·6
La Paz		31·9	147	i 6 31	+16	e 12 23	?	e 12 57	P_cS	15·8
Palisades		32·2	19	e 6 15	− 3	—	—	—	—	e 16·9
Harvard		34·3	20	e 6 30	− 6	—	—	—	—	e 18·3
Ottawa		35·9	12	e 6 45	− 4	—	—	i 6 58	pP	—
Pierce Ferry		36·2	320	i 6 53	+ 1	—	—	—	—	—
Palomar		36·6	315	i 6 56a	+ 1	i 12 58	+30	i 7 7	pP	—
Boulder City		36·7	320	e 6 57	+ 1	—	—	—	—	—
Overton	z.	36·8	320	i 6 58	+ 1	—	—	—	—	—
Riverside	z.	37·3	314	i 7 1a	0	—	—	—	—	—
Pasadena		38·0	314	i 7 7a	0	—	—	—	—	e 21·1
Haiwee	z.	38·9	317	i 7 15	0	—	—	—	—	—
Tinemaha		39·6	318	i 7 23	+ 3	—	—	i 9 26	P_cP	—
Fresno	z.	40·4	317	e 7 27k	0	e 14 0	?	—	—	—
Reno	z.	41·9	320	e 7 41k	+ 2	—	—	—	—	—
Lick	z.	42·0	316	i 7 41k	+ 1	—	—	—	—	—
Berkeley		42·7	316	i 7 46a	0	—	—	—	—	e 23·0
Mineral	z.	43·6	320	e 7 52	− 1	—	—	e 9 18	P_cP	—
Shasta Dam		44·3	320	e 7 57	− 2	—	—	—	—	—
Hungry Horse		44·7	334	i 8 0	− 2	—	—	i 9 42	PP	—
College		69·0	337	e 10 51	− 3	—	—	—	—	e 33·0
Granada		77·5	55	i 11 41a	− 2	—	—	—	—	37·9
Stuttgart		85·5	41	e 12 28?	+ 3	—	—	e 39 17	Q	e 52·3
Ksara		109·2	49	—	—	37 27	SSS	46 59	Q	—

Additional readings :
Tacubaya i = 3m.47s.
Huancayo e = 10m.9s.
St.Louis e = 5m.49s., eP_cP = 8m.53s., e = 9m.15s. and 10m.49s., eSS = 11m.42s., eSSS = 12m.44s.
Washington e = 7m.22s.
Palomar iP_cPZ = 8m.25s.
Fresno eZ = 7m.59s.
Lick iZ = 7m.49s.
Reno eN = 8m.11s., eZ = 8m.41s.
Long waves were also recorded at Bozeman, Chicago, Sitka, Resolute Bay, Weston, Scoresby Sund and other European stations.

Nov. 1d. Readings also at 0h. (Collmberg), 1h. (Puebla, Tacubaya, Vera Cruz, Bogota, Chinchina, Fort de France, San Juan, Columbia, Philadelphia, Palisades, Harvard, Ottawa, Bozeman, Mount Wilson, Palomar, Riverside, Tinemaba, Tucson, Boulder City, Overton, Pierce Ferry, Reno, Hungry Horse, Seattle, College, and Tamanrasset), 3h. (Andijan, near Fergana, Stalinabad, and Tchimkent), 4h. (Tacubaya, Tamanrasset, and near Andijan), 5h. (Nanking, Bombay, Poona, New Delhi, Tashkent, Potsdam, Stuttgart, Tamanrasset, and College), 8h. (Hungry Horse, Tamanrasset, Messina, Rome, Triest, Stuttgart, and near Athens), 9h. (near San Juan), 10h. (College and Kodaikanal), 11h. (Jena, Stuttgart, and College), 12h. (San Juan and Hungry Horse), 15h. (College), 16h. (Djakarta, Overton (3), Pierce Ferry, Hungry Horse, College (2), and near Ottawa), 17h. (Overton, Pierce Ferry, and College), 18h. (Ashkabad), 20h. (near Boulder City, Overton, and Pierce Ferry), 21h. (Stuttgart), 22h. (near Reykjavik (2)), 23h. (near Tacubaya).

Nov. 2d. 7h. 7m. 35s. Epicentre 24°·6N. 121°·1E. (as on 1946 March 16d.).

$A = -\cdot4702$, $B = +\cdot7794$, $C = +\cdot4140$; $\delta = -5$; $h = +3$;
$D = +\cdot856$, $E = +\cdot517$; $G = -\cdot214$, $H = +\cdot354$, $K = -\cdot910$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		6·5	2	e 1 45	+ 6	3 31	S_g	—	—	i 3·8
Nanking		7·7	345	1 58	+ 2	i 3 31	+ 6	—	—	i 3·8
Manila		10·0	182	e 2 55	P_g	i 4 59	S*	—	—	—
Vladivostok		20·5	23	i 4 41	− 1	—	—	—	—	—
Irkutsk		30·4	339	e 6 17	+ 1	e 11 24	+ 8	—	—	—
Bandong		34·0	204	e 6 47	− 1	i 12 5	− 8	—	—	—
New Delhi	N.	39·3	287	e 7 33	+ 1	i 13 41	+ 7	16 37	SS	—
Hyderabad		40·3	268	e 7 40	0	e 13 53	+ 4	17 13	SS	—
Almata		40·6	309	e 7 44	+ 1	e 14 4	+10	—	—	—
Naryn		40·9	306	e 7 47	+ 1	—	—	—	—	—
Frunse		42·2	307	i 7 58	+ 2	i 14 29	+12	—	—	—
Andijan		43·5	304	e 8 8	+ 1	14 49	+13	—	—	—
Fergana		43·5	304	e 8 13	+ 6	—	—	—	—	—
Kodaikanal	E.	43·8	260	e 8 26	+17	e 14 56	+16	—	—	20·6
Poona		44·2	272	e 8 13	+ 1	e 14 52	+ 6	18 20	SS	—
Bombay		45·0	273	e 8 20	+ 1	i 15 5	+ 7	e 10 9	PP	—
Obi-garm		45·4	301	i 8 22	0	i 15 10	+ 6	—	—	—
Tchimkent		45·7	306	i 8 25	+ 1	i 15 18	+10	—	—	—
Tashkent		45·9	305	i 8 27	+ 1	i 15 20	+ 9	—	—	—
Stalinabad		46·1	301	e 8 30	+ 2	e 15 24	+10	—	—	—
Samarkand		47·5	301	e 8 40	+ 2	—	—	—	—	—
Mary		51·6	301	e 9 12	+ 2	—	—	—	—	—
Sverdlovsk		53·7	324	i 9 25	− 1	17 3	+ 4	—	—	—
Ashkabad		54·3	301	e 9 28	− 2	—	—	—	—	—
Baku		60·6	304	—	—	e 18 46	+16	—	—	—
Riverview		64·8	153	e 10 34	− 9	e 19 23	0	e 23 47	SS	e 30·5
College		68·5	27	e 11 1	− 5	e 20 13	+ 5	i 11 34	P_cP	e 34·6
Yalta		71·1	311	e 11 25	+ 3	—	—	—	—	—
Helsinki		72·0	330	(e 12 25?)	+57	—	—	—	—	e 12·4
Ksara		73·0	299	i 11 34	+ 1	e 21 49	+49	e 16 11	PP	—
Upsala		75·5	330	—	—	e 33 4	?	—	—	e 40·4
Istanbul		75·7	309	e 11 44	− 5	e 21 35	+ 5	—	—	—
Warsaw		76·8	322	—	—	e 21 45	+ 3	e 30 55	SSS	e 42·4
Helwan		78·0	297	e 12 1	− 1	e 21 55	0	e 16 42	PPP	—
Copenhagen		79·8	327	—	—	22 19	+ 5	—		41·4
Potsdam		81·1	324	—	—	i 22 34	+ 6	—	—	e 42·4
Prague		81·5	322	—	—	e 27 34	SS	—	—	e 35·9
Jena	E.	82·6	323	e 12 42?	+16	—	—	—	—	—
Stuttgart		85·1	323	e 12 35	− 4	e 22 59	[− 2]	e 15 55	PP	e 47·4
De Bilt		85·4	326	—	—	e 23 7	− 4	—	—	e 46·4
Aberdeen		85·7	333	e 19 41	?	i 23 11	− 3	e 28 27	SS	e 44·4
Strasbourg		86·0	323	e 13 0	+17	e 23 10	[+ 3]	—	—	—
Rome		86·6	315	e 16 7	PP	e 23 29	+ 6	—	—	—
Durham	N.	87·0	331	—	—	i 23 19	[+ 5]	—	—	e 46·9
Pavia		87·0	320	—	—	e 23 20	[+ 6]	e 33 10	SSS	e 52·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Victoria	z.	87·2	37	e 12 45	− 4	—	—	—	—	—
Seattle		88·3	37	e 12 52k	− 3	e 23 35	− 4	e 13 23	pP	—
Kew		88·5	328	—	—	e 23 25	[+ 1]	e 29 50	SSP	e 44·4
Hungry Horse		92·2	33	i 13 10	− 3	—	—	—	—	—
Shasta Dam		92·3	43	e 13 7	− 6	—	—	—	—	—
Overton	z.	99·8	42	e 13 56	+ 9	—	—	—	—	—

Additional readings :—
Hyderabad eE =13m.59s.
Bombay eSSEN =18m.35s.
College iP =11m.4s.
Warsaw eSN =21m.49s.
Helwan eSKSZ =22m.6s.
Stuttgart ePS =23m.58s.
Aberdeen eEN =22m.36s., eE =29m.41s., eEN =39m.21s.
Strasbourg e =23m.32s.
Rome, e =20m.41s.
Kew eEN =23m.46s.
Long waves were also recorded at Rathfarnham Castle, Alicante, Granada, Malaga, Palisades, and Bozeman.

Nov. 2d. 7h. Undetermined shock. " Fiji Is. : Deep focus " (Pasadena).

Tuai eN =35m.52s.
Wellington e =36m.34s., i =36m.44s.
Kaimata ePNE =37m.19s.
Lick iPZ =42m.5s.k.
Pasadena iPZ =42m.6s.
Palomar iPZ =42m.8s.k.
Riverside iPZ =42m.8s.
Shasta Dam iP =42m.12s.
Mineral ePZ =42m.14s.
Boulder City eP =42m.22s.
Overton iPZ =42m.25s.
Pierce Ferry iP =42m.25s.
Tucson iP =42m.27s., epP =44m.23s.
Victoria ePZ =42m.33s.
College eP =42m.50s.
Stuttgart ePKPZ =49m.24s., eZ =49m.34s. and 49m.54s.
Strasbourg ePKP =49m.56s.
Long waves were also recorded at Seven Falls.

Nov. 2d. 15h. 28m. 12s. Epicentre 7°·5S. 129°·0E. Depth of focus 0·030.
(as on 1949, June 27d.).

Felt as strong shock at Fort Darwin, Australia. Less strongly over a wide area of Northern Australia. Suggested epicentre 6°·5S. 129°·5E. with depth 50km. (Gutenberg).

Seismo. Notes, Bull. Seismo. Soc., America, Vol. 41, No. 1., January, 1951, p.73.

Some European stations consider a double shock, the second occurring about 70 sec. later.

A = −·6240, B = +·7706, C = −·1297 ; δ = +2 ; h = +7 ;
D = +·777, E = +·629 ; G = +·082, H = −·101, K = −·992.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bandong		21·2	271	i 4 31	+ 2	i 8 28	+22	—	—	—
Djakarta		22·0	273	i 4 39	+ 2	i 8 37	+17	—	—	—
Manila		23·3	341	i 4 49	0	e 8 28	−14	—	—	—
Guam		26·1	36	5 10	− 5	—	—	—	—	—
Perth		27·2	204	i 5 46	+21	10 11	+25	6 23	PP	—
Brisbane		30·2	134	i 5 54k	+ 2	—	—	—	—	—
Riverview		33·3	146	i 6 24k	+ 6	i 11 31	+ 9	i 6 37	pP	—
Yakusima		37·8	2	6 56	0	12 25	− 5	e 7 39	pP	—
Zi-ka-wei	N.	39·2	350	e 7 10	+ 2	12 56	+ 5	8 16	PP	—
Miyazaki		39·3	4	i 7 6a	− 3	i 12 49	− 4	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tomie		39·9	0	7 15	+ 1	i 12 57	− 5	7 56	pP	e 14·6
Nagasaki		40·0	2	i 7 11	− 4	12 57	− 6	i 7 54	pP	18·2
Unzendake		40·0	2	7 14	− 1	13 1	− 2	—	—	23·1
Kumamoto		40·1	3	e 7 13	− 2	12 55	− 9	—	—	22·8
Simidu		40·2	6	7 17	+ 1	i 13 4	− 2	8 3	pP	17·0
Nanking		40·5	346	i 7 17a	− 2	i 13 7	− 3	—	—	—
Hukuoka		40·9	3	e 7 19a	− 3	13 12	− 4	e 8 3	pP	e 16·4
Kôti		41·1	7	i 7 21	− 3	i 12 54	−25	i 7 59	pP	—
Hirosima		41·8	5	7 27	− 2	i 13 23	− 6	—	—	—
Owase		41·9	9	i 7 28	− 2	13 25	− 6	8 14	pP	—
Sumoto		42·0	8	i 7 28	− 3	i 13 26	− 6	i 8 14	pP	16·1
Hamada		42·3	5	7 31	− 2	13 16	−21	e 13 43	S	—
Kobe		42·4	8	7 32	− 2	i 13 42	+ 4	i 8 19	pP	21·5
Osaka		42·4	8	e 7 32	− 2	13 36	− 2	i 8 20	pP	17·0
Kameyama		42·7	10	i 7 34	− 2	i 13 39	− 3	16 48?	Q	19·8
Kyoto		42·8	9	e 7 34	− 3	e 13 19	−25	—	—	—
Omaesaki		42·8	12	7 36	− 1	e 13 36	− 8	e 9 34	PP	—
Hikone		43·1	8	i 7 39	− 1	13 44	− 4	e 8 54	PP	e 26·7
Nagoya		43·1	10	7 38	− 2	13 44	− 4	i 8 24	PP	15·8
Shizuoka		43·2	12	e 7 37	− 3	13 48	− 2	8 25	pP	17·4
Gihu		43·3	10	7 38	− 3	13 46	− 5	i 8 26	pP	20·6
Hunatu		43·8	12	7 41	− 4	13 49	− 9	i 8 28	pP	16·5
Kohu		43·8	12	e 7 45	0	e 14 16	+18	e 9 39	PP	—
Yokohama		43·9	13	e 7 45	− 1	13 47	−13	9 13	PP	18·6
Tokyo		44·1	13	i 7 47	− 1	14 26	+23	e 8 25	pP	e 19·0
Kumagaya		44·5	12	e 7 45	− 6	e 12 56	?	8 55	PP	14·9
Maebasi		44·7	12	i 7 47	− 5	e 13 56	−15	—	—	—
Matusiro		44·7	11	i 7 48	− 4	13 59	−12	8 36	pP	19·7
Tukubasan		44·7	13	7 48	− 4	14 4	− 7	i 8 45	pP	15·2
Nagano		44·8	10	i 7 51	− 2	i 14 7	− 6	8 51	pP	18·7
Mito		45·0	13	7 53	− 2	i 14 10	− 6	i 8 43	pP	—
Utunomiya		45·0	12	e 7 50	− 5	14 9	− 7	8 46	pP	23·3
Wazima		45·3	9	7 55	− 2	14 13	− 7	—	—	e 18·9
Aikawa		46·1	10	8 2	− 2	14 15	−16	—	—	—
Hukusima		46·3	13	8 3	− 2	i 14 29	− 5	i 9 20	PP	i 19·1
Sendai		46·9	15	8 8	− 2	14 38	− 4	—	—	e 19·0
Mizusawa	E.	47·7	13	8 14	− 2	14 49	− 5	—	—	19·5
Morioka		48·3	13	i 8 17a	− 3	i 14 57	− 5	—	—	—
Miyako		48·4	14	8 17a	− 4	14 59	− 5	11 13	PPP	—
Hatinohe		49·2	13	8 25	− 2	15 17	+ 2	—	—	22·2
Mori	N.	50·5	11	i 8 36	− 1	15 29	− 3	—	—	23·0
Vladivostok		50·5	3	i 8 33	− 4	i 15 29	− 3	—	—	—
Auckland	N.	50·8	131	i 8 48	+ 9	e 18 54	SS	—	—	20·9
Colombo	E.	51·0	284	8 43	+ 2	13 18	?	—	—	—
Kaimata	N.E.	51·1	140	8 48	+ 6	e 15 39	− 2	—	—	—
New Plymouth	E.	51·2	135	i 8 50	+ 8	i 15 56	+14	—	—	—
Sapporo		51·6	12	i 8 41	− 4	i 15 44	− 4	i 9 36	pP	e 25·2
Christchurch		52·3	140	i 8 55	+ 5	16 0	+ 3	e 11 18	PP	—
Wellington		52·7	137	i 8 56	+ 2	i 16 13	+11	i 9 45	pP	21·3
Nemuro		52·8	15	e 9 52	+58	e 17 4	+60	—	—	—
Tuai	N.	53·3	134	9 3	+ 5	i 16 16	+ 6	—	—	—
Kodaikanal	E.	54·2	288	i 9 9	+ 5	i 13 51	?	(17 12)	PPS	17·2
Hyderabad		55·7	297	i 9 17	+ 2	i 16 48	+ 6	10 25	PcP	27·2
Apia		58·4	101	9 37	+ 3	e 17 34	+16	e 10 32	pP	e 28·3
Poona		60·2	297	i 9 48	+ 2	i 17 48	+ 7	10 36	pP	27·6
Bombay		61·3	297	i 9 54	0	i 18 0	+ 5	i 11 50	PP	24·5
New Delhi		61·5	308	i 9 54	− 1	i 17 58	+ 1	10 45	pP	24·5
Dehra Dun	N.	61·6	311	e 10 12	+16	e 18 12	+14	—	—	e 27·0
Irkutsk		63·2	344	i 10 6	0	i 18 18	0	11 9	PcP	—
Przhevalsk		67·8	323	i 10 37	+ 1	i 19 21	+ 7	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Naryn		68·7	320	i 10 41	0	—	—	—	—	—
Klyuchi		68·8	19	10 42	0	i 19 26	0	i 20 17	pS	—
Almata		69·1	322	i 10 45	+ 1	i 19 35	+ 5	i 11 43	pP	—
Frunse		70·4	320	i 10 52	0	—	—	11 46	pP	—
Andijan		70·7	317	i 10 54	+ 1	19 53	+ 5	—	—	—
Fergana		70·9	317	10 56	+ 2	e 19 52	+ 2	11 54	pP	—
Obi-garm		71·6	315	i 10 57	− 2	i 19 59	+ 1	—	—	—
Stalinabad		72·2	314	i 11 4	+ 2	—	—	—	—	—
Tashkent		73·1	317	i 11 9	+ 1	—	—	—	—	—
Tchimkent		73·3	319	i 11 10	+ 1	i 20 24	+ 7	12 8	pP	—
Samarkand		73·9	314	i 11 14?	+ 2	i 20 27?	+ 3	—	—	—
Adak		75·2	31	i 11 20	0	i 20 39	+ 1	—	—	—
Mary		76·9	312	e 11 32	+ 3	—	—	—	—	—
Honolulu		77·2	66	i 11 31	0	e 21 3	+ 3	e 14 34	PP	e 38·2
Ashkabad		79·6	311	i 11 47	+ 3	—	—	—	—	—
Tananarive		79·6	252	e 11 48	+ 4	i 21 58	+33	i 11 54	P_cP	i 33·1
Kizyl-Arvat		81·5	311	i 11 54	0	—	—	—	—	—
Sverdlovsk		84·7	329	i 12 12	+ 2	i 22 15	− 2	i 13 9	pP	—
Lenkoran		87·1	310	i 12 25	+ 3	—	—	—	—	—
Grozny		90·2	314	12 41	+ 5	22 51	[+ 7]	—	—	—
Erevan		90·6	310	e 12 43	+ 5	—	—	—	—	—
Tiflis		90·6	312	i 12 40	+ 2	i 22 55	[+ 9]	—	—	—
Leninakan		91·2	311	e 12 45	+ 4	23 1	−16	—	—	—
Borzhomi		91·7	312	12 48	+ 5	i 23 3	−18	—	—	—
Abastumanj		92·1	312	12 50	+ 5	e 23 5	[+11]	—	—	—
Piatigorsk		92·2	314	12 48	+ 3	i 23 40	+14	i 16 34	PP	—
Zugdidi		92·9	313	e 12 53	+ 4	23 8	[+ 9]	—	—	—
College		93·8	25	e 12 50	− 3	e 23 4	[− 1]	i 16 52	PP	—
Pietermaritzburg	z.	93·8	240	i 13 1	+ 8	—	—	e 16 33	PP	e 48·8
Sotchi		94·6	313	13 1	+ 5	23 16	[+ 7]	e 25 14	sS	—
Grahamstown	z.	96·2	236	i 13 11	+ 7	e 26 2	PS	e 17 8	PP	e 41·3
Pretoria	z.	96·4	243	i 13 11	+ 7	—	—	i 17 10	PP	e 45·3
Ksara		96·7	303	i 13 10a	+ 4	24 39	S_cS	—	—	—
Moscow		96·9	325	i 13 8	+ 1	i 23 29	[+ 8]	—	—	—
Theodosia		97·8	315	e 13 16	+ 5	i 23 35	[+ 9]	—	—	—
Yalta		98·7	314	13 18	+ 3	—	—	—	—	—
Sitka		99·3	33	e 13 19	+ 1	i 23 40	[+ 8]	i 17 19	PP	e 39·2
Helwan		100·3	298	i 13 25a	+ 3	—	—	17 36	PP	—
Pulkovo		100·8	329	i 13 24	− 1	i 23 46	[+ 6]	—	—	—
Istanbul		102·4	311	e 13 33	+ 1	e 23 52	[+ 5]	—	—	—
Kishinev		102·4	317	13 32	0	23 55	[+ 8]	24 50	SKKS	—
Helsinki		103·4	331	e 13 38	+ 2	e 28 23	PPS	i 14 30	pP	e 47·8
Cernauti		104·3	318	13 42	+ 1	i 24 3?	[+ 7]	i 18 6	PP	—
Bucharest	E.	104·4	314	e 13 46	+ 5	i 17 16	PP	—	—	—
Lwow		105·3	320	i 13 45	0	—	—	20 40	PPP	—
Athens		106·6	307	e 13 49	P	i 25 40	+13	e 18 4	PP	—
Sofia		106·6	312	13 52	P	i 25 40	+13	i 24 16	SKS	—
Warsaw		106·9	322	e 13 54	P	24 47	SKKS	i 18 33	PP	e 45·8
Upsala		107·1	331	i 18 4	PP	i 24 13	[+ 4]	e 21 19	PKS	e 46·2
Victoria		107·2	42	e 13 54	P	24 15	[+ 5]	e 17 47	PKP	—
Timisoara		107·7	315	e 14 15?	P	—	—	e 18 33	PP	—
Skalnate Pleso		107·9	320	e 13 58	P	e 24 22	[+ 9]	e 17 34	PKP	e 43·8
Seattle		108·1	42	i 14 7k	P	i 24 23	[+10]	i 18 15	PP	—
Belgrade		108·4	314	e 14 1	P	i 24 25	[+10]	i 17 30	PKP	e 50·8
Resolute Bay		108·4	12	13 44	P	—	—	—	—	—
Ukiah		108·5	51	e 13 56	P	i 24 23	[+ 8]	e 18 22	PP	e 43·4
Budapest		108·9	318	e 13 48	P	24 25	[+ 8]	17 42	PKP	41·8
Raciborzu		109·0	321	e 15 5	?	—	—	e 19 41	PP	—
Shasta Dam		109·0	49	e 14 2	P	e 24 23	[+ 6]	e 17 24	PKP	—
Berkeley		109·3	53	i 14 4a	P	i 24 26	[+ 7]	i 18 30	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Kalossa	E.	109·3	317	e 14 4	P	e 24 35	[+16]	e 18 37	PP		e 47·3
Ogyalla		109·4	318	e 14 8	P	e 24 28	[+ 9]	e 17 48	PKP		e 44·8
Mineral	Z.	109·6	50	e 14 16	P	—	—	i 18 10	PKP		—
Santa Clara		109·6	53	e 14 12	P	i 24 29	[+ 9]	i 19 29	PP		e 52·5
Lick		109·9	53	e 14 8k	P	e 24 27	[+ 6]	i 18 7	PKP		e 53·0
Copenhagen		111·0	328	i 14 11	P	34 24	SS	18 30	PP		51·8
Reno		111·1	51	e 14 13k	P	e 24 37	[+11]	e 18 53	PP		—
Taranto		111·3	311	18 37	PP	e 24 35	[+ 8]	e 33 40	SS		—
Fresno		111·4	53	e 14 19k	P	e 24 36	[+ 9]	e 18 20	PKP		e 51·3
Prague		111·4	321	e 14 14a	P	e 24 32	[+ 5]	e 17 49	PKP		e 45·8
Potsdam		111·6	324	i 14 14a	P	i 24 42	[+14]	i 18 0	PKP		—
Collmberg		112·0	322	e 14 17	P	e 24 47	[+18]	e 18 50	PP		e 45·3
Tinemaha		112·6	53	—	—	e 24 22	[−10]	—	—		—
Bergen		112·7	334	e 14 19	P	24 40	[+ 8]	18 24	PP		44·1
Cheb		112·7	322	e 14 36	P	e 29 18	PPS	—	—		e 55·8
Jena		112·9	323	e 14 20	P	27 48	PS	e 18 16	PKP		e 45·8
Triest		112·9	316	e 14 14	P	i 24 40	[+ 7]	i 19 7	PP		—
Haiwee		113·0	54	i 18 16	[+ 6]	i 24 44	[+11]	—	—		—
Messina		113·0	309	e 18 1	[− 9]	e 24 30	[− 3]	e 28 7	PS		—
Pasadena		113·0	57	e 14 22	P	i 24 42	[+ 9]	e 18 3	PKP		i 46·2
Hungry Horse		113·4	40	i 14 22	P	e 27 59	PS	i 18 16	PKP		—
Riverside		113·7	57	e 14 24	P	i 24 47	[+11]	i 18 16	PKP		—
Palomar		114·2	57	i 14 32	P	i 24 50	[+12]	i 18 19	PKP		—
Scoresby Sund		114·4	349	i 14 25	P	24 45	[+ 6]	i 18 15	PKP		—
Padova		114·4	316	e 14 30	P	i 24 48	[+ 9]	i 19 8	PP		52·6
Rome		114·6	313	i 14 26a	P	e 25 0	[+21]	15 38	pP		50·4
Bologna		114·8	316	e 15 5	P	e 25 16	SKKS	e 19 25	PP		—
Butte	N.	115·0	42	e 18 57	PP	e 26 30	SKKS	e 21 40	PPP		e 47·0
Stuttgart		115·0	320	i 14 31a	P	e 24 38	[− 3]	e 18 12	PKP		55·8
Florence		115·1	315	e 14 33	P	i 26 4	SKKS	i 15 39	pP		—
Salo		115·1	318	e 14 32	P	e 30 1	PPS	e 18 58	PP		e 51·5
Chur		115·4	319	e 14 33k	P	e 24 50	[+ 8]	e 18 18	PKP		—
Boulder City		115·5	54	e 14 36	P	e 25 31	SKKS	i 18 20	PKP		—
Karlsruhe		115·5	322	e 14 34	P	—	—	e 18 22	PKP		e 49·8
Overton	Z.	115·7	52	e 14 34	P	e 29 0	PKKP	e 18 23	PKP		—
Zürich		115·9	320	e 14 34a	P	e 19 17	PP	e 18 5	PKP		—
Strasbourg		116·0	321	e 14 33a	P	i 24 54	[+ 9]	i 18 21	PKP		i 56·8
Bozeman		116·1	42	e 18 21	[+ 5]	e 24 53	[+ 8]	e 19 21	PP		e 47·0
Pavia		116·1	318	e 14 37a	P	i 24 54	[+ 9]	e 15 50	pP		—
Pierce Ferry		116·1	53	e 14 36	P	e 25 2	[+17]	e 18 23	PKP		—
De Bilt		116·3	326	e 14 28	P	e 30 5	PPS	e 19 8	PP		e 59·8
Basle		116·5	320	e 18 20	[+ 3]	e 28 42	PS	e 19 37	PP		—
Logan		116·6	47	e 15 2	P	e 24 21	[−26]	e 18 16	PKP		—
Saskatoon		116·6	35	19 26	PP	25 0	[+13]	26 6	SKKS		—
Salt Lake City		116·8	48	e 18 27	[+ 9]	i 24 56	[+ 8]	e 19 28	PP		e 53·0
Neuchatel		117·0	320	e 18 23	[+ 5]	e 30 9	PPS	e 19 37	PP		—
Aberdeen		117·6	333	i 15 5	P	i 24 25	[−25]	i 18 43	PKP		58·2
Besançon		117·6	320	e 14 31	P	i 19 27	PP	18 24	PKP		—
Durham		118·7	330	e 15 13	P	i 31 22	PPS	i 18 35	PKP		—
Edinburgh	E.	118·8	332	i 19 46	PP	i 27 44	?	i 30 18	PPS		—
Paris		119·2	322	i 14 53	P	i 25 9	[+13]	i 18 27	PKP		—
Tucson		119·4	57	e 15 2	P	e 26 0	SKKS	e 18 28	PKP		e 47·6
Kew		119·6	326	e 14 48	P	e 29 29	PS	i 18 26	PKP		e 46·8
Clermont-Ferrand		120·0	319	e 14 54	P	i 26 14	SKKS	i 18 33	PKP		e 54·2
Jersey	E.	121·7	325	e 14 27?	P	e 25 51	[+47]	e 19 3?	PKP,		e 56·8
Rathfarnham Castle		121·8	331	i 18 30	[+ 3]	e 26 36	SKKS	i 20 7	PP		e 50·8
Barcelona		122·2	316	e 19 28	?	e 31 5	PPS	e 21 2	PP		e 51·0
Algiers Univ.	Z.	123·0	309	15 13	P	e 25 35	[+26]	i 18 34	PKP		—
Tortosa		123·6	315	i 18 38	[+ 7]	25 22	[+11]	i 20 19	PP		51·0
Tamanrasset	Z.	123·7	293	e 15 15	P	e 30 14	PS	e 18 37	PKP		—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Alicante		125·2	313	18 32	[− 2]	25 56	[+41]	20 14	PP	e 57·5
Ivigtut		126·4	358	21 27	PP	i 27 7	SKKS	29 37	PS	61·8
Toledo		127·1	315	i 18 42	[+ 4]	27 22	SKKS	i 20 35	PP	52·3
Lincoln	E.	127·6	43	e 18 53	[+14]	e 28 8	SKKS	e 20 42	PP	e 52·1
Granada		127·9	312	i 18 13k	[−26]	25 52	[+29]	i 19 13	pPKP	i 64·5
Lome		128·1	272	i 18 49	[+ 9]	i 27 26	SKKS	i 20 50	PP	e 41·7
Malaga	Z.	128·7	312	i 18 44k	[+ 3]	i 25 58	[+33]	—	—	57·8
Lisbon		131·2	316	18 46k	[+ 1]	26 9	[+38]	i 21 11	PP	60·5
Tacubaya		131·8	71	i 18 53	[+ 6]	i 22 3	PKS	i 38 1	SS	—
Florissant		132·8	42	e 18 53	[+ 4]	i 22 6	PKS	—	—	—
Puebla		132·8	71	e 18 52	[+ 3]	i 22 4	PKS	—	—	—
Chicago		132·9	37	e 18 54	[+ 5]	e 27 22	SKKS	e 21 14	PP	e 53·3
St. Louis		133·0	42	e 18 41	[− 8]	—	—	i 21 20	PP	—
Vera Cruz		134·7	70	e 18 51	[− 1]	—	—	—	—	—
Ottawa		136·6	26	e 18 48	[− 7]	28 10	SKKS	21 39	PP	63·1
Cleveland		136·7	34	i 19 0k	[+ 4]	i 22 13	PKS	i 32 32	PPS	—
Seven Falls	E.	137·0	19	18 51	[− 5]	29 12	SKKS	22 11	PP	—
Buffalo		137·1	30	i 19 2	[+ 6]	e 28 24	SKKS	e 24 46	PPP	—
La Plata		137·3	172	19 0	[+ 3]	28 24	SKKS	21 54	PP	66·8
New Kensington	E.	138·3	33	e 19 8	[+ 9]	i 28 28	SKKS	i 21 58	PP	e 63·7
Pennsylvania		139·1	31	i 19 3	[+ 3]	i 26 14	[+28]	i 21 51	PP	—
Harvard		140·7	23	i 18 59	[− 4]	e 29 21	SKKS	e 22 25	PKS	—
Palisades		140·9	27	e 18 58	[− 5]	i 22 25	PKS	i 22 5	PP	—
Washington		140·9	32	e 18 59	[− 4]	i 26 21	[+32]	i 21 48	PP	e 54·6
Weston		140·9	23	e 18 57	[− 6]	i 22 26	PKS	i 21 43	PP	—
Fordham		141·0	27	e 19 2	[− 1]	i 22 41	PKS	—	—	—
Philadelphia		141·1	30	i 22 45	PP	i 28 43	SKKS	i 23 28	PKS	e 57·0
Halifax		141·4	14	19 13	[+ 9]	26 20	[+30]	22 9	PP	—
Columbia		141·7	42	e 18 58	[− 7]	e 27 40	?	e 22 23	PP	e 55·7
Cherry Point		144·5	38	i 19 12	[+ 2]	—	—	—	—	—
Huancayo		149·0	130	e 19 30	[+13]	i 29 22	SKKS	i 42 9	SS	i 70·0
La Paz		150·7	145	i 19 29a	[+ 9]	26 18	[+15]	i 19 49	PKP_2	—
Balboa Heights		151·7	85	i 19 42	[+21]	—	—	—	—	—
Bermuda		152·1	25	e 19 31	[+ 9]	i 29 52	SKKS	i 24 36	PKS	e 57·8
Chinchina		155·4	92	—	—	e 44 10	SSP	—	—	—
Galerazamba		155·8	80	i 19 37	[+10]	i 23 33	SKP	i 20 32	PKP_2	72·8
Port au Prince		156·5	60	e 14 46	?	—	—	—	—	—
Bogota		156·9	94	i 19 36	[+ 8]	—	—	i 21 27	PKP_2	—
San Juan		161·7	52	e 19 37	[+ 3]	i 30 36	SKKS	e 25 32	PP	e 65·1
Fort de France		167·7	53	i 19 46	[+ 7]	i 32 16	?	—	—	—

Additional readings :—
Perth PPP =6m.38s.
Riverview iPPEN =7m.28s., iPPPEN =7m.41s., iE =11m.38s., iN =11m.42s., iEN = 12m.49s., iSSN =13m.20s., iSSSN =13m.49s.
Tomie iN =8m.51s., SSN =14m.23s.
Simidu PPZ =8m.9s.
Hukuoka e =8m.11s. and 8m.31s., P_cP? =9m.52s.
Kôti ePP =8m.59s., eSS? =14m.43s.
Sumoto P_cPEN =9m.58s.
Kobe PPE =9m.8s., ePPP?N =9m.35s., P_cP =9m.39s., P_cS?N =13m.30s., iEN = 14m.47s., SSE =15m.53s., QEN =16m.10s.
Osaka iE =14m.47s.
Hikone ePPP =9m.35s., eSS =16m.7s.
Shizuoka PPP =10m.28s., SPP =10m.50s., sS =14m.59s., sSS =18m.22s.
Gihu i =9m.35s., P_cP =9m.39s., S_cS =18m.1s.
Hunatu sS =15m.53s.
Yokohama PPP =9m.35s., SS =15m.28s.
Tokyo iE =8m.46s., eN =11m.0s.
Matusiro PP =9m.29s., pPP =10m.12s., PPP =10m.29s., sS =15m.12s., SS =17m.15s., QZ =18m.33s.
Tukubasan isS?N =14m.29s.
Nagano PPP? =11m.5s., QN =16m.43s.
Mito i =9m.17s.
Utunomiya S_cS? =15m.29s.
Sendai eE =15m.51s.
Mizusawa eSN =14m.53s.
Miyako sSE =16m.4s.
Sapporo i =11m.11s. and 14m.21s., esS =16m.55s., eS_cS =18m.2s., esSS =21m.23s.

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Christchurch i =9m.52s., SEZ =16m.8s., eZ =17m.23s., eSS?Z =21m.28s.
Wellington iP$_c$P =10m.15s., i =17m.28s., iS$_c$S? =18m.40s.
Hyderabad PPE =11m.16s., iE =12m.31s., SSE =21m.34s.
Apia eE =12m.29s.
Poona PPN =12m.4s., PPPN =13m.25s., P$_c$SN =14m.40s., PSN =18m.3s., PPSN = 18m.18s., S$_c$SN =19m.51s., SSN =22m.3s., SSSN =24m.10s., QN =24m.33s.
Bombay iSSEN =22m.7s., iSSSN =24m.4s., iSSSE =24m.20s.
New Delhi PPEN =12m.2s., iEN =13m.13s., PPPN =13m.27s., iN =14m.52s., PSEN = 18m.11s., iEN =19m.22s., S$_c$SN =19m.42s., iN =20m.23s., SSN =21m.49s., iN = 23m.35s.
Honolulu eSS =26m.30s., eSSS =30m.3s.
Tananarive ePP =14m.50s., iPPS =23m.11s., SS? =26m.37s., SSS? =29m.41s. and other unidentified phases.
Piatigorsk iPPP =18m.46s., iPKS =20m.6s., SKS =23m.3s.
College i =17m.56s. and 23m.40s., iPS =24m.50s., e =28m.16s., iPKKP =30m.0s., eSS = 30m.22s., eSSS? =34m.43s.
Grahamstown ePKKP =29m.52s.
Sitka ePPP =19m.20s., iPS =25m.48s., iSS =30m.58s., eSSS =34m.48s.
Helwan iN =16m.48s.
Helsinki iZ =15m.28s. and 15m.45s., eZ =21m.8s., eN =34m.3s. and 39m.58s.
Bucharest eN =13m.51s., eS?N =17m.21s., iEN =18m.6s.
Athens iSKS =24m.14s.
Scfia i =17m.31s., 19m.35s., and 28m.40s.
Warsaw PPP =20m.23s., eSKPEZ =21m.22s., SKKS =25m.12s., iPS =27m.15s., iPPSEZ =28m.27s., SS =33m.27s., SSS =37m.49s., and other unidentified readings.
Upsala eN =19m.35s. and 23m.35s., eSN =25m.37s., ePS?N =26m.53s., iPPSN = 28m.11s., eN =31m.7s., 34m.37s., and 39m.48s.
Victoria e =18m.3s., iPP =18m.28s., S =25m.33s., PS =27m.59s., SS =33m.56s.
Timisoara iE =17m.55s., ePPN =18m.37s., epPPN =19m.24s.
Skalnate Pleso iPPE =18m.32s., ePPN =18m.38s., ePPP =21m.17s., eSKKS =25m.21s., ePSN =27m.16s., ePSE =27m.38s., ePPS =28m.40s., eSS =33m.30s., eSSS = 38m.0s., and other e readings.
Seattle iP II =15m.27s., iPP? II =19m.36s., iPPP =20m.41s., iPPP? II =21m.58s., and numerous other readings without phase.
Belgrade iPPP =21m.59s., iSKKS =25m.44s., iPS =28m.57s.
Ukiah e =19m.19s., 21m.56s., 24m.55s., and 26m.53s., ePPS =28m.48s., iSS =33m.41s., eSSS? =38m.26s.
Budapest PKP =14m.5s., i =18m.36s. and 19m.52s., SKS =21m.12s., SKKS =21m.42s., PPS =25m.13s., i =25m.52s., e =28m.19s., SS =29m.18s.; phases wrongly identified.
Raciborzu eZ =20m.21s.
Shasta Dam ePP? =18m.13s., eSKKS? =25m.25s.
Berkeley iE =19m.25s., eEN =26m.7s.
Kalossa iN =18m.13s. and 19m.28s., iE =19m.38s., iN =19m.59s., iE =20m.4s., iN = 21m.3s., iE =21m.47s., eN =25m.6s., eE =25m.27s., eN =28m.56s.
Ogyalla ePP =18m.20s. and 18m.48s., ePPP? =21m.2s., eSKKSE =25m.30s., ePS = 27m.56s., ePPS =28m.58s., eSS =33m.48s., eSSS =38m.54s., and other unidentified e readings.
Mineral eZ =15m.41s., iZ =19m.2s.
Santa Clara iEN =28m.34s.
Lick ePSZ =27m.45s., iPKKPZ =29m.17s. and other unidentified readings.
Copenhagen 14m.22s., eP II =15m.24s. and 19m.4s., i II =20m.3s. and 22m.21s., SKS II = 25m.59s., iPS II =29m.12s., SS II =35m.30s.
Reno eZ =15m.27s., eSKKSZ =25m.36s., eZ =28m.0s.
Taranto e =20m.30s.
Fresno eZ =14m.57s., ePPZ =18m.54s., eEN =20m.18s., ePS?N =27m.38s., ePPS?Z = 28m.10s., eZ =30m.39s. and 33m.15s.
Prague ePP =18m.54s., eS? =26m.19s., iPSZ =28m.8s., ePPS =29m.23s., eSS = 33m.54s., eSSS =38m.48s. and many other unidentified e readings. Also eP II = 15m.22s., ePP II =20m.3s., iSKS II =25m.48s., iS? II =27m.36s.
Potsdam iPE =14m.17s., iPNZ II =15m.25s., iPE II =15m.29s., iPKPN =18m.10s., iPPEZ =18m.52s., iPPN =18m.58s., iPPEZ II =20m.14s., iPPPEZ =21m.19s., iPKSEZ =21m.57s., iPKSN =22m.5s., iPKS II =23m.16s., iSKSZ II =25m.27s., iSKKSEN =25m.46s., iSKKSZ =25m.56s., iSKKSN II =27m.12s., iPPS =iPS II = 29m.34s. and 29m.38s., iSSN =34m.31s., eSSZ II =35m.33s., iSSN II =35m.43s., iSSPEZ II =35m.59s., and many unidentified phases.
Collmberg ePEZ II =15m.33s., ePPEN II =20m.15s., eSKSE II =27m.10s., ePPSZ = 30m.9s., eSSZ =35m.17s., eSSN II =37m.15s., eSSSN =39m.37s. and many other unidentified e readings.
Bergen eNZ =15m.29s., eZ =19m.16s., eEN =20m.16s., SKKSEN =25m.41s., PPSZ = 28m.18s., eE =29m.24s., eZ =29m.44s., SSN =34m.49s.?
Jena ePEN =14m.29s., iPPZ =19m.8s., ePPE II =20m.20s., SN II =27m.53s., ePS?N = 28m.58s. and 29m.8s., and many other readings without phase.
Triest iSKP? =19m.37s., ipPP? =20m.6s., isPP? =20m.31s., ePPP =21m.41s., iSKKS = 25m.44s., iPS =28m.43s., iPSKS =29m.18s., iPPS =29m.48s., iSS =35m.47s.
Messina i =19m.7s., e =29m.55s.
Pasadena iPZ =18m.16s., iPPZ =18m.55s., eS?Z =27m.3s., iPSZ =28m.16s., iPKKPZ = 29m.16s., iEN =29m.19s., ePPSZ =29m.55s., iSSN =35m.12s., ePKP,PKPZ = 38m.3s.

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Hungry Horse e =15m.5s., ePP =19m.7s., iPKKP =29m.3s.
Riverside ePKKPZ =28m.58s., ePKP,PKPZ =38m.3s.
Palomar iPSZ =28m.26s., iPKKPZ =28m.58s., iZ =29m.42s.
Scoresby Sund i =14m.34s., iP II =15m.31s., i =18m.24s. and 19m.10s., II =20m.5s. and 26m.12s., also 34m.35s.
Padova e =15m.12s., S =27m.0s., PS? =28m.58s., PPS =29m.53s.
Rome PP =18m.12s., SKKS? =25m.58s., S? =26m.32s., PS =28m.10s., iPPSE = 29m.50s.
Bologna e =18m.23s., 18m.32s., 19m.48s., 21m.53s., and 26m.13s.
Butte ePPN =19m.25s., eN =20m.11s. and 28m.11s., eSS?N =36m.9s., eSSS?N = 40m.2s.
Stuttgart eP II =15m.41s., ePKP =18m.18s., iPPZ =18m.58s., ePKP II =19m.21s., ePP II =20m.36s., ePPP =22m.9s., ePPP II =23m.3s., eSKKS =26m.8s., ePKKP? = 28m.3s., eSP II =29m.54s., ePPS =30m.38s., eSS =35m.28s., eSS II =36m.32s., ePKP,PKP?Z =38m.23s., eSSS =40m.8s., eQ =48·8m., and several other e readings.
Florence iPP =19m.7s., i =19m.31s., iPS =29m.17s., iPPS =30m.12s.
Salo eZ =18m.18s., eEZ =19m.27s., iZ =19m.30s., iPPPZ =21m.49s., eEN =35m.53s.
Boulder City ePP =19m.31s., iPKKP =29m.1s., eSS =35m.13s.
Zürich i =18m.22s.
Strasbourg iPP =19m.12s., iPP? =19m.15s., ePP =19m.21s., ePPP =21m.57s., iSKKS = 26m.21s., iS =27m.6s., iPS =28m.54s., iPPS =30m.3s., iQ? =50·9m., and many other unidentified readings.
Bozeman e =26m.19s., eS =26m.53s., eSS =35m.11s., eSSS? =39m.54s.
Pavia eZ =14m.40s., iPPE =19m.22s., iPPZ =19m.33s., eSS =36m.25s.
Pierce Ferry ePP =19m.17s., i =28m.18s., iPS =29m.13s.
De Bilt e =20m.36s., eSS =35m.48s.
Basle e =22m.2s.
Logan i =18m.57s. and 19m.37s.
Saskatoon PPS =30m.10s., SS =36m.24s., SSS =40m.36s.
Salt Lake City e =20m.27s., ePS =29m.6s., ePPS =30m.20s., eSS =35m.28s.
Aberdeen iPPEN =19m.46s., iPPPE =22m.18s., iSKKSEN =26m.25s., iSE =27m.40s., iSN =28m.41s., iPSEN =30m.16s., iSSEN =36m.53s., and many other i readings.
Besançon e? =14m.41s., e =15m.36s. and 15m.50s., i =18m.32s., e =19m.1s., i =19m.45s.
Edinburgh iE =20m.50s.
Paris iPP =19m.52s., iPPP =22m.21s., iSKS =24m.19s., iSKKS =26m.34s., iS = 27m.43s., iSP? =28m.31s., iPS? =29m.52s., iPPS? =30m.25s. and 30m.34s., iPKKS =32m.13s., iSS =35m.46s., iQ =38m.49s., and many other i readings.
Tucson i =18m.34s. and 18m.48s., iPP =19m.46s., iPS =29m.31s., iPKKP? =29m.47s., eSS =35m.59s., eSSS =40m.20s.
Kew e =15m.48s., ePP =19m.53s., e =20m.57s., ePPP =23m.24s., ePPSEN =30m.21s., eSKKS?EN =37m.49s., eSSSEN =40m.45s.
Clermont-Ferrand iPP =19m.38s., iPPP =22m.14s., iPS =29m.19s., and other unidentified readings.
Jersey eE =17m.54s.? and 19m.24s., ePPE =20m.20s.?, ePPPE =22m.51s., eE = 23m.48s., eSKKSE =26m.52s., eSE =27m.48s., eE =28m.48s., ePPSE =31m.30s., eE =33m.38s., eSSE =36m.46s., eSSSE =41m.48s.
Rathfarnham Castle e =21m.18s. and 21m.56s., ePPP =22m.59s., eEN =27m.55s., iPKKP =28m.49s., ePSEN =30m.14s., eEN =32m.25s. and 37m.43s., eSSSEN = 40m.35s.
Durham iEN =17m.0s., iE =19m.23s. and 19m.33s., iN =19m.45s., iEN =20m.20s., 20m.46s., 21m.4s., 22m.0s., and 31m.48s.
Algiers Univ. iZ =18m.43s. and 19m.13s., ePP?E =20m.13s., iSKP?Z =21m.54s., ePPP?Z =23m.0s., eZ =23m.23s. and 25m.3s., eSKKSZ =27m.18s., ePKKPZ = 28m.32s., ePS?Z =29m.54s.
Tortosa PPPE =23m.18s., SKKSN =27m.31s., PS?E =30m.18s., SS?N =38m.45s., and many other unidentified i readings.
Tamanrasset ePPZ =20m.19s., ePPPZ =23m.1s., ePPSZ =31m.33s., eSSZ =37m.3s.
Alicante PKS =21m.56s., PPP =22m.52s., PS =30m.45s., PPS =32m.18s., SS = 36m.33s., SSP =38m.15s.
Ivigtut 28m.29s. and 43m.12s.
Toledo iZ =19m.23s., 21m.11s., and 21m.32s., PPPN =23m.18s., iE =29m.16s. and 33m.32s., SSN =37m.30s., iE =39m.46s.
Lincoln eE =24m.26s., ePSE =31m.6s., eSS?E =38m.40s., eSSSE =41m.54s.
Granada iPP =20m.49s., pPP =21m.7s., SKP =22m.4s., PPP =23m.13s., SKKS = 27m.52s., iS =28m.51s., PS =31m.31s., PPS =33m.37s., iSS =37m.4s., SSS = 42m.37s., Q =56·1m.
Lome iSKP =22m.39s., iPPP =23m.50s., ePS =31m.11s., eSS? =39m.3s. and other unidentified i readings.
Malaga iPP?Z =21m.38s., iPPPZ =24m.52s., SKKSZ =28m.51s.
Lisbon PKPNZ =18m.50s. and 18m.57s., SKPZ =21m.58s., PKS =22m.7s., 22m.26s., EZ =23m.23s., SPP? =33m.54s., SSS? =44m.36s., QEN =53m.57s.
Tacubaya i =19m.19s., ePPS =32m.58s.
Florissant i =22m.18s.
Chicago eSKKS =27m.55s., iSS? =39m.42s., eSSS? =44m.58s.
St. Louis iPKP =18m.52s., i =19m.33s. and 21m.59s.
Vera Cruz i =19m.6s.
Ottawa i =18m.57s., 19m.5s., and 19m.39s., PKSZ =22m.13s., SKP =22m.32s., S? = 29m.33s., PS =32m.8s., PPS =33m.32s., SS =39m.17s.

Continued on next page.

Cleveland iN =21m.53s., 22m.30s., and 22m.46s.
Seven Falls iE =19m.9s., PKSE =22m.34s., eE =28m.18s., PSE =33m.0s., PPSE = 34m.57s., eE =39m.28s., SSE =40m.38s.
Buffalo ePP? =21m.41s., iSKP =22m.25s., e =30m.1s.
La Plata N =18m.48s., PKPZ =19m.7s., PKSN =22m.34s., SKSPN =32m.18s., PSZ = 34m.19s., PPS?N =36m.12s., SSN =39m.42s., SSSN =46m.18s., and other readings without given phase.
New Kensington eSS?E =40m.36s., eSSS?E =46m.4s.
Pennyslvania i =19m.23s., iEZ =19m.55s., iE =20m.4s., i =22m.14s., iN =22m.39s.
Harvard eSKSP? =31m.36s., ePPS =34m.30s., eSS =40m.58s.
Palisades iPS =32m.28s., iPPS =34m.24s., eSS =40m.12s.
Washington iPKP =19m.8s., i =20m.36s. and 22m.15s., e =26m.59s., i =30m.57s. and 33m.56s., iPPS? =35m.14s., ePSPS =41m.23s., eSS =44m.28s.
Weston i =19m.12s., iPSPS =41m.10s.
Fordham i =19m.17s.
Philadelphia e =28m.11s., i =33m.21s. and 37m.25s., iSS =40m.18s., iPSPS =41m.20s., i =41m.32s., iSSS =45m.42s., i =46m.45s.
Halifax i =20m.5s., PKS =22m.48s., PS =32m.24s., PPS =34m.23s., SS =41m.24s., SSS =46m.30s.
Columbia eSS? =41m.34s., eSSS? =46m.48s.
Huancayo e =20m.11s., i =25m.25s., iSKSP =34m.14s., iSSS =48m.12s., i =52m.42s. and 62m.21s.
La Paz PP =23m.30s., iSKKS =29m.48s., i =34m.23s., iPPS =36m.18s., iSS =42m.53s., iSSP =43m.43s.
Bermuda iPKP =19m.34s., iSKSP =33m.36s., iSS? =43m.41s., eSSS? =48m.6s., and other unidentified i readings.
Galerazamba iPSKSEN =33m.13s.
San Juan i =20m.37s., 21m.32s., and 22m.30s., ePPP =27m.21s., eSKSP? =35m.24s., i =36m.11s., eSS =45m.0s., eSSS? =49m.44s.
Long waves were also recorded at Reykjavik.

Nov. 2d. 16h. 51m. 13s. Epicentre 45°·8N. 10°·3E. (as on 1949, May 31d.).

A = +·6883, B = +·1251, C = +·7146 ; δ = +6 ; λ = −4 ;
D = +·179, E = −·984 ; G = +·703, H = +·128, K = −·700.

		△	Az.	P.	O−C.	S.	O−C.		Supp.	
		°	°	m. s.	s.	m. s.	s.		m.	s.
Salo	z.	0·2	143	i 0 3	P_g	i 0 6	S_g		—	—
Pavia		1·0	232	i 0 24 a	+ 3	i 0 41	+ 5		—	—
Chur		1·2	333	e 0 23	− 1	e 0 41	0		—	—
Bologna		1·5	151	i 0 28	0	i 0 47	− 2		—	—
Padova		1·7	140	e 0 20	−11	e 0 33	−21		—	—
Zürich		1·8	323	e 0 37	+ 5	e 1 9	S_g	e 0 40		P_g
Florence		2·1	162	e 0 43	+ 6	—	—	—		—
Ravensburg		2·1	347	e 0 37?	0	e 1 10	S_g	e 0 40		P_g
Triest		2·3	94	e 0 44	P*	e 1 39	S_g	e 0 49		P_g
Basle		2·5	313	e 0 48	P_g	e 1 28	S_g	—		—
Neuchatel		2·6	297	e 0 48	P_g	e 1 31	S_g	—		—
Stuttgart	z.	3·1	346	e 0 50	− 1	e 1 29	0	e 1 3		P_g
Besançon		3·3	288	e 0 52	− 1	e 1 23	−12	e 1 4		P_g
Strasbourg		3·3	330	e 0 55	+ 2	e 1 32	− 3	e 1 7		P_g
Karlsruhe		3·5	339	—	—	e 1 55	S_g	—		—
Prague		5·1	31	e 1 11	− 9	e 2 11	− 9	e 2 35		S*
Jena		5·2	8	e 1 41?	P_g	e 2 44	S*	e 2 52		S_g
Collmberg	z.	5·8	18	—	—	e 2 43	+ 5	e 3 4		S_g

Additional readings :—
Ravensburg eZ =43s., e =1m.13s., eZ =1m.31s.
Stuttgart eZ =1m.0s., and 1m.7s., eS_gZ =1m.45s.
Besançon iS_g =1m.53s.
Strasbourg iP* =59s., e? =1m.24s., e =1m.36s., eS_g =1m.54s.
Prague eS_g =2m.39s.
Jena eP_gE =1m.45s.

Nov. 2d. 18h. 14m. 26s. Epicentre 7°·5S. 129°·0E. (as at 15h.). Depth of focus 0·030.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Djakarta		22·0	273	i 4 30	− 7	i 8 23	+ 3	—	—	—
Manila		23·3	341	e 4 50	+ 1	—	—	—	—	—
Brisbane		30·2	134	i 5 54a	+ 2	e 10 50	+17	e 9 12	PcP	—
Riverview		33·3	146	i 6 22a	+ 4	i 11 34	+12	—	—	—
Nanking	z.	40·5	346	i 7 18	− 1	—	—	—	—	i 18·8
Mizusawa		47·7	13	(e 8 16)	0	(10 8)	PP	—	—	—
Colombo	e.	51·0	284	8 40	− 1	15 40	+ 1	—	—	—
Poona	z.	60·2	297	i 9 43	− 3	i 21 21	SS	—	—	—
New Delhi		61·5	308	i 9 52	− 3	i 17 55	− 2	i 18 53	pS	—
Irkutsk		63·2	344	e 10 6?	0	—	—	—	—	—
Przhevalsk		67·8	323	i 10 35	− 1	19 19	+ 5	—	—	—
Naryn		68·7	320	e 10 41	0	—	—	—	—	—
Almata		69·1	322	i 10 44	0	e 19 35	+ 5	—	—	—
Andijan		70·7	317	10 52	− 1	e 19 53	+ 5	—	—	—
Obi-garm		71·6	315	i 10 54	− 5	i 19 59	+ 1	—	—	—
Stalinabad		72·2	314	i 11 0	− 2	20 6	+ 1	—	—	—
Tchimkent		73·3	319	i 11 9	0	e 20 23	+ 6	—	—	—
Samarkand		73·9	314	i 11 11	− 1	—	—	—	—	—
Mary		76·9	312	i 11 29	0	e 11 59	pP	—	—	—
Sverdlovsk		84·7	329	i 12 10	0	e 22 21	+ 4	—	—	—
Grozny		90·2	314	e 12 38	+ 2	—	—	—	—	—
Tiflis		90·6	312	e 12 38	0	—	—	—	—	—
Borzhomi		91·7	312	e 12 43	0	—	—	—	—	—
College		93·8	25	i 12 53	0	—	—	i 29 57	PKKP	—
Grahamstown	z.	96·2	236	i 13 6	+ 2	—	—	—	—	—
Pretoria	z.	96·4	243	i 13 6	+ 2	—	—	e 16 59	PP	—
Istanbul		102·4	311	e 17 45	PP	e 24 0	[+13]	—	—	—
Reno	z.	111·1	51	e 18 12	[+ 6]	—	—	e 19 0	pPKP	—
Fresno	z.	111·4	53	e 18 46k	PP	—	—	—	—	—
Prague		111·4	321	e 18 15	[+ 8]	—	—	e 19 5	pPKP	—
Collmberg	z.	112·0	322	e 18 11	[+ 3]	—	—	e 18 56	pPKP	—
Jena		112·9	323	e 18 9?	[− 1]	e 19 7	PP	e 18 49	pPKP	—
Pasadena	z.	113·0	57	i 18 15	[+ 5]	—	—	—	—	—
Hungry Horse		113·4	40	i 18 15	[+ 4]	—	—	—	—	—
Palomar	z.	114·2	57	i 18 17	[+ 5]	—	—	—	—	—
Stuttgart	z.	115·0	320	e 18 16	[+ 2]	e 28 55	PS	e 19 19	PP	—
Boulder City		115·5	54	e 18 21	[+ 6]	—	—	e 28 55	PKKP	—
Overton	z.	115·7	52	e 18 22	[+ 7]	—	—	e 20 46	PPP	—
Zürich		115·9	320	e 18 18a	[+ 2]	—	—	—	—	—
Strasbourg		116·0	321	i 18 20k	[+ 4]	i 24 15	[−30]	e 19 7	pPKP	—
Pierce Ferry		116·1	53	i 18 22	[+ 6]	—	—	—	—	—
Basle		116·5	320	e 18 20	[+ 3]	—	—	—	—	—
Besançon		117·6	320	i 18 21	[+ 2]	—	—	e 19 4	pPKP	—
Paris		119·2	322	i 18 26	[+ 4]	—	—	i 19 47	PP	—
Tucson		119·4	57	i 18 28	[+ 5]	e 28 41	PKKP	e 19 58	PP	—
Algiers Univ.	z.	123·0	309	i 18 32a	[+ 2]	—	—	—	—	—
Tamanrasset	z.	123·7	293	i 18 35k	[+ 4]	e 20 19	PP	i 19 42	pPKP	—
Alicante		125·2	313	18 50	[+16]	25 50	[+35]	20 27	PP	e 59·7
Ottawa	z.	136·6	26	e 18 49	[− 6]	—	—	e 22 17	PP	—
Harvard		140·7	23	i 19 0	[− 3]	—	—	—	—	—
Weston		140·9	23	i 19 1	[− 2]	—	—	—	—	—
Palisades		140·9	27	i 19 1	[− 2]	—	—	—	—	—
La Paz		150·7	145	i 19 26	[+ 6]	26 10	[+ 7]	i 19 46	PKP$_3$	—

Additional readings :—
Nanking iZ = 7m.49s. and 15m.39s.
Mizusawa readings have been reduced by 6 minutes.
College i = 30m.34s.
Prague e = 18m.31s., 19m.44s., and 21m.10s.
Collmberg eZ = 23m.54s.
Stuttgart eZ = 24m.10s. and 29m.3s.
Overton iZ = 21m.52s.
Besançon e = 24m.22s.
Paris e = 18m.35s.
Tucson e = 21m.0s.
Tamanrasset eZ = 20m.9s., ePPZ = 22m.57s.
Tinemaha eZ = 20m.9s., ePPPZ = 22m.57s.
Alicante PPP = 23m.14s., PS = 30m.35s., SS = 36m.14s.
La Paz PPZ = 22m.58s., SKKS = 30m.4s.

Nov. 2d. 20h. 17m. 27s. Epicentre 30°·5N. 97°·5E.

$A = -·1127$, $B = +·8557$, $C = +·5050$; $\delta = -5$; $h = +2$;
$D = +·991$, $E = +·131$; $G = -·066$, $H = +·501$, $K = -·863$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi		17·8	269	e 4 7	− 4	i 7 27	− 1	4 27	PP	—
Nanking		18·3	79	i 4 20	+ 3	e 7 51	+12	—	—	9·2
Przhevalsk		19·4	315	i 4 30	0	8 8	+ 4	—	—	—
Naryn		20·5	309	i 4 43	+ 1	e 8 30	+ 3	—	—	—
Almata		20·8	315	i 4 45	0	i 8 38	+ 5	—	—	—
Hyderabad	E.	21·7	237	4 54	− 1	8 59	+ 8	—	—	—
Frunse		22·1	310	i 5 0	+ 1	i 9 7	+ 9	—	—	—
Irkutsk		22·3	12	—	—	9 13	+11	—	—	—
Andijan		22·8	303	e 5 5	0	9 16	+ 5	—	—	—
Fergana		23·1	303	e 5 9	+ 1	i 9 21	+ 5	—	—	—
Obi-garm		24·3	298	i 5 19	− 1	i 9 37	0	—	—	—
Poona		24·6	246	i 5 22	− 1	i 9 45	+ 3	—	—	—
Stalinabad		24·9	298	i 5 25	− 1	i 9 49	+ 2	—	—	—
Bombay		25·2	248	e 5 27	− 2	e 9 53	+ 1	10 23	Q	11·9
Tashkent		25·2	304	i 5 30	+ 1	—	—	—	—	—
Tchimkent		25·2	307	i 5 31	+ 2	i 10 2	+10	—	—	—
Samarkand		26·5	299	e 5 40	− 1	—	—	—	—	—
Kodaikanal	E.	27·5	228	e 5 50	0	e 10 32	+ 2	—	—	12·9
Colombo	E.	28·7	219	6 56	PP	—	—	—	—	—
Mary		30·2	294	i 6 14	0	—	—	—	—	—
Sverdlovsk		36·7	327	i 7 13	+ 3	12 57	+ 3	—	—	—
Tiflis		43·4	301	8 15	+ 9	—	—	—	—	—
Borzhomi		44·5	300	8 15	0	—	—	—	—	—
Moscow		48·6	320	e 8 47	0	e 15 50	+ 1	—	—	—
Ksara		51·6	291	e 9 11	+ 1	e 16 37	+ 6	—	—	—
Pulkovo		52·8	325	e 9 18	− 1	e 16 47	0	—	—	—
Prague		63·0	315	e 10 33	+ 2	—	—	e 12 51	PP	—
Potsdam		63·2	318	e 10 33	+ 1	e 26 3	SSS	—	—	e 32·6
Collmberg	Z.	63·6	316	e 10 37	+ 2	—	—	—	—	—
Jena	E.	64·5	316	e 10 40	− 1	—	—	e 11 6	P_cP	—
Stuttgart		66·7	314	e 10 53	− 2	—	—	e 10 57	P	e 35·6
Strasbourg		67·7	314	e 11 1	0	—	—	i 11 35	P_cP	—
De Bilt		67·9	319	e 20 3	PS	—	—	—	—	37·6
Besançon		69·3	314	e 11 10	− 1	—	—	—	—	—
College		72·4	24	i 11 30	0	e 20 55	+ 2	e 14 10	PP	—
Resolute		74·8	4	11 45	+ 1	e 19 48	−92	—	—	—
Algiers Univ.	Z.	75·7	304	e 11 48	− 1	—	—	—	—	—
Tamanrasset	Z.	80·4	291	i 12 15a	0	—	—	i 12 42	P_cP	—
Pretoria	Z.	86·8	238	i 12 46	− 1	—	—	—	—	—
Hungry Horse		96·6	21	i 13 35	+ 2	—	—	—	—	—
Overton	Z.	106·9	27	e 18 50	PP	—	—	—	—	—
Pierce Ferry		107·4	27	e 18 56	PP	—	—	—	—	—

Additional readings :—
New Delhi iEN = 7m.31s.
Prague e = 11m.8s., 11m.19s., 12m.9s., and 12m.23s.
Jena eE = 10m.44s.
Besançon e = 12m.14s.
College i = 11m.34s.
Tamanrasset iZ = 13m.3s.
Hungry Horse e = 16m.51s.
Long waves were also recorded at other European stations.

Nov. 2d. Readings also at 0h. (Tacubaya), 1h. (Wellington), 3h. (Tucson, Overton, Pierce Ferry, and near Mizusawa), 4h. (Andijan and near Obi-garm), 5h. (Tucson, Boulder City, Overton, Pierce Ferry, and Shasta Dam), 6h. (Frunse, Lunacharskoe, Naryn, Tchimkent, Overton, Chinchina, Huancayo, near La Paz, Tamanrasset, Rome, near Andijan, Fergana, near Algiers Univ., and Alicante), 8h. (Overton and Pierce Ferry), 9h. (Tacubaya, Tucson, Overton, Pierce Ferry, and College), 10h. (College and near Mizusawa), 11h. (Prague), 14h. (College), 15h. (Manila, Stuttgart, Bologna, and Pavia), 16h. (Brisbane, Overton, Pierce Ferry, Shasta Dam, College, and Stuttgart), 18h. (Riverview, Boulder City, Overton, Pierce Ferry, Shasta Dam, and Hungry Horse), 19h. (Ashkabad), 20h. (near Mizusawa and near Obi-garm), 22h. (Brisbane and College).

Nov. 3d. 6h. 29m. 48s. Epicentre 17°·0N. 68°·5W. (as on 1950, October 6d.).

$A = +·3507$, $B = -·8903$, $C = +·2906$; $\delta = +7$; $h = +5$;
$D = -·930$, $E = -·367$; $G = +·107$, $H = -·270$, $K = -·957$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
San Juan		2·6	59	i 0 39	− 5	i 1 5	−12	e 1·3
Fort de France		7·4	107	e 1 39	−13	e 3 9	− 9	—
Bogota		13·5	205	e 3 21	+ 6	e 5 53	+ 6	e 6·5
Chinchina		13·8	211	e 3 18	− 1	—	—	—
Washington		23·1	344	e 5 22	+14	—	—	—
Weston		25·4	355	i 5 32	+ 1	e 10 12	+16	—
Harvard		25·6	355	i 5 34	+ 2	—	—	—
La Paz		33·3	179	e 6 36	− 5	e 11 36	−26	i 15·4
Tucson		41·1	300	e 7 54	+ 7	—	—	—
Hungry Horse		48·4	321	i 8 49	+ 3	—	—	—
Shasta Dam		51·9	309	i 9 14	+ 2	—	—	—
Tamanrasset	z.	69·2	71	e 11 10	0	e 13 39	PP	—
Stuttgart	z.	69·3	43	e 11 10	− 1	—	—	—
College		70·2	334	e 11 18	+ 1	—	—	—

Long waves were also recorded at Bermuda.

Nov. 3d. Readings also at 0h. (College and Ksara), 2h. (Ashkabad), 3h. (Stuttgart, near Algiers Univ., and near La Paz), 4h. (Stuttgart and Kodaikanal), 5h. (Granada), 7h. (Tacubaya), 8h. (Nanking, Tashkent, College, and near Tucson), 10h. (College, Nanking, Sverdlovsk, and near Manila), 11h. (Tacubaya (2)), 12h. (Collmberg and near Ashkabad), 13h. (Collmberg and near La Paz), 14h. (College, Tamanrasset, near Andijan, and near Collmberg), 15h. (Pretoria, Kizyl-Arvat, Mary, and near Ashkabad), 16h. (Durham), 17h. (Tacubaya and Tucson), 18h. (Prague, Obi-garm, Samarkand, Tashkent, near Almata, Andijan, Frunse, Naryn, Przhevalsk, Tchimkent, and near Granada), 19h. (Frunse, Naryn, Samarkand, Stalinabad, Tchimkent, near Andijan, Fergana, and Obi-garm), 20h. (Harvard, near Bandong, and Batavia), 21h. (Port au Prince), 22h. (Prague).

Nov. 4d. 7h. 22m. 44s. Epicentre 14°·9S. 167°·1E. Depth of focus 0·010. (as on 1950, September 10d.).

$A = -·9424$, $B = +·2158$, $C = -·2555$; $\delta = -3$; $h = +6$;
$D = +·223$, $E = +·975$; $G = +·249$, $H = -·057$, $K = -·967$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·1	224	i 4 10	+ 4	e 7 34	+12	i 4 52	sP	—
Apia		20·5	90	4 31	− 1	e 8 16	+ 5	—	—	—
Riverview		23·7	214	i 5 6k	+ 2	e 9 19	+11	i 5 39	pP	—
Wellington		27·1	167	e 5 36	0	e 9 56	− 9	e 11 44	SSS	—
Kaimata	N.E.	27·8	173	e 5 46	+ 4	—	—	—	—	—
Christchurch		28·9	171	—	—	e 10 31	− 3	e 12 38	SS	e 14·6
Bandong		58·8	272	e 9 52	+ 2	e 17 52	+ 6	—	—	—
Djakarta		59·7	272	i 9 56	− 1	e 17 58	0	—	—	—
Berkeley	z.	84·4	49	e 12 20a	− 3	—	—	i 12 55	pP	—
Lick	z.	84·6	49	e 12 19a	− 5	—	—	i 12 46	pP	—
Shasta Dam		85·5	46	e 12 25	− 3	—	—	e 12 59	pP	—
Fresno	z.	85·8	50	e 12 28k	− 2	—	—	e 13 7	pP	—
Mineral	z.	85·9	47	e 12 28	− 2	—	—	e 13 2	pP	—
Pasadena	z.	86·1	54	i 12 28	− 3	—	—	i 13 4	pP	—
College		86·5	18	e 12 28	− 5	—	—	e 13 5	pP	—
Riverside	z.	86·6	54	i 12 31	− 3	—	—	i 13 6	pP	—
Palomar	z.	86·8	55	i 12 32a	− 3	—	—	i 13 7	pP	—
Reno		86·8	48	e 12 34k	− 1	—	—	e 13 12	pP	—
Haiwee	z.	86·9	52	e 13 8	pP	—	—	—	—	—
Seattle		88·3	40	i 12 41	− 1	—	—	i 13 21	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City		89·3	53	e 12 45	− 1	—	—	e 13 20	pP	—
Overton	z.	89·7	52	i 12 47	− 1	—	—	i 13 23	pP	—
Pierce Ferry		90·0	53	i 12 48	− 2	—	—	i 13 23	pP	—
Tucson		91·3	57	e 12 54	− 2	—	—	i 13 33	pP	—
Ottawa	z.	119·5	45	e 18 36	[− 3]	—	—	—	—	—
Ksara		132·2	302	e 21 27	?	—	—	23 27	PPP	—
Collmberg	z.	138·1	335	e 19 21	[+ 7]	—	—	e 19 36	pPKP	—
Stuttgart	z.	141·7	336	e 19 18	[− 2]	—	—	e 21 18	?	—
Pavia		144·0	333	e 19 24	[0]	—	—	e 20 2	pPKP	—
Algiers Univ.	z.	154·0	329	e 19 40	[0]	e 23 54	PP	e 20 26	pPKP	—
Tamanrasset	z.	160·9	298	e 19 49?	[+ 1]	24 12	PP	e 20 29	pPKP	—

Additional readings :—
Brisbane iZ = 7m.41s., iE = 7m.45s.
Riverview iZ = 8m.57s., iE = 9m.30s., isSN = 10m.17s., iN = 10m.33s., iE = 10m.44s.
Wellington $iS_ePP?$ = 11m.58s.
Berkeley iZ = 12m.34s., ePPZ = 15m.36s.
Lick eZ = 16m.9s.
Shasta Dam ePP = 15m.44s., epPP = 16m.16s.
Fresno ePPZ = 15m.46s.
Mineral eZ = 16m.7s.
College ipP = 13m.10s.
Reno eN = 13m.6s.
Tamanrasset eZ = 21m.10s. and 23m.49s., epPPZ = 25m.1s.

Nov. 4d. Readings also at 1h. (Huancayo, La Paz, College, Gori (2), near Borzhomi (2), Leninakan (2), and Tiflis (2)), 2h. (Boulder City), 3h. (College, Ksara, and near Lenkoran), 4h. (Oaxaca, near Puebla, and Tacubaya), 5h. (Vera Cruz, Boulder City, Overton, Pierce Ferry, and College), 6h. (Boulder City (2), Overton, Pierce Ferry, Shasta Dam, and Seattle), 7h. (Boulder City and near Mizusawa), 9h. (Haiwee, Palomar, Pasadena, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Berkeley, Lick, Mineral, Reno, Victoria, College (2), Helwan, Ksara, Istanbul, Ashkabad, Lenkoran, and Shemakla), 10h. (College, Prague (2), and near Athens), 11h. (Boulder City (2), Overton (2), Pierce Ferry, Reno, Mineral, Lick, Salt Lake City, Seattle, Palisades, and near Tucson (2)), 12h. (Boulder City (2), Overton, and Pierce Ferry), 13h. (Boulder City (2), Overton (2), Pierce Ferry (2), Berkeley, Lick, Reno, Hungry Horse, Seattle, Salt Lake City, Palisades, and near Tucson), 14h. (College and near Ottawa), 15h. (Boulder City, Overton (2), Pierce Ferry (2), Kizyl-Arvat, and near Ashkabad), 16h. (Chihuahua), 17h. (Tamanrasset and College), 18h. (Ottawa), 19h. (Strasbourg, Stuttgart, and College), 22h. (College, Istanbul, Ksara, Stuttgart, Collmberg, near Yalta, and near Lenkoran).

Nov. 5d. 10h. 18m. 18s. Epicentre 46°·1N. 16°·4E.

Intensity IV at Krizevci and vicinity. Epicentre as adopted.

M. Uzelac.
Annuaire macroséismique de l'Institut Séismologique de Beograd, 1950, Nouvelle Série, No. 10, Belgrade, 1951, p. 59.

$A = +·6675$, $B = +·1965$, $C = +·7182$; $\delta = -2$; $h = -4$;
$D = +·282$, $E = -·959$; $G = +·689$, $H = +·203$, $K = -·696$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kalossa	E.	1·8	76	e 0 36	+ 4	e 0 49	− 7	—	—	—
Triest		1·9	256	e 0 35	+ 1	i 0 54	− 5	i 0 46	S_g	—
Budapest		2·3	53	e 0 56	P_g	e 1 22	S_g	—	—	—
Prague		4·2	342	e 1 30	P_g	e 1 58	+ 1	e 2 3	S*	—
Stuttgart	z.	5·6	301	e 1 22?	− 5	e 2 52	S*	—	—	—
Collmberg	z.	5·7	338	e 1 31	+ 3	e 2 35	0	e 2 0	P_g	e 2·8
Jena		5·8	328	e 1 34?	+ 5	e 2 37	− 1	e 2 53	S*	—
Strasbourg		6·4	296	e 1 33	− 5	e 3 3	+10	e 3 34	S_g	e 4·2

Additional readings :—
Triest e = 42s.
Prague e = 1m.46s., 1m.50s., and 1m.54s.
Zürich (△ = 5°·5), e = 17m.
Stuttgart eP_gZ = 1m.30s., eZ = 2m.48s., 2m.56s., and 3m.0s.
Jena eE = 2m.35s., eEN = 2m.44s., eN = 2m.49s, and 3m,2s,
Strasbourg e = 1m.45s,

Nov. 5d. 16h. 35m. 24s. Epicentre 14°·3N. 91°·7W. Depth of focus 0·005.
(as on October 28d.).

$A = -\cdot0288$, $B = -\cdot9690$, $C = +\cdot2454$; $\delta = +1$; $h = +6$;
$D = -\cdot999$, $E = +\cdot030$; $G = -\cdot007$, $H = -\cdot245$, $K = -\cdot969$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		5·5	299	1 16	− 5	2 23	− 1	—	—	—
Vera Cruz		6·5	319	1 28	− 7	2 44	− 5	—	—	—
Merida		6·9	17	e 1 44	+ 3	3 8	+ 9	—	—	—
Puebla		7·8	309	1 49	− 4	3 19	− 2	—	—	—
Tacubaya		8·8	306	i 2 1a	− 6	i 3 44	− 2	—	—	—
Guadalajara		12·8	301	2 56	− 5	—	—	—	—	i 6·2
Manzanillo		13·0	294	—	—	i 5 42	+15	—	—	—
Galerazamba		16·4	100	i 4 33	PP	e 8 10	L	—	—	13·6
Guantanamo Bay		16·8	68	i 4 2	+10	—	—	—	—	—
Chinchina		18·2	119	i 3 31	−39	i 7 10	−17	i 3 51	PP	—
Bogota		19·9	118	i 4 35	+ 6	i 8 25	+21	i 4 54	PP	—
Columbia		21·9	23	e 4 54	+ 5	e 8 57	+15	—	—	e 11·8
St. Louis		24·3	3	i 5 15	+ 3	i 9 44	+20	i 5 40	PP	—
Florissant		24·4	3	i 5 17	+ 4	e 9 54	+28	e 5 46	PP	—
San Juan		24·9	76	e 5 57	+39	—	—	—	—	10·6
Tucson		25·0	320	i 5 19	0	e 9 34	− 2	i 5 45	PP	e 9·9
Lincoln	E.	26·8	355	e 6 26	PP	e 9 54	−11	—	—	e 11·8
Chicago		27·7	6	e 5 37	− 7	e 10 33	+13	—	—	e 11·2
Washington		27·7	28	i 6 17	+33	—	—	—	—	e 13·2
Cleveland		28·5	16	i 5 54a	+ 3	e 10 55	+22	i 6 34	PP	—
Pennsylvania		29·0	23	i 5 58	+ 2	e 10 20	−21	i 6 15	pP	—
Philadelphia		29·4	28	e 7 11	PP	e 11 10	+23	—	—	e 14·4
Pierce Ferry		29·5	322	i 6 1	+ 1	e 10 59	+10	—	—	—
Fort de France		29·6	85	e 9 7	PcP	—	—	—	—	e 13·2
Palomar		29·7	315	i 6 1a	− 1	—	—	—	—	—
Boulder City		29·9	321	i 6 5	+ 1	—	—	—	—	—
Overton	Z.	30·0	322	i 6 6	+ 1	e 11 16	+19	—	—	—
Riverside	Z.	30·4	315	i 6 7a	− 1	—	—	—	—	—
Buffalo		30·6	20	—	—	e 11 19	+13	—	—	e 15·0
Fordham		30·7	28	e 7 18	PP	—	—	—	—	16·6
Palisades		30·8	27	e 6 15	+ 3	e 11 23	+14	—	—	e 16·0
Huancayo		30·8	147	i 6 15	+ 3	e 11 18	+ 9	e 7 6	PP	e 14·0
Pasadena		31·1	315	i 6 13a	− 1	e 11 18	+ 4	e 7 16	PP	e 14·1
Salt Lake City		31·7	330	e 6 56	+36	e 11 46	+23	e 7 50	PP	e 13·3
Tinemaha		32·8	320	i 6 29a	0	—	—	i 9 19	PcP	—
Weston		33·1	28	e 6 38	+ 6	—	—	—	—	e 16·5
Fresno	Z.	33·6	318	e 6 34a	− 2	e 11 33	−20	—	—	e 17·0
Ottawa		33·8	20	i 6 41a	+ 3	i 12 8	+12	14 49	SSS	—
Vermont		34·0	24	e 6 41	+ 1	e 12 11	+12	—	—	e 14·4
Lick	Z.	35·1	317	e 6 49a	0	—	—	e 8 14	PP	—
Reno		35·2	323	e 6 51	+ 1	—	—	—	—	e 19·0
Bozeman		35·3	337	e 6 56	+ 5	e 12 32	+13	—	—	e 15·6
Santa Clara		35·3	317	e 6 57	+ 6	e 12 33	+14	—	—	e 18·7
Berkeley		35·8	317	i 6 56	+ 1	i 12 39	+12	i 8 21	PP	e 17·6
Butte	N.	36·2	338	e 7 0	+ 2	e 12 46	+13	—	—	e 20·6
Mineral	Z.	36·8	322	e 7 4	+ 1	—	—	e 8 32	PP	—
Seven Falls	E.	37·1	33	—	—	e 12 57	+10	e 15 54	SSS	—
Ukiah		37·1	318	e 7 24	+18	e 13 7	+20	e 8 25	PP	e 17·9
Shasta Dam		37·5	322	e 7 0	− 9	—	—	e 8 33	PP	—
La Paz		38·4	141	i 7 20	+ 3	13 21	+14	i 8 58	PP	19·1
Halifax		38·5	33	e 8 58	PP	e 16 18	SS	—	—	—
Seattle		41·9	330	e 7 45k	− 1	e 16 5	SS	e 19 44	Q	e 23·6
Victoria		42·9	330	i 7 55a	+ 1	e 17 51	SS	—	—	—
La Plata		58·5	147	—	—	22 12	SS	24 30	SSS	32·5
College		63·1	337	i 10 23	0	—	—	e 13 56	PP	e 31·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Durham	N.	78·5	37	—	—	i 21 56	+11	—	—	—
Kew		79·8	39	—	—	e 22 36?	+37	—	—	e 39·6
De Bilt		83·0	38	e 12 30	+10	e 23 0	+28	—	—	e 39·6
Strasbourg		85·5	41	e 12 28	− 4	e 23 10	+13	e 16 0	PP	e 39·6
Stuttgart		86·4	40	e 12 39	+ 3	e 23 24	+19	e 40 36?	Q	44·6
Upsala		87·0	29	—	—	e 23 5	− 6	e 32 48	SSS	e 41·6
Potsdam		87·6	37	—	—	i 23 32	+15	e 23 52	PS	e 42·6
Prague		89·2	38	e 12 56	+ 6	e 23 52?	+20	—	—	—
Tamanrasset	Z.	91·2	65	e 13 4	+ 5	—	—	—	—	—
Ksara		110·9	46	e 14 36?	P	e 25 42	SKKS	—	—	—

Additional readings :—
Chinchina iS_cPZ = 11m.42s.
Bogota iSSEN = 8m.43s.
St. Louis i = 8m.16s. and 9m.9s., iSS = 10m.21s.
Cleveland iZ = 6m.28s., eN = 11m.52s.
Riverside iZ = 6m.15s.
Pasadena iZ = 6m.20s., iP_cPZ = 9m.16s., eS_cPZ = 12m.59s.
Fresno eZ = 6m.42s.
Ottawa i = 6m.48s.
Lick iZ = 6m.58s.
Reno eZ = 6m.58s.
Santa Clara eE = 13m.19s.
Berkeley eP_cPZ = 9m.19s.
Mineral eZ = 7m.32s., eP_cPZ = 9m.20s.
La Paz iP_cP = 9m.40s., iSS = 16m.6s., S_cS = 17m.41s.
Seattle i = 7m.53s., 8m.56s., 9m.27s., and 9m.57s.
La Plata E = 30m.18s., N = 30m.54s.
Strasbourg eP = 12m.34s., e = 12m.48s., and 14m.46s., ePS = 23m.27s.
Upsala eN = 28m.18s.
Long waves were also recorded at Harvard, New Kensington, Sitka, Ivigtut, Scoresby Sund, and other European stations.

Nov. 5d. 17h. 37m. 33s. Epicentre 33°·5N. 134°·9E. Depth of focus 0·005.

Intensity VI at Himeji ; V at Kameyama, Wakayama, Koti, Sumoto, Takamatsu, Owasi, Kobe, Tu, Yonago, Muroto, Toyooka, Tokushima, and Hukui ; IV at Iida and Kyoto ; II-III at Simidu, Irako, Hirosima, Hikone, Tottori, and Kanazawa. Epicentre as adopted. Shallow. Macroseismic radius >300km.

Seismo. Bull., Cent. Met. Obs., Japan, 1950. Tokyo, 1952, pp. 45, 46, with macroseismic chart.

$A = -·5898$, $B = +·5919$, $C = +·5493$; $\delta = -6$; $h = +1$;
$D = +·708$, $E = +·706$; $G = -·388$, $H = +·389$, $K = -·836$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Muroto	0·6	247	−0 2	−16	0 6	−19	—	—	—
Sumoto	0·9	359	0 14a	− 4	0 24	− 7	—	—	—
Koti	1·1	273	0 3a	−17	0 19	−17	—	—	—
Kobe	1·2	11	0 19a	− 3	0 38	0	—	—	—
Owase	1·2	62	0 18k	− 4	0 30	− 8	—	—	—
Osaka	1·3	25	0 19	− 4	0 32	− 8	—	—	—
Kyoto	1·7	24	0 25a	− 3	0 43	− 7	—	—	—
Simidu	1·8	246	0 23a	− 7	0 54	+ 2	—	—	—
Toyooka	2·0	358	0 34	+ 2	0 55	− 2	—	—	—
Hikone	2·1	32	0 32a	− 2	0 52	− 7	—	—	—
Hirosima	2·2	293	0 31a	− 4	1 6	+ 4	—	—	—
Nagoya	2·4	46	0 38k	0	1 6	− 1	1 9	S	—
Gihu	2·5	39	0 38a	− 1	1 11	+ 2	—	—	—
Hamada	2·7	301	0 40a	− 2	1 25	+11	—	—	—
Omaesaki	3·0	68	0 45	− 2	1 33	+11	—	—	—
Shizuoka	3·2	63	0 45	− 4	1 41	+14	—	—	—
Miyazaki	3·3	241	0 48a	− 3	1 25	− 4	—	—	—
Kumamoto	3·6	260	0 49a	− 6	1 29	− 8	—	—	—
Hukuoka	3·7	273	0 53a	− 3	2 0	+21	—	—	—
Misima	3·7	63	0 51	− 5	1 52	+13	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toyama		3·7	30	1 8	+12	1 54	+15	—	—	—
Hunatu		3·8	56	0 57k	− 1	1 58	+16	—	—	—
Unzendake		4·0	260	0 55	− 6	1 35	−12	—	—	—
Matusiro		4·1	41	0 59	− 3	1 46	− 3	1 50	S	—
Nagano		4·2	39	1 3k	0	2 1	+ 9	—	—	—
Wazima		4·2	22	1 3	0	2 15	+23	—	—	—
Mera		4·3	69	1 12	+ 7	2 11	+17	—	—	—
Nagasaki		4·3	261	2 0	S	(2 0)	+ 6	3 13	?	—
Yokohama		4·4	62	1 15	+ 9	2 16	+19	—	—	—
Kumagaya		4·5	53	1 12	+ 5	2 4	+ 5	—	—	—
Maebasi		4·5	48	1 14	+ 7	2 13	+14	—	—	—
Tokyo		4·6	60	1 17	+ 8	2 21	+19	—	—	—
Yakusima		4·8	232	1 10	− 2	2 3	− 4	—	—	—
Tukubasan		5·1	56	1 19	+ 3	2 29	+15	—	—	—
Utunomiya		5·1	52	1 21	+ 5	2 27	+13	—	—	—
Tomic		5·2	262	1 18	+ 1	2 46	+29	—	—	—
Mito		5·4	56	1 34	+14	2 37	+15	—	—	—
Onahama		6·0	53	1 39	+11	3 5	+28	—	—	—
Hukusima		6·2	45	1 35	+ 4	3 10	+29	—	—	—
Sendai		6·8	44	1 45	+ 6	3 2	+ 6	—	—	—
Akita		7·5	32	1 51	+ 2	3 30	+16	—	—	—
Mizusawa	E.	7·5	40	1 51	+ 2	3 49	+35	—	—	—
Morioka		8·0	37	1 55k	− 1	3 29	+ 3	—	—	—
Miyako		8·4	41	2 0	− 2	3 38	+ 2	—	—	—
Aomori		8·7	31	2 7	+ 1	—	—	—	—	—
Hatinohe		8·8	35	2 8	+ 1	3 50	+ 4	—	—	—
Vladivostok		9·9	347	i 2 21	− 1	i 4 21	+ 9	—	—	—
Sapporo		10·8	26	2 36	+ 2	4 43	+ 9	—	—	—
Zi-ka-wei	E.	11·6	262	e 2 45	0	6 15	L	—	—	(6·2)
Nemuro		12·9	37	3 6	+ 4	5 44	+19	—	—	—
Nanking		13·6	268	3 8a	− 3	5 45	+ 4	—	—	6·4
Manila		22·7	218	e 4 35	−22	i 8 36	−20	—	—	—
Irkutsk		28·9	321	5 55	0	—	—	—	—	—
Calcutta	E.	42·2	268	i 7 49	+ 1	14 10	+ 7	e 9 35	PP	—
Przhevalsk		44·7	300	8 8	0	—	—	—	—	—
Almata		45·7	302	i 8 16	0	—	—	—	—	—
Naryn		46·6	298	8 24	+ 1	15 15	+ 8	—	—	—
Frunse		47·4	300	i 8 31	+ 1	i 15 28	+10	—	—	—
Djakarta		47·6	220	e 8 29a	− 2	e 15 25	+ 4	—	—	—
Bandong		47·8	219	e 8 33	0	e 15 33	+ 9	—	—	—
Dehra Dun	N.	47·8	283	e 17 0?	?	e 20 51	?	—	—	e 26·8
New Delhi		49·1	282	e 8 43	0	i 15 44	+ 2	10 35	PP	—
Andijan		49·5	298	8 46	0	—	—	—	—	—
Fergana		50·0	298	i 8 49	− 1	—	—	—	—	—
Tchimkent		51·1	301	e 8 59	+ 1	—	—	—	—	—
Tashkent		51·6	300	i 9 2	0	i 16 25	+ 9	—	—	—
Lunacharskoe		51·6	300	e 9 1	− 1	—	—	—	—	—
Obi-garm		52·0	296	i 9 5	0	i 16 30	+ 8	—	—	—
Stalinabad		52·7	296	e 9 12	+ 2	e 16 42	+11	—	—	—
Hyderabad		52·8	268	9 10	− 1	16 53	+20	11 14	PP	25·6
Samarkand		53·7	298	e 9 18	0	—	—	—	—	—
Sverdlovsk		54·3	320	i 9 22	0	i 17 0	+ 7	—	—	—
College		54·9	31	i 9 27	+ 1	i 17 11	+10	i 9 45	pP	—
Poona	N.	56·1	271	9 36	+ 1	e 17 29	+12	14 32	S_cP	26·4
Bombay		56·8	273	e 9 39	− 1	e 17 34	+ 8	12 2	PP	26·1
Colombo	E.	57·2	256	9 45	+ 2	17 43	+11	—	—	28·8
Kodaikanal	E.	57·3	262	i 9 49	+ 5	i 17 53	+20	13 19	PPP	26·9
Mary		58·2	298	i 9 51	+ 1	17 54	+ 9	—	—	—
Honolulu		60·1	83	—	—	e 18 18	+ 9	—	—	e 25·4
Ashkabad		60·7	299	i 10 6	− 1	18 27?	+10	—	—	—
Kizyl-Arvat		61·8	301	i 10 13	− 1	i 18 38	+ 7	—	—	—
Sitka		62·5	38	—	—	i 18 51	+11	i 20 15	S_cS	e 25·7
Moscow		66·8	324	i 10 47	0	i 19 37	+ 4	—	—	—
Lenkoran		67·2	303	i 10 49	0	—	—	—	—	—
Resolute Bay		67·3	14	e 10 51	+ 1	19 40	+ 1	e 15 4	PPP	e 26·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grozny		67·4	309	10 52	+ 1	19 46	+ 6	—	—	—
Pulkovo		68·4	329	i 10 57	0	i 19 58	+ 6	—	—	—
Riverview		68·7	166	e 11 2	+ 3	e 20 2	+ 7	e 14 46	PPP	e 30·2
Tiflis		68·7	307	10 58	− 1	20 2	+ 7	—	—	—
Gori		69·1	308	11 2	+ 1	—	—	—	—	—
Borzhomi		69·6	308	11 5	+ 1	20 14	+ 8	—	—	—
Leninakan		69·8	307	e 11 11?	+ 6	—	—	—	—	—
Abastumanj		70·0	308	11 7	0	20 19	+ 8	—	—	—
Zugdidi		70·3	310	e 11 11	+ 2	—	—	—	—	—
Sotchi		71·2	311	11 26	+12	20 44	+19	—	—	—
Victoria		72·7	43	e 11 24	+ 1	i 20 49	+ 7	12 33	SKS	—
Theodosia		73·2	314	e 11 31	+ 5	—	—	—	—	—
Upsala		73·7	333	e 11 28?	− 1	i 20 57	+ 4	i 11 42	pP	e 37·4
Seattle		73·8	44	i 11 38k	+ 9	—	—	—	—	—
Yalta		74·2	314	11 32	0	—	—	14 19	PP	—
Scoresby Sund		75·0	353	e 11 38	+ 2	e 21 17	+ 9	—	—	35·4
Kishinev		76·0	318	11 40	− 2	21 21	+ 2	—	—	—
Lwow		77·0	322	i 11 47	− 1	i 26 23	SS	e 14 35	PP	—
Shasta Dam		77·5	50	e 11 43	− 7	e 21 27	− 8	e 14 52	PP	—
Bergen		77·7	338	e 11 53	+ 2	21 45	+ 8	e 26 49	SS	39·0
Ukiah		77·8	52	—	—	e 21 46	+ 8	e 26 2	SS	e 32·3
Mineral	z.	78·2	50	e 11 53	− 1	—	—	—	—	—
Lund		78·2	332	—	—	21 50	+ 8	—	—	—
Copenhagen		78·5	332	i 11 56	0	i 21 51	+ 6	14 48	PP	39·8
Ksara		78·7	303	i 11 58	+ 1	22 2?	+14	—	—	—
Bucharest		79·0	317	e 12 3	+ 4	i 21 59	+ 8	—	—	37·4
Berkeley		79·1	52	i 12 3a	+ 4	i 22 2	+10	e 26 57	SS	e 36·4
Istanbul		79·2	313	e 11 58	− 2	e 22 15	+22	—	—	—
Saskatoon		79·2	34	—	—	(23 27)	PPS	—	—	23·4
Skalnate Pleso		79·3	324	e 12 0	0	e 21 58	+ 4	e 30 57	SSS	e 35·4
Santa Clara	E.	79·6	52	—	—	i 22 9	+12	—	—	e 38·1
Raciborzu		79·7	325	e 12 6	+ 4	—	—	—	—	e 42·8
Lick	z.	79·8	52	i 12 9k	+ 6	—	—	i 12 35	pP	—
Reno		79·8	49	e 12 5	+ 2	e 22 8	+ 9	e 12 13	pP	—
Butte		80·2	41	e 12 38	pP	e 22 11	+ 8	e 26 46	SS	e 33·2
Potsdam		80·6	329	i 12 8a	+ 1	i 22 17	+ 9	i 12 19?	pP	e 39·4
Budapest		81·0	322	12 9	0	i 22 20	+ 8	23 43	PPS	e 42·0
Timisoara	E.	81·0	319	e 12 19	+10	e 22 13?	+ 1	—	—	e 44·4
Ogyalla		81·2	323	e 12 41	pP	e 22 24	+10	e 15 39	PP	—
Bozeman		81·2	41	e 11 57	−13	i 22 23	+ 9	17 31	PPP	e 33·6
Fresno		81·4	52	e 12 12a	+ 1	e 23 27	PS	e 15 29	PP	—
Collmberg	z.	81·4	328	e 12 11	0	e 22 23	+ 7	e 15 40	PP	e 38·0
Prague		81·5	326	i 12 11	− 1	i 22 23	+ 6	i 12 19	pP	e 38·4
Kalossa	E.	81·6	323	e 12 31	pP	e 22 23	+ 5	e 15 11	PP	e 44·0
Sofia		81·7	316	—	—	i 22 36	+17	—	—	—
Belgrade		82·0	319	e 12 16a	+ 2	e 22 30	+ 8	e 16 26	PP	e 45·9
Jena		82·2	328	e 12 15	0	e 22 29	+ 5	e 15 36?	PP	e 38·4
Tinemaha	z.	82·2	51	i 12 19	+ 4	—	—	—	—	—
Cheb		82·5	328	e 12 17?	0	22 30	+ 3	e 15 45	PP	e 40·4
Aberdeen		82·7	339	i 12 17	− 1	i 22 43	+14	i 15 35	PP	42·8
Haiwee	z.	82·9	51	e 12 24	+ 5	—	—	—	—	—
Wellington		83·0	152	—	—	e 22 34	+ 2	i 23 38	PS	43·0
Salt Lake City		83·9	45	—	—	e 22 51	+10	e 27 59	SS	e 34·3
Pasadena		84·0	53	e 12 26	+ 1	i 22 45	+ 3	e 27 57	SS	e 34·0
Christchurch		84·0	154	—	—	e 22 55	+13	e 28 42	SS	e 36·1
Edinburgh	E.	84·0	338	—	—	22 47	+ 5	23 2	PS	—
De Bilt		84·1	332	e 12 27a	+ 2	i 22 51	+ 8	e 15 45	PP	e 43·4
Helwan		84·1	302	i 12 26a	+ 1	22 46	+ 3	15 42	PP	—
Athens		84·4	312	—	—	e 22 46	0	—	—	—
Durham		84·5	336	i 12 25	− 2	i 22 51	+ 4	i 12 44	pP	—
Riverside	z.	84·6	53	e 12 28	0	—	—	—	—	—
Overton	z.	84·9	49	i 12 32	+ 3	e 23 3	+12	—	—	—
Stuttgart		84·9	328	i 12 29a	0	e 22 52	+ 1	e 12 39	PcP	43·4
Triest		84·9	323	i 12 29a	0	i 22 47	− 4	i 23 41	PS	—
Boulder City		85·0	50	e 12 32	+ 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Karlsruhe		85·1	328	e 12 27?	− 3	e 22 49	− 4	—	—	e 47·4
Palomar		85·3	53	e 12 33	+ 2	e 22 59	+ 4	—	—	—
Pierce Ferry		85·5	49	i 12 34	+ 2	e 23 8	+11	—	—	—
Ivigtut		85·6	2	—	—	22 56	− 2	28 51	SS	42·4
Strasbourg		85·7	329	e 12 33	0	i 23 1	+ 2	e 15 54	PP	e 43·4
Chur		86·1	326	e 12 42k	+ 7	—	—	—	—	e45·3
Zürich		86·2	328	e 12 33k	− 2	e 23 11	+ 7	e 23 55	PS	—
Basle		86·5	328	e 12 39	+ 2	e 23 14	+ 8	—	—	—
Salo	E.	86·6	325	—	—	e 23 5	− 2	—	—	e 38·2
Taranto		86·6	318	—	—	e 23 9	+ 2	—	—	—
Padova		86·7	323	e 12 45	+ 7	e 23 3	− 5	—	—	e 37·8
Kew		86·7	334	i 12 39a	+ 1	e 23 4	− 4	e 15 36	PP	e 40·4
Rathfarnham Castle		87·2	338	i 12 49	+ 9	e 23 25	+12	e 16 4	PP	e 45·4
Neuchatel		87·2	328	e 12 42	+ 2	e 23 23	+10	—	—	—
Florence		87·5	323	i 12 46	+ 4	i 23 8	− 8	i 16 3	PP	—
Prato		87·5	323	e 12 51	+ 9	i 23 27	+11	—	—	—
Paris		87·7	331	i 12 44	+ 1	e 23 12	− 6	i 12 50	P_cP	e 45·4
Rocca di Papa		88·2	321	e 17 24	PPP	—	—	—	—	—
Rome		88·2	321	e 12 44	− 1	i 23 16	− 6	e 16 4	PP	46·7
Jersey	E.	89·2	334	—	—	23 39	+ 7	—	—	46·4
Clermont-Ferrand		89·9	329	e 12 53	0	e 23 53	+15	e 16 45	PP	e 34·7
Tucson		90·0	51	e 12 56	+ 2	e 23 51	+12	e 16 33	PP	e 36·4
Lincoln	E.	92·1	37	—	—	e 23 45	−13	—	—	e 44·1
Tortosa		94·9	326	—	—	i 26 39	PPS	35 26	SSS	e 46·4
Chicago		95·5	31	—	—	e 24 28	+ 1	e 31 12	SS	e 39·9
Seven Falls	E.	96·5	17	—	—	i 24 41	+ 6	31 42	SS	—
Ottawa		96·7	21	—	—	e 23 45	[− 9]	—	—	—
St. Louis		96·9	34	e 20 11	PP	i 24 54	+15	e 31 29	SS	—
Alicante		97·4	326	e 13 27	− 1	25 13	+30	17 15	PP	e 47·8
Toledo		97·7	329	—	—	e 24 9	[+10]	e 35 36	SSS	59·4
Buffalo		97·9	24	—	—	e 24 54	+ 7	—	—	—
Cleveland		98·2	27	—	—	e 24 19	[+17]	i 24 59	S	e 43·0
Vermont		98·2	20	—	—	e 24 12	[+10]	e 25 2	S	e 39·5
Granada		99·7	328	13 45	+ 7	23 27	[+18]	17 17	PP	i 51·0
Pennsylvania		100·1	25	i 13 45	+ 5	i 25 15	+ 9	i 18 23	PP	—
Halifax		100·4	13	—	—	e 24 21	[+ 8]	e 23 21	SS	—
Malaga	z.	100·5	328	i 17 49k	PP	e 23 13	?	i 28 37	?	49·6
Weston		100·7	19	e 16 53	PP	e 25 39	PS	—	—	e 46·8
Lisbon		100·8	332	—	—	25 19	+ 8	32 9	SS	51·4
Palisades		101·3	21	—	—	i 24 23	[+ 6]	i 25 28	S	—
Philadelphia		101·8	23	—	—	e 25 26	+ 6	—	—	e 42·0
Tamanrasset	z.	106·1	312	e 14 11	P	e 27 47	PS	e 18 32	PP	51·0
San Juan		124·6	24	—	—	e 25 5	[−43]	e 31 51	PPS	—
Fort de France		129·7	20	e 19 58	?	—	—	—	—	—
Chinchina		132·1	42	i 18 24	[−43]	e 21 51	PKS	e 38 50	SS	63·4
Bogota		133·2	41	—	—	e 22 53	PKS	e 39 26	SS	58·4
Huancayo		145·1	59	e 19 35	[+ 5]	e 29 46	SKKS	e 41 49	SS	e 60·6
La Paz		153·2	55	i 19 27	[−16]	26 49	[+ 8]	i 20 3	PKP_2	73·0
La Plata		169·3	101	25 9	PP	31 39	SKKS	35 29	SKSP	87·4

Additional readings :—
Calcutta ePPPE =10m.11s., iSSE =17m.29s.
New Delhi SSN =19m.11s., iN =19m.25s. and 19m.39s.
Hyderabad SSE =20m.36s.
College ePP? =12m.2s., ePPP =13m.0s., eS_cS =19m.19s., eSS =21m.13s.
Poona PSN =17m.39s., S_cSN =19m.19s., SSN =21m.8s., SSSN =22m.41s., QN = 23m.38s.
Bombay iPPSN =17m.48s., iPPSE =17m.52s., SSN =21m.22s., SSE =21m.25s.
Kodaikanal S_cSE =19m.48s.
Sitka eSS =22m.55s.
Resolute Bay e =24m.0s.
Riverview iE =20m.8s. and 21m.5s., eSS?N =24m.3s., eE =25m.3s., eZ =27m.45s., eQN =27m.57s.
Upsala eE =14m.51s., ePP =16m.2s., iPPSE =21m.45s., eN =25m.2s., eSSE =25m.39s., eSSN =25m.51s., eSSS? =29m.15s.
Seattle i =11m.46s. and 11m.54s.

Continued on next page.

Yalta PPP =16m.8s.
Scoresby Sund i =11m.43s., 21m.31s., and 22m.6s., SS =26m.9s., SSS =28m.21s.
Lwow ePPP =15m.39s., SSS =30m.27s.
Bergen eN =21m.49s.
Ukiah eSSS? =32m.6s.
Mineral eZ =12m.35s. and 13m.24s.
Copenhagen i =12m.1s., 16m.57s., and 22m.12s., PPS =22m.35s., SS =26m.57s., SSS = 30m.51s.
Berkeley eZ =12m.31s., eE =32m.33s.
Skalnate Pleso e =12m.8s.
Reno eZ =12m.34s.
Potsdam iPPZ =15m.12s., ePPN =15m.19s.?, eZ =18m.30s., eEN =18m.34s., eSSN = 27m.33s., iSSE =27m.38s., eEN =31m.36s., eZ =32m.3s.
Budapest PN =12m.30s., PPE =15m.15s., SSE =27m.30s., eN =28m.12s., SSSE = 31m.57s.
Timisoara ePN =12m.22s., eSN =22m.22s.
Ogyalla e =14m.11s., ePPP =17m.17s., eSSS =31m.27s.
Bozeman e =12m.45s., eSS =27m.17s., eSSS =31m.5s.
Fresno eZ =12m.42s., eN =14m.8s., eZ =15m.33s.
Collmberg eZ =12m.17s.
Prague eN =13m.30s., e =13m.51s., ePP? =14m.57s., ePPP? =16m.34s., e =18m.37s., ePS =23m.10s., eSS =27m.41s., eSSS =31m.17s.
Belgrade e =13m.33s.
Jena ePEN =12m.23s., eN =12m.37s., eE =13m.2s.
Cheb ePS =23m.7s., e =23m.27s., eSS =28m.3s., eSSS =31m.45s.
Aberdeen iPPPN =18m.50s., iEN =19m.10s., iPSEN =23m.27s., iN =26m.49s., iSSSEN =31m.57s., iEN =34m.30s.
Wellington iSS =27m.54s., Q =38m.27s.
Christchurch eSSSEN =32m.7s.
Edinburgh SE =22m.51s., PSE =23m.51s., PPSE =24m.8s.
De Bilt iPS =23m.50s., eSS =28m.37s.
Helwan eZ =13m.37s., PSN =23m.45s.
Durham iEN =23m.9s.
Stuttgart eZ =12m.36s., e =13m.34s., ePP =15m.47s., e =19m.15s., ePS =23m.57s., eSS =28m.27s., eSSS? =31m.27s., eQ? =34·4m.
Triest eZ =11m.54s., iSS =28m.35s.
Palomar eN =22m.6s.
Ivigtut 23m.9s. and 32m.51s.
Strasbourg ePP =15m.57s., ePPP =17m.57s., eSKS =22m.46s., iPS =23m.57s., iPPS = 24m.27s., eSS =28m.37s. and 28m.49s., eSSS =32m.29s., iSSS =32m.44s., iQ = 35m.36s., and other unidentified readings.
Basle e =13m.51s. and 14m.19s.
Kew e =19m.28s., eSKSEN =22m.38s., ePS =23m.20s., e =24m.44s., eSS =28m.48s.
Rathfarnham Castle eEN =32m.57s.
Florence iSS =28m.46s.
Paris iPP =16m.10s., ePPP =18m.12s., eSKS =23m.4s., iPPS =24m.45s., eSS? = 28m.30s., eSSS =32m.40s., and other unidentified phases.
Rome e =22m.58s., SS =28m.37s., SSS =33m.12s.
Clermont-Ferrand e =17m.23s., eSKS =23m.28s., i =24m.47s., ePS =24m.57s., e = 25m.4s., iPPS =25m.35s., eSSS =33m.47s.
Tucson ePPP =18m.34s., eSKS =23m.33s., eSS =29m.43s.
Seven Falls E =34m.46s. and 38m.44s.
St. Louis e =34m.31s. and 37m.10s.
Alicante PPP =19m.16s., PS =26m.41s., PPS =27m.20s., SS =32m.38s., Q =41m.43s.
Toledo eEN =26m.40s., eE =39m.3s., eN =39m.27s.
Cleveland eN =25m.5s. and 31m.24s., eEN =31m.46s.
Vermont ePS =26m.32s.
Granada PPS =27m.45s., SS =32m.18s., SSS =37m.9s.
Pennsylvania iE =20m.16s., iEN =20m.43s., eN =21m.44s.
Lisbon QE =43·4m.
Palisades e =25m.18s., iPS =26m.54s., iSS =32m.23s.
Tamanrasset eZ =17m.11s., 17m.47s., and 20m.34s., ePPPZ =20m.53s., eSSZ =33m.47s.
Huancayo e =28m.44s., eSSS =47m.29s.
La Paz PP =23m.43s., iSKKS =30m.37s., PPS =36m.39s., iSS =43m.3s., iSSS =49m.12s.
La Plata SKKSN =31m.57s., SKKSE(Δ >180°) =33m.15s., SKSPE =35m.39s., SKSPN =35m.57s., PPS?E =38m.39s., PPS?N =39m.9s., SSN =46m.9s., SSE = 46m.21s., PSSN =48m.45s., SSS?E =60m.21s., QE =66·6m.
Long waves were also recorded at Harvard, Saskatoon, Helsinki, Bologna, Messina, Pavia, and Barcelona.

Nov. 5d. Readings also at 0h. (Port au Prince), 1h. (Tamanrasset), 3h. (Jena, Gori, Zugdidi, near Borzhomi, Tiflis, and near Obi-garm), 5h. (Mount Wilson, Palomar, Tamanrasset, Almata, Frunse, Mary, Naryn, Samarkand, Tchimkent, near Andijan, Fergana, Kulyab, Obi-garm, Stalinabad, and Tashkent), 9h. (Strasbourg), 10h. (Ashkabad), 11h. (College, Overton, near Boulder City, and Pierce Ferry), 15h. (College, Samarkand, near Andijan, Obi-garm, and Stalinabad), 16h. (Ashkabad), 17h. (Istanbul, Fergana, near Obi-garm, Stalinabad, and near Granada (3)), 21h. (Victoria and near Ashkabad).

Nov. 6d. 20h. 55m. 44s. Epicentre 32°·7N. 117°·8W.

Epicentre given by Pasadena.

$A = -·3932$, $B = -·7459$, $C = +·5377$; $\delta = +9$; $h = +1$;
$D = -·885$, $E = +·466$; $G = -·251$, $H = -·476$, $K = -·843$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		0·5	70	i 0 12	− 2	i 0 21	− 2	—	—	—
Palomar		1·0	50	i 0 21	0	—	—	—	—	—
Riverside		1·3	16	i 0 26k	+ 1	i 0 45	+ 1	—	—	—
Pasadena		1·5	348	i 0 27	− 1	e 0 45	− 4	—	—	—
Santa Barbara		2·4	317	i 0 40	− 1	—	—	—	—	—
Boulder City		4·1	36	i 1 6	+ 1	—	—	i 1 12	P*	—
Fresno		4·3	338	i 1 9a	+ 1	i 2 22	S_g	i 1 26	P_g	—
Pierce Ferry		4·6	42	i 1 13	+ 1	i 2 6	− 1	1 20	P*	2·5
Overton	z.	4·7	35	i 1 15	+ 1	—	—	1 21	P*	—
Lick		5·6	327	i 1 25a	− 2	e 2 32	− 1	i 1 36	P*	—
Tucson		5·9	93	e 1 30	− 1	i 2 36	− 4	i 1 59	P_g	i 2·9
Berkeley	z.	6·3	326	i 1 34	− 2	—	—	—	—	—
Reno		7·0	347	e 2 4	P*	e 3 28	S*	e 3 44	S_g	—
Hungry Horse		15·9	9	i 3 51	+ 4	—	—	—	—	—

Additional readings :—
Boulder City i = 1m.46s.
Fresno eZ = 1m.50s. and 4m.11s.
Lick iZ = 2m.8s. and 2m.16s.
Tucson i = 1m.38s.
Reno eN = 2m.51s.

Nov. 6d. 22h. 22m. 9s. Epicentre 7°·2S. 155°·3E. (as on 1950, Aug. 10d.).

$A = -·9014$, $B = +·4146$, $C = -·1245$; $\delta = -8$; $h = +7$;
$D = +·418$, $E = +·909$; $G = +·113$, $H = -·052$, $K = -·992$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		20·3	185	i 4 33k	− 7	i 8 21	− 2	i 4 36	P	—
Riverview		26·8	187	i 5 47k	+ 3	i 10 13	− 6	i 5 59	SS	e 13·4
Apia		33·0	103	e 6 29	−10	—	—	—	—	e 13·8
Wellington		38·1	155	i 9 0	PPP	i 13 2	−14	i 15 53	SS	18·8
Christchurch		39·2	159	e 7 36	+ 5	e 13 16	−16	9 5	PP	e 19·2
Perth		44·2	230	—	—	14 53	+ 7	18 11	SS	—
Bandong		47·3	268	—	—	15 35	+ 4	—	—	—
Djakarta		48·1	269	e 8 33	−10	e 15 37	− 5	—	—	—
Nanking		52·3	320	i 9 16a	+ 1	16 45	+ 5	16 59	PS	—
Honolulu		54·0	57	e 9 20	− 8	—	—	—	—	e 24·5
Vladivostok		54·4	339	i 9 30	− 1	i 17 10	+ 1	—	—	—
Calcutta	E.	71·8	297	e 11 30	+ 4	e 20 50	+ 4	e 21 33	PPS	—
Irkutsk		73·4	331	e 11 36	0	21 7	+ 2	—	—	—
Colombo	E.	76·5	278	11 53	− 1	21 41	+ 2	—	—	—
New Delhi		83·1	300	e 12 33	+ 4	i 22 45	− 3	—	—	—
College		83·2	20	i 12 24	− 5	e 22 42	− 7	e 28 23	SS	e 38·9
Poona		84·2	290	12 34	0	e 22 58	− 1	22 40	SKS	35·4
Sitka		85·0	30	—	—	e 23 7	0	e 29 17	SS	38·8
Bombay		85·2	290	e 12 41	+ 2	i 23 11	+ 2	—	—	—
Przhevalsk		85·3	314	12 41	+ 1	23 1	[− 2]	—	—	—
Almata		86·5	315	i 12 46	0	—	—	—	—	—
Naryn		86·8	312	i 12 47	0	e 23 7	[− 6]	—	—	—
Ukiah		87·9	50	—	—	e 23 55	[+35]	e 32 26	SSS	42·2
Frunse		88·1	313	i 12 54	0	e 23 40	+ 3	—	—	—
Berkeley		88·4	52	e 12 48k	− 7	e 23 4	[−19]	e 16 22	PP	e 42·2
Santa Clara		88·6	52	e 13 8	+12	e 23 53	+11	—	—	e 49·6
Shasta Dam		88·8	49	e 12 53	− 4	—	—	e 16 21	PP	—
Lick	z.	88·8	52	e 12 53a	− 4	—	—	e 16 25	PP	—
Andijan		89·3	311	12 59	0	23 51	+ 3	—	—	—
Mineral	z.	89·4	49	e 12 55	− 5	—	—	e 16 25	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Victoria		89·6	41	—	—	e 24 3	S_cS	—	—	e 42·4
Fergana		89·7	311	i 13 1	0	e 23 25	[− 6]	—	—	—
Fresno	z.	90·2	53	e 12 59a	− 5	—	—	—	—	—
Reno		90·6	51	e 12 59a	− 6	—	—	e 16 22	PP	—
Pasadena		91·1	56	i 13 3a	− 5	e 23 28	[−11]	i 25 13	PS	e 37·4
Tinemaha		91·4	53	i 13 5a	− 4	—	—	—	—	—
Stalinabad		91·6	309	i 13 10	0	i 24 10	+ 1	—	—	—
Tchimkent		91·6	312	i 13 11	+ 1	—	—	—	—	—
Haiwee	z.	91·6	54	i 13 5	− 5	—	—	—	—	—
Tashkent		91·7	311	i 13 11	+ 1	i 23 42	[− 1]	e 16 54	PP	—
Lunacharskoe		91·7	311	e 13 11	+ 1	—	—	—	—	—
Riverside		91·8	56	i 13 6a	− 5	—	—	i 13 19	P_cP	—
Palomar		92·1	57	i 13 8a	− 4	—	—	e 13 26	P_cP	—
Samarkand		93·2	309	e 13 19	+ 2	e 23 48	[− 3]	—	—	—
Boulder City		94·1	54	e 13 17	− 5	—	—	e 17 1	PP	—
Overton	z.	94·4	53	i 13 19	− 4	—	—	e 17 4	PP	—
Pierce Ferry		94·8	54	i 13 20	− 5	—	—	e 17 0	PP	—
Hungry Horse		95·8	42	i 13 23	− 6	—	—	—	—	—
Butte	N.	96·6	44	—	—	—	—	e 32 25	SS	41·1
Tucson		97·1	58	e 13 31	− 4	e 26 6	PS	e 17 23	PP	42·1
Mary		97·1	307	—	—	e 24 14	[+ 2]	—	—	—
Bozeman		97·7	45	—	—	e 25 3	+ 2	e 26 26	PS	47·0
Sverdlovsk		98·5	326	i 13 39	− 3	24 15	[− 5]	i 17 43	PP	—
Resolute Bay		102·1	15	17 49	PP	24 41	[+ 4]	31 18	SS	39·6
Tiflis		110·0	312	e 18 9?	[−24]	—	—	—	—	—
Borzhomi		111·1	312	e 18 25	[−10]	—	—	—	—	—
St. Louis		113·5	50	e 19 25	PP	e 28 59	PS	e 30 31	PPS	—
Yalta		117·0	316	e 19 55	PP	—	—	—	—	—
Ksara		118·3	304	e 20 9	PP	41 27	SSS	—	—	—
Pretoria	z.	119·1	236	e 18 20	[−31]	—	—	—	—	—
Warsaw		121·6	329	e 23 21	PPP	e 30 13	PS	27 15	SS	e 59·8
Istanbul		121·7	314	e 18 52	[− 4]	e 30 53	PS	—	—	—
Pennsylvania	N.	122·2	46	e 30 19	?	e 30 26	PS	—	—	—
Ottawa		122·6	39	e 18 52	[− 6]	e 30 23	PS	—	—	—
Copenhagen		123·4	336	e 20 40	PP	26 6	[+ 5]	—	—	58·8
Raciborzu	z.	124·3	328	19 0	[− 1]	—	—	20 58	PP	—
Palisades		124·9	43	i 18 58	[− 4]	e 32 17	PPS	e 20 47	PP	e 58·2
Potsdam		125·4	333	e 19 3	[0]	—	—	—	—	e 60·8
Prague		125·7	331	i 19 2	[− 2]	e 42 51	SSS	e 20 43	PP	—
Harvard		125·8	41	i 19 1	[− 3]	—	—	—	—	e 60·6
Weston		126·1	41	i 19 0	[− 4]	—	—	—	—	e 58·8
Huancayo		126·1	110	e 19 3	[− 1]	e 31 4	PS	e 37 48	SS	e 59·8
Collmberg	z.	126·1	333	e 19 3	[− 1]	—	—	—	—	—
Jena		127·0	332	e 19 6	[0]	—	—	e 21 3	PP	—
De Bilt		129·0	337	e 21 21	PP	e 38 51	SS	—	—	e 62·8
Chinchina		129·3	88	e 18 4	[−67]	—	—	21 23	PP	59·8
Stuttgart		129·7	332	e 19 6	[− 5]	e 22 33	SKP	e 21 24	PP	64·8
Karlsruhe		129·9	332	i 19 12	[0]	—	—	—	—	—
Strasbourg		130·1	333	i 19 12k	[0]	e 43 21	SSS	e 21 22	PP	58·8
Bogota		130·8	90	e 19 12	[− 2]	e 38 44	SS	e 22 51	SKP	62·8
Chur		130·8	331	e 21 28	PP	e 22 37	PKS	—	—	—
Zürich		130·9	331	e 19 11	[− 3]	e 22 34	PKS	e 21 27	PP	—
La Paz		131·0	119	i 19 14	[0]	26 13	[− 9]	28 29	SKKS	63·8
Kew		131·5	340	e 22 40	PP	e 35 26	PS	e 45 7	SSS	e 65·8
Rathfarnham Castle		131·6	345	i 19 15	[0]	e 44 31	SSS	—	—	62·8
Basle		131·7	331	e 19 13	[− 2]	e 22 42	PKS	e 21 39	PP	—
Prato		131·9	325	e 19 2	[−14]	i 22 43	PKS	—	—	—
Florence		131·9	325	i 21 39	PP	i 31 41	PS	—	—	—
Besançon		132·3	332	e 19 14	[− 2]	e 22 42	PKS	e 21 40	PP	—
Rome		132·3	322	e 19 12	[− 4]	e 33 41	PPS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		132·6	336	i 19 17	[0]	i 22 46	SKP	i 21 35	PP	—
San Juan		138·1	70	e 22 58	PP	e 34 22	PPS	—	—	e 64·0
Algiers Univ.	z.	141·2	329	i 19 27	[− 6]	e 23 6	PKS	i 22 35	PP	—
Alicante		142·0	328	19 34	[0]	26 54	[+12]	29 59	SKKS	e 69·2
Toledo	z.	142·6	333	i 19 32	[− 3]	—	—	—	—	—
Granada		144·5	331	19 38	[0]	30 26	{+39}	42 14	SS	72·6
Malaga	z.	145·3	331	i 19 40k	[0]	—	—	—	—	86·4
Tamanrasset	z.	147·1	302	i 19 42	[− 1]	e 33 51	PS	e 22 57	PP	—

Additional readings :—
Riverview iN =6m.12s., ePPZ =6m.25s., ePPPZ =6m.38s., iZ =10m.34s., iN =10m.38s., iSSE =11m.12s., iSSSE =11m.29s., iN =12m.27s.
Wellington i =13m.32s.
Christchurch eQEN =15m.51s., eSSZ =16m.1s.
College eSSS =31m.45s.
Poona PPPE =17m.48s., ScSE =23m.2s., PSE =23m.44s., PPSEN =24m.11s., SSE =28m.29s., SSSE =32m.2s.
Berkeley eZ =13m.5s. and 14m.47s., eE =22m.34s., eS?N =23m.56s., eScSN =24m.11s., eQN =35m.3s.
Lick iZ =13m.14s.
Fresno eZ =13m.19s., eE =15m.35s., eZ =17m.27s.
Reno eZ =14m.1s., 15m.33s., and 17m.6s.
Pasadena iZ =13m.17s., iEZ =13m.24s., i =13m.33s., iEZ =13m.46s., eS?EN =24m.10s.
Tashkent ePP =18m.47s., ePS =25m.33s.
Riverside iZ =13m.26s.
Hungry Horse e =13m.39s., ePP? =16m.33s.
Tucson ePPP? =20m.28s.
Bozeman eSS =31m.1s.
Sverdlovsk SKKS =24m.43s., PS =26m.35s.
Resolute Bay e =20m.17s., 21m.11s., 25m.13s., and 27m.14s., eE =28m.19s. and 29m.32s., e =32m.21s.
St. Louis e =29m.39s. and 46m.12s.
Warsaw ePKKS =33m.23s.
Raciborzu eZ =18m.3s.
Prague ePKPE =19m.5s., e =21m.0s. and 21m.31s.
Huancayo e =29m.54s.
Jena eE =19m.16s., eN =19m.20s.
Stuttgart ePKPZ =19m.9s., ePPPZ =24m.25s., ePPS =34m.9s., eQ =61m.51s.
Strasbourg e =19m.34s. and 19m.54s., iPKS =22m.36s., e =23m.15s., ePPP? =23m.56s., e =27m.13s., and 29m.0s., ePPS =33m.21s., e =37m.51s., eSS? =39m.9s.
Bogota eSKSEN =27m.7s.
La Paz PPZ =22m.41s., PS =32m.5s., PPS =33m.25s., iSS =39m.17s., SSP =40m.3s., iSSS =44m.35s.
Rathfarnham Castle iZ =20m.15s., eEN =32m.22s.
Besançon e =19m.26s.
Rome eZ =22m.32s.
Paris e? =19m.6s., i =19m.28s. and 21m.26s., ePKS =22m.35s., e =23m.10s.
Algiers Univ. ePKP?Z =19m.22s., eZ =20m.12s.
Alicante PP =22m.52s., PPP =26m.6s., PS =33m.47s., SS =42m.6s., SSP =42m.46s., SSS =48m.2s., Q =61m.2s.
Toledo eZ =21m.16s.
Granada PP =23m.26s.
Tamanrasset eZ =23m.23s., ePPPZ =26m.3s.
Long waves were also recorded at Auckland, La Plata, Galerazamba, Tananarive, Seven Falls, Lincoln, Rapid City, Salt Lake City, Washington, Seattle, Scoresby Sund, Aberdeen, Upsala, and Helsinki.

Nov. 6d. Readings also at 0h. (near New Delhi), 2h. (near Andijan), 5h. (College and Tamanrasset), 9h. (Apia, Christchurch, Wellington, Kaimata, Tuai, Karlsruhe, Strasbourg, Stuttgart, and near Obi-garm), 10h. (Mount Wilson, Palomar, Riverside, Tucson, Boulder City (2), Overton, and Pierce Ferry (2)), 11h. (Palomar, Pasadena, Overton, Pierce Ferry, College, and Tacubaya), 12h. (College and near Mizusawa), 15h. (Besançon, Strasbourg, and near Obi-garm), 16h. (College, Pierce Ferry, New Delhi, Almata, Frunse, Lunacharskoe, Przhevalsk, Samarkand, Tashkent, near Andijan, Fergana, Naryn, Obi-garm, Stalinabad, and Tchimkent), 17h. (Prague, near Boulder City, Overton, and Pierce Ferry), 18h. (near Ottawa, near Boulder City, Overton, and Pierce Ferry), 19h. (near Boulder City, Overton, and Pierce Ferry), 20h. (Ottawa and Pierce Ferry), 21h. (Palomar, Pasadena, Riverside, Tinemaha, Overton, Pierce Ferry, Shasta Dam, College, Tamanrasset, and near Fergana), 23h. (College and Tamanrasset).

Nov. 7d. 1h. 27m. 29s. Epicentre 17°·0N. 68°·5W. (as on 3d.).

$A = +·3507$, $B = -·8903$, $C = +·2906$; $\delta = +7$; $h = +5$;

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
San Juan		2·6	59	e 0 38	− 6	e 1 2	−15	e 1·2
Fort de France		7·4	107	e 2 18	P_g	—	—	—
Harvard		25·6	355	e 5 46	+14	—	—	—
Tucson		41·1	300	e 7 43	− 4	—	—	—
Pierce Ferry		44·5	305	e 8 20	+ 5	—	—	—
Overton	z.	44·9	306	i 8 24	+ 6	—	—	—
Boulder City		45·1	305	e 8 25	+ 5	—	—	—
Riverside	z.	46·8	302	e 8 35	+ 2	—	—	—
Hungry Horse		48·4	321	i 8 48	+ 2	—	—	—
Lick	z.	50·7	305	i 9 8	+ 5	—	—	—
Shasta Dam		51·9	309	e 9 14	+ 2	—	—	—
Tamanrasset	z.	69·2	71	e 11 8	− 2	—	—	—
College		70·2	334	e 11 17	0	—	—	—

Nov. 7d. 6h. 24m. 37s. Epicentre 7°·2S. 155°·3E. (as on 6d.).

$A = -·9014$, $B = +·4146$, $C = -·1245$; $\delta = -8$; $h = +7$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Brisbane		20·3	185	i 4 41a	+ 1	e 8 26	+ 3	i 4 57	PP
Riverview		26·8	187	—	—	e 10 23	+ 4	i 11 55	SSS
College		83·2	20	e 12 28	− 1	—	—	—	—
Shasta Dam		88·8	49	e 12 59	+ 2	—	—	—	—
Reno	z.	90·6	51	e 13 7k	+ 2	—	—	—	—
Pasadena	z.	91·1	56	i 13 7	− 1	—	—	e 13 26	pP
Tinemaha	z.	91·4	53	i 13 11	+ 2	—	—	—	—
Riverside	z.	91·8	56	i 13 11	0	—	—	e 13 31	pP
Palomar	z.	92·1	57	i 13 13	+ 1	—	—	e 13 32	pP
Boulder City		94·1	54	e 13 22	0	—	—	—	—
Overton	z.	94·4	53	e 13 24	+ 1	—	—	—	—
Pierce Ferry		94·8	54	e 13 25	0	—	—	—	—
Collmberg	z.	126·1	333	e 19 8	[+ 4]	—	—	—	—
Stuttgart	z.	129·7	332	e 19 14	[+ 3]	—	—	—	—
Strasbourg		130·1	333	e 19 17	[+ 5]	—	—	—	—
Tamanrasset	z.	147·1	302	i 19 47a	[+ 4]	—	—	e 23 23	PP

Additional readings :—
Brisbane iZ = 4m.47s., eSEN = 8m.30s.
Tamaurasset iZ = 20m.8s.

Nov. 7d. Readings also at 2h. (near Seven Falls, near Ashkabad, and near Alicante)' 4h. (Pasadena, Riverside, Palomar, and near Pierce Ferry), 5h. (Tacubaya and Messina), 6h. (College, Strasbourg, near Obi-garm, Kulyab, and Andijan), 8h. (Hungry Horse), 9h. (Ashkabad), 10h. (La Paz, Huancayo, Pierce Ferry, and Hungry Horse), 12h. (Christchurch, Wellington, College, Overton, Tucson, and Tamanrasset), 13h. (Boulder City, Overton, Pierce Ferry, and Tucson), 14h. (College, Boulder City, Overton, Pierce Ferry, Tucson, and near Alicante), 15h. (Boulder City (2), Overton, and near Djakarta), 16h. (College, Hungry Horse, Shasta Dam, Pasadena, Palomar, Overton, and Pierce Ferry), 17h. (Brisbane and College), 18h. (Granada (2) and near Athens), 19h. (Kodaikanal), 22h. (Overton, Pierce Ferry, Raciborzu, Prague, Jena, and Stuttgart), 23h. (near Obi-garm and Stalinabad).

Nov. 8d. 2h. New Hebrides region.

Brisbane iP =3m.7s.k.
Riverview iS?EN =8m.4s., eLE =10·0m.
Mineral eP?Z =11m.10s.
Berkeley iPZ =11m.48s.a, eZ =12m.11s.
Lick ePZ =11m.51s.k, iZ =12m.4s.
Shasta Dam iP =11m.54s.
Pasadena iPZ =11m.55s.
Riverside iPZ =11m.57s.
Palomar ePZ =11m.58s.
Tinemaha iPZ =12m.2s.
College eP =12m.4s., e =12m.31s.
Victoria eZ =12m.12s.
Overton ePZ =12m.14s.
Pierce Ferry iP =12m.14s., ePP? =16m.9s.
Tucson iP =12m.20s.
Collmberg eZ =18m.39s.
Karlsruhe ePKP =18m.41s.
Stuttgart ePKPZ =18m.46s., eZ =19m.2s., e =23m.54s.
Strasbourg ePKP =18m.49s., e =19m.3s., 19m.9s., and 19m.44s.
Besançon ePKP =18m.54s.
Paris ePKP =18m.57s.
Tamanrasset ePKPZ =19m.11s., cPKP$_2$Z =20m.5s., eZ =20m.19s.

Nov. 8d. 2h. 18m. 11s. Epicentre 9°·7S. 159°·6E. (as on Oct. 15d.).

A = −·9241, B = +·3437, C = −·1674; δ = +11; h = +7;
D = +·349, E = +·937; G = +·157, H = −·058, K = −·986.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·7	198	i 4 20k	− 2	e 7 54	+ 6	—	—	—
Riverview		25·2	196	i 5 28k	− 1	i 9 51	− 1	i 5 36	pP	e 21·1
Apia		28·3	102	e 5 59	+ 2	e 10 38	− 5	—	—	e 12·8
Auckland	N.	30·3	155	6 16	+ 1	e 11 24	+ 9	—	—	13·8
New Plymouth	E.	32·0	158	e 6 29	− 1	e 11 42	0	—	—	—
Tuai	N.	33·0	154	e 6 38	− 1	e 11 54	− 3	—	—	—
Wellington		34·2	160	i 6 46	− 3	i 12 9	− 7	i 8 11	PP	14·8
Kaimata	N.E.	34·3	164	6 48	− 2	e 12 18	+ 1	—	—	—
Christchurch		35·6	164	i 6 58	− 3	i 12 30	− 8	e 8 16	PP	14·7
Perth		46·1	235	i 8 31	+ 3	15 22	+ 8	i 10 16	PP	—
Shizuoka		48·7	338	e 8 48	0	e 15 58	+ 8	e 20 25	SSS	22·5
Owase		48·9	335	e 8 48	− 2	e 20 45	SSS	—	—	22·7
Tokyo		48·9	339	e 8 49	− 1	15 54	+ 1	11 43	PPP	22·0
Hunatu		49·1	339	8 52	+ 1	15 56	0	—	—	22·1
Mito		49·2	341	e 9 0	+ 8	e 16 11	+13	—	—	22·5
Tukubasan		49·3	341	8 52	− 1	—	—	—	—	20·3
Kameyama		49·4	336	8 55	+ 2	—	—	11 49?	PPP	—
Kumagaya		49·4	339	8 53	0	15 48	−12	—	—	e 21·9
Miyazaki		49·4	329	8 54	+ 1	16 3	+ 3	—	—	—
Nagoya		49·5	337	e 8 53	− 1	e 16 6	+ 4	—	—	22·6
Osaka		49·6	334	e 8 57	+ 2	—	—	—	—	e 21·6
Utunomiya		49·6	340	e 8 55	0	e 16 5	+ 2	—	—	22·8
Koti		49·7	332	8 57	+ 1	e 16 2	− 2	e 10 46	PP	21·2
Sumoto		49·7	335	i 8 55	− 1	16 3	− 1	—	—	21·7
Gihu		49·8	337	8 56	0	16 11	+ 5	11 11	PP	22·4
Kobe		49·8	333	e 8 57	+ 1	e 16 10	+ 4	e 10 7	PcP	e 24·6
Maebasi		49·8	339	e 9 1	+ 5	e 16 4	− 2	e 10 55	PP	23·7
Hikone		49·9	336	e 8 59	+ 2	e 16 11	+ 4	—	—	23·2
Kyoto		49·9	336	e 8 52	− 5	e 15 58	− 9	—	—	20·4
Matuyama		50·3	331	e 9 1	+ 1	e 16 13	0	—	—	e 22·5
Nagano		50·3	338	e 8 57	− 3	e 16 32	+19	e 11 12	PP	24·0
Hukusima		50·5	342	9 2	0	e 16 21	+ 5	—	—	—
Toyama		50·7	338	e 9 9	+ 6	e 16 27	+ 9	e 11 8	PP	e 23·1
Hirosima		50·8	331	e 9 5	+ 1	e 16 23	+ 3	—	—	e 22·0
Sendai		50·8	342	e 9 4	0	e 16 23	+ 3	e 20 19	SS	e 22·0
Hukuoka		51·2	330	e 9 7	0	16 26	+ 1	e 20 17	SS	e 22·6
Bandong		51·4	270	e 9 10	+ 1	i 16 33	+ 5	—	—	—
Hamada		51·4	331	9 7	− 2	16 27	− 1	16 58	PPS	24·6
Wazima		51·4	338	9 7	− 2	—	—	—	—	e 26·8
Mizusawa		51·5	343	9 11	+ 2	16 20	− 9	—	—	e 22·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Honolulu		51·7	54	e 9 9	− 2	e 16 33	+ 1	—	—	e 21·7
Miyako		51·7	344	9 9	− 2	e 16 18	−14	—	—	22·0
Morioka		52·0	343	e 9 11	− 2	e 16 38	+ 2	—	—	e 22·9
Djakarta		52·3	271	i 9 13	− 2	i 16 37	− 3	—	—	—
Nemuro		54·3	348	e 9 31	+ 1	e 17 9	+ 2	—	—	e 23·3
Zi-ka-wei		54·7	320	e 9 35	+ 2	17 13	0	—	—	—
Nanking		56·9	319	9 49 a	0	17 45	+ 3	11 59	PP	23·8
Vladivostok		58·3	337	i 9 57	− 2	i 18 3	+ 2	—	—	—
Adak		64·7	16	i 10 40	− 2	i 19 25	+ 3	—	—	—
Klyuchi		65·8	2	10 54	+ 5	—	—	—	—	—
Calcutta	E.	76·8	297	e 11 59	+ 4	i 21 52	+10	e 16 35	PPP	—
Irkutsk		77·7	330	11 59	− 1	21 57	+ 5	—	—	—
Colombo	E.	81·1	279	12 26	+ 8	22 42	+14	—	—	46·2
College		84·0	20	e 12 29	− 4	i 22 59	+ 2	i 15 53	PP	e 34·3
Kodaikanal	E.	84·1	282	i 12 35	+ 1	i 23 7	+ 9	15 52	PP	40·1
Hyderabad	N.	84·5	289	e 12 42	+ 6	23 2	0	29 41	?	—
Sitka		85·2	30	i 12 41	+ 2	i 23 6	− 3	e 15 53	PP	e 35·5
Ukiah		86·3	50	e 12 52	PcP	e 23 16	− 4	—	—	e 40·6
Berkeley		86·7	52	i 12 45 a	− 2	e 23 14	[+ 2]	i 23 32	S	e 35·7
Santa Clara		86·8	52	i 12 52	+ 5	i 23 18	[+ 5]	—	—	e 40·4
Lick		87·0	52	i 12 47 a	− 1	e 23 31	+ 4	i 12 52	PP	e 40·8
Shasta Dam		87·3	48	i 12 48	− 2	—	—	e 30 11	PKKP	—
Mineral		87·8	49	e 12 51 a	− 1	e 23 31	− 3	e 13 54	?	—
New Delhi	N.	88·0	300	e 12 53	0	i 23 38	+ 2	23 18	SKS	
Fresno		88·3	53	e 12 54 k	− 1	e 23 33	− 6	e 24 57	PS	41·4
Victoria		88·7	41	e 12 56	− 1	23 32	{ 0}	25 6	PPS	—
Pasadena		89·0	56	i 12 58 a	0	i 23 45	0	e 16 28	PP	i 36·3
Reno		89·0	50	e 12 57 a	− 1	e 23 34	{ 0}	e 23 41	S	e 40·8
Poona		89·1	289	i 12 57	− 1	i 23 49	+ 3	16 35	PP	42·9
Seattle		89·2	42	i 13 2 k	+ 3	e 23 28	[0]	e 16 25	PP	e 36·8
Haiwee		89·6	54	i 13 0	− 1	e 23 44	− 7	—	—	—
Riverside		89·6	56	i 12 59 a	− 2	e 23 45	− 6	—	—	—
Tinemaha		89·6	53	i 13 1	0	—	—	—	—	—
Palomar		89·9	57	i 13 0	− 2	i 23 36	[+ 4]	i 24 2	S	—
Bombay		90·1	289	e 13 6	+ 3	i 23 29	[− 4]	e 16 44	PP	42·4
Przhevalsk		90·1	313	13 2	− 1	23 30	[− 3]	—	—	—
Almata		91·3	314	13 7	− 2	i 23 41	[+ 1]	—	—	—
Naryn		91·6	312	e 13 10	0	e 23 37?	[− 5]	e 16 57	PP	—
Overton	Z.	92·5	54	i 13 13	− 1	e 23 49	[+ 2]	e 16 53	PP	—
Pierce Ferry		92·8	54	i 13 16	0	e 23 54	[+ 5]	i 16 51	PP	e 43·2
Frunse		92·9	312	i 13 19	+ 3	i 23 55	[+ 5]	i 24 33	S	—
Andijan		94·2	310	e 13 22	0	24 2	[+ 5]	—	—	—
Fergana		94·5	310	e 13 23	0	e 24 0	[+ 2]	—	—	—
Tucson		94·7	58	e 13 25	+ 1	e 24 7	[+ 8]	e 17 13	PP	e 38·6
Hungry Horse		94·8	42	e 13 23	− 2	e 23 53	[− 7]	e 30 2	PKKP	—
Salt Lake City		95·2	49	e 13 36	+ 9	e 24 15	[+13]	e 31 9	SS	e 39·2
Butte	N.	95·4	44	e 14 23	+55	e 24 0	[− 3]	e 24 45	S	e 39·1
Obi-garm		95·9	308	e 13 30	0	e 24 9	[+ 3]	—	—	—
Bozeman		96·4	45	e 13 35	+ 3	i 24 9	[0]	e 24 53	S	e 42·4
Tchimkent		96·4	312	i 13 32?	0	—	—	—	—	—
Lunacharskoe		96·5	311	e 13 37	+ 5	i 24 47	− 4	—	—	—
Stalinabad		96·6	308	i 13 34	+ 1	—	—	—	—	—
Tashkent		96·6	311	i 13 31	− 2	i 24 48?	−4	i 17 37	PP	—
Chinchina		98·3	62	—	—	i 26 49	PS	—	—	e 46·6
Saskatoon		99·9	38	26 51	PS	24 26	[− 1]	25 13	S	—
Rapid City	E.	101·8	46	e 13 57	+ 1	e 24 39	[+ 3]	e 27 21	PS	e 46·0
Sverdlovsk		103·0	326	i 14 4	+ 2	27 34	PS	i 18 17	PP	—
Resolute Bay		103·4	15	18 26	PP	24 46	[+ 3]	25 28	S	—
Tacubaya		103·7	72	e 18 36	PS	e 25 53	+ 2	e 27 8	PS	e 47·8
Vera Cruz		106·5	72	—	—	e 24 49	[− 8]	e 46 7	Q	e 51·8
Lincoln	E.	106·7	50	e 19 1	PP	e 25 2	[+ 4]	e 28 3	PS	e 48·1
Tananarive		107·2	247	20 26	PPP	25 2	[+ 2]	27 56	PS	55·6
Florissant		111·6	52	e 19 25	PP	i 25 22	[+ 3]	e 21 44	PPP	—
St. Louis		111·7	52	e 18 37	[0]	i 25 25	[+ 6]	e 18 4	?	—
Lenkoran		112·2	308	i 19 29	PP	—	—	i 23 40	?	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chicago		113·4	48	e 19 25	PP	e 25 23	[− 3]	e 29 7	PS	e 44·8
Tiflis		114·9	312	e 18 48	[+ 5]	—	—	e 19 54	PP	—
Moscow		115·7	328	e 19 48	PP	e 25 42	[+ 7]	e 26 53	SKKS	—
Borzhomi		115·9	312	e 19 59	PP	—	—	—	—	—
Pulkovo		117·4	334	e 20 4	PP	25 36	[− 5]	27 3	SKKS	—
Cleveland		117·9	47	e 20 3k	PP	e 25 43	[0]	e 27 6	SKKS	e 53·3
Grahamstown		118·2	224	e 18 55	[+ 6]	—	—	—	—	e 55·8
Sotchi		118·2	315	20 2	PP	—	—	—	—	—
Helsinki		119·4	337	e 20 16	PP	e 25 40	[− 8]	i 36 41	SS	e 52·8
New Kensington	E.	119·5	48	e 20 23	PP	e 25 49	[+ 1]	e 27 6	SKKS	e 54·2
Columbia		119·7	55	e 20 3	PP	e 25 49	[0]	e 30 1	PS	e 51·1
Pennsylvania		120·8	47	i 20 30	PP	i 26 4	[+11]	i 27 17	SKKS	—
Ottawa		120·9	42	e 18 53	[− 1]	25 55	[+ 2]	20 13	PP	—
Pretoria	Z.	121·1	232	e 19 28	?	e 29 31	?	e 20 49	PP	—
Huancayo		121·3	110	e 18 59	[+ 4]	e 22 49	PKS	e 20 34	PP	e 51·5
Yalta		121·7	317	e 20 24?	PP	e 21 52	?	e 22 31	PKS	—
Washington		121·8	49	e 19 0	[+ 4]	e 30 24	PS	e 20 35	PP	e 58·1
Upsala		122·4	338	e 20 14	PP	i 26 9	[+11]	e 30 30	PS	e 51·8
Shawinigan Falls	N.	122·5	40	e 19 1	[+ 3]	—	—	e 20 38	PP	—
Vermont		122·9	43	e 20 47	PP	e 25 54	[− 5]	e 27 38	SKKS	e 49·7
Philadelphia		123·0	48	e 20 7	?	e 26 1	[+ 1]	e 20 39	PP	e 48·6
La Plata		123·2	143	20 37	PP	27 25	{−10}	30 25	PS	60·5
Ksara		123·3	303	e 19 4	[+ 5]	37 15	SS	—	—	—
Seven Falls	E.	123·4	38	19 1	[+ 2]	25 56	[− 5]	20 37	PP	—
Palisades		123·6	46	e 19 0	[0]	i 26 14	[+12]	i 20 33	PP	57·9
Fordham		123·7	46	e 19 5	[+ 5]	i 26 16	[+14]	e 20 37	PP	63·1
Kishinev		124·2	321	19 1	[0]	—	—	—	—	—
Harvard		124·8	44	i 19 2	[0]	i 22 24	PKS	i 20 56	PP	e 57·8
Weston		125·0	44	i 19 3	[+ 1]	e 26 7	[+ 1]	e 20 49	PP	—
Chinchina		125·1	90	e 15 46?	?	e 34 36?	?	e 49 2?	Q	56·8
Lwow		125·7	326	e 19 6	[+ 2]	30 55	SKSP	42 50	SSS	—
Bergen		125·9	344	e 20 51?	PP	e 26 23	[+14]	e 30 38	SKSP	—
Warsaw		125·9	330	(19 8)	[+ 4]	(e 26 18)	[+ 9]	(i 20 58)	PP	(e 54·8)
Galerazamba		126·1	83	—	—	e 34 4	?	i 39 24	?	58·8
La Paz		126·1	118	19 8	[+ 4]	i 27 15	[+66]	i 21 6	PP	60·3
Istanbul		126·4	314	e 19 6	[+ 1]	e 26 10	[0]	—	—	—
Bogota		126·6	91	e 19 7	[+ 2]	—	—	e 21 6	PP	e 50·9
Bucharest		127·1	319	e 19 31	[+25]	e 26 29	[+17]	e 31 8	PS	59·8
Copenhagen		127·4	337	i 19 13	[+ 6]	i 26 25	[+12]	i 21 9	PP	55·8
Helwan		127·8	300	e 19 7	[− 1]	e 29 13	?	21 10	PP	—
Skalnate Pleso		128·1	327	e 21 15	PP	e 26 27	[+12]	e 33 5	PPS	e 51·3
Raciborzu		128·6	330	e 19 15	[+ 6]	e 22 19	PKS	e 21 20	PP	e 72·8
Halifax		129·1	38	22 35	PKS	28 11	{− 3}	38 31	SS	—
Timisoara	E.	129·4	322	e 19 28	[+17]	e 22 40	PKS	—	—	—
Potsdam		129·5	334	e 19 13	[+ 2]	i 22 29	PKS	i 21 22	PP	e 61·8
Budapest		129·7	326	19 18	[+ 7]	26 19	[0]	21 29	PP	e 60·8
Sofia		129·7	318	e 19 19	[+ 8]	—	—	—	—	—
Ogyalla		130·0	327	e 21 10	PP	e 26 25	[+ 5]	e 22 39	PKS	e 51·3
Collmberg		130·3	332	e 19 12	[− 1]	e 22 35	PKS	e 21 27	PP	e 58·3
Kalocsa		130·3	325	19 20	[+ 7]	26 14	[− 7]	21 42	PP	e 61·8
Belgrade		130·4	322	e 19 11k	[− 2]	e 22 36	PKS	—	—	e 66·3
Prague		130·5	331	e 19 9?	[− 4]	e 26 35	[+14]	e 21 21	PP	e 55·8
Aberdeen	N.	130·6	347	i 22 49	PKS	e 26 55	[+34]	—	—	64·1
Jena		131·2	332	e 19 17	[+ 3]	e 22 53	PKS	e 21 51	PP	e 59·8
Athens		131·5	312	e 19 10	[− 5]	i 22 45	PKS	—	—	—
Cheb		131·5	333	e 19 27	[+12]	e 26 32	[+ 8]	e 22 48	PKS	e 56·3
Durham		132·6	345	i 21 52	?	i 28 37	{+ 1}	i 22 50	PKS	—
De Bilt		132·9	338	e 21 46	?	i 22 45	PKS	i 24 38	PPP	e 54·8
Bermuda		133·4	54	i 21 57	?	i 28 51	{+10}	i 22 59	PKS	e 54·9
Stuttgart		133·8	333	e 19 18	[− 1]	e 28 51	{+ 7}	e 21 50	PP	e 63·8
Triest		133·8	327	e 19 22	[+ 3]	i 26 21	[− 8]	e 22 3	PP	e 69·2
Karlsruhe		134·0	334	i 21 50	PP	i 22 58	PKS	—	—	e 71·8
Strasbourg		134·6	334	e 19 21	[0]	e 26 40	[+10]	e 21 58	PP	e 58·8
Taranto		134·7	319	e 20 4	?	22 39	PKS	31 39	PSKS	—
San Juan		134·9	73	e 19 36	[+15]	e 22 59	PKS	e 39 44	SS	e 54·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rathfarnham Castle		135·1	347	e 19 23	[+ 1]	e 39 41	SS	e 16 35?	?	e 58·8
Chur		135·2	331	e 19 23	[+ 1]	—	—	e 22 0	PP	e 64·2
Kew		135·2	342	i 21 57	PP	e 28 47	(− 5)	i 23 1	PKS	e 53·8
Zürich		135·2	333	e 19 23	[+ 1]	e 22 53	PKS	e 21 59	PP	—
Padova		135·4	327	e 19 33	[+11]	23 0	PKS	—	—	—
Basle		135·5	333	e 19 22	[0]	e 22 50	PKS	e 22 1	PP	—
Salo		135·5	329	e 19 25	[+ 3]	e 23 7	PKS	e 22 18	PP	—
Bologna		135·8	328	e 19 31	[+ 8]	—	—	—	—	e 69·8
Neuchatel		136·2	333	e 19 23	[− 1]	—	—	—	—	—
Florence		136·3	326	e 19 55	[+31]	23 11	PKS	i 22 9	PP	—
Besançon		136·4	334	e 19 28	[+ 4]	e 23 3	PKS	e 22 2	PP	—
Pavia		136·5	329	e 19 28	[+ 4]	e 22 55	PKS	e 32 18	PSKS	—
Paris		136·6	338	e 19 22	[− 2]	i 26 40	[+ 6]	i 22 0	PP	65·8
Rome		136·8	323	e 19 37k	[+12]	i 23 0	PKS	i 22 11	PP	—
Messina		137·0	317	e 19 33	[+ 8]	e 34 46	PPS	e 22 27	PP	—
Jersey	E.	137·8	342	—	—	e 22 51	PKS	e 36 45	?	59·8
Clermont-Ferrand		138·8	335	i 22 31	PP	i 29 15	(+ 1)	e 22 57	PKS	e 74·8
Tortosa		143·9	332	i 19 43	[+ 6]	27 13	[+28]	i 22 56	PP	74·8
Algiers Univ.	Z.	145·7	325	e 19 38	[− 2]	e 33 58	PS	e 23 8	PP	—
Alicante		146·3	331	18 55	[−46]	27 9	[+20]	23 13	PP	e 69·2
Toledo		146·6	336	i 19 43	[+ 1]	42 16	SS	i 19 50	PKP_2	61·8
Granada		148·7	333	19 52k	[+ 7]	i 30 16	(+ 5)	i 23 49	PP	i 74·4
Lisbon		149·4	342	i 19 54a	[+ 8]	43 27	SSP	48 31	SSS	69·0
Malaga	N.W.	149·4	334	i 20 2	PKP_2	—	—	i 23 28	PP	79·4
Tamanrasset	Z.	152·0	301	e 19 52	[+ 2]	—	—	i 20 6	PKP_2	—

Additional readings and notes :—
Brisbane eSN =7m.57s., iE =8m.2s.
Riverview iPPZ =6m.6s., iPPPE =6m.15s., iP_cPN =8m.57s., and other unidentified i readings.
Wellington iPPP?Z =8m.37s., i =12m.37s.
Christchurch PP =8m.29s.
Perth SS =18m.29s., SSS =19m.14s.
Tokyo PPN =10m.3s., SSE =19m.26s., QEN =20m.17s.
Osaka e =9m.20s. and 17m.15s.
Gihu P_cP? =9m.35s., PPP =12m.52s., S_cS =19m.31s., SS =19m.54s.
Maebasi ePPP? =11m.44s., eSSEN =20m.12s.
Nagano eSSN =16m.52s., Q =21m.17s.
Toyama ePPP? =12m.13s., eP_cS? =13m.49s., eS_cS =18m.32s., eSS =19m.43s.
Mizusawa eSN =16m.9s.
Nanking iZ =10m.30s.
Calcutta iSSE =26m.49s., E =27m.23s.
College iPPP =18m.1s., iSS =28m.27s., iSSS =31m.49s., ePKP,PKP =39m.0s.
Kodaikanal PPPE =17m.52s., SSE =28m.45s., QE =35m.57s.
Sitka i =12m.49s., ePPP =17m.56s., eSS =28m.43s.
Ukiah e =15m.24s. and 28m.19s.
Berkeley eN =25m.55s., eSSN =29m.49s.
Lick eZ =15m.48s., eEN =40m.30s.
New Delhi PS?N =24m.26s., PPSN =24m.48s., iN =25m.33s., and 27m.2s.
Fresno eZ =13m.47s., eEZ =23m.40s., eN =23m.51s., eZ =26m.45s. and 38m.49s.
Victoria e =14m.23s., SS =29m.31s.
Pasadena iZ =13m.2s., iP_cP?Z =13m.6s., iZ =13m.26s., eSKS =23m.24s., eSPZ =24m.42s., eSSZ =30m.7s., ePKP,PKPZ =38m.45s.
Reno eZ =15m.53s.
Poona PPPE =18m.16s., SKSE =23m.21s., PSE =24m.54s., PPSE =25m.27s., SSE =29m.49s., SSPE =30m.8s., SSSE =33m.48s., QE =38m.29s.
Seattle iP? =13m.38s., 14m.54s., and 16m.51s., iS =23m.44s., and many unidentified readings.
Bombay ePPN =17m.9s., PPPE =18m.39s., PPPN =19m.9s., iSEN =24m.11s., SSE =30m.2s., SSN =30m.44s.
Overton ePKKP?Z =31m.3s., eZ =34m.41s., ePKP,PKPZ =38m.41s.
Pierce Ferry ePKKP =31m.5s., e =34m.44s., ePKP,PKP =38m.42s.
Frunse ePP =17m.22s.
Tucson e =14m.2s., ePPP =20m.0s., eS =24m.51s., ePS =25m.53s., ePKKP =30m.30s., eSS =31m.6s., eSSS =34m.55s., ePKP,PKP =38m.41s.
Hungry Horse ePP? =16m.38s., e =23m.23s., ePKP,PKP =38m.36s.
Salt Lake City ePP? =16m.29s., e =23m.24s.
Butte eN =29m.41s.
Bozeman e =13m.57s., ePS =26m.17s., eSS =31m.25s., eSSS =34m.59s., e =37m.21s.
Tashkent iSKS =24m.2s., ePS =26m.41s.
Saskatoon SS =32m.27s.
Rapid City eE =17m.9s. and 22m.59s., eSSE =33m.15s., eSSSE =36m.33s.
Sverdlovsk SS =32m.51s.

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Resolute Bay PPP =20m.16s., eE =20m.31s. and 23m.16s., PS =27m.26s., eN =28m.23s.
Lincoln eS?E =25m.57s., eSSE =33m.34s.
Tananarive SS =34m.32s.
Florissant iSKKS =26m.22s., iS =27m.7s., iPS =28m.49s.
St. Louis iPP =19m.24s., ePPP =21m.38s., e =23m.22s., eSKKS =26m.22s., iS =27m.3s., iPS =28m.49s.
Chicago eS =27m.13s., e =33m.27s., eSS? =38m.13s., eSSS? =39m.5s.
Moscow eSKSP =29m.20s., eSS =35m.57s.
Pulkovo PS =29m.49s.
Cleveland ePPEZ =20m.12s., iSKSEN =25m.56s., iSKKSE =27m.13s., iPSE =29m.55s., eE =35m.5s.
Helsinki eZ =20m.22s. and 20m.33s., eSKS =25m.58s.
New Kensington ePSE =30m.3s.
Columbia ePP =20m.9s., eS =28m.1s., eSS =36m.21s.
Pennsylvania iE =22m.8s. and 25m.56s., iEN =27m.30s., iPS?EN =30m.23s., iN =31m.28s., iPPS?E =31m.59s., iN =35m.29s., iSSN =36m.47s.
Ottawa SKKS =27m.24s., PS =30m.17s., SS =36m.55s.
Huancayo e =21m.3s., 21m.12s., 23m.19s., 30m.13s., and 37m.1s.
Washington iPP =20m.43s.
Upsala eN =28m.39s., ePPS =32m.6s., eE =33m.13s., eN =35m.11s., eSS =37m.5s., e =40m.19s., eSSS =41m.55s., eN =44m.49s.
Vermont iPS =30m.42s., ePPS =33m.2s., eSS =37m.2s., e =40m.32s. and 45m.20s.
Philadelphia iSKKS =27m.42s., iPS? =30m.37s., eSS =37m.10s.
La Plata PPPN =25m.25s., PPPE =26m.1s., SKSE =27m.43s., PPSN =34m.55s., SSSE =47m.43s., QE =54m.37s., readings wrongly identified, and other readings without phase.
Palisades i =22m.14s., eSKKS =27m.40s., iPS =30m.45s., iSS =37m.19s.
Fordham i =20m.49s., iSKKS? =27m.52s.
Seven Falls SKKSE =27m.41s., PSE =30m.43s., SSE =38m.22s.
Harvard iPPP =23m.34s., e =25m.11s., iSKKS =28m.2s., e =29m.59s., ePS =30m.52s., ePPS =32m.17s., e =36m.43s., eSS =37m.34s., e =38m.9s., ePSPS =38m.34s., e =38m.57s. and 44m.46s.
Warsaw eSKPZ =(22m.50s.), eSKPE =(23m.6s.), ePP =(23m.31s.), eSKKS =(27m.45s.), ePS =(31m.8s.), ePPS =(32m.40s.), eSSE =(38m.14s.), eSS?N =(38m.17s.), eSSSE =(42m.5s.), eSSSN =(42m.13s.), and other unidentified e readings. Times increased by 1 minute.
La Paz iPKSZ =22m.5s., iSKKS =28m.3s., iPS =31m.13s., iPPS =32m.55s., iSS =38m.9s. i =41m.9s.
Bucharest eE =22m.34s., eN =30m.3s.
Copenhagen 22m.39s., SKKS =28m.10s., 31m.8s.
Helwan iZ =19m.21s.
Skalnate Pleso e =22m.2s., 22m.15s., and 24m.2s., eSKSP =31m.18s., e =32m.7s., eSS =37m.49s.
Raciborzu ePPN =21m.26s., eNZ =25m.19s.
Potsdam iPPEN =21m.25s., iPKSN =22m.35s., iPSZ =31m.22s., iPSEN =31m.25s., iPPSNZ =33m.8s., iZ =35m.44s.
Budapest PKSE =22m.36s., PKSN =22m.40s., eN =23m.40s., PPPN =24m.29s., PPPE =24m.38s., SKSE =26m.11s., SKKSE =28m.27s., SKKSN =28m.33s., eE =31m.31s., SSN =38m.51s., SSE =39m.14s., eE =41m.17s., SSSE =44m.11s.
Ogyalla e =23m.20s., 23m.59s., 24m.58s., and 27m.15s., eSKSP =31m.40s., ePS =32m.6s., ePPS =33m.13s., e =33m.34s. and 34m.4s.
Collmberg eZ =19m.21s., eZ =23m.55s., ePPP?N =25m.21s., eSS?N =41m.4s., eE =41m.23s.
Kalocsa PKSE =22m.41s., eN =24m.44s., SKKSE =28m.38s.
Belgrade ePPP =27m.43s., eSSS =41m.11s., readings wrongly identified.
Prague iPKPN =19m.15s., eSKP =22m.41s., eSKKS =28m.13s., eSKSP =31m.56s., ePS? =32m.21s., ePPS =33m.19s., eSS =38m.49s., eSSS =43m.19s. and numerous unidentified readings.
Aberdeen iPKSN =23m.25s., iPSN =32m.37s., iN =40m.51s.
Jena ePP?E =21m.54s. and other unidentified e readings.
Cheb ePP =21m.45s., i =22m.56s., e =23m.29s., 23m.57s., and 26m.9s., eSKKS =28m.14s., ePS =32m.20s., ePPS =33m.27s., eSS =38m.49s., e =40m.19s. and 43m.17s. eSS =44m.13s.
Durham iN =22m.58s., iEN =33m.41s. and 44m.11s.
De Bilt eSS =39m.19s., eSSS =44m.49s.?.
Bermuda ePPS? =34m.32s., iSS =39m.32s.
Stuttgart ePKPZ =19m.27s., eZ =20m.9s., iPP =21m.53s., eSKP =22m.47s., iSKP =23m.1s., ePSKS =32m.5s., e =33m.49s., eZ =35m.49s., eSS? =41m.13s., eSSS =44m.37s., e =52m.13s.
Triest iSKKS=28m.50s., iSKKP=32m.3s., iPSKS=32m.20s., iPS=33m.30s., iSS=41m.31s.
Strasbourg ePKP =19m.26s., ePKS =22m.56s., iPKS =23m.0s., iPPP =24m.52s., ePPP =25m.1s., iSKKS =28m.51s. and 29m.0s., iPSKS =32m.10s., ePSKS =32m.25s., iPPS =33m.55s., eSS =39m.43s., iSSP =39m.56s., eSSS =44m.18s., and numerous unidentified readings.
Taranto e =41m.39s.
San Juan e =27m.35s., eSKKS? =29m.24s., e =31m.49s., eSSS =45m.32s.
Rathfarnham Castle ePPEN =22m.5s., e =23m.16s., ePPPEN =24m.59s., eEN =27m.53s., eSKSEN =32m.14s.

Continued on next page.

Kew iZ =22m.9s., ePPP =26m.29s., ePKKP =31m.57s., ePS =33m.59s., ePPS = 35m.57s., ePKP,PKP =39m.9s., ePSS =41m.29s., eSSS =44m.53s.; readings wrongly identified.
Basle e =27m.31s.
Salo e =20m.8s., 24m.17s., and 26m.7s.
Bologna e =19m.42s. and 20m.27s., eSKP? =22m.33s., e =23m.25s. and 24m.23s.
Florence PSKS =32m.30s., SS =40m.59s.
Besançon e =19m.32s. and 20m.14s., i =22m.12s.
Pavia eN =19m.33s., e =22m.10s. and 24m.19s.
Paris iPKS =22m.56s., iPPP =25m.0s., eSKKS? =29m.7s., iPSKS =32m.18s., eSS = 40m.5s., Q =59·8m., and many unidentified readings.
Rome iN =24m.45s., e =25m.21s., ePSKSEN =32m.23s., iPPS =34m.21s., eSSN = 40m.27s., eSSS =45m.37s.
Clermont-Ferrand ePKS? =23m.12s., ePPP =25m.4s., i =27m.44s., iPS =32m.57s., e =33m.29s., ePPS =34m.44s.
Tortosa PS?N =33m.24s.
Algiers Univ. iZ =20m.9s. and 21m.5s., eZ =22m.59s. and 25m.4s., ePPPZ =26m.24s.
Alicante PPP =26m.41s., PS =34m.15s., PPS =36m.21s., SS =42m.37s., SSS =47m.59s., Q =61m.1s.
Toledo iPP =23m.16s., SSS =48m.0s.
Granada PPP =27m.25s., SKSP =33m.52s., PPS =37m.22s., iSS =42m.46s., SSS = 48m.42s.
Lisbon NZ =20m.35s., EN =24m.32s. and 52m.43s., N =55m.43s., QE =61m.25s.
Malaga iPPPNW =26m.42s.
Tamanrasset iZ =19m.59s., ePPZ =23m.37s., ePPPZ =27m.8s.
Long waves were also recorded at Guadalajara, Puebla, Ivigtut, and Edinburgh.

Nov. 8d. 2h. 36m. 0s. (I) } Epicentre 9°·7S. 159°·6E.
6h. 41m. 7s. (II) } (as at 2h. 18m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s	
I Brisbane		18·7	198	i 4 22k	0	—	—	—	—
II		18·7	198	i 4 23a	+ 1	e 7 58	+10	—	—
II Riverview	N.	25·2	196	—	—	e 9 53	+ 1	—	—
I College		84·0	20	i 12 31	− 2	—	—	—	—
II		84·0	20	i 12 31	− 2	—	—	—	—
I Berkeley	Z.	86·7	52	e 12 46	− 1	—	—	—	—
I Lick	Z.	87·0	52	i 12 49	+ 1	—	—	i 12 57	P_cP
II	Z.	87·0	52	e 12 48a	0	—	—	—	—
I Shasta Dam		87·3	48	i 12 49	− 1	—	—	e 21 3	?
II		87·3	48	i 12 49	− 1	—	—	—	—
I Mineral	Z.	87·8	49	e 12 51	− 1	—	—	—	—
II	Z.	87·8	49	e 12 51	− 1	—	—	—	—
I Pasadena	Z.	89·0	56	i 12 59	+ 1	—	—	—	—
II	Z.	89·0	56	e 12 57	− 1	—	—	—	—
II Reno		89·0	50	e 12 50	− 8	—	—	e 13 21	?
I Seattle		89·2	42	e 6 13	?	—	—	—	—
I Haiwee	Z.	89·6	54	i 13 0	− 1	—	—	—	—
I Riverside	Z.	89·6	56	i 13 0	− 1	—	—	—	—
II	Z.	89·6	56	e 12 59	− 2	—	—	—	—
I Tinemaha	Z.	89·6	53	i 13 1	0	—	—	—	—
II	Z.	89·6	53	e 13 1	0	—	—	—	—
I Palomar		89·9	57	i 13 2	0	—	—	—	—
II	Z.	89·9	57	e 13 1	− 1	—	—	—	—
I Boulder City		92·1	54	e 13 13	+ 1	e 25 18	PS	e 16 58	PP
I Overton	Z.	92·5	54	—	—	e 25 19	PS	—	—
II	Z.	92·5	54	e 13 14	0	—	—	—	—
I Pierce Ferry		92·8	54	—	—	e 25 19	SP	—	—
II		92·8	54	i 13 16	0	—	—	—	—
II Tucson		94·7	58	e 13 29	+ 5	—	—	—	—
I Helwan	N.	127·8	300	i 20 36	PP	—	—	i 25 24	?
II Prague		130·5	331	e 21 34	PP	e 22 33	PKS	e 23 18	?
I Jena		131·2	332	—	—	e 22 41	PKS	e 23 25	?
I Stuttgart	Z.	133·8	333	—	—	e 22 48	PKS	—	—
I Algiers Univ.	Z.	145·7	325	e 19 40	[0]	—	—	23 10	PP
I Tamanrasset	Z.	152·0	301	e 19 53	[+ 3]	—	—	e 20 8	PKP_2
II	Z.	152·0	301	e 19 59	[+ 9]	—	—	e 20 14	PKP_2

Additional readings :—
Riverview II eN =10m.4s.
Boulder City I e =20m.55s.
Tamanrasset II iZ =20m.0s., ePPZ =23m.38s., ePPPZ =27m.11s.
Long waves to II were recorded at Christchurch and Wellington.

Nov. 8d. 10h. 7m. 54s. Epicentre 38°·2N. 39°·0E. (as on 1949, August 25d.).

$A = +·6123$, $B = +·4958$, $C = +·6159$; $\delta = +6$; $h = -1$;
$D = +·629$, $E = -·777$; $G = +·479$, $H = +·388$, $K = -·788$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Leninakan		4·5	54	1 16?	+ 5	2 24?	+19	—	—	—
Abastumanj		4·6	39	e 1 6?	− 6	—	—	—	—	—
Erevan		4·7	64	1 24	P*	2 28	S*	—	—	—
Zugdidi		4·8	26	—	—	2 20	+ 8	—	—	—
Borzhomi		5·0	42	e 1 15	− 3	—	—	—	—	—
Ksara		5·0	211	i 1 19	+ 1	2 56	S_g	—	—	—
Gori		5·4	45	e 1 28	+ 4	—	—	—	—	—
Sotchi		5·4	6	—	—	2 30	+ 2	—	—	—
Tiflis		5·7	50	1 24	− 4	i 2 58	S*	i 1 40	P*	—
Yalta		7·3	331	—	—	e 3 0	−15	—	—	—
Lenkoran		7·7	83	1 57	+ 1	—	—	—	—	—
Istanbul		8·2	293	e 2 5	+ 2	e 4 33	S_g	—	—	—
Helwan	z.	10·5	220	e 2 38	+ 3	e 4 42	+ 7	e 2 47	PP	e 5·3
Bucharest		11·5	307	—	—	e 4 42	−17	e 5 30	SSS	e 7·0
Athens		12·0	274	i 3 3	PP	—	—	—	—	—
Ashkabad		15·2	85	e 3 44	+ 6	—	—	—	—	—
Moscow		17·6	357	e 4 6?	− 2	e 7 24?	+ 1	—	—	—
Mary		17·9	83	4 12	0	—	—	—	—	—
Messina		18·4	278	e 4 22	+ 4	—	—	—	—	—
Warsaw		18·8	324	—	—	e 7 51	+ 1	—	—	e 10·1
Triest		20·2	300	e 5 22	PPP	i 8 29	+ 8	e 9 30	SSS	e 12·0
Rome		20·6	289	e 4 50	+ 7	e 8 42	+13	—	—	—
Prague		21·1	312	e 4 49	+ 1	e 8 47	+ 8	e 6 14	?	e 15·1
Samarkand		21·8	77	e 4 55	− 1	—	—	—	—	—
Pulkovo		22·3	348	e 5 3	+ 2	—	—	—	—	—
Collmberg	z.	22·5	312	e 5 1	− 1	—	—	—	—	—
Stalinabad		23·3	78	i 5 9	− 1	i 9 25	+ 5	—	—	—
Tashkent		23·4	72	e 5 8?	− 3	e 9 22?	+ 1	—	—	—
Lunacharskoe		23·5	72	e 5 11	− 1	—	—	—	—	—
Sverdlovsk		23·5	29	i 5 8	− 4	9 24	+ 1	—	—	—
Tchimkent		23·6	69	i 5 11	− 2	—	—	—	—	—
Stuttgart		23·9	306	e 5 16	0	e 9 41	+11	—	—	e 14·7
Obi-garm		24·0	78	i 5 15	− 2	—	—	—	—	—
Basle		24·7	303	(e 5 23)	− 1	—	—	—	—	—
Strasbourg		24·8	305	e 5 13	−12	—	—	—	—	—
Fergana		25·4	73	e 5 30	− 1	—	—	—	—	—
Andijan		25·8	73	e 5 33	− 1	10 5	+ 3	—	—	—
Besançon		25·8	301	e 5 34	0	—	—	e 6 12	PP	—
Frunse		27·3	68	e 5 47	− 1	—	—	—	—	—
Tamanrasset	z.	32·5	253	e 6 36	+ 2	—	—	—	—	—
College		77·1	3	e 11 57	0	e 22 38	PS	—	—	—
Hungry Horse		90·5	342	e 13 5	0	—	—	—	—	—
Pierce Ferry		101·8	337	e 18 13	PP	—	—	—	—	—

Additional readings and note :—
Basle reading increased by 2 minutes.
Besançon e = 5m.43s.
Tamanrasset iZ = 6m.40s.
Long waves were also recorded at Skalnate Pleso.

Nov. 8d. Readings also at 1h. (Fort de France and Palisades), 2h. (Hungry Horse, Harvard, Weston, Palisades, Brisbane, and College (3)), 3h. (Tamanrasset and College), 4h. (College (3), Overton, Pierce Ferry, Tananarive, and Collmberg), 5h. (College), 6h. (Zürich and near Stuttgart), 7h. (College and Pierce Ferry), 8h. (College (2), Overton (2), and Pierce Ferry), 9h. (College (2)), 11h. (Brisbane (2), Riverview, and near Alicante), 12h. (La Paz, Christchurch, Wellington, College (3), Shasta Dam, Mineral, Pasadena (2), Riverside (2), Palomar (2), Tinemaha, Boulder City (2), Overton (2), Pierce Ferry (2), and Tamanrasset (2)), 13h. (near Messina), 14h. (Brisbane, College (2), Overton, Pierce Ferry, Ashkabad, Mary, Samarkand, Frunse, Naryn, Przhevalsk, near Fergana, Obi-garm, Andijan, Stalinabad, Lunacharskoe, Tashkent, and Tchimkent), 15h. (Seattle, Mount Wilson, Palomar, Boulder City, Overton, Pierce Ferry, Tucson, and near Alicante), 16h. (College), 17h. (Overton, Pierce Ferry, and near Huancayo), 19h. (Palisades), 20h. (College, Pierce Ferry, Puebla, and Tacubaya), 21h. (College, near Athens, and near Apia (2)), 22h. (College), 23h. (Overton and Pierce Ferry).

Nov. 9d. 3h. 48m. 0s. Epicentre 45°·9N. 105°·4E.

A = −·1855, B = +·6733, C = +·7158 ; δ = +11 ; h = −4 ;
D = +·964, E = +·266 ; G = −·190, H = +·690, K = −·698.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		6·4	354	1 39	+ 1	2 47	− 6	—	—	—
Przhevalsk		19·6	273	e 4 37	+ 5	—	—	—	—	—
Almata		20·4	276	e 4 39	− 2	e 8 35	+10	—	—	—
Naryn		21·7	270	e 4 57	+ 2	e 9 0	+ 9	—	—	—
Frunse		22·2	275	e 4 49?	−11	e 8 55?	− 5	—	—	—
Andijan		24·5	271	e 5 18	− 4	e 9 39	− 1	—	—	—
Fergana		25·0	271	e 5 22	− 5	e 9 49	0	—	—	—
Tchimkent		25·8	276	i 5 43	+ 9	—	—	—	—	—
Tashkent		26·4	275	—	—	e 10 20	+ 8	—	—	—
Obi-garm		27·2	269	e 5 51	+ 4	e 10 33	+ 8	—	—	—
Calcutta		27·2	217	—	—	e 10 35	+10	—	—	15·0
Stalinabad		27·9	270	e 5 49	− 5	i 10 35	− 2	—	—	—
Samarkand		28·7	273	e 6 22	+21	—	—	—	—	—
Sverdlovsk		29·5	309	e 6 5	− 3	e 10 56	− 6	—	—	—
Bombay		38·0	236	e 7 22	+ 1	—	—	—	—	—
Tiflis		43·0	288	8 4	+ 1	—	—	—	—	—
College		55·9	29	i 9 46	+ 4	—	—	—	—	28·5
Prague		57·3	311	e 9 53	+ 1	—	—	e 11 23	PP	—
Collmberg	z.	57·4	312	e 9 51	− 2	—	—	—	—	30·3
Jena	E.	58·3	313	e 10 0	+ 1	—	—	—	—	—
Stuttgart	z.	60·9	312	e 10 16	− 1	—	—	—	—	—
Hungry Horse		80·0	25	i 12 17	+ 4	—	—	—	—	—
Tamanrasset	z.	80·5	293	e 12 15	0	—	—	—	—	—
Overton	z.	90·4	32	e 13 11	+ 7	—	—	—	—	—
Boulder City		90·8	32	e 13 13	+ 7	—	—	—	—	—
Pierce Ferry		91·0	32	e 13 13	+ 6	—	—	—	—	—
Mount Wilson	z.	91·1	35	e 13 14	+ 6	—	—	—	—	—

Additional readings :—
Tamanrasset eZ = 14m.45s.
Long waves were also recorded at Warsaw, Potsdam, Granada, Harvard, and Sitka.

Nov. 9d. 7h. Undetermined shock. Asia.

Grozny iP_g = 32m.46s.
Tiflis P_g = 33m.13s., S = 33m.39s.
Piatigorsk P = 33m.22s.
Leninakan P = 33m.32s.
Abastumanj iP = 33m.39s.
Zugdidi eP = 33m.39s.
Shemakla P = 33m.46s.
Baku eP = 33m.53s.
Ksara e = 35m.44s. and 39m.21s.
Moscow eP = 35m.45s., eS = 38m.17s.
Sverdlovsk eP = 36m.28s., iS = 39m.19s.?
Tchimkent iP = 36m.40s.
Stalinabad iP = 36m.48s.
Collmberg eZ = 36m.51s.
Lunacharskoe eP = 36m.52s.
Obi-garm eS = 36m.55s.
Fergana P = 37m.4s.
Andijan eP = 37m.8s.
Frunse P = 37m.18s.
Przhevalsk eP = 37m.38s.
Almata eP = 37m.41s.
Stuttgart eZ = 38m.12s. and 39m.5s.
Lwow eP = 39m.43s.?, eS = 42m.33s.
Warsaw eEN = 41m.0s., 41m.31s., 41m.51s., 42m.15s., 43m.1s., 45m.54s., and 46m.43s.
Pulkovo eP = 43m.4s., eS = 47m.3s.
College eP = 44m.0s.
Hungry Horse iP = 45m.25s.
Upsala iN = 45m.28s. and 47m.35s.
Potsdam eN = 45m.36s., eE = 45m.48s.

Nov. 9d. 11h. 55m. 4s. Epicentre 46°·5N. 150°·7E. Depth of focus 0·030.
(as on 1938, November 23d.).

Intensity IV at Nakashibetu (Hokkaido); II-III at Nemuro, Kusiro, Urakawa, Hatinohe, and Morioka.
Macroseismic radius >300km. Depth 250km.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1950, Tokyo, 1952, p. 46-47. Epicentre 46°·2N. 150°·5E.

$A = -·6024$, $B = +·3381$, $C = +·7231$; $\delta = +7$; $h = -4$;
$D = +·489$, $E = +·872$; $G = -·631$, $H = +·354$, $K = -·691$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		4·8	231	1 9	− 4	2 5	− 6	—	—	—
Sapporo		7·5	246	1 48	+ 1	3 8	− 4	—	—	—
Hatinohe		8·9	232	2 4	− 2	3 39	− 5	—	—	—
Aomori		9·1	235	2 10	+ 2	3 46	− 2	—	—	—
Miyako		9·4	226	2 10	− 2	3 48	− 7	—	—	—
Morioka		9·7	229	2 12	− 4	3 55	− 7	—	—	—
Akita		10·3	232	2 25	+ 1	4 14	− 2	—	—	—
Sendai		11·0	225	2 29	− 3	4 29	− 3	—	—	—
Hukusima		11·6	225	2 38	− 2	4 43	− 3	—	—	—
Mito		12·7	221	2 52	− 2	5 9	− 2	—	—	—
Utunomiya		12·8	223	2 49	− 6	5 14	+ 1	—	—	—
Maebasi		13·3	225	3 9	+ 8	5 46	+21	—	—	—
Kumagaya		13·4	223	3 9	+ 6	5 29	+ 2	—	—	—
Nagano		13·6	228	3 8	+ 3	5 45	+14	—	—	—
Tokyo		13·6	221	3 10	+ 5	5 32	+ 1	—	—	—
Wazima		13·7	233	3 11	+ 5	5 35	+ 1	—	—	—
Vladivostok		13·8	262	i 3 5	− 3	i 5 36	0	—	—	—
Toyama		14·1	230	3 11	0	5 59	+17	—	—	—
Hunatu		14·2	224	3 13	+ 1	6 3	+18	—	—	—
Nagoya		15·3	227	3 28	+ 2	6 23	+14	—	—	—
Gihu		15·3	228	3 26	0	6 16	+ 7	—	—	—
Hikone		15·6	229	3 29	− 1	6 24	+ 8	—	—	—
Kyoto		16·1	230	3 31	− 5	6 32	+ 5	—	—	—
Kobe		16·6	230	3 49	+ 8	6 50	+12	—	—	—
Hukuoka		20·1	236	4 20	+ 2	8 2	+16	—	—	—
Kumamoto		20·5	236	4 28	+ 6	8 12	+19	—	—	—
Nanking		28·4	252	i 5 37	+ 1	—	—	—	—	—
College		37·4	38	i 6 49	− 4	e 12 7	−17	i 7 24	pP	e 16·6
Shasta Dam		60·1	61	i 9 44	− 2	—	—	—	—	—
Hungry Horse		60·2	49	i 9 45	− 1	—	—	i 10 21	pP	—
China Lake	z.	66·1	62	i 10 25	0	—	—	e 11 4	pP	—
Pasadena	z.	66·9	64	i 10 28	− 2	—	—	i 11 8	pP	—
Riverside	z.	67·5	64	i 10 32	− 2	—	—	i 11 11	pP	—
Overton	z.	67·6	60	e 10 33	− 1	—	—	—	—	—
Boulder City		67·7	61	e 10 35	0	—	—	i 11 14	pP	—
Pierce Ferry		68·1	60	i 10 37	− 1	—	—	e 11 13	pP	—
Palomar		68·2	64	i 10 37	− 1	i 19 24	+ 5	e 11 16	pP	—
Tucson		72·7	61	i 11 5	0	—	—	e 11 43	pP	—
Collmberg	z.	76·0	334	e 11 19	− 5	—	—	e 12 6	pP	—
Karlsruhe		79·4	336	e 11 36	− 7	—	—	—	—	—
Stuttgart	z	79·4	336	e 11 39	− 4	—	—	e 12 29	pP	—
Ottawa	z.	79·8	31	e 11 41	− 4	—	—	—	—	—
Ksara		80·8	310	—	—	e 21 56	+18	—	—	e 35·9
Zürich		80·8	336	e 11 48	− 2	—	—	—	—	—
Basle		80·9	336	e 11 48k	− 2	—	—	e 17 51	?	—
Harvard		83·8	30	i 12 3	− 2	—	—	—	—	—
Weston		84·0	30	i 12 5	− 1	—	—	i 12 50	pP	—
Helwan		86·3	311	i 12 17k	− 1	e 22 26	− 6	—	—	—
Algiers Univ.	z.	92·2	334	i 12 42k	− 3	—	—	—	—	—
Tamanrasset	z.	104·2	327	e 13 39	− 1	—	—	e 14 30	pP	—
La Paz		136·1	60	e 19 6	[+11]	—	—	—	—	—

For Notes see next page.

NOTES TO NOVEMBER 9d. 11h. 55m. 4s.

Additional readings :—
Nanking i = 6m.25s.
Pasadena esPZ = 11m.23s.
Palomar isPEN = 11m.21s.
Tucson ePKKP? = 26m.6s.
Helwan eZ = 12m.42s. and 16m.20s.
Tamanrasset ePPZ = 17m.54s., epPPZ = 18m.40s.

Nov. 9d. Readings also at 1h. (Bucharest, Overton, Pierce Ferry, and near Kishinev), 2h. (Overton, Nanking, and Tamanrasset), 3h. (China Lake, Pasadena, Riverside, Boulder City, Overton, Pierce Ferry, Hungry Horse, College, Strasbourg, Stuttgart, and near Vladivostok), 7h. (Grozny (3)), 8h. (Bucharest, near Grozny (2), and near Kishinev), 9h. (Puebla, Tacubaya, Vera Cruz, Lick, Palomar, Overton, Pierce Ferry, College, and Tucson), 10h. (Ashkabad and near Grozny), 11h. (Mount Wilson, Palomar, Tucson, Hungry Horse, College, Ottawa, Harvard, Weston, near Grozny, and near Andijan), 12h. (Brisbane, Riverview, Christchurch, Haiwee (2), Palomar (2), Pasadena (2), Riverside (2), China Lake (2), Tucson, Boulder City (2), Overton (2), Pierce Ferry (2), Lick, Shasta Dam, Hungry Horse, College (2), Harvard, Weston, Tamanrasset (2), Algiers Univ., Basle, Collmberg, and Stuttgart), 13h. (near Prague and near Alicante (2)), 14h. (near Basle, Neuchatel, Zürich, and Stuttgart), 16h. (Tamanrasset, Toledo, near Granada, and Malaga), 17h. (Ashkabad, near Basle, Neuchatel, Zürich, and Stuttgart), 18h. (College, Ashkabad, Basle, near Neuchatel, Zürich, and near Messina), 19h. (Lick), 21h. (Hungry Horse), 22h. (Huancayo), 23h. (College and near Athens).

Nov. 10d. 2h. 14m. 13s. Epicentre 19°·6N. 109°·3W. (as on 1950, September 27d.).

$A = -\cdot3116$, $B = -\cdot8898$, $C = +\cdot3334$; $\delta = -1$; $h = +5$;
$D = -\cdot944$, $E = +\cdot331$; $G = -\cdot110$, $H = -\cdot315$, $K = -\cdot943$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		4·7	96	2 21	S	(2 21)	+11	—	—	—
Guadalajara		5·7	78	2 47	S	(2 47)	+12	—	—	—
Tacubaya		9·5	90	e 3 6	P_e	5 0	S*	—	—	—
Puebla		10·5	91	e 3 47	?	—	—	—	—	e 6·0
Vera Cruz		12·4	90	e 3 38	+37	—	—	—	—	6·8
Tucson		12·7	351	e 3 3	− 2	e 5 33	+ 5	—	—	e 6·2
Palomar		15·3	335	e 3 38	− 1	—	—	—	—	—
Riverside		16·0	335	i 3 52	+ 4	—	—	—	—	—
Pasadena		16·5	333	e 3 56	+ 2	e 7 0	+ 2	—	—	i 8·3
Boulder City		17·0	345	i 4 3	+ 2	e 6 42	−28	—	—	—
Pierce Ferry		17·0	348	i 4 1	0	e 7 26	+16	—	—	—
Overton	Z.	17·4	347	e 4 7	+ 1	—	—	—	—	e 10·5
China Lake	Z.	17·7	340	e 4 9	− 1	—	—	—	—	—
Tinemaha		19·1	338	i 4 27	0	—	—	—	—	—
Fresno		19·4	335	e 4 29a	− 1	e 8 19	+15	—	—	e 9·8
Lick		20·7	332	i 4 44a	0	e 8 46	+15	—	—	e 13·1
Santa Clara		20·8	332	e 5 6	+21	i 8 48	+15	—	—	e 10·7
Salt Lake City		21·2	356	e 4 45	− 4	e 8 55	+14	—	—	e 10·4
Berkeley		21·4	332	i 4 51a	0	i 8 57	+12	—	—	e 11·2
Reno		21·8	340	e 4 55k	− 1	—	—	—	—	e 11·6
Logan		22·2	356	e 4 45	−15	e 8 40	−20	e 5 30	PP	e 10·2
Ukiah		22·9	333	e 5 23	+17	e 9 21	+ 8	e 6 1	PP	e 11·3
Mineral		23·2	336	e 5 9	0	—	—	—	—	—
Shasta Dam		23·8	336	i 5 14	− 1	—	—	—	—	—
Rapid City	E.	24·9	11	e 5 29	+ 3	e 9 43	− 4	—	—	—
Bozeman		26·1	358	—	—	e 10 6	− 1	—	—	e 13·1
Butte	N.	26·5	356	e 5 56	+15	e 10 13	− 1	e 6 43	PP	e 14·3
Chicago		28·8	34	e 5 55	− 7	e 10 35	−16	—	—	e 12·0
Columbia		28·9	53	—	—	e 10 58	+ 5	—	—	—
Hungry Horse		28·9	354	e 6 1	− 2	—	—	—	—	e 16·3
Seattle		29·9	344	e 6 24	+12	—	—	e 9 5	PcP	e 14·4
Cleveland		32·1	40	—	—	e 11 16	−27	e 13 0	SS	—
Saskatoon		32·5	3	—	—	11 53	+ 4	—	—	17·3
Washington		33·8	47	e 6 53	+ 7	—	—	—	—	e 15·0
Philadelphia		35·6	47	—	—	e 12 39	+ 1	—	—	e 14·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palisades		36·9	46	e 8 34	PP	e 13 0	+ 2	i 15 37	SS	i 22·5
Bogota		37·4	108	e 7 37	+21	e 13 17	+12	—	—	—
Ottawa		37·8	39	e 7 17	− 3	e 13 13	+ 2	15 53	SS	—
Vermont		38·9	42	—	—	e 13 24	− 4	—	—	e 15·8
Harvard		39·1	45	e 7 22	− 9	—	—	—	—	e 22·1
San Juan		40·8	83	—	—	e 13 58	+ 2	—	—	—
Seven Falls	E.	41·6	39	—	—	e 17 3	SS	—	—	—
Bermuda		41·8	62	—	—	e 14 20	+ 9	—	—	e 17·1
Sitka		42·1	340	—	—	e 14 18	+ 2	e 17 49	S_eS	e 17·6
Huancayo		45·9	129	e 8 32	+ 6	e 15 23	+12	—	—	—
College		51·9	341	e 9 10	− 2	—	—	—	—	e 27·4
La Paz		54·1	128	e 8 43	−46	17 13	+ 8	i 9 41	P	23·2
Resolute Bay		55·7	5	—	—	17 17	− 9	e 21 14	SS	29·1
Kew		86·1	36	e 16 52	PP	—	—	—	—	e 35·8

Additional readings :—
Guadalajara S = 4m.14s.
Tucson i = 3m.22s. and 3m.26s.
Fresno eZ = 4m.37s., eE = 5m.19s.
Lick iZ = 4m.49s.
Salt Lake City eS = 9m.3s.
Reno eZ = 5m.15s., 5m.43s., and 9m.41s.
Logan e = 8m.54s.
Chicago e = 11m.3s.
Hungry Horse e = 8m.34s.
Seattle e = 8m.6s. and 12m.17s.
Washington i = 7m.6s.
Palisades iQ = 19m.44s.
Ottawa S_eS = 17m.33s.
Resolute Bay eN = 17m.34s., eE = 17m.44s. and 23m.59s., eN = 27m.25s., eE = 28m.23s.
Long waves were also recorded at Mazatlan, Honolulu, Victoria, Lincoln, New Kensington, Weston, Ivigtut, Granada, and Ksara.

Nov. 10d. 5h. 2m. 8s. Epicentre 16°·5S. 175°·5W. Depth of focus 0·050.

A = −·9563, B = −·0753, C = −·2823 ; $\delta = -13$; $h = +5$;
D = −·078, E = +·997 ; G = +·281, H = +·022, K = −·959.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		4·5	54	i 1 15k	0	e 2 11	− 2	—	—	—
Auckland	N.	22·0	201	e 4 27	0	e 8 35	+33	—	—	—
Wellington		26·1	198	i 5 52	PP	e 8 56	−13	—	—	—
Kaimata	N.E.	28·3	201	e 4 52?	−32	—	—	—	—	—
Christchurch		28·8	198	e 7 16	?	e 11 46	SS	e 7 55	P_eP	e 14·4
Brisbane		31·1	244	i 5 46a	− 3	—	—	i 6 54	PP	—
Riverview		34·6	233	i 6 19a	+ 1	i 11 19	− 3	i 7 34	pP	i 16·1
Berkeley	Z.	73·6	42	i 10 58a	+ 1	e 20 3	+ 5	—	—	—
Lick	Z.	73·7	42	i 10 58k	0	—	—	i 12 37	pP	—
Pasadena		74·2	47	i 11 1k	0	e 20 9	+ 5	—	—	—
Fresno	Z.	74·6	44	e 11 2k	− 1	—	—	e 12 23	pP	—
Palomar		74·7	48	i 11 3	− 1	i 20 16	+ 6	—	—	—
Riverside	Z.	74·7	47	i 11 3k	− 1	—	—	—	—	—
China Lake	Z.	75·5	45	i 11 9k	+ 1	—	—	—	—	—
Mineral	Z.	75·5	40	i 11 8	0	—	—	—	—	—
Tinemaha		75·8	44	i 11 10	0	—	—	—	—	—
Reno	Z.	76·2	41	e 11 12k	0	—	—	—	—	—
Boulder City		77·3	46	i 11 20	+ 2	—	—	—	—	—
Overton	Z.	78·1	46	i 11 23	+ 1	—	—	—	—	—
Pierce Ferry		78·2	47	i 11 24	+ 1	i 20 53	+ 6	i 14 54	PP	—
Tucson		78·6	51	i 11 26	+ 1	e 20 59	+ 8	e 14 27	PP	—
Seattle		79·6	34	i 11 31k	+ 1	e 21 4	+ 2	e 13 29	pP	—
Victoria	Z.	79·6	33	e 11 28	− 2	—	—	—	—	—
Logan		82·5	43	e 11 45	0	e 21 35	+ 4	—	—	—
Tacubaya		83·0	67	i 11 54	+ 6	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		83·8	12	e 11 49	− 3	e 21 41	− 3	e 13 15	pP	—
Hungry Horse		84·5	36	i 11 54	− 1	—	—	—	—	—
Saskatoon		90·5	35	—	—	e 22 47	+ 1	—	—	—
La Paz		101·2	111	e 13 15	+ 3	24 22	+ 5	17 32	PP	—
Collmberg	z.	144·6	352	i 18 53	[− 2]	—	—	—	—	—
Raciborzu	z.	144·7	346	e 18 55	[0]	—	—	—	—	—
Jena		145·2	352	e 18 57	[+ 1]	—	—	e 20 34	pPKP	—
Prague		145·6	349	i 18 59	[+ 2]	e 22 14	PP	e 20 20	pPKP	—
Ksara		146·9	308	i 19 3	[+ 4]	—	—	i 20 29	pPKP	—
Stuttgart	z.	147·6	354	e 19 1	[+ 1]	—	—	e 20 30	pPKP	—
Basle		148·9	356	e 19 7a	[+ 5]	—	—	—	—	—
Zürich		149·0	356	e 19 8a	[+ 6]	—	—	—	—	—
Algiers Univ.	z.	159·8	4	e 19 57	PKP_2	—	—	e 21 22	$pPKP_2$	—
Tamanrasset	z.	173·7	—	i 19 29k	[+ 2]	e 31 14	SKKS	i 21 0	pPKP	—

Additional readings :—
Wellington iPPPZ = 6m.50s., iZ = 7m.45s.
Christchurch $ePcPZ$ = 8m.22s., eQEZ = 12m.54s.
Lick iZ = 11m.8s.
Pasadena eZ = 11m.41s. and 13m.26s., iZ = 13m.51s.
Tucson i = 11m.59s., eSKS = 21m.8s., esS = 23m.12s.
Seattle i = 11m.39s.
Raciborzu ePN = 18m.59s.
Prague $ePKP_2$ = 19m.6s., e = 19m.19s., 19m.26s., and 19m.54s., $epPKP_2$ = 20m.40s.
Stuttgart iPKPZ = 19m.4s.
Tamanrasset iPPZ = 24m.50s., epPPZ = 26m.27s., ePPPZ = 29m.5s.

Nov. 10d. Readings also at 0h. (Christchurch, Kaimata, Tuai, Wellington, Frunse, Obi-garm, near Andijan, Fergana, Stalinabad, Tchimkent, La Plata, near Overton, and Pierce Ferry), 1h. (Frunse, near Andijan (2), Fergana (2), Obi-garm, Stalinabad, and Tchimkent), 2h. (Tucson and near Andijan), 4h. (Hungry Horse and Resolute Bay), 6h. (near Overton), 7h. (College and near Rome), 11h. (College (2), Harvard, Weston, near San Juan, and near Zugdidi), 12h. (Rathfarnham Castle, Strasbourg, and Stuttgart), 14h. (near Zürich), 15h. (near Alicante), 16h. (Granada), 17h. Boulder City, Overton, Shasta Dam, and Galerazamba), 18h. (Hungry Horse), 19h. (Kodaikanal, Ksara, Tamanrasset, Hungry Horse, and near Ottawa), 20h. (La Paz, La Plata, Overton, Pierce Ferry, Hungry Horse, and Tamanrasset), 21h. (Lick and Hungry Horse), 22h. (near Fergana), 23h. (Mary, Naryn, Frunse, near Andijan, Fergana, Luncharskoe, Obi-garm, Stalinabad, Tashkent, and Tchimkent).

Nov. 11d. 3h. 38m. 6s. Epicentre 5°·8S. 148°·1E. (as on 1948, Feb. 23d.).

$A = -·8447$, $B = +·5258$, $C = -·1004$; $\delta = +6$; $h = +7$;
$D = +·528$, $E = +·849$; $G = +·085$, $H = -·053$, $K = -·995$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		19·4	350	4 45	+15	—	—	—	—	—
Brisbane		22·1	169	i 4 57	− 2	i 8 56	− 2	i 5 32	PP	—
Riverview		28·0	175	i 5 55k	0	i 10 35	− 3	i 6 47	PP	e 13·5
Wellington		42·6	151	i 7 59	0	i 14 11	−12	i 8 18	pP	—
Christchurch		43·3	154	8 9	+ 4	14 15	−18	9 47	PP	e 19·8
Irkutsk		68·8	334	e 11 7	− 1	e 20 15	+ 4	—	—	—
College		84·5	23	i 12 37	+ 1	e 24 22	PPS	—	—	e 34·4
Sitka		87·7	33	—	—	e 23 21	[+ 2]	—	—	e 36·9
Berkeley		93·2	53	e 13 19	+ 2	e 26 4	PPS	—	—	e 43·1
Lick	z.	93·7	53	e 13 21k	+ 1	—	—	—	—	—
Mineral	z.	93·9	50	e 13 22	+ 1	—	—	—	—	—
Pasadena		96·3	56	e 13 32	0	—	—	—	—	e 44·4
China Lake	z.	96·8	54	e 13 35	+ 1	—	—	—	—	—
Riverside	z.	97·0	56	e 13 35	0	—	—	—	—	—
Overton	z.	99·4	54	e 17 52	PP	—	—	—	—	—
Hungry Horse		99·5	42	e 13 46	0	—	—	e 38 25	P′P′	—
Pierce Ferry		99·8	54	e 13 50	+ 3	—	—	—	—	—
Ksara		111·6	304	19 28	PP	29 5	PS	—	—	—
Prague		121·3	327	e 18 46	[− 9]	—	—	—	—	—
Stuttgart	z.	124·9	328	e 19 9?	[+ 7]	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa	z.	125·3	36	e 19 5a	[+ 2]	—	—	—	—	—
Strasbourg		125·7	329	e 20 8	PP	e 32 1	PPS	—	—	—
Palisades		128·7	39	e 22 33	PKS	e 33 24	?	—	—	e 61·8
Huancayo		133·3	112	i 19 23	[+ 5]	i 22 55	PKS	e 21 36	PP	—
Chinchina		136·5	87	(i 19 34)	[+10]	—	—	(e 21 57)	PP	—
La Paz		137·9	122	i 19 34	[+ 7]	i 23 8	PKS	i 22 26	PP	—
Bogota		138·0	88	e 19 34	[+ 7]	e 23 6	PKS	e 22 39	PP	—
Tamanrasset	z.	140·2	299	e 19 34	[+ 3]	e 23 30	PKS	e 22 56	PP	—
Fort de France		149·9	71	e 19 50	[+ 3]	—	—	—	—	—

Additional readings and note :—
Brisbane ePE =5m.3s., iZ =5m.13s., iE =9m.24s., iSSE =9m.43s.
Riverview iZ =6m.10s. and 6m.18s., iE =10m.30s., and 10m.47s., isSN =10m.50s., iN =11m.12s., eQ E =11m.48s., iSSN =11m.59s.,i SSSE =12m.20s., iScSE =16m.40s.
Wellington iZ =8m.59s., iPPZ =9m.44s., iPcP? =9m.59s., iZ =10m.49s. and 13m.56s., ScS? =17m.32s.
Christchurch eSSNZ =17m.14s
Chinchina readings have been increased by 4m. by comparison with Bogota.
Tamanrasset ePPPZ =25m.59s., eZ =30m.50s.
Long waves were also recorded at other American and European stations.

Nov. 11d. 9h. 28m. 26s. Epicentre 19°·6N. 109°·3W. (as on 10d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		4·7	96	—	—	3 0	S_g	—	—	—
Guadalajara		5·7	78	i 1 38	P*	i 3 10	S_g	i 2 48	S*	—
Chihuahua		9·5	18	e 2 35	+15	—	—	—	—	—
Tacubaya		9·5	90	e 2 24	+ 4	e 4 52?	S*	—	—	e 5·1
Puebla		10·5	91	e 2 40	+ 5	e 5 42	SS	—	—	—
Tucson		12·7	351	i 3 2	− 3	e 5 30	+ 2	—	—	e 5·9
Palomar	E.	15·3	335	e 3 32	− 7	—	—	—	—	—
Riverside	z.	16·0	335	i 3 48	0	—	—	—	—	—
Pasadena		16·5	333	i 3 51	− 3	e 6 46	−12	—	—	i 8·2
Boulder City		17·0	345	i 3 59	− 2	e 7 26	+16	—	—	—
Pierce Ferry		17·0	348	i 3 59	− 2	—	—	—	—	e 10·1
China Lake	z.	17·7	340	i 4 8	− 2	—	—	—	—	—
Tinemaha		19·1	338	i 4 26	− 1	—	—	—	—	—
Fresno		19·4	335	e 4 27k	− 3	e 8 15	+11	—	—	—
Lick	z.	20·7	332	e 4 41k	− 3	e 8 48	+17	—	—	—
Santa Clara		20·8	332	e 4 48	+ 3	i 8 41	+ 8	—	—	—
Salt Lake City		21·2	356	e 4 47	− 2	e 8 56	+15	—	—	e 10·4
Berkeley		21·4	332	e 4 49k	− 2	i 8 52	+ 7	e 5 26	PP	e 11·3
Reno		21·8	340	e 4 54k	− 2	e 9 12	+20	—	—	e 11·7
Logan		22·2	356	e 5 36	PP	e 9 1	+ 1	—	—	e 12·0
Ukiah		22·9	333	e 5 15	+ 9	e 9 26	+13	e 5 39	PP	e 12·0
Mineral	z.	23·2	336	e 5 8	− 1	—	—	—	—	e 13·0
Lincoln	E.	23·8	24	—	—	e 8 42	PcP	—	—	—
Rapid City	E.	24·9	11	e 5 28	+ 2	e 9 56	+ 9	e 6 27	PP	e 11·8
Bozeman		26·1	358	—	—	e 10 6	− 1	—	—	e 12·8
Butte	N.	26·5	356	e 5 58	+17	e 10 19	+ 5	—	—	e 14·4
Chicago		28·8	34	—	—	e 10 49	− 2	—	—	e 12·6
Colombia		28·9	53	—	—	e 10 50	− 3	—	—	—
Hungry Horse		28·9	354	e 5 57	− 6	—	—	—	—	—
Seattle		29·9	344	e 6 13	+ 1	e 11 45	+36	e 7 49	PP	e 16·6
Victoria	z.	31·0	343	6 16	− 5	—	—	—	—	—
Cleveland		32·1	40	—	—	e 11 41	− 2	e 13 15	SS	—
Washington		33·8	47	e 6 47	+ 1	—	—	—	—	e 20·2
Palisades		36·9	46	e 7 11	− 1	e 12 54	− 4	e 15 23	SS	e 22·2
Bogota		37·4	108	e 7 26	+10	i 13 22	+17	e 8 29	PP	21·6
Ottawa		37·8	39	e 6 37	−43	13 14	+ 3	15 47	SS	e 19·8
Vermont		38·9	42	—	—	e 13 15	−13	—	—	e 15·9
Harvard		39·1	45	e 7 28	− 3	—	—	—	—	e 22·2
San Juan		40·8	83	e 7 42	− 3	e 13 39	−17	e 9 57	PPP	e 19·9
Seven Falls	E.	41·6	39	—	—	e 17 9	SS	—	—	--

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda	41·8	62	—	—	e 14 17	+ 6	(e 17 7)	SS	e 17·1
Sitka	42·1	340	—	—	e 14 16	0	(e 17 34)	SS	e 17·6
Huancayo	45·9	129	e 13 30	?	i 15 28	+17	—	—	e 21·4
College	51·9	341	e 9 10	− 2	e 20 9	SS	—	—	e 26·8
La Paz	54·1	128	e 9 29	0	i 17 16	+11	20 58	SS	26·2
Resolute Bay	55·7	5	e 9 38	− 2	17 24	− 2	17 49	PS	28·9

Additional readings :—
Tucson i =3m.56s., iS =5m.37s.
Pasadena iZ =3m.57s.
Lick iZ =4m.50s. and 5m.11s.
Seattle e =6m.42s. and 13m.30s.
Palisades eQ =19m.10s.
Ottawa e =7m.20s.
La Paz iP =9m.36s.
Resolute Bay SS =21m.45s., SSS =24m.12s., eE =27m.1s.
Long waves were also recorded at Mazatlan, Vera Cruz, Honolulu, New Kensington, Weston, Saskatoon, Ivigtut, and Scoresby Sund.

Nov. 11d. 13h. 51m. 10s. Epicentre 10°·4N. 85°·7W. (as on 1d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		6·2	104	e 1 15	−20	e 3 4	+16	—	—	—
Galerazamba		10·3	87	e 2 27	− 5	i 4 25	− 5	i 5 23	S_g	—
Bogota		12·9	116	i 3 3	− 4	e 5 40	+ 7	i 8 11	P_cP	—
Puebla		14·8	307	e 3 36	+ 4	—	—	—	—	—
Tacubaya		15·8	305	e 3 59	+14	—	—	—	—	—
San Juan		20·5	66	e 4 44	+ 2	(e 8 35)	+ 8	—	—	e 8·6
Fort de France		24·3	78	e 5 24	+ 4	—	—	—	—	—
Huancayo		24·6	157	i 5 18	− 5	i 9 43	+ 1	—	—	—
Cleveland		31·2	6	i 6 28a	+ 5	—	—	—	—	e 14·3
Tucson		31·8	317	e 6 29	+ 1	—	—	e 7 46	PPP	e 18·9
La Paz		31·9	147	e 6 26	− 3	11 33	− 7	i 7 26	PP	15·2
Palisades		32·2	19	e 6 39	+ 7	—	—	e 14 12	Q	e 15·9
Harvard		34·3	20	e 6 56	+ 6	—	—	—	—	e 17·5
Ottawa	Z.	35·9	12	e 7 0	− 4	—	—	—	—	—
Pierce Ferry		36·2	320	i 7 9	+ 3	—	—	—	—	—
Boulder City		36·7	320	e 7 20	+10	—	—	—	—	—
Overton	Z.	36·8	320	e 7 15	+ 4	—	—	—	—	—
Perris	Z.	37·1	314	i 7 14a	0	—	—	e 9 32	P_cP	—
Pasadena		38·0	314	i 7 22a	+ 1	—	—	e 9 35	P_cP	—
China Lake	Z.	38·4	318	i 7 26	+ 1	—	—	—	—	—
Logan		38·7	329	e 7 35	+ 8	—	—	—	—	—
Haiwee	Z.	38·9	317	i 7 38	+ 9	—	—	—	—	—
Fresno	Z.	40·4	317	e 7 42a	+ 1	e 13 58	+ 8	—	—	—
Reno	Z.	41·9	320	e 7 55k	+ 1	—	—	e 10 4	PPP	—
Lick	Z.	42·0	316	i 7 56a	+ 2	—	—	—	—	—
Santa Clara	E.	42·2	316	e 8 29	+35	e 14 55	PPS	—	—	e 24·5
Berkeley		42·7	316	e 8 2k	+ 2	e 14 46	+22	e 9 59	PP	e 23·4
Mineral	Z.	43·6	320	e 8 7	− 1	—	—	e 10 2	PP	—
Hungry Horse		44·7	334	i 8 15	− 1	—	—	i 9 57	P_cP	—
Victoria	Z.	49·4	328	e 8 50	− 3	—	—	—	—	—
Resolute Bay		64·5	358	e 10 47	+ 6	—	—	—	—	e 33·6
College		69·0	337	e 11 5	− 4	—	—	—	—	e 32·8
Tamanrasset	Z.	87·1	68	e 12 54	+ 5	—	—	—	—	—

Additional readings :—
San Juan i =4m.54s.
La Paz iPPP =7m.40s., i =12m.28s. and 14m.20s.
Palisades e =7m.49s.
Pierce Ferry i =7m.17s.
Perris iZ =7m.24s., eZ =9m.41s.
Pasadena iZ =7m.31s., eZ =9m.44s.
China Lake iZ =7m.34s.
Fresno eZ =7m.50s., eE =8m.32s., eZ =10m.28s.
Reno eNZ =8m.4s.
Lick iZ =8m.5s. and 8m.35s.
Berkeley iZ =8m.10s.
College i =11m.15s.
Tamanrasset P?Z =12m.24s.
Long waves were also recorded at Vera Cruz, Scoresby Sund, Granada, and other American and New Zealand stations.

Nov. 11d. 14h. 19m. 46s. Epicentre 53°·1N. 160°·0E. (as on 1948, March 7d.).

$A = -·5698$, $B = +·1973$, $C = +·7977$; $\delta = -8$; $h = -7$;
$D = +·327$, $E = +·945$; $G = -·754$, $H = +·261$, $K = -·603$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Klyuchi		3·2	359	1 6	P_g	i 1 51	S_g	—	—
College		28·1	45	e 5 56	+ 1	—	—	—	—
Resolute Bay	z.	43·1	23	e 8 8	+ 4	—	—	e 9 53	P_cP
Victoria	z.	46·0	63	—	—	e 19 29	SSS	—	—
Hungry Horse		51·0	58	i 9 6	0	—	—	—	—
Mineral	z.	52·1	71	e 9 13	− 1	—	—	—	—
Reno	z.	53·7	70	e 9 26a	0	—	—	—	—
Lick	z.	54·1	74	e 9 28a	− 1	—	—	—	—
China Lake	z.	57·5	72	e 9 52	− 1	—	—	—	—
Pasadena	z.	58·4	74	e 9 58	− 2	—	—	—	—
Overton	z.	58·8	69	e 10 2	0	—	—	—	—
Boulder City		59·0	71	e 10 23	+19	—	—	—	—
Perris	z.	59·0	74	e 10 2	− 2	—	—	—	—
Pierce Ferry		59·3	70	e 10 6	0	—	—	—	—
Tucson		64·0	71	e 10 34	− 4	—	—	—	—
Collmberg	z.	72·5	340	e 11 31	+ 1	—	—	e 11 44	P_cP
Stuttgart	z.	75·7	341	e 11 50	+ 1	—	—	—	—
Strasbourg		76·2	342	i 11 53k	+ 1	e 21 45	+ 9	—	—
Besançon		77·8	343	e 12 2	+ 1	—	—	—	—
Ksara		81·1	317	i 12 19	+ 1	e 24 13	PPS	—	—
Tamanrasset	z.	101·5	337	e 18 1	PP	—	—	—	—

Additional readings :—
College e =6m.25s.
Lick eZ =9m.42s.
Pierce Ferry i =10m.19s.
Strasbourg e =13m.54s., e? =21m.26s.
Besançon e =12m.12s.
Tamanrasset Z =17m.40s.

Nov. 11d. Readings also at 0h. (Overton, Pierce Ferry, College (2), near Apia, and near Samarkand), 4h. (Ashkabad), 5h. (College), 6h. (near Grozny), 7h. (Klyuchi), 8h. (Pasadena, Tucson, Pierce Ferry, Berkeley, Lick, Mineral, College, Grozny, near Obi-garm, Stalinabad, Tchimkent, Fergana, and near Apia), 9h. (La Plata, Lick, Overton, Tucson, and Collmberg), 10h. (Huancayo, La Paz, Tucson, Overton, Pierce Ferry, Berkeley, Lick, Hungry Horse, Wellington, and Ksara), 13h. (Tamanrasset and Harvard), 14h. (Tucson, Boulder City, Pierce Ferry, Lick, Reno, Hungry Horse, College, Logan, Puebla, Tacubaya, Vera Cruz, and near Oaxaca), 15h. (near Seven Falls, Abastumanj, near Borzhomi, Gori, Tiflis, and near Istanbul), 16h. (Ottawa), 18h. (Pierce Ferry, near Puebla, and Tacubaya), 19h. (Grozny, Boulder City, and Overton), 20h. (near Istanbul), 22h. (Brisbane, Riverview, Christchurch, Wellington, Lick, Reno, College, Stuttgart (2), and Tamanrasset), 23h. (Overton, Pierce Ferry, Hungry Horse, and Palisades).

Nov. 12d. 16h. 37m. 36s. Epicentre 33°·3N. 58°·0E.

$A = +·4438$, $B = +·7103$, $C = +·5464$; $\delta = +4$; $h = +1$;
$D = +·848$, $E = -·530$; $G = +·290$, $H = +·463$, $K = -·838$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Ashkabad	4·7	4	e 1 16	+ 2	e 2 13	+ 3	—
Mary	5·3	35	e 1 24	+ 2	i 3 2	S_g	—
Kizyl-Arvat	5·9	347	e 0 24	?	i 1 24	P	—
Samarkand	9·6	46	e 2 26	+ 5	—	—	—
Stalinabad	10·2	56	e 2 30	− 1	i 4 24	− 3	—
Obi-garm	10·9	57	e 2 40	0	e 4 45	+ 1	—
Tashkent	12·0	45	e 2 56	+ 1	—	—	—
Tchimkent	12·8	42	e 3 8	+ 2	e 5 40	+10	—
Fergana	13·1	53	e 3 7	− 3	e 5 30	− 8	—
Tiflis	13·4	313	e 3 20	+ 6	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.		L.
		°	°	m. s.	s.	m. s.	s.		m.
Gori		14·0	312	e 3 22	0	—	—		—
Borzhomi		14·4	311	e 3 25	− 2	—	—		—
Abastumanj		14·7	310	e 3 30	− 1	—	—		—
Naryn		16·4	55	e 4 1	+ 8	—	—		—
Ksara		18·4	278	—	—	e 7 48	+ 7		e 10·4
Sverdlovsk		23·6	4	5 13	0	—	—		—
Istanbul		24·2	297	e 5 12	− 7	—	—		—
Collmberg	z.	37·2	313	e 7 8	− 7	—	—		—

Long waves were also recorded at Helwan.

Nov. 12d. 21h. 30m. 24s. Epicentre 26°·8N. 95°·0E. (as on 1950, September 11d.).

A = −·0779, B = +·8904, C = +·4485; δ = +3; h = +3;
D = +·996, E = +·087; G = −·039, H = +·447, K = −·894.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	7·4	236	e 1 57	+ 5	e 3 23	+ 5	e 2 39	P_g	3·2
New Delhi		15·9	281	e 3 45	− 2	i 6 39	− 5	5 6	PPP	7·3
Hyderabad	E.	17·9	242	e 4 12	0	—	—	—	—	e 9·6
Przhevalsk		20·7	323	4 43	− 1	8 30	− 1	—	—	—
Poona		21·2	251	i 4 52	+ 3	i 8 46	+ 5	5 16	PP	10·1
Naryn		21·4	317	e 4 47	− 4	e 8 39	− 6	—	—	—
Nanking		21·4	70	e 4 55	+ 4	—	—	—	—	e 11·0
Bombay		21·9	253	e 5 0	+ 3	9 1	+ 7	—	—	10·1
Almata		22·0	323	i 4 55	− 3	e 8 50	− 6	—	—	—
Frunse		23·1	318	e 5 9	+ 1	e 9 21	+ 5	—	—	—
Andijan		23·3	312	e 5 9	− 1	e 9 21	+ 1	—	—	—
Fergana		23·5	312	i 5 11	− 1	9 22	− 1	—	—	—
Obi-garm		24·3	306	i 5 18	− 2	i 9 35	− 2	—	—	—
Stalinabad		24·9	306	i 5 24	− 2	i 9 45	− 2	—	—	—
Tashkent		25·6	311	e 5 31	− 1	e 9 59	0	—	—	—
Tchimkent		25·9	313	i 5 33	− 2	—	—	—	—	—
Irkutsk		26·4	11	e 5 44	+ 4	—	—	—	—	—
Sverdlovsk		38·7	330	7 25	− 2	13 21	− 4	—	—	—
Ksara		50·9	292	—	—	e 16 54	+33	—	—	—
Istanbul		55·3	303	e 9 18	−20	—	—	—	—	—
Collmberg	z.	64·7	316	e 10 40	− 2	—	—	—	—	—
Stuttgart		67·7	315	e 11 0	− 1	—	—	—	—	—
College		76·6	23	e 11 52	− 2	—	—	—	—	—
Pretoria	z.	82·9	236	e 13 0	+32	—	—	—	—	—
Hungry Horse		100·8	18	e 14 17	+25	—	—	—	—	—
Overton	z.	111·2	24	e 18 53	PP	—	—	—	—	—
Pierce Ferry		111·7	24	e 19 20	PP	—	—	—	—	—

Additional readings :—
Calcutta S*E = 3m.42s., SSE = 3m.45s., S_gE = 4m.7s.
New Delhi P*E = 5m.29s., QEN = 6m.34s., SSEN = 6m.53s., SSSEN = 7m.6s., S*EN = 7m.41s.
Poona PPPE = 5m.29s., QE = 9m.6s., SSE = 9m.26s., SSSE = 9m.37s., S_cPN = 12m.16s.
Stuttgart eZ = 11m.9s.
College iP = 11m.57s.
Long waves were also recorded at Warsaw, Copenhagen, Kew, Palisades, Berkeley, Christchurch, and Wellington.

Nov. 12d. Readings also at 0h. (near Borzhomi and near Istanbul), 2h. (Bologna, near Pavia, Salo, Stuttgart, Zürich, and near Istanbul), 4h. (Ashkabad, Balboa Heights (2), and near Bogota), 5h. (near Balboa Heights), 7h. (Overton), 8h. (Shasta Dam), 9h. (Mount Wilson, China Lake, Overton, Pierce Ferry, College, Kew, and near Klyuchi), 11h. (Overton), 12h. (Tacubaya and Raciborzu), 13h. (Pasadena, Perris, China Lake, Tucson, Overton, Pierce Ferry, Lick, Hungry Horse, Ottawa, Balboa Heights, Tacubaya, near Andijan, Obi-garm, and Stalinabad), 14h. (College (2) and Overton), 15h. (Gori, Leninakan, Piatigorsk, near Abastumanj, Borzhomi, Grozny, Tiflis, and near Andijan), 16h. (near Fergana, Obi-garm, and Stalinabad), 17h. (Ashkabad and Istanbul), 18h. (Overton and Pierce Ferry), 19h. (Tuai, Wellington, Overton (2), Pierce Ferry, and Shasta Dam), 20h. (Overton, Pierce Ferry, Shasta Dam, and Lick), 21h. (Riverview, near Basle, Zürich, and Stuttgart), 22h. (Overton, Pierce Ferry, and Kodaikanal), 23h. (Fresno, Lick, near Overton, and Pierce Ferry).

Nov. 13d. Readings at 0h. (College, Lick, Pasadena, China Lake, Perris, Overton, Pierce Ferry, Harvard, and Ottawa), 2h. (near Obi-garm), 3h. (near Mizusawa), 4h. (near Istanbul), 5h. (Fergana, Samarkand, Naryn, near Obi-garm, Stalinabad, and Tchimkent), 6h. (near Tacubaya), 7h. (Brisbane, Wellington, and Huancayo), 8h. (College (2), Lick, Pasadena, China Lake, Perris, Overton, Pierce Ferry, Fergana, Andijan, Lunacharskoe, Frunse, Naryn, near Obi-garm, Stalinabad, Tashkent, Samarkand, and Tchimkent), 9h. (Frunse, Naryn, near Andijan, Fergana, and Tchim. nekt), 13h. (Pavia (2), La Paz, near Balboa Heights, and near Huancayo), 14h. (Pavia (3), Tchimkent, near Obi-garm, Stalinabad, Fergana, Andijan, and Samarkand), 15h. (near Lwow), 18h. (Jena, Collmberg, Stuttgart, and Strasbourg), 20h. (Abastumanj (2), near Borzhomi (2), Leninakan (2), Tiflis (2), and near Fergana).

Nov. 14d. 4h. 23m. 45s. Epicentre 10°·5S. 161°·5E. (as on 1947, September 3d.).

$A = -\cdot 9327$, $B = +\cdot 3121$, $C = -\cdot 1811$; $\delta = +13$; $h = +6$;
$D = +\cdot 317$, $E = +\cdot 948$; $G = +\cdot 172$, $H = -\cdot 057$, $K = -\cdot 984$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·7	204	i 4 19	− 3	i 7 50	+ 2	—	—	—
Riverview		25·1	199	i 5 29a	+ 1	i 9 49	− 2	i 10 46	SS	e 11·8
Apia		26·3	99	e 5 39	0	e 10 51	SS	—	—	e 12·2
Wellington		32·8	161	i 6 36	− 1	—	—	8 0	PPP	16·2
Christchurch		34·3	165	6 48	− 2	e 11 51	−26	e 8 7	PP	e 17·4
Perth		47·2	236	—	—	i 15 35	+ 6	i 19 5	SS	—
College		84·1	19	e 12 34	0	e 28 0	SS	—	—	—
Sitka		84·8	29	—	—	e 23 19	+14	—	—	e 41·3
Berkeley		85·7	51	i 12 44	+ 2	e 23 17	+ 3	e 28 51	SS	—
Kodaikanal	E.	86·1	281	—	—	e 23 36	+18	e 31 54	SSS	41·9
Lick	Z.	86·1	51	i 12 47a	+ 3	—	—	e 12 57	PcP	—
Shasta Dam		86·5	48	e 12 43	− 3	—	—	—	—	—
Fresno	Z.	87·3	52	e 12 50a	0	—	—	e 13 2	PcP	—
Pasadena	Z.	87·9	55	e 12 55	+ 2	—	—	—	—	—
Reno	Z.	88·0	49	e 12 39	−14	—	—	e 12 55	P	—
China Lake	Z.	88·8	53	e 12 59	+ 2	—	—	—	—	—
Boulder City		91·0	54	e 13 8	+ 1	—	—	—	—	—
Overton	Z.	91·5	53	e 13 13	+ 3	—	—	e 16 50	PP	—
Pierce Ferry		91·7	54	i 13 11	+ 1	—	—	—	—	—
Bombay	N.	92·1	288	e 22 15?	?	—	—	—	—	—
Tucson		93·6	58	e 13 22	+ 3	—	—	—	—	e 43·4
Hungry Horse		94·1	41	e 13 20	− 2	—	—	—	—	—
Logan		94·4	48	—	—	e 25 37	PS	—	—	e 46·2
Bozeman		95·7	45	—	—	e 25 15	+31	e 25 55	PS	e 40·6
Resolute Bay	E.	103·7	16	—	—	e 24 49	[+ 4]	e 27 45	PS	—
Cleveland	E.	117·0	48	—	—	e 35 16	?	e 36 5	SS	—
Huancayo		119·3	110	e 18 54	[+ 3]	e 36 21	SS	e 30 18	PS	e 56·7
Ottawa	Z.	120·3	43	—	—	e 27 9	{− 7}	—	—	—
Palisades		122·8	48	e 20 38	PP	e 22 10	PKS	e 30 44	PS	e 61·2
La Paz		124·1	118	19 5	[+ 4]	i 30 49	PS	i 20 51	PP	51·2
Bogota		124·7	91	—	—	e 32 26	PPS	—	—	58·2
Ksara		125·3	303	20 54	PP	29 13	?	—	—	—
Istanbul		128·3	315	e 19 0	[− 9]	—	—	e 21 16?	PP	—
Helwan	Z.	129·8	300	e 21 26	PP	e 29 45	?	—	—	—
Prague		132·1	332	e 19 6	[−10]	e 22 23	PKS	e 21 21	PP	—
Bermuda		132·3	55	e 21 38	PP	e 22 43	PKS	e 33 29	PPS	e 64·2
San Juan		133·3	74	i 22 51	PKS	e 26 11	[−17]	e 32 51	PS	e 64·8
Stuttgart		135·4	324	e 19 26?	[+ 4]	—	—	—	—	e 69·2
Kew		136·5	343	e 21 15?	PP	—	—	—	—	—
Rome		138·6	326	e 22 28	PP	i 31 35	?	—	—	—
Tamanrasset	Z.	154·0	302	e 19 48	[− 5]	—	—	e 20 1	PKP,	—

Additional readings :—
Riverview iN = 9m.59s., iEN = 10m.24s., iSSSE = 11m.0s.
Christchurch eZ = 8m.35s. and 11m.0s., eSS?E = 13m.23s., eQ = 14m.45s.
College i = 13m.6s.
Berkeley eZ = 14m.46s.
Bozeman ePPS? = 27m.17s., eSS? = 31m.47s.
Resolute Bay eE = 25m.32s., eN = 25m.57s., eE = 32m.45s., eN = 33m.15s.
Huancayo e = 45m.15s.
La Paz iPPS = 32m.15s.
Bermuda e = 30m.57s., eSS = 39m.21s.
Tamanrasset eZ = 21m.9s. and 22m.17s.
Long waves were also recorded at La Plata, Seattle, Honolulu, Saskatoon, Seven Falls, Harvard, Washington, Copenhagen, Potsdam, and Rathfarnham Castle.

Nov. 14d. 6h. 34m. 33s. Epicentre 40°·5N. 121°·6W. (as on March 26d.).

According to Pasadena, the largest of a swarm of shocks in the Mount Lassen region of California.

A = −·3996, B = −·6495, C = +·6469; δ = +1; h = −2;
D = −·852, E = +·524; G = −·339, H = −·551, K = −·763.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno	z.	1·7	125	e 0 26	− 5	—	—	—	—	—
Ukiah		1·8	222	e 0 41	P_g	—	—	—	—	e 1·4
Berkeley		2·7	191	i 0 42a	− 3	e 1 14	− 5	—	—	—
Branner	z.	3·1	188	i 0 49a	− 2	—	—	—	—	—
Fresno	z.	4·0	159	e 1 3k	− 1	—	—	—	—	—
Tinemaha		4·3	142	—	—	e 1 48	−12	—	—	—
Haiwee		5·2	146	e 1 35	P*	e 2 40	S*	—	—	—
China Lake	z.	5·6	145	e 1 25	− 2	e 2 50	S*	e 1 40	P*	—
Overton	z.	6·9	123	i 1 47	+ 2	—	—	—	—	e 3·6
Pasadena	z.	6·9	156	e 1 43	− 2	—	—	—	—	—
Boulder City		7·0	128	e 1 41	− 5	—	—	e 2 24	P_g	—
Seattle		7·2	356	i 1 52	+ 3	e 3 31	S*	i 2 7	P*	e 4·4
Pierce Ferry		7·4	124	i 1 50	− 2	—	—	—	—	—
Logan		7·5	77	e 1 49	− 4	e 3 24	+ 4	e 2 19	P*	e 3·8
Hungry Horse		9·5	32	e 2 20	0	—	—	—	—	e 5·1
Tucson		12·0	131	e 2 56	+ 1	—	—	—	—	e 6·3

Additional readings :—
Boulder City e = 2m.6s.
Seattle i = 1m.58s., 2m.15s., and 2m.19s.
Long waves were also recorded at Bozeman.

Nov. 14d. 8h. 32m. 33s. Epicentre 10°·5S. 161°·5E. (as at 4h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·7	204	i 4 18a	− 4	i 7 53	+ 5	—	—	—
Riverview		25·1	199	—	—	e 9 53	+ 2	—	—	e 12·0
Tuai	N.	31·5	156	—	—	e 13 27?	SSS	—	—	—
Wellington		32·8	161	—	—	e 14 27?	SSS	—	—	e 18·5
Christchurch		34·3	165	—	—	e 14 47	SSS	—	—	e 18·6
College		84·1	19	i 12 36	+ 2	—	—	—	—	—
Lick	z.	86·1	51	e 12 46k	+ 2	—	—	i 12 52	P_cP	—
Shasta Dam		86·5	48	i 12 47	+ 1	—	—	—	—	—
Fresno	z.	87·3	52	e 12 50a	0	—	—	—	—	—
Pasadena	z.	87·9	55	i 12 55	+ 2	—	—	—	—	e 40·2
Perris	z.	88·6	56	i 12 57	+ 1	—	—	—	—	—
China Lake	z.	88·8	53	i 12 59	+ 2	—	—	—	—	—
Boulder City		91·0	54	e 13 10	+ 3	—	—	—	—	—
Overton	z.	91·5	53	e 13 8	− 2	—	—	—	—	—
Pierce Ferry		91·7	54	i 13 13	+ 3	—	—	—	—	—
Tucson		93·6	58	e 13 25	+ 6	—	—	—	—	—
Hungry Horse		94·1	41	e 13 22	0	—	—	—	—	—
La Paz		124·1	118	20 45	PP	—	—	—	—	—
Tamanrasset	z.	154·0	302	e 19 59	[+ 6]	—	—	e 20 14	PKP_2	—

Riverview gives also iN = 9m.58s.
Long waves were also recorded at Kaimata and Palisades.

Nov. 14d. 21h. Undetermined shock.
Bogota ePEN = 42m.53s., eSEN = 46m.1s.
Chinchina iP = 44m.14s., eSEN = 47m.12s.
Huancayo eP? = 45m.23s., eS = 49m.24s.
Tacubaya eP = 45m.40s., eL = 50m.4s.
La Paz P = 46m.56s., iS = 51m.40s., SS = 53m.19s., L = 54m.20s.
Tucson eP? = 47m.52s., e = 48m.21s. and 56m.27s., eL = 59m.16s.
Palomar iPZ = 48m.25s.
Riverside iPZ = 48m.32s.
Pasadena iPZ = 48m.37s
Hungry Horse eP = 49m.49s.
San Juan eS = 51m.51s., eL = 55m.40s.
Palisades e = 55m.17s. and 58m.27s., eL = 61·0m.
College eP = 57m.47s. and eL = 80m.34s.
Long waves were also recorded at Overton, Harvard, and Resolute Bay.

Nov. 14d. 22h. 4m. 42s. Epicentre 24°·9N. 63°·5E. (as on July 9d.).

A = +·4052, B = +·8127, C = +·4187 ; δ = −2 ; h = +3 ;
D = +·895, E = −·446 ; G = +·187, H = +·375, K = +·908.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay	N.	10·5	123	e 2 34	− 1	e 4 42	+ 7	—	—	—
Poona		11·5	121	2 49	+ 1	i 5 10	+11	3 0	PP	5·8
Mary		12·7	354	e 3 9	+ 4	—	—	—	—	—
New Delhi		12·8	70	i 2 57	− 9	i 5 24	− 6	3 14	PP	5·3
Ashkabad		13·7	343	e 3 31	PP	—	—	—	—	—
Dehra Dun	N.	14·0	64	e 3 33	PP	e 7 42	L	—	—	(e 7·7)
Kulyab		14·0	20	i 3 22	0	—	—	—	—	—
Stalinabad		14·3	17	i 3 25?	− 1	e 6 18?	+12	—	—	—
Samarkand		15·0	10	e 3 37	+ 2	—	—	—	—	—
Kizyl-Arvat		15·4	338	i 3 33	− 7	6 25	− 7	—	—	—
Hyderabad	N.	15·8	115	i 3 47	+ 2	6 57	SS	—	—	8·6
Tashkent		17·1	15	i 3 59	− 3	i 7 16	+ 4	—	—	—
Andijan		17·4	23	4 6	0	e 7 28	+ 9	—	—	—
Tchimkent		18·1	15	i 4 14	0	—	—	—	—	—
Lenkoran		18·6	324	4 19	− 2	—	—	—	—	—
Baku		19·2	327	e 4 29	+ 1	—	—	—	—	—
Naryn		19·5	30	e 4 30	− 1	e 8 10	+ 4	—	—	—
Kodaikanal	E.	19·7	135	i 4 33	− 1	i 8 28	+18	12 38	P_cS	9·8
Frunse		20·1	24	i 4 39	+ 1	e 8 25	+ 6	—	—	—
Almata		21·4	27	i 4 52	+ 1	i 8 52	+ 7	—	—	—
Przhevalsk		21·4	31	4 51	0	8 55	+10	—	—	—
Erevan		22·0	319	e 5 1	+ 3	—	—	—	—	—
Leninakan		22·8	319	e 5 9?	+ 4	—	—	—	—	—
Tiflis		22·8	322	5 6	+ 1	e 9 18	+ 7	—	—	—
Calcutta	E.	22·9	90	e 5 29	+23	e 9 40	+27	—	—	—
Grozny		23·4	326	5 13	+ 2	9 27	+ 6	—	—	—
Borzhomi		23·7	322	i 5 17	+ 3	—	—	—	—	—
Abastumanj		24·0	321	5 20	+ 3	—	—	—	—	—
Zugdidi		25·0	321	5 30	+ 3	—	—	—	—	—
Piatigorsk		25·3	324	5 33	+ 3	e 10 2	+ 8	—	—	—
Ksara		25·6	297	i 5 34	+ 2	i 10 15	+16	—	—	—
Helwan		28·9	288	e 6 2	− 1	e 10 54	+ 1	—	—	e 15·4
Yalta		30·8	317	e 6 18	− 2	e 11 25	+ 2	—	—	—
Sverdlovsk		32·0	357	i 6 28	− 2	e 11 44	+ 2	—	—	—
Istanbul		32·8	308	e 6 36	− 1	—	—	—	—	—
Moscow		36·2	336	e 7 5	− 1	—	—	—	—	—
Irkutsk		41·2	38	—	—	e 14 9	+ 7	—	—	—
Raciborzu	Z.	43·0	319	e 8 1	− 2	—	—	—	—	—
Prague		45·3	318	e 8 18	− 3	e 14 52	−10	—	—	—
Collmberg	Z.	46·5	319	e 8 29	− 2	—	—	e 10 23	PP	—
Jena	E.	47·3	318	e 8 36	− 1	—	—	—	—	—
Chur		47·8	312	e 9 0	+19	—	—	—	—	—
Stuttgart		48·4	315	e 8 42	− 4	—	—	—	—	—
Zürich		48·6	313	e 8 40	− 7	—	—	—	—	—
Karlsruhe	Z.	48·9	316	e 8 48	− 2	—	—	—	—	—
Strasbourg		49·3	315	—	—	e 14 1	P_cS	—	—	25·3
Besançon		50·3	312	e 11 36	PPP	—	—	—	—	—
Algiers Univ.	Z.	52·5	298	e 9 23	+ 6	—	—	—	—	—
Paris		52·8	314	i 9 18	− 1	—	—	—	—	—
Pretoria	Z.	60·8	217	i 10 17	+ 1	—	—	—	—	—
Pietermaritzburg	Z.	62·8	212	e 10 29	− 1	—	—	—	—	—
Resolute Bay	E.	79·7	355	e 12 5	− 6	—	—	—	—	e 41·9
College		87·3	13	i 12 49	− 1	—	—	—	—	e 49·6

Additional readings :—
Poona QE = 5m.1s., SSE = 5m.27s., SSSE = 5m.40s.
New Delhi SSEN = 5m.40s.
Helwan eZ = 6m.39s., S?N = 11m.6s., eN = 11m.24s.
Collmberg eZ = 8m.37s. and 9m.14s.
Jena eN = 8m.44s., eE = 8m.48s., eN = 9m.22s., eE = 9m.27s.
Stuttgart eZ = 9m.51s., e = 12m.42s.
Paris i = 9m.26s. and 9m.37s.
Resolute Bay eE = 13m.19s., 16m.12s., and 18m.31s.
Long waves were also recorded at Warsaw, Potsdam, De Bilt, Kew, Copenhagen, Upsala, Palisades, and Harvard.

Nov. 14d. Readings also at 1h. (Ottawa, Stalinabad, Lunacharskoe, Tchimkent, near Andijan, Fergana, Obi-garm and Naryn), 2h. (Seattle, Boulder City (2), Overton (3), Pierce Ferry (2), Logan, Hungry Horse (2), Tucson (2), near Mineral, Shasta Dam (2), Reno, Ukiah, Berkeley, Branner, Lick and Fresno), 4h. (Brisbane, Tamanrasset, College, Berkeley, Lick, Fresno, Reno, Pasadena, Perris, China Lake, Boulder City (2), Overton (2), Pierce Ferry (2), Hungry Horse (2), Tucson (2), near Shasta Dam and Ukiah), 5h. (Weston, Boulder City, Overton, Pierce Ferry, Hungry Horse, Tucson, near Shasta Dam and near Istanbul), 7h. (Hungry Horse), 8h. (Harvard, near Ashkabad, and near Huancayo), 9h. (Stuttgart and near Obi-garm), 10h. (La Paz), 12h. (Ashkabad, College and Hungry Horse), 13h. (College (2), Hungry Horse, Shasta Dam, Palisades, near Vladivostok and near Yalta (2)), 14h. (La Paz), 15h. (College and Hungry Horse), 16h. (Hungry Horse, Overton, Tchimkent, Tashkent, near Fergana and Andijan), 17h. (near Naryn), 18h. (near Athens), 21h. (College, Hungry Horse, Pasadena, Riverside, Palomar, Pierce Ferry, Tucson and near Ukiah), 22h. (College, Tucson, and near Stalinabad), 23h. (Prague).

Nov. 15d. Readings at 0h. (Overton), 1h. (College (2), Ksara and near Athens), 3h. (Overton, Ukiah, Hungry Horse, Logan and near Obi-garm), 6h. (Frunse, Lunacharskoe, Tchimkent, near Andijan, Fergana, Kulyab, Naryn, Obi-garm, Stalinabad and near Mary), 8h. (Bandong, Djakarta, Manila, Nanking, Bombay, Brisbane, Riverview, Tashkent, Ksara and College), 9h. (Harvard, Palisades, near Bandong, Djakarta and near Ashkabad (2)), 10h. (Huancayo), 12h. (College, Ottawa, Weston, Harvard, Stuttgart, near Basle and Zürich), 13h. (Ottawa), 14h. (near Ottawa and near Mizusawa), 17h. (Lick, Tamanrasset, Ksara and Pietermaritzburg), 18h. (near Mizusawa), 21h. (Logan and near Tacubaya), 22h. (Apia, Boulder City, Pierce Ferry, Hungry Horse, and College), 23h. (Honolulu).

Nov. 16d. 0h. 57m. 25s. Epicentre 18°·7N. 145°·4E. Depth of focus 0·015.
(as on 1948 Feb. 15d.).

$A = -\cdot7802$, $B = +\cdot5382$, $C = +\cdot3187$; $\delta = -6$; $h = +5$;
$D = +\cdot568$, $E = +\cdot823$; $G = -\cdot262$, $H = +\cdot181$, $K = -\cdot948$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		26·9	338	e 5 50	+19	i 10 2	+ 6	—	—	—
College		63·4	26	e 10 15	− 3	e 19 17	+38	—	—	e 25·7
Sverdlovsk		71·7	325	e 11 11	+ 1	e 20 16	− 2	—	—	—
Resolute Bay		79·5	14	e 11 53	− 1	21 41	− 2	22 3	S_cS	—
Shasta Dam		79·7	51	i 11 55	0	—	—	—	—	—
Mineral	z.	80·4	51	i 11 59	0	—	—	—	—	—
Berkeley	z.	80·5	53	i 12 0a	+ 1	—	—	—	—	—
Lick	z.	81·2	53	i 12 3a	0	—	—	i 12 20	pP	—
Reno	z.	81·9	51	e 12 7a	0	—	—	—	—	—
Fresno	z.	82·8	53	e 12 9a	− 2	—	—	e 12 36	pP	—
Hungry Horse		83·0	41	i 12 13	+ 1	—	—	—	—	—
China Lake	z.	84·7	54	i 12 21a	0	—	—	i 12 46	pP	—
Pasadena	z.	84·8	56	i 12 21a	0	—	—	i 12 49	pP	—
Riverside	z.	85·5	56	i 12 24a	− 1	—	—	i 12 52	pP	—
Palomar	z.	86·1	56	e 12 28	0	—	—	—	—	—
Boulder City		86·8	53	i 12 32	+ 1	—	—	—	—	—
Logan		86·9	47	e 12 33	+ 2	—	—	—	—	—
Overton	z.	86·9	52	i 12 33	+ 2	—	—	—	—	—
Pierce Ferry		87·4	53	i 12 35	+ 1	—	—	—	—	—
Tucson		91·3	55	i 12 53	+ 1	—	—	i 13 22	pP	—
Tamanrasset	z.	123·1	315	18 45	[+ 4]	—	—	—	—	—
La Paz		148·0	90	i 19 36	[+ 9]	—	—	—	—	72·6

Additional readings :—
Resolute Bay, PS = 22m.36s., SS = 27m.0s.
Mineral iZ = 12m.46s., eZ = 14m.15s.
La Paz i = 19m.45s.

Nov. 16d. 5h. 26m. 44s. Epicentre 41°·7N. 144°·9E. (as on 1942, Nov. 3d.).

Intensity II-III at Kusiro and Hatinohe. Epicentre 41°·5N. 144°·7E. Depth 30-100km. Macroseismic radius >300km.

Seismo. Bull., Cent. Met. Obs., Japan, 1950. Tokyo, 1952, pp.47, 48, with macroseismic chart.

$A = -·6126$, $B = +·4306$, $C = +·6627$; $\delta = -13$; $h = -2$;
$D = +·575$, $E = +·818$; $G = -·542$, $H = +·381$, $K = -·749$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro	1·7	17	0 34 a	+ 3	0 55	+ 1	—	—	—
Hatinohe	2·8	245	0 47	0	1 18	− 4	—	—	—
Sapporo	3·0	298	0 55 a	+ 5	1 29	+ 2	—	—	—
Aomori	3·2	254	0 56	+ 4	1 34	+ 2	—	—	—
Mori	3·3	277	0 59	+ 6	1 25	−10	—	—	—
Morioka	3·5	236	0 56 a	− 1	1 33	− 7	—	—	—
Mizusawa	3·9	230	1 4	+ 2	1 41	− 9	—	—	—
Akita	4·1	243	1 8	+ 3	1 53	− 2	—	—	—
Sendai	4·6	223	1 9	− 3	1 58	− 9	—	—	—
Hukusima	5·2	222	1 17	− 4	2 13	− 9	—	—	—
Onahama	5·7	214	1 22	− 6	2 22	−13	—	—	—
Mito	6·3	215	1 31	− 5	2 40	−10	—	—	—
Utunomiya	6·5	219	1 37	− 2	2 42	−13	—	—	—
Tukubasan	6·6	216	1 37	− 4	2 45	−13	—	—	—
Kumagaya	7·0	220	1 45	− 1	2 55	−13	—	—	—
Maebasi	7·0	223	1 49	+ 3	2 54	−14	—	—	—
Nagano	7·2	228	2 48	+59	4 9	+56	—	—	—
Tokyo	7·2	216	1 39	−10	3 1	−12	—	—	—
Matusiro	7·3	227	1 50	0	—	—	—	—	—
Yokohama	7·5	215	2 2	+ 9	—	—	—	—	—
Wazima	7·5	238	1 46	− 7	—	—	—	—	—
Hunatu	7·8	220	1 54	− 4	3 19	− 9	—	—	—
Toyama	7·8	232	2 15	+17	3 51	+23	—	—	—
Mera	7·9	212	2 3	+ 4	—	—	—	—	—
Misima	8·1	217	2 0	− 2	3 22	−13	—	—	—
Osima	8·2	214	1 58	− 5	—	—	—	—	—
Omaesaki	8·8	219	3 54	S	(3 54)	+ 1	—	—	—
Gihu	8·9	228	2 14	+ 2	3 47	− 8	—	—	—
Nagoya	9·0	226	2 12	− 1	3 44	−14	—	—	—
Kameyama	9·5	227	1 58	−22	—	—	—	—	—
Vladivostok	9·7	283	e 2 25	+ 3	i 4 18	+ 3	—	—	—
Osaka	10·2	229	2 43	+12	—	—	—	—	—
Sumoto	10·8	230	2 39	0	—	—	—	—	—
Nanking	22·9	254	e 5 8	+ 2	e 9 24	+11	—	—	—
College	43·7	34	e 8 9	+ 1	—	—	i 8 15	pP	e 18·2
Frunse	50·6	296	i 9 4	+ 2	—	—	—	—	—
Sverdlovsk	53·5	318	i 9 26	+ 2	17 1	+ 4	—	—	—
Fergana	53·6	295	e 9 25	0	—	—	—	—	—
Tchimkent	54·2	298	i 9 29	0	—	—	—	—	—
Tashkent	54·8	297	9 35	+ 1	—	—	—	—	—
Resolute Bay	57·4	16	9 52	− 1	17 49	0	24 22	SSS	e 30·6
Ashkabad	63·8	299	e 10 27	− 9	—	—	—	—	—
Moscow	65·1	324	e 10 44	− 1	—	—	—	—	—
Shasta Dam	66·2	56	i 10 51	− 1	—	—	i 11 2	pP	—
Hungry Horse	66·6	45	i 10 54	0	—	—	i 11 7	pP	—
Reno	z. 68·5	55	e 11 6 k	0	—	—	—	—	—
Tiflis	70·1	309	e 11 17	+ 1	—	—	—	—	—
Borzhomi	70·8	310	e 11 24	+ 4	—	—	—	—	—
Abastumanj	71·2	310	e 11 24	+ 1	—	—	—	—	—
Zugdidi	71·2	311	e 11 26	+ 3	—	—	—	—	—
China Lake	z. 72·1	57	i 11 28	0	—	—	i 11 40	pP	—
Pasadena	z. 72·8	59	i 11 31	− 1	—	—	i 11 44	pP	—
Riverside	z. 73·4	59	i 11 34	− 2	—	—	i 11 47	pP	—
Overton	z. 73·7	56	e 11 38	0	—	—	i 11 51	pP	—
Boulder City	73·8	56	e 11 39	+ 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		74·2	56	i 11 41	+ 1	—	—	i 11 54	pP	—
Palomar	z.	74·2	59	e 11 40	0	—	—	—	—	—
Collmberg	z.	78·4	331	e 12 3	− 1	—	—	e 12 30	sP	—
Tucson		78·7	57	i 12 6	0	—	—	—	—	—
Prague		78·8	330	e 12 20	+14	e 21 40	−24	—	—	—
Jena		79·2	332	e 12 10	+ 2	—	—	e 12 22	pP	—
Ksara		80·6	307	e 12 16?	0	e 23 5	+42	—	—	—
Stuttgart		81·8	332	e 12 22	0	—	—	e 12 35	pP	e 45·3
Strasbourg		82·5	333	e 12 39	+13	—	—	—	—	—
Paris		84·0	337	i 12 34	+ 1	—	—	—	—	—
Besançon		84·2	333	e 12 36	+ 2	—	—	e 12 48	pP	—
St. Louis		85·6	40	i 12 42	+ 1	e 23 14	+ 1	i 12 54	pP	—
Ottawa	z.	86·0	28	e 12 42	− 1	—	—	—	—	—
Harvard		90·0	26	i 13 4	+ 1	—	—	—	—	—
Weston		90·1	26	i 13 5	+ 2	—	—	—	—	—
Palisades		90·5	28	i 13 6	+ 1	—	—	—	—	—
Tamanrasset	z.	105·6	321	18 17	PKP	—	—	i 18 38	PP	—
La Paz	z.	142·1	58	e 19 40	[+ 6]	—	—	—	—	—

Additional readings :—
Resolute Bay eZ = 11m.6s., eE = 20m.26s. and 23m.38s.
Jena eN = 12m.34s., eE = 13m.30s.
Stuttgart eZ = 12m.49s.
Tamanrasset ePPPZ = 20m.55s.

Nov. 16d. 8h. 51m. 31s. Epicentre 1°·2S. 99°·3E.

A = −·1616, B = +·9866, C = −·0208 ; δ = −7 ; h = +7 ;
D = +·987, E = +·162,; G = +·003, H = −·021, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Djakarta		9·0	124	e 2 13	0	e 4 41	L	—	—	(e 4·7)
Bandong		10·1	125	e 2 31	+ 2	e 4 28	+ 3	—	—	—
Bombay		32·8	309	e 5 55	−42	e 12 4	+10	e 14 17	SSS	—
Naryn		47·4	337	i 8 38	0	—	—	—	—	—
Obi-garm		48·2	329	i 8 43	− 1	e 15 42	− 1	—	—	—
Fergana		48·4	333	e 8 46	0	—	—	—	—	—
Andijan		48·4	333	8 47	+ 1	e 15 49	+ 3	—	—	—
Stalinabad		48·5	329	e 8 46	0	15 46	− 2	—	—	—
Almata		48·6	339	i 8 49	+ 2	e 15 52	+ 3	—	—	—
Frunse		49·2	336	i 8 52	0	e 16 0	+ 2	—	—	—
Tashkent		50·3	331	e 9 0?	0	e 16 15?	+ 2	—	—	—
Tchimkent		50·9	332	i 9 5	0	—	—	—	—	—
Mary		51·8	322	i 9 13	+ 1	—	—	—	—	—
Ashkabad		54·3	321	e 9 30	0	—	—	—	—	—
Brisbane	z.	57·7	122	i 9 41k	−14	—	—	—	—	—
Lenkoran		61·0	317	e 9 2	−76	e 16 15	?	—	—	—
Sverdlovsk		65·7	339	i 10 46	− 2	e 19 31	− 3	—	—	—
Ksara		68·8	307	e 11 10	+ 2	e 27 12	SSS	—	—	—
Pretoria	z.	72·5	244	e 11 30	0	—	—	—	—	—
Collmberg	z.	88·6	321	e 12 55	− 1	—	—	—	—	—
Stuttgart	z.	91·0	319	e 13 5	− 2	—	—	—	—	—
Tamanrasset	z.	94·0	293	e 13 21	0	—	—	—	—	—
College		100·6	23	e 17 39	PP	—	—	—	—	—
Hungry Horse		124·9	26	i 18 55	[− 7]	—	—	—	—	—
China Lake	z.	131·4	39	e 19 9	[− 6]	—	—	e 19 30	?	—
Pasadena	z.	132·0	42	e 19 9	[− 7]	—	—	—	—	—
Riverside	z.	132·7	42	e 19 10	[− 7]	—	—	e 19 30	?	—
Overton	z.	133·0	37	e 19 12	[− 6]	—	—	—	—	—
Pierce Ferry		133·5	38	e 19 13	[− 6]	—	—	—	—	—

Long waves were also recorded at European stations.

Nov. 16d. 9h. 9m. 7s. Epicentre 27°·5N. 96°·4E. (as on Oct. 29d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	8·8	237	—	—	e 3 58	+ 5	—	—	i 5·7
New Delhi		17·0	278	e 3 59	− 2	e 6 57	−13	7 17	SS	—
Nanking		20·0	71	e 4 37	0	e 8 18	+ 1	—	—	e 9·8
Przhevalsk		20·9	320	e 4 52	+ 6	—	—	—	—	—
Naryn		21·7	315	e 5 7	+12	—	—	—	—	—
Almata		22·3	320	e 5 6	+ 5	e 9 28	+26	—	—	—
Poona		22·5	252	i 4 54	− 8	i 8 33	−32	5 15	PP	9·7
Bombay		23·3	253	e 4 53?	−17	e 9 17	− 3	—	—	—
Frunse		23·4	316	e 5 19	+ 8	e 9 53	SS	—	—	—
Andijan		23·8	309	e 5 19	+ 4	—	—	—	—	—
Fergana		24·0	309	e 5 19	+ 2	e 9 54	+22	—	—	—
Kodaikanal	E.	24·8	230	—	—	e 9 17	−29	—	—	—
Obi-garm		24·9	304	i 5 26	0	e 10 6	+19	—	—	—
Stalinabad		25·6	303	5 30	− 2	e 10 14	+15	—	—	—
Tchimkent		26·3	310	e 5 40	+ 1	—	—	—	—	—
Samarkand		27·2	304	e 5 46	− 1	—	—	—	—	—
Ashkabad		33·5	298	e 6 44	+ 1	—	—	—	—	—
Sverdlovsk		38·7	329	e 7 30	+ 3	—	—	—	—	—
Tiflis		44·1	303	e 8 13	+ 1	—	—	—	—	—
Upsala	N.	61·1	326	—	—	e 24 53	SS	—	—	e 33·9
Collmberg	Z.	65·1	316	e 10 43	− 2	—	—	—	—	—
Stuttgart		68·1	315	e 11 2	− 2	—	—	—	—	e 38·9
College		75·5	23	e 11 43	− 5	—	—	—	—	—
Tamanrasset	Z.	80·5	291	e 12 22	+ 7	—	—	—	—	—
Pretoria	Z.	84·3	237	e 12 22	−13	—	—	—	—	—

Additional readings :—
Poona PPPE =5m.28s., QE =9m.2s., SSE =9m.8s., SSSE =9m.19s., S_cPE =12m.45s., S_cSE =16m.35s.
Stuttgart eZ =11m.19s.

Nov. 16d. Readings also at 1h. (near La Paz), 2h. (Overton, Santa Clara, and Edinburgh), 3h. (La Paz and near Athens), 4h. (College and Tamanrasset), 5h. (Samarkand (2), Mary, Lunacharskoe, Tchimkent, near Obi-garm (3), Theodosia, Andijan, and Stalinabad (3)), 6h. (Santa Clara, Tacubaya, Samarkand, Fergana, Andijan, Stalinabad, and near Obi-garm), 7h. (Brisbane, Riverview, Pasadena, Riverside, China Lake, Overton, Pierce Ferry, College, Samarkand, Lunacharskoe, Andijan, Stalinabad, and near Obi-garm), 8h. (Mount Wilson, China Lake, Overton, Raciborzu, Stuttgart, near Collmberg, Jena, and Prague), 9h. (Pasadena, Riverside, China Lake, Tucson, Boulder City, Overton, College, and Tamanrasset), 10h. (Overton, Pierce Ferry, Tacubaya, and near Alicante (2)), 11h. (Ashkabad, Prague, Ksara, and Tamanrasset), 13h. (Brisbane, Christchurch, Kaimata, Wellington, New Plymouth, Tuai, Palomar, Pasadena, Riverside, China Lake, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, College, Harvard, Weston, Ottawa, Collmberg, Tamanrasset, near Neuchatel, Zürich, Stuttgart, Samarkand, near Obi-garm, Fergana, Andijan, and Stalinabad ; several shocks). 15h. Mount Wilson, Tucson, Boulder City, College (2), Tacubaya, and near Obi-garm), 16h. (Mount Wilson, Dalton, Tucson, Overton, Pierce Ferry (2), College, Bogota, La Paz (2), and near Huancayo), 17h. (Tamanrasset, College, and near Victoria), 19h. (Ashkabad), 21h. (College and near Apia), 23h. (Grozny, near Borzhomi, near Ashkabad, near Obi-garm, and near Tacubaya.).

Nov. 17d. 15h. 57m. 40s. Epicentre 5°·5N. 35°·5W.

Rough.

A = +·8104, B = −·5781, C = +·0952; δ = +1; h = +7;
D = −·581, E = −·814,; G = +·078, H = −·055, K = −·996.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		38·4	271	e 7 36	+11	e 13 8	−12	—	—	e 15·6
La Paz		39·0	235	i 7 29	− 1	i 13 50	+21	9 9	PP	19·5
Granada		42·9	37	i 9 16 a	PP	17 10	SS	e 14 37	PS	22·9
Tamanrasset	z.	43·1	62	e 8 10	+ 6	—	—	e 9 56	PP	—
Huancayo		43·3	246	e 6 59	−66	—	—	—	—	e 13·9
La Plata	E.	45·4	205	—	—	18 20	SS	—	—	23·4
Alicante		45·6	39	e 9 46	PP	15 18	+12	12 38	PcP	e 20·1
Algiers Univ.	z.	47·0	43	e 8 35	0	—	—	e 10 34	PP	—
Tortosa	N.	47·7	37	8 22	−18	—	—	9 43	?	e 19·3
Paris		53·8	30	i 9 22	− 4	e 16 50	−11	—	—	—
Kew		54·3	26	—	—	(e 17 20?)	+13	—	—	e 17·3
Rome		55·9	42	e 10 34	+52	e 17 22	− 7	—	—	e 29·2
Florence		56·0	39	—	—	e 17 30	0	—	—	—
Strasbourg		56·5	33	e 9 50	+ 4	e 17 33	− 4	—	—	e 24·3
Stuttgart		57·3	33	e 9 50?	− 2	e 17 46	− 1	e 21 44	SS	26·3
De Bilt		57·3	28	—	—	e 17 44	− 3	—	—	e 22·3
Copenhagen		62·9	28	—	—	e 18 50	−10	—	—	28·3
Pretoria	z.	69·1	120	e 11 38	+28	—	—	—	—	—
Ksara		71·5	57	e 5 34	?	16 48	?	—	—	—
Tucson		74·7	302	e 11 41	− 2	—	—	—	—	—
Resolute Bay		76·9	346	e 11 50	− 6	21 17	−26	22 29	PPS	—
Pierce Ferry		77·5	306	e 11 57	− 2	—	—	—	—	—
Overton	z.	77·9	306	e 12 0	− 1	—	—	—	—	—
Boulder City		78·2	305	e 12 7	+ 4	—	—	—	—	—
Hungry Horse		78·3	318	e 11 57	− 6	—	—	—	—	—

Additional readings :—
Alicante Q = 17m.36s.
Stuttgart eQ = 24m.50s.
Resolute Bay SS = 26m.5s., SSS = 29m.31s.
Long waves were also recorded at Bermuda and at other European stations.

Nov. 17d. 19h. 28m. 16s. Epicentre 16°·8N. 100°·7W. (as on 1949, Oct. 13d.).

Felt strongly in the state of Guerrero, intensity IV in the whole of the federal district. Epicentre 16°31′N., 100°23′W. (Tacubaya), 17°·5N, 100°·5W. (U.S.C.G.S.).

Monthly Seismic Bulletin, Tacubaya, November, 1950, p.4.

A = −·1778, B = −·9412, C = +·2872; δ = −5; h = +5;
D = −·983, E = +·186; G = −·053, H = −·282, K = −·958.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya		3·0	29	0 47 k	− 3	—	—	—	—	1·5
Puebla		3·3	47	0 52	− 1	—	—	—	—	1·7
Oaxaca		3·8	85	0 55	− 6	1 40	− 7	—	—	—
Manzanillo		4·1	304	0 58	− 7	—	—	—	—	2·2
Guadalajara		4·6	328	1 14	+ 2	2 16	+ 9	—	—	—
Vera Cruz		5·0	61	1 13	− 5	i 2 26	S*	—	—	—
Mazatlan		8·3	321	2 7	+ 3	—	—	—	—	4·2
Swan Island		16·0	85	i 3 48	0	—	—	—	—	—
Tucson		17·9	331	i 4 13	+ 1	e 7 38	+ 8	—	—	9·0
Balboa Heights		22·0	108	e 5 7	+ 9	—	—	—	—	—
Palomar		22·0	323	i 4 58 k	0	i 9 7	+11	—	—	—
Pierce Ferry		22·6	332	i 5 5	+ 2	i 9 44	SS	—	—	i 11·7
Riverside		22·8	323	i 5 5 k	0	i 9 18	+ 7	8 56	PcP	—
Boulder City		22·9	330	i 5 8	+ 2	e 9 24	+11	—	—	e 10·7
Overton	z.	23·1	331	i 5 10	+ 2	i 9 36	+20	—	—	i 12·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena		23·3	223	i 5 12k	+ 2	i 9 28	+ 8	e 8 53	PcP	—
St. Louis		23·6	20	i 5 10	− 3	i 9 21	− 4	i 10 15	SSS	i 14·7
Florissant		23·7	20	i 5 11	− 3	i 9 24	− 3	—	—	i 11·6
Lincoln	E.	24·2	7	e 5 9	−10	e 9 35	0	e 6 44	PPP	e 11·0
China Lake	z.	24·2	326	i 5 20k	+ 1	e 10 0	+25	i 13 12	ScP	—
Guantanamo Bay		24·5	78	i 5 21	− 1	—	—	—	—	—
Columbia		24·6	41	i 5 22	− 1	i 9 44	+ 2	—	—	e 10·6
Galerzamba		25·4	99	—	—	e 10 15	+19	—	—	e 13·7
Tinemaha		25·5	326	i 5 33	+ 1	—	—	—	—	e 13·3
Salt Lake City		25·8	341	e 5 32	− 2	e 9 59	− 3	—	—	e 12·4
Fresno		26·1	324	e 5 37k	0	e 10 10	+ 3	—	—	e 12·5
Logan		26·6	342	e 5 41	− 1	i 10 15	− 1	i 6 25	PP	i 12·6
Chicago		27·4	20	i 5 44	− 5	i 10 21	− 7	i 6 18	PP	e 11·6
Lick	z.	27·6	323	i 5 51k	0	—	—	i 9 9	PcP	e 15·2
Santa Clara		27·8	323	e 5 45	− 8	i 10 37	+ 2	—	—	e 15·2
Reno		28·1	328	i 5 57k	+ 2	e 10 46	+ 6	—	—	—
Berkeley		28·3	323	i 5 58k	+ 1	i 10 48	+ 5	e 6 33	PP	e 15·3
Bogota		28·8	111	e 6 8	+ 6	i 6 59	PPP	—	—	i 20·0
Ciudad Trujillo		29·4	81	e 6 0	− 7	e 13 35	SSS	—	—	—
Cleveland		29·6	29	i 6 4	− 5	e 10 58	− 6	i 12 33	SS	13·7
Pittsburgh		29·6	32	i 6 10	+ 1	i 11 2	− 2	i 12 20	SS	—
Ukiah		29·7	324	e 6 21	+11	i 11 13	+ 7	—	—	e 14·1
New Kensington	E.	29·9	33	e 6 6	− 6	e 11 6	− 3	—	—	e 12·8
Bozeman		30·1	347	e 6 12	− 1	e 11 10	− 2	e 7 24	PPP	e 13·7
Washington		30·2	38	i 6 12	− 2	e 11 10	− 3	—	—	e 12·9
Butte	N.	30·8	346	i 6 20	0	e 11 22	− 1	e 7 7	PP	e 14·2
Pennsylvania		31·0	34	i 6 20	− 1	i 11 19	− 7	—	—	—
Buffalo		32·0	31	i 6 24	− 6	i 11 34	− 8	—	—	—
Philadelphia		32·0	39	e 6 19	−11	i 11 33	− 9	—	—	e 13·3
San Juan		33·0	81	i 6 43	+ 4	e 11 49	− 8	—	—	—
Fordham		33·3	38	i 6 38	− 3	i 12 1	− 1	—	—	—
Hungry Horse		33·3	344	i 6 40	− 1	e 11 45	−17	—	—	—
Palisades		33·4	38	i 6 39k	− 3	i 12 1	− 2	i 8 2	PP	i 16·6
Ottawa		35·4	30	i 6 55k	− 5	12 28	− 6	8 15	PP	—
Seattle		35·5	336	e 7 3a	+ 3	i 12 59	+23	—	—	e 16·7
Saskatoon		35·6	354	6 59	− 2	12 33	− 5	—	—	—
Harvard		35·7	38	i 6 59	− 3	i 12 37	− 2	e 14 52	SS	i 18·5
Weston		35·8	38	i 6 59	− 4	e 12 34	− 7	—	—	—
Bermuda		36·0	58	e 7 0	− 5	e 12 24	−20	e 8 23	PP	e 15·8
Victoria		36·7	336	i 7 10k	0	12 57	+ 3	8 41	PP	—
Shawinigan Falls	N.	37·6	32	e 7 15	− 3	—	—	—	—	—
Fort de France		38·1	87	e 7 23	+ 1	—	—	e 13 45	?	—
Huancayo		38·1	137	i 7 24	+ 2	i 13 26	+10	—	—	e 16·3
Seven Falls	E.	39·0	32	i 7 27	− 3	13 26	− 3	16 17	SS	—
Halifax		41·7	40	7 52	0	14 4	− 6	17 54	SSS	—
La Paz		46·1	133	i 8 30a	+ 2	i 15 19	+ 5	10 24	PP	21·7
Sitka		47·8	337	e 8 46	+ 5	i 15 42	+ 4	e 10 38	PP	22·0
Honolulu		53·9	285	i 9 32	+ 5	—	—	—	—	e 25·3
College		57·4	338	e 9 51	− 2	i 17 45	− 4	e 20 40	SS	23·8
Ivigtut		57·8	27	—	—	18 8	PS	—	—	28·7
Resolute Bay		58·0	2	9 55	− 2	17 45	−12	10 51	PcP	e 24·1
La Plata		65·5	141	9 44	−63	19 32	0	23 56	SS	35·6
Scoresby Sund		70·5	20	e 11 16	− 2	i 20 32	0	27 56	SSS	33·7
Rathfarnham Castle		79·3	37	e 12 16	+ 7	e 22 16	+ 7	e 15 23	PP	33·7
Aberdeen	N.	80·6	33	e 21 13	?	e 27 33	SS	38 44	Q	e 42·0
Durham		81·6	35	—	—	i 22 36	+ 3	i 23 31	PPS	—
Bergen		83·2	28	—	—	22 59	+10	—	—	e 43·7
Kew		83·3	38	e 12 35	+ 5	e 22 47	− 3	e 15 40	PP	e 34·7
Toledo		84·4	50	i 12 34	− 2	i 22 55	− 6	i 15 53	PP	44·1
Malaga	z.	85·0	53	i 12 42a	+ 4	i 23 6	− 1	i 16 0	PP	40·6
Granada		85·5	53	i 12 40a	− 1	i 22 7	−65	e 15 7	PP	51·1
Paris		85·9	40	i 12 42	− 1	i 23 13	− 3	i 12 56	pP	39·7
De Bilt		86·3	36	i 12 51k	+ 6	i 23 24	+ 4	e 24 9	PS	e 36·7
Clermont-Ferrand		87·4	43	—	—	i 23 33	+ 3	e 29 20	SS	—
Alicante		87·5	50	12 52	+ 1	23 34	+ 3	24 32	PS	e 44·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Copenhagen		88·7	31	e 12 59	+ 2	23 52	+ 9	29 30	SS	40·7
Besançon		88·7	40	e 12 55	− 2	—	—	—	—	—
Upsala		88·9	27	—	—	i 23 18	[− 8]	e 29 10	SS	e 38·7
Strasbourg		89·2	39	e 12 59	0	e 23 21	[− 7]	e 16 28	PP	e 41·7
Basle		89·6	39	e 13 5	+ 4	e 24 7	+16	e 16 33	PP	—
Stuttgart		90·0	39	e 12 59	− 4	23 29	[− 4]	e 24 58	PS	e 43·7
Zürich		90·2	40	e 13 2	− 2	e 23 30	[− 4]	e 16 32	PP	—
Jena		90·4	36	e 13 4	0	e 24 0	+ 2	16 53	PP	—
Potsdam		90·6	33	i 16 37	PP	i 24 14	+14	i 25 3	PS	e 35·7
Algiers Univ.	z.	90·7	51	e 13 4	− 2	—	—	e 16 40	PP	—
Collmberg	z.	91·0	35	e 13 5	− 2	—	—	—	—	—
Cheb		91·3	36	—	—	e 23 37	[− 3]	e 24 14	SKKS	—
Helsinki	N.	91·7	24	—	—	e 30 8	SS	—	—	e 43·7
Prague		92·4	35	e 13 14?	0	e 24 16	0	e 23 44	SKS	e 42·7
Florence		93·5	42	e 13 28	+ 9	i 23 50	[− 3]	—	—	—
Padova		93·6	41	—	—	e 23 58	[+ 5]	e 24 19	SKKS	—
Pulkovo		94·0	22	—	—	e 23 54	[− 2]	e 30 42?	SS	—
Triest		94·2	39	e 13 25	+ 3	i 23 53	[− 4]	i 17 9	PP	e 46·7
Warsaw		94·8	31	—	—	e 24 0	[0]	e 31 3	SS	e 46·7
Rome		95·2	43	e 13 36	+ 9	e 24 54	+14	e 23 58	SKS	—
Tamanrasset	z.	97·8	63	e 13 38	0	—	—	i 17 36	PP	—
Belgrade		98·7	38	e 17 41k	PP	e 24 17	[− 4]	—	—	e 61·4
Taranto		99·0	43	—	—	23 32	[−50]	—	—	—
Moscow		99·6	22	e 17 40	PP	24 22	[− 3]	26 48	PS	—
Vladivostok		103·3	323	e 18 19	PP	e 25 57	+ 9	e 27 31	PS	—
Sverdlovsk		105·0	10	i 18 28	PP	i 24 50	[− 1]	e 27 40	PS	—
Istanbul		106·0	37	e 18 37	PP	e 24 52	[− 3]	—	—	—
Yalta		106·4	32	—	—	e 24 56	[− 1]	—	—	—
Irkutsk		107·9	344	e 14 27	+ 4	25 0	[− 3]	e 28 4	PS	—
Riverview		114·0	240	—	—	—	—	e 29 22	PS	e 53·6
Helwan		114·5	45	e 19 34	PP	e 25 26	[− 4]	—	—	—
Ksara		114·8	39	19 38	PP	—	—	29 24?	PS	—
Frunse		120·5	4	e 20 20	PP	e 27 13	{− 4}	e 30 11	PS	—
Tashkent		121·4	8	e 20 28	PP	36 44	SS	i 30 6	PS	—
Mary		123·5	15	e 19 2	[+ 3]	—	—	—	—	—
Stalinabad		124·1	9	e 20 42	PP	—	—	—	—	—
Pretoria	z.	131·8	109	e 19 18	[+ 2]	—	—	—	—	—
Bandong		150·6	287	e 20 1	PKP,	—	—	—	—	—

Additional readings :—
Tucson i = 5m.35s., e = 6m.47s., iS = 7m.41s.
Riverside iZ = 5m.22s.
Pasadena iZ = 5m.30s., iN = 6m.12s., iEN = 7m.6s., iS_cPN = 13m.7s.
St. Louis i = 7m.11s., 9m.12s., and 9m.33s., iSS = 9m.59s., i = 13m.20s.
Florissant e = 9m.14s., i = 9m.46s.
Lincoln eE = 7m.13s.
China Lake iZ = 5m.32s.
Fresno eZ = 7m.20s.
Logan i = 6m.10s., 6m.35s., and 10m.28s.
Chicago e = 7m.7s., i = 11m.1s.
Berkeley eZ = 10m.51s., eE = 13m.56s.
Bogota eEN = 10m.46s.
Cleveland iE = 6m.44s., ePPPE = 7m.16s., eN = 13m.8s.
Pittsburgh i = 7m.12s.
New Kensington eE = 8m.8s., 9m.50s., and 12m.12s.
Pennsylvania eE = 6m.54s., iE = 12m.39s.
Palisades eSS = 14m.22s.
Ottawa PPP = 8m.35s., P_cP = 9m.28s., SSS = 15m.16s.
Seattle i = 7m.11s., 7m.23s., 13m.16s., and 13m.53s.
Harvard e = 8m.6s., eP_cP = 9m.3s., eSS = 15m.36s., iS_cS = 16m.52s.
Bermuda isS = 12m.52s.
Huancayo e = 8m.4s.
Seven Falls PPE = 8m.52s.
La Paz PPP = 11m.12s., iPS = 15m.44s., iSS = 18m.44s.
Sitka eS_cS = 18m.37s., eSS = 19m.18s.
College i = 10m.29s.
Resolute Bay S_cS = 19m.45s., SS = 21m.51s.
La Plata PN = 9m.50s., PPN = 12m.20s., S?N = 17m.44s., SKSN = 19m.26s., SKKSE = 19m.50s., SSN = 24m.14s., SSSN = 29m.14s., N = 33m.2s.

Continued on next page.

Scoresby Sund i =21m.17s. and 25m.2s.
Rathfarnham Castle iZ =13m.23s., ePS =22m.36s., eSSEN =27m.56s.
Kew ePSZ =22m.56s., eSS =27m.32s., eSSS =31m.15s.
Toledo i =12m.42s.
Malaga iPSZ =24m.16s.
Granada SS =29m.13s.
Paris i =12m.50s. and 13m.18s., ePP =15m.51s., ePPP =17m.48s., iSKS =23m.3s., iSSS =33m.14s.
De Bilt e =22m.58s., eSS =28m.44s.?
Clermont-Ferrand i =23m.50s., e =29m.39s.
Alicante PP =17m.4s., S_cS =23m.46s., SS =30m.2s., Q =37m.52s.
Copenhagen 16m.22s., 23m.22s., i =24m.0s.
Besançon e =13m.3s. and 13m.58s.
Upsala iN =23m.59s.
Strasbourg ePP? =16m.17s., iS? =24m.6s., ePS =24m.44s., eSS =29m.38s., eQ = 35m.44s., and many other e readings.
Stuttgart eZ =14m.2s., ePP =16m.29s., eS =24m.11s., eSS =29m.52s.
Zürich eS =24m.11s.
Jena eN =13m.31s. and 14m.4s., eE =14m.7s., eN =14m.33s., eE =17m.15s., eS?E = 24m.4s., eSEN =24m.18s.
Algiers University eZ =15m.36s.
Cheb eS? =24m.28s., eSS? =30m.2s.
Prague eN =13m.48s., e =22m.8s., eSKKS =24m.13s., ePS =25m.19s., e =26m.44s., eSS =30m.44s.
Triest iSKKS =24m.38s., iS =24m.56s., iPS =25m.47s., iPSKS =28m.17s., eSS = 30m.54s.
Warsaw eSKKSE =24m.21s., eE =26m.11s., ePPSE =26m.36s., eE =26m.57s., e = 34m.17s., eSSS =35m.2s.
Rome iPPZ =17m.16s., iSKSN =24m.5s., eSS? =30m.54s.
Tamanrasset ePPPZ =19m.45s., ePKKPZ =30m.13s., ePKP,PKPZ =38m.30s.
Moscow SS =32m.0s.
Irkutsk PP =18m.48s., ePPP =21m.2s., eSS =33m.38s.
Helwan eZ =21m.53s.
Tashkent ePPP =22m.57s.
Vladivostok iSS =33m.10s.
Long waves were also recorded at Tortosa, Christchurch, and Wellington.

Nov. 17d. 22h. 1m. 3s. Epicentre 38°·6N. 70°·5E. (as on 1950, Aug. 8d.).

A = +·2615, B = +·7386, C = +·6213; δ = −7; h = −1;
D = +·943, E = −·334; G = +·207, H = +·586, K = −·784.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		0·6	279	i 0 13	P*	—	—	—	—	—
Stalinabad		1·4	268	i 0 27	0	—	—	—	—	—
Fergana		2·0	29	0 38	P*	1 9	S_g	—	—	—
Andijan		2·6	34	i 0 48	P*	1 25	S_g	—	—	—
Samarkand		2·9	291	e 0 49	+ 1	i 1 39	S_g	—	—	—
Lunacharskoe		2·9	342	0 50	+ 2	e 1 30?	S*	—	—	—
Tashkent		2·9	341	i 0 52	P*	—	—	—	—	—
Tchimkent		3·8	352	i 1 1	0	1 45	− 2	—	—	—
Naryn		5·1	54	e 1 22	+ 2	2 22	+ 2	—	—	—
Frunse		5·3	35	e 1 25	+ 3	i 2 26	+ 1	—	—	—
Almata		6·8	44	e 1 46	+ 2	i 3 5	+ 2	—	—	—
Mary		6·9	264	i 1 41?	− 4	—	—	—	—	—
Przhevalsk		7·2	55	1 50	+ 1	—	—	—	—	—
Ashkabad		9·6	270	e 2 18	− 3	e 4 3	− 9	—	—	—
New Delhi		11·4	149	e 2 45	− 2	e 4 58	+ 2	5 12	SS	—
Grozny		19·3	293	4 32	+ 3	—	—	—	—	—
Bombay		19·7	175	4 35	+ 1	e 8 21	+11	—	—	—
Tiflis		19·9	289	e 4 32	− 4	e 8 10	− 5	—	—	—
Poona	N.	20·2	171	i 4 42	+ 3	i 8 29	+ 8	4 56	PP	9·0
Leninakan		20·6	287	e 4 47	+ 4	—	—	—	—	—
Borzhomi		20·9	289	e 4 47	+ 1	—	—	—	—	—
Zugdidi		22·1	291	4 59	0	—	—	—	—	—
Ksara		28·3	272	i 5 59	+ 2	i 11 17	+34	—	—	—
Helwan		33·3	267	e 6 46	+ 5	e 12 9	+ 7	e 7 34	PP	—
Prague		40·8	307	e 9 12	PP	—	—	e 9 58	PPP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Potsdam	z.	41·5	310	—	—	e 17 9	SS	—	—	e 24·0
Collmberg	z.	41·6	308	e 7 49	− 2	—	—	e 9 31	PP	—
Cheb		42·1	307	e 9 50	P_cP	e 18 9	SSS	—	—	—
Jena		42·5	308	7 56	− 3	—	—	—	—	—
Stuttgart		44·4	305	e 8 11	− 3	e 18 27	SS	e 19 27	SSS	e 26·0?
Strasbourg		45·3	306	e 8 19	− 2	—	—	—	—	e 25·0
Paris		48·7	307	i 8 47	− 1	—	—	—	—	e 31·0
Tamanrasset	z.	57·0	275	i 9 48k	− 2	—	—	—	—	—
College		72·6	17	e 11 28	− 3	—	—	—	—	—
Pretoria	z.	75·3	220	e 11 46	− 1	—	—	—	—	—
Hungry Horse		93·3	4	i 13 17	− 1	—	—	—	—	—

Additional readings :—
Poona SSN =9m.19s., SSSN =9m.41s.
Helwan eZ =7m.12s.
Jena eEN =8m.16s.
Paris e =9m.6s.
Long waves were also recorded at Dehra Dun, Kew, Aberdeen, Upsala, Copenhagen, Granada, De Bilt, and Warsaw.

Nov. 17d. Readings also at 0h. (Stuttgart and near Zürich), 1h. (Stuttgart and Yalta), 2h. (Besançon, Clermont-Ferrand, Jersey, Strasbourg, Stuttgart, Zürich, and near Paris), 3h. (Overton and near Pierce Ferry), 4h. (Pasadena, Riverside, China Lake, Tucson, Overton, Pierce Ferry, Pretoria, and Tamanrasset), 5h. (Apia, College, and Tacubaya), 6h. (College), 7h. (Djakarta and near Ashkabad), 9h. (College), 11h. (Apia, near Overton, and Pierce Ferry), 12h. (Mount Wilson, Palomar, Tucson, Boulder City, Hungry Horse, College, and Tacubaya), 13h. (Bucharest, Tacubaya, and Overton), 14h. (Hungry Horse, College, and near Mizusawa), 15h. (Hungry Horse, College (2), and Djakarta), 16h. (La Paz), 17h. (Ottawa), 20h. (Wellington and near Tacubaya), 21h. (College, Tacubaya, Prague, and Sverdlovsk), 22h. (Andijan, Samarkand, Stalinabad, and near Obi-garm), 23h. (Frunse, Lunacharskoe, Samarkand, Tashkent, near Andijan, Fergana, Obi-garm (2), Stalinabad, and near Victoria).

Nov. 18d. 0h. 44m. 0s. Epicentre 24°·9N. 94°·7E. (as on 1947, March 8d.).

$A = -·0744$, $B = +·9050$, $C = +·4187$; $\delta = -13$; $h = +3$;
$D = +·997$, $E = +·082$; $G = -·034$, $H = +·417$, $K = -·908$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi		16·1	287	e 3 57	+ 8	e 6 40	− 9	6 33	?	—
Poona	z.	20·4	256	i 5 2	+21	e 8 37	+12	5 18	PP	9·6
Bombay		21·2	258	—	—	9 28	SS	—	—	e 11·6
Przhevalsk		22·1	328	4 48	−11	—	—	—	—	—
Naryn		22·7	323	e 5 2	− 2	—	—	—	—	—
Almata		23·4	327	e 5 4	− 7	—	—	—	—	—
Andijan		24·4	315	5 23	+ 2	e 9 37	− 2	—	—	—
Frunse		24·4	322	e 5 20	− 1	e 9 37	− 2	—	—	—
Fergana		24·6	315	e 5 20	− 3	e 9 35	− 7	—	—	—
Obi-garm		24·6	309	i 5 28	+ 5	e 9 48	+ 6	—	—	—
Lunacharskoe		26·7	314	e 5 44	+ 1	—	—	—	—	—
Tashkent		26·7	314	e 5 46	+ 3	—	—	—	—	—
Tchimkent		27·0	316	e 5 43	− 2	—	—	—	—	—
Samarkand		27·5	308	e 5 55	+ 5	—	—	—	—	—
Sverdlovsk		40·2	331	e 7 36	− 4	—	—	—	—	—
Tiflis		44·3	304	e 8 18	+ 5	—	—	—	—	—
Borzhomi		45·4	305	e 8 29	+ 7	—	—	—	—	—
Ksara		51·4	293	e 9 35	+26	e 17 42?	?	—	—	—
Stuttgart	z.	68·8	315	e 11 7	− 1	—	—	—	—	—
College		78·5	23	e 12 0	− 4	—	—	—	—	—
Pretoria	z.	81·6	237	e 12 39	+18	—	—	—	—	—

Additional readings :—
Poona PPPZ =5m.27s., QZ =8m.44s., SSZ =9m.4s., P_cPZ =9m.15s., SSSZ =9m.22s.
Stuttgart eZ =11m.11s. and 11m.46s.
Long waves were recorded also at Copenhagen.

Nov. 18d. Readings also at 1h. (Lunacharskoe, near Andijan, Fergana, and Obi-garm), 2h. (Ashkabad, Mary, Frunse, Lunacharskoe, Tashkent, Tchimkent, near Andijan (2), Fergana (2), Naryn (2), Obi-garm (3), Samarkand (2), and Stalinabad (2)), 3h. (Overton, Pierce Ferry, near Messina, near Obi-garm), 4h. (San Juan, near Boulder City (2), Overton (2), Pierce Ferry (2), Naryn, near Andijan (3), Fergana (4), Lunacharskoe (2), Obi-garm (4), Samarkand (2), Stalinabad (4), Tashkent (2), Tchimkent (2), and near Prague), 5h. (Samarkand, near Andijan (2), Fergana, Obi-garm (2), and Stalinabad (2)), 6h. (Samarkand, Stalinabad, near Andijan, Fergana, and Obi-garm (3)), 7h. (Tacubaya), 8h. (Malaga, Andijan, and near Obi-garm (4)), 9h. (near Obi-garm (2)), 10h. (Bogota, Pretoria, Huancayo, Tananarive, Obi-garm, Samarkand, Tashkent, Tchimkent, near Andijan, Fergana, and Stalinabad), 11h. (Pasadena, Palomar, Riverside, China Lake, Tucson, Boulder City, Overton, Pierce Ferry, College, Stuttgart, Tamanrasset, Lunacharskoe, Obi-garm, near Andijan, Fergana, and Stalinabad), 12h. (San Juan, near Andijan, and Obi-garm (2)), 13h. (San Juan, Stuttgart, and Mizusawa), 16h. (Pierce Ferry, College (2), New Delhi, Ashkabad, Mary, Almata, Frunse, Lunacharskoe, Naryn, near Andijan, Fergana, Obi-garm, Samarkand, Stalinabad, Tashkent, near Tchimkent, and near Zürich), 17h. (La Paz and near Huancayo), 18h. (near San Juan, and near Obi-garm (2)), 19h. (Almata, Przhevalsk, Samarkand, Stalinabad, near Andijan (2), Fergana, Frunse, Lunacharskoe, Obi-garm (2), Tashkent, Tchimkent, and near Mary), 20h. (Prague, Riverside, Tucson, Overton, Pierce Ferry, and near Victoria), 21h. (La Plata and near Obi-garm), 22h. (Tamanrasset, Overton, Lick, Hungry Horse, College, near Andijan, Obi-garm, and Stalinabad), 23h. (San Juan, Hungry Horse, Shasta Dam, College, and Nanking).

Nov. 19d. 7h. 2m. 38s. (I) } Epicentre 46°·3N. 7·°4E. (as on 1949, February 17d.).
7h. 10m. 41s. (II) }

Intensity shock I V at Montana ; IV-V at Sion ; IV at Matten, Gstaad, and Gsteig. Shock II V at Matten ; IV-V at Montana and Sion ; IV at Gstaad and Gsteig.
Epicentre 46°·3N. 7°·5E.

E. Wanner.
Jahresbericht des Erdbebendientes der Schweiz im Jahre, 1950, Zürich, 1951, p. 3 ; map of epicentres Fig. 6.

$A = +·6875$, $B = +·0893$, $C = +·7206$; $\delta = -10$; $h = -4$;
$D = +·129$, $E = -·992$; $G = +·715$, $H = +·093$, $K = -·693$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
I	Neuchatel	0·7	336	i 0 15	− 2	i 0 23	− 5	—	—
II		0·7	336	e 0 14	− 3	i 0 23	− 5	—	—
I	Besançon	1·3	314	i 0 26	+ 1	i 0 41	− 3	—	—
II		1·3	314	e 0 30	+ 5	i 0 43	− 1	i 0 46	S_g
I	Basle	1·3	6	e 0 22	− 3	e 0 39	− 5	—	—
II		1·3	6	e 0 23	− 2	e 0 40	− 4	—	—
I	Zürich	1·3	37	e 0 23	− 2	e 0 41	− 3	—	—
II		1·3	37	e 0 24	− 1	i 0 43	− 1	—	—
I	Ravensburg z.	2·1	45	e 0 38	+ 1	e 1 7	S*	—	—
II		2·1	45	e 0 43	P_g	e 1 7	S*	—	—
I	Strasbourg	2·3	6	e 0 50	P_g	e 1 16	S_g	—	—
II		2·3	6	e 0 50	P_g	e 1 12	+ 3	e 1 21	S_g
I	Stuttgart z.	2·7	26	e 0 49	+ 4	e 1 22	+ 3	e 1 1	P_g
II	z.	2·7	26	e 0 47?	+ 2	e 1 21	+ 2	e 0 53	P_g
I	Jena	5·4	30	e 1 35?	P*	e 2 27	− 1	e 1 48	P_g
II		5·4	30	e 1 47	P_g	e 2 48	S*	e 2 59	S_g

Additional readings :—
Strasbourg I e = 56s., 1m.20s., 1m.25s., and 1m.31s., II e = 1m.5s., eS*? = 1m.19s.
Stuttgart I eP*Z = 54s., eZ = 1m.25s. and 1m.29s., eS*Z = 1m.32s., eS_gZ = 1m.36s.,
II eZ = 1m.27s., eS_g?Z = 1m.29s. and 1m.32s.
Jena I eS_g?E = 2m.43s., eS_g?N = 2m.49s., eE = 2m.56s.

Nov. 19d. 20h. Undetermined shock. Indian Ocean.

Bombay iPEN =38m.36s., eSEN =41m.56s., SSEN =42m.3s.
Poona iPEZ =38m.45s., PPE =39m.2s., PPPE =39m.10s., eSE =42m.6s.
Kodaikanal iPE =39m.12s., iSE =43m.11s., RE =44m.45s.
Hyderabad PE =39m.28s., SE =43m.37s., LE =45m.6s.
Ksara iP =40m.56s., S =46m.14s.
Pretoria iZ =43m.10s.
Pietermaritzburg eZ =43m.25s.
Istanbul e =43m.41s.
Tamanrasset ePZ =43m.43s.
Collmberg eZ =44m.4s.
Stuttgart ePZ =44m.10s.?
Prague eP =44m.20s., e =45m.13s. and 49m.57s. ?
Calcutta ePE =46m.20s.
College eP? =52m.50s.
Hungary Horse eP? =53m.34s.
Shasta Dam eP? =53m.50s.
Pierce Ferry eP? =54m.8s.
Overton iZ =56m.24s.

Nov. 19d. 21h. 34m. 56s. Epicentre 38°·4N. 72°·2E. (as on 1948, July 18d.).

$A = +\cdot2402$, $B = +\cdot7481$, $C = +\cdot6186$; $\delta = +2$; $h = -1$;
$D = +\cdot952$, $E = -\cdot306$; $G = +\cdot189$, $H = +\cdot589$, $K = -\cdot786$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fergana		2·0	351	e 0 31	− 4	—	—	—	—	—
Obi-garm		2·0	279	i 0 31	− 4	e 0 55	− 7	—	—	—
Andijan		2·3	3	0 41	+ 1	i 1 9	S*	—	—	—
Stalinabad		2·7	273	i 0 45	0	e 1 18	− 1	—	—	—
Lunacharskoe		3·6	324	e 0 58	0	i 1 37	− 5	—	—	—
Tashkent		3·6	324	0 58	0	i 1 42	0	—	—	—
Naryn		4·2	43	e 1 6?	− 1	1 55	− 2	—	—	—
Samarkand		4·3	289	e 1 6?	− 2	i 2 1?	+ 1	—	—	—
Frunse		4·8	21	i 1 15	0	i 2 22	S*	—	—	—
Almata		6·0	35	1 32	0	—	—	—	—	—
Mary		8·2	268	i 1 55	− 8	e 3 26	−12	—	—	—
New Delhi		10·6	155	e 2 36	0	i 4 35	− 2	4 45	SS	4·4
Ashkabad		10·9	272	2 35	− 5	4 32	−12	—	—	—
Kizyl-Arvat		12·5	278	e 2 49	−13	i 4 58	−25	—	—	—
Lenkoran		18·3	280	—	—	7 41	+ 2	—	—	—
Bombay		19·5	179	e 4 33	+ 2	e 8 15	+ 9	—	—	—
Poona		19·8	176	e 4 37	+ 2	i 8 16	+ 3	5 0	PP	9·4
Sverdlovsk		20·0	341	e 4 33	− 4	—	—	—	—	—
Grozny		20·6	293	4 40	− 3	—	—	—	—	—
Calcutta		21·0	135	—	—	e 8 31	− 6	—	—	e 13·3
Tiflis		21·2	289	4 44	− 5	—	—	—	—	—
Hyderabad	E.	21·6	165	—	—	e 9 23	+34	—	—	e 11·5
Gori		21·7	290	e 4 52	− 3	—	—	—	—	—
Borzhomi		22·3	289	e 4 55	− 6	—	—	—	—	—
Kodaikanal	E.	28·4	170	—	—	e 9 43	−62	—	—	—
Ksara		29·6	273	—	—	e 11 31	+27	—	—	e 17·2
Collmberg	Z.	42·8	308	e 7 55	− 6	—	—	e 9 57	PP	—
Jena		43·7	307	e 8 9	+ 1	—	—	—	—	—
Stuttgart	Z.	45·6	304	e 8 24	0	—	—	e 10 6	PP	—
Strasbourg		46·6	305	e 8 32k	0	—	—	—	—	—
Algiers Univ.	Z.	53·6	292	e 9 19	− 6	—	—	—	—	—
Tamanrasset	Z.	58·3	276	e 9 52	− 7	—	—	—	—	—
Resolute Bay		66·9	357	e 10 52	− 4	—	—	—	—	e 35·3
College		72·4	18	i 11 28	− 2	—	—	—	—	—
Pretoria	Z.	76·0	221	e 11 48	− 3	—	—	—	—	—
Hungry Horse		93·5	4	e 13 15	− 4	—	—	—	—	—

Additional readings :—
New Delhi SSS =4m.57s.
Poona PPPE =5m.6s., QE =8m.21s.. SSE =8m.42s., P_cPE =8m.52s., SSSE =9m.1s.
Collmberg eZ =8m.0s. and 10m.36s.
Jena eN =8m.16s.
Stuttgart eZ =8m.42s. and 11m.22s.
Strasbourg e =8m.38s.
Hungry Horse i =13m.22s.
Long waves were also recorded at Kew.

Nov. 19d. Readings also at 0h. (Stalinabad, near Andijan, and Obi-garm (2)), 2h. (near Obi-garm), 4h. (Bucharest, near Boulder City, and Pierce Ferry), 6h. (Mount Wilson, Tucson, College, and Tacubaya), 7h. (Irkutsk, Nanking, Overton, Shasta Dam, Hungry Horse, near College, near Santa Clara, Stuttgart (2), near Neuchatel (2), and Zürich (2)), 8h. (near Obi-garm (2)), 9h. (Haiwee, China Lake, Perris, Pasadena, Riverside, Tucson, Overton, Shasta Dam, Hungry Horse, Fergana, near Obi-garm (2), and Stalinabad), 10h. (Shasta Dam), 11h. (near Alicante (3)), 12h. (Stuttgart), 14h. (Ashkabad), 15h. (near Yalta), 16h. (Ashkabad (2)), 17h. (Ashkabad, Edinburgh, and near Messina), 18h. (near Andijan), 20h. (Messina and Stuttgart), 21h. (Pierce Ferry, College, near Huancayo, and near Obi-garm), 23h. (Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, near Santa Clara, and near Messina).

Nov. 20d. 12h. 26m. 24s. Epicentre 62°·0S. 19°·5W.

$A = +\cdot4448$, $B = -\cdot1575$, $C = -\cdot8816$; $\delta = -13$; $h = -10$;
$D = -\cdot334$, $E = -\cdot943$; $G = -\cdot831$, $H = +\cdot294$, $K = -\cdot472$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grahamstown	Z.	40·9	67	e 7 46	0	—	—	—	—	—
Pretoria	Z.	48·9	64	i 8 42	− 8	—	—	—	—	—
La Paz		56·8	301	i 9 46a	− 2	i 17 38	− 3	12 16	PP	28·4
Huancayo		63·8	296	e 10 38	+ 2	e 19 12	+ 1	—	—	e 26·0
Riverview	E.	84·2	172	—	—	e 23 18	+19	e 28 53	SS	e 34·8
Tamanrasset	Z.	86·8	23	e 12 46	− 1	e 16 1	PP	e 18 17	PPP	—
Ksara		105·4	45	e 18 50	PP	—	—	—	—	—
Tucson		118·5	286	e 18 56	[+ 6]	—	—	—	—	—
Riverside	Z.	123·0	281	e 19 0	[+ 1]	—	—	—	—	—
Pierce Ferry		123·2	285	e 19 4	[+ 5]	—	—	—	—	—
Overton	Z.	123·7	285	e 19 8	[+ 8]	—	—	—	—	—
Hungry Horse		133·0	295	e 19 18	[0]	—	—	—	—	—
Resolute Bay		144·9	333	e 19 36	[− 3]	e 40 54	SS	—	—	—
College		157·2	300	e 20 13	[+16]	—	—	—	—	—

Additional readings :—
Pretoria eZ = 8m.58s.
La Paz iPS = 17m.56s.
Resolute Bay e = 46m.54s., eE = 47m.48s.
College i = 20m.27s.
Long waves were also recorded at Wellington.

Nov. 20d. Readings also at 0h. (Overton and Pierce Ferry), 1h. (near Andijan), 2h. (near Prague), 3h. (near Andijan, Obi-garm, and Stalinabad), 5h. (Bermuda, Palisades, near San Juan, and near Istanbul), 6h. (near Obi-garm), 9h. (near Andijan), 10h. (Tamanrasset and near Istanbul), 11h. (Hungry Horse, College, Resolute Bay, Ksara, Bombay, and Nanking), 12h. (Perris, Tucson, Boulder City, Overton, Pierce Ferry, College, Puebla, Tacubaya, and Vera Cruz), 13h. (Overton), 16h. (near Ottawa), 17h. (near Ashkabad), 18h. (Ashkabad, Hungry Horse, and near College), 20h. (near Andijan, Obi-garm, Stalinabad, and Tchimkent), 21h. (Lick, Pierce Ferry, Tamanrasset, Huancayo, near La Paz (2), Galerazamba, near Bogota, and Chinchina.

Nov. 21d. 7h. 10m. 3s. Epicentre 29°·0N. 96°·0E.

$A = -\cdot0916$, $B = +\cdot8712$, $C = +\cdot4823$; $\delta = -1$; $h = +2$;
$D = +\cdot995$, $E = +\cdot105$; $G = -\cdot051$, $H = +\cdot480$, $K = -\cdot876$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi		16·5	273	e 3 51	− 3	i 6 57	− 1	7 14	SS	7·6
Hyderabad	E.	19·8	238	e 4 32	− 3	e 8 15	+ 2	—	—	—
Nanking		19·9	74	e 4 40	+ 4	e 8 19	+ 4	—	—	—
Naryn		20·5	318	e 4 41	− 1	—	—	—	—	—
Almata		20·9	318	—	—	e 8 37	+ 2	—	—	—
Frunse		22·1	314	e 5 9?	+10	e 9 13?	+15	—	—	—
Andijan		22·6	307	e 5 4	+ 1	9 11	+ 4	—	—	—
Poona		22·8	247	1 5 3	− 2	9 11	0	5 35	PP	10·8
Fergana		22·9	306	e 5 8	+ 2	e 9 16	+ 3	—	—	—
Bombay		23·4	249	e 5 10	− 1	e 9 24	+ 3	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		23·8	301	e 5 20	+ 5	e 9 34	+ 6	—	—	—
Stalinabad		24·5	301	e 5 24	+ 2	i 9 40	0	—	—	—
Tashkent		25·0	306	e 5 32	+ 5	e 9 52	+ 3	—	—	—
Tchimkent		25·1	309	i 5 29	+ 1	—	—	—	—	—
Kodaikanal	E.	25·5	227	e 5 27	− 5	e 9 56	− 1	—	—	—
Samarkand		26·1	301	e 5 39	+ 2	—	—	—	—	—
Ksara		50·9	291	e 13 25	?	e 19 40	?	—	—	—
Collmberg	Z.	63·7	315	e 10 35	− 1	—	—	—	—	—
Jena	N.	64·7	315	e 10 44	+ 2	—	—	—	—	—
Stuttgart	Z.	66·8	314	e 10 55	− 1	—	—	—	—	—
College		74·3	23	e 11 39	− 2	—	—	e 14 42	PP	—
Tamanrasset	Z.	79·7	290	i 12 8a	− 3	—	—	—	—	—
Pretoria	Z.	84·8	236	i 12 36	− 1	—	—	—	—	—
Hungry Horse		98·4	19	i 13 41	0	—	—	—	—	—
Overton	Z.	108·8	24	e 18 58	PP	—	—	—	—	—
Pierce Ferry		109·3	24	e 19 12	PP	—	—	—	—	—

Additional readings :—
New Delhi QEN =6m.53s.
Poona PPPE =5m.47s., P_cP?E =8m.43s., QE =9m.41s., SSE =10m.3s., SSSE =10m.17s., S_cPE =12m.14s., S_cSE =16m.3s.
Stuttgart eZ =11m.2s.
Long waves were also recorded at Wellington.

Nov. 21d. 13h. 55m. 59s. Epicentre 21°·0S. 65°·5W. Depth of focus 0·040.
(as on 1943, June 24d.).

A = +·3875, B = −·8502, C = −·3563 ; δ = −5 ; h = +4 ;
D = −·910, E = −·415 ; G = −·148, H = +·324, K = −·934.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
La Paz		5·2	329	i 1 20a	0	i 2 21	− 1	—	—
Huancayo		13·0	312	i 2 54	− 2	e 5 15	0	—	—
Bogota	Z.	26·8	341	i 5 12	− 4	—	—	—	—
San Juan		39·2	0	i 7 0	− 2	—	—	—	—
Tucson		68·4	321	i 10 33	+ 1	—	—	—	—
Pierce Ferry		73·0	322	i 11 1	+ 1	—	—	—	—
Boulder City		73·4	321	e 11 3	+ 1	—	—	—	—
Perris	Z.	73·5	318	i 11 3k	0	—	—	e 12 8	pP
Overton	Z.	73·6	322	i 11 4	0	—	—	i 12 10	pP
Riverside	Z.	73·7	318	i 11 3k	− 1	—	—	e 12 9	pP
Mount Wilson	Z.	74·3	318	i 11 7k	− 1	—	—	e 12 13	pP
China Lake	Z.	75·0	320	i 11 12	0	—	—	—	—
Reno	Z.	78·7	321	e 11 33a	+ 1	—	—	e 12 51	pP
Mineral	Z.	80·3	321	i 11 40	0	—	—	—	—
Shasta Dam		81·0	321	i 11 42	− 2	—	—	—	—
Hungry Horse		81·5	330	i 11 47	0	—	—	—	—
Pretoria	Z.	84·3	115	i 12 2	+ 1	—	—	—	—

Additional readings :—
La Paz i =1m.27s., 2m.31s., and 2m.44s.
Huancayo i =2m.57s.
San Juan i =7m.19s.
Reno eZ =13m.4s.

Nov. 21d. 20h. Pasadena suggests region of Easter Island.

La Plata PE =27m.0s., PPPE =29m.48s., PPPN =30m.0s., P_cSN =32m.6s., S_cS?N = 36m.6s., S_cSE =36m.24s., SSSN =39m.30s., L?E =40·4m.
Huancayo eP =29m.44s., ePP? =31m.24s., iS =35m.37s., eL =38m.12s.
La Paz iPZ =30m.12s.k, PPZ =31m.48s., iS =36m.17s., iSS =39m.1s., iS_cS =40m.20s., i =40m.54s., L =42m.6s.
Bogota ePEN =31m.38s., iSEN =38m.50s., eLEN =46m.42s.
Tucson eP? =33m.24s..
Pasadena eZ =33m.40s.
Riverside eZ =33m.40s.
Pierce Ferry eP? =33m.48s.
China Lake eZ =33m.49s., iZ =34m.1s.
Overton eP?Z =33m.52s.
Boulder City eP? =33m.59s.
Lick ePZ =34m.11s.k.
Shasta Dam eP =34m.17s.
Reno eP?Z =34m.20s., eZ =34m.39s., eE =35m.19s.
Hungry Horse eP? =34m.39s.
Ksara e =45m.2s. and 50m.2s.
Chinchina ePPSEN =46m.50s.
Wellington e =50m.

Nov. 21d. 20h. 53m. 56s. Epicentre 38°·6N. 70°·5E. (as on 17d.).

A = +·2615, B = +·7386, C = +·6213 ; $\delta = -7$; $h = -1$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		0·6	279	i 0 14	− 1	—	—	—	—	—
Stalinabad		1·4	268	i 0 26	− 1	—	—	—	—	—
Fergana		2·0	29	e 0 39	+ 4	e 1 5	S_g	—	—	—
Andijan		2·6	34	e 0 49	+ 5	i 1 27	S_g	—	—	—
Lunacharskoe		2·9	342	e 0 51	+ 3	i 1 35	S_g	—	—	—
Samarkand		2·9	291	e 0 50	+ 2	i 1 38	S_g	—	—	—
Tashkent		2·9	341	i 0 50?	+ 2	i 1 41?	S_g	—	—	—
Tchimkent		3·8	352	i 1 3	+ 2	1 46	− 1	—	—	—
Naryn		5·1	54	e 1 20	0	e 2 49	S_g	—	—	—
Frunse		5·3	35	e 1 27	P*	i 2 32	S*	—	—	—
Almata		6·8	44	e 1 45	+ 1	—	—	—	—	—
Mary		6·9	264	e 1 41	− 4	—	—	—	—	—
Ashkabad		9·6	270	e 2 25	+ 4	—	—	—	—	—
New Delhi		11·4	149	e 2 47	0	i 4 57	+ 1	—	—	4·8
Semipalatinsk		13·7	27	—	—	e 5 46	− 6	—	—	—
Bombay		19·7	175	4 39	+ 5	e 8 24	+14	—	—	—
Poona		20·2	171	i 4 37	− 2	e 8 17	− 4	9 4	SSS	9·4
Hyderabad	N.	22·2	160	—	—	e 9 4	+ 4	—	—	—
Ksara		28·3	272	e 8 27	?	—	—	—	—	e 13·4
Kodaikanal	E.	28·9	167	—	—	e 11 26	+33	—	—	—
Collmberg	Z.	41·6	308	e 7 50	− 1	—	—	—	—	—
Stuttgart	Z.	44·4	305	e 8 13?	− 1	—	—	—	—	—
College		72·6	17	e 11 29	− 2	—	—	—	—	—

Poona gives also QE =8m.30s.
Long waves were also recorded at Kew.

Nov. 21d. 22h. New Guinea.

Brisbane iPZ =26m.40s.k, eE =26m.48s., eSE =31m.10s.
Riverview eSN =32m.33s., eLE =35·5m.
Vladivostok P =32m.43s., eS =37m.3s.
College eP =33m.42s.
Lick iPZ =33m.44s.a, iZ =34m.44s.
Shasta Dam iP =34m.33s.
China Lake ePZ =34m.48s.
Hungry Horse eP =35m.0s.
Pierce Ferry eP =35m.3s.
Stuttgart ePKPZ =40m.18s.
San Juan ePKP =40m.52s.
Tacubaya e =64m.24s.
Long waves were also recorded at Wellington.

Nov. 21d. Readings also at 1h. (College, Shasta Dam, Pasadena, Riverside, China Lake, Boulder City, Overton, and Pierce Ferry), 2h. (College, near Apia, Ashkabad, Naryn, Tashkent, near Tchimkent, Obi-garm (2), Fergana, Andijan, Stalinabad, Samarkand, and near Mary), 5h. (College), 6h. (Fergana, Samarkand, Lunacharskoe, near Obi-garm, Stalinabad, and Andijan), 7h. (Ksara and near Obi-garm), 8h. (College), 9h. (La Paz), 10h. (near Obi-garm), 11h. (Bombay, College, and near Obi-garm), 12h. (near Athens), 13h. (Chinchina and College), 14h. (near Naryn and near Obi-garm), 15h. (College and near Stalinabad), 17h. (Borzhomi, Erevan, near Tiflis, Grozny, Gori, Leninakan, Abastumanj, and Zugdidi), 18h. (near Obi-garm), 19h. (College, near Apia, and near Mizusawa), 20h. (College, Hungry Horse, Shasta Dam, Mount Wilson, Riverside, China Lake, Boulder City, Overton, Pierce Ferry, Ivigtut, Przhevalsk, Tashkent, near Naryn, and near Huancayo), 21h. (Huancayo, Tucson, Overton, Pierce Ferry, Mount Wilson, China Lake (2), Lick, Reno, College, Mary, Naryn, Almata (2), Frunse (2), near Przhevalsk, Obi-garm (4), Stalinabad (2), Fergana (3), Andijan (2), Lunacharskoe (2), Tashkent (2), Samarkand (2), and Tchimkent), 22h. (College, Lunacharskoe (3), Tashkent, Tchimkent, Almata, near Obi-garm (6), Stalinabad (4), Fergana (4), Andijan (6), Samarkand (3), and Naryn), 23h. (Pierce Ferry, Lunacharskoe, Tchimkent, near Obi-garm (4), Stalinabad, Andijan (2), and Samarkand (2)).

Nov. 22d. 1h. 28m. 18s. Epicentre 37°·6N. 71°·6E. Depth of focus 0·030.
(as on 1938, January 19d.).

Given by U.S.S.R.

$A = +·2507$, $B = +·7537$, $C = +·6076$; $\delta = +9$; $h = -1$;
$D = +·949$, $E = -·316$; $G = +·192$, $H = +·577$, $K = -794$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Obi-garm		1·9	306	i 0 36	− 4	i 1 3	− 7	—
Stalinabad		2·4	293	e 0 19?	?	i 0 51	?	—
Fergana		2·8	3	i 0 50	+ 1	e 1 26	− 1	—
Andijan		3·2	11	i 1 35	S	(i 1 35)	0	—
Samarkand		4·1	302	e 1 4	0	i 1 52	− 2	—
Lunacharskoe		4·1	336	e 1 6	+ 2	1 1 55	+ 1	—
Tashkent		4·1	336	e 1 6	+ 2	e 1 55	+ 1	—
Tchimkent		4·9	343	i 1 18	+ 4	i 2 15	+ 3	—
Naryn		5·1	41	e 1 16	− 1	e 2 15	− 2	—
Frunse		5·8	23	—	—	e 2 34	+ 2	—
Almata		7·0	35	e 1 42	+ 1	—	—	—
Mary		7·7	273	i 1 49	− 1	—	—	—
New Delhi	E.	10·1	151	e 2 15	− 6	i 3 54	−18	3·7
Ashkabad		10·5	276	e 2 27	+ 1	i 4 19	− 2	—

Nov. 22d. 6h. 35m. 26s. Epicentre 40°·1N. 120°·1W.

$A = -·3847$, $B = -·6636$, $C = +·6416$; $\delta = +1$; $h = -2$;
$D = -·865$, $E = +·502$; $G = -·322$, $H = -·555$, $K = -·767$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Reno		0·6	158	i 0 11k	− 4	i 0 19	− 7	—	—	—
Mineral		1·2	282	e 0 21	− 3	—	—	—	—	—
Berkeley		2·8	217	i 0 48k	+ 1	e 1 24	+ 2	—	—	—
Lick		3·0	204	i 0 48$_a$	− 2	e 1 25	− 2	—	—	—
Fresno		3·4	175	e 1 0$_a$	P*	—	—	—	—	—
Tinemaha		3·4	153	e 0 54	− 1	e 1 48	S*	i 1 2	P*	—
Haiwee		4·3	156	i 1 20	P*	i 2 17	S*	—	—	—
China Lake	z.	4·7	154	i 1 17	+ 3	i 2 30	S_E	i 1 25	P*	—
Overton	z.	5·7	127	e 1 29	+ 1	—	—	—	—	i 3·0
Boulder City		5·9	133	e 1 29	− 2	—	—	—	—	—
Pasadena		6·1	165	e 1 33	− 1	e 2 46	+ 1	—	—	—
Pierce Ferry		6·2	128	e 1 36	+ 1	—	—	—	—	—
Riverside	z.	6·5	159	i 1 38	− 1	—	—	—	—	—

Nov. 22d. 10h. 16m. 26s. Epicentre 51°·4N. 176°·0W. (as on 1949, December 28d.).

$A = -·6249$, $B = -·0437$, $C = +·7795$; $\delta = +3$; $h = -6$;
$D = -·070$, $E = +·998$; $G = -·778$, $H = -·054$, $K = -·626$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Adak		0·6	321	i 0 14	− 1	i 0 21	− 5	—	—	—
Klyuchi		14·5	299	2 31	−57	4 21	?	—	—	—
College		19·8	36	e 4 34	− 1	i 8 24	+11	i 5 2	PPP	e 10·2
Sitka		24·1	60	i 5 20	+ 2	e 9 39	+ 5	e 6 22	PPP	e 10·7
Aomori		31·4	267	6 31	+ 6	—	—	—	—	—
Akita		32·4	265	e 6 31	− 3	—	—	—	—	—
Sendai		32·8	263	e 6 37	0	—	—	—	—	e 15·4
Honolulu		33·2	146	e 6 38	− 2	e 12 1	+ 1	—	—	e 13·9
Hukusima		33·4	263	6 37	− 5	e 12 1	− 2	—	—	e 16·1
Victoria		33·4	74	i 6 44k	+ 2	12 8	+ 5	—	—	—
Seattle		34·4	74	e 6 54s	+ 3	i 12 36	+17	e 7 39	PP	e 23·6
Utunomiya		34·5	262	e 6 47	− 5	—	—	—	—	—
Kumagaya		35·0	262	e 6 54	− 2	e 14 4	SS	—	—	—
Tokyo		35·1	261	e 7 2	+ 5	12 28	− 2	8 25	PP	16·2
Matusiro		35·5	264	6 56	− 4	e 13 29	+53	8 9	PP	17·6
Nagano	N.	35·5	264	e 7 5	+ 5	—	—	—	—	—
Vladivostok		35·6	277	i 6 56	− 5	i 12 30	− 8	—	—	—
Shizuoka		36·4	261	e 7 3	− 5	—	—	—	—	e 15·5
Gihu		37·2	262	e 7 19	+ 4	—	—	—	—	—
Shasta Dam		37·9	84	i 7 22	+ 2	e 13 20	+ 7	—	—	—
Ukiah		38·3	87	e 7 24	0	e 13 27	+ 8	e 9 22	PP	e 16·2
Kobe		38·6	264	i 7 23	− 3	e 16 28	SSS	—	—	e 19·3
Mineral	Z.	38·6	84	i 7 28	+ 2	—	—	e 8 55	PP	—
Resolute Bay		39·0	24	6 39	−51	13 22	− 7	9 12	PP	e 18·9
Hungry Horse		39·0	69	i 7 30	0	i 13 24	− 5	i 9 45	P_cP	—
Berkeley		39·7	89	i 7 38k	+ 2	i 13 42	+ 2	i 9 12	PP	e 16·8
Reno		40·2	84	e 7 41k	+ 1	e 13 45	− 3	i 7 54	pP	—
Santa Clara	E.	40·2	89	e 8 14	+34	e 14 2	+14	—	—	e 19·1
Lick	Z.	40·4	89	i 7 42k	+ 1	e 13 29	−21	i 7 56	pP	—
Kôti		40·4	264	e 7 37	− 4	e 13 46	− 4	—	—	e 20·8
Butte	N.	41·0	71	e 8 2	+16	e 14 4	+ 5	—	—	e 17·2
Saskatoon		41·4	61	—	—	14 9	+ 4	—	—	—
Fresno	Z.	41·9	87	e 7 54k	0	e 18 10	SSS	—	—	e 20·5
Hukuoka		42·3	266	i 7 54	− 3	e 14 11	− 8	—	—	20·2
Tinemaha	Z.	42·7	86	i 8 1k	+ 1	—	—	i 8 12	pP	—
China Lake	Z.	43·9	86	i 8 9k	− 1	e 13 49	S_cP	i 8 24	sP	—
Logan		43·9	76	i 8 10	0	e 14 40	− 2	i 8 36	sP	e 19·1
Salt Lake City		44·4	77	e 8 15	+ 1	e 14 49	0	—	—	e 23·2
Pasadena		44·6	89	i 8 15k	− 1	e 14 52	0	i 8 25	pP	e 18·2
Riverside		45·2	89	i 8 20k	0	—	—	i 8 33	sP	—
Overton	Z.	45·4	84	i 8 23	+ 1	e 13 51	S_cP	—	—	—
Perris	Z.	45·4	89	i 8 22k	0	e 13 49	S_cP	—	—	—
Boulder City		45·5	85	e 8 24	+ 1	—	—	i 10 3	P_cP	—
Palomar		45·9	89	i 8 27k	+ 1	—	—	i 8 40	pP	—
Pierce Ferry		45·9	84	i 8 29	+ 3	—	—	—	—	—
Irkutsk		46·9	304	e 8 36	+ 2	—	—	—	—	—
Rapid City	E.	47·6	68	e 8 40	+ 1	e 15 33	− 2	e 10 48	PP	e 21·5
Tucson		50·4	86	i 9 1	0	e 16 13	− 1	i 9 14	pP	e 20·6
Nanking		50·6	274	i 8 56	− 6	16 8	− 9	i 10 15	P_cP	21·5
Lubbock		55·1	77	9 36	0	—	—	—	—	—
Scoresby Sund		57·0	11	e 9 49	− 1	e 17 41	− 2	19 38	S_cS	28·6
Chicago		58·0	62	e 9 54	− 3	e 17 54	− 3	—	—	e 26·8
Florissant		58·4	66	e 9 59	− 1	i 18 0	− 2	i 18 8	PS	—
St. Louis		58·6	66	i 9 59	− 2	i 18 3	− 1	i 10 12	pP	—
Ivigtut		60·3	26	—	—	24 58	SSS	—	—	31·4
Cincinnati		61·5	62	i 12 48	pPP	e 23 18	SS	—	—	35·6
Cleveland		61·5	58	i 10 20	− 1	e 18 40	− 2	e 22 36	SS	—
Ottawa		61·7	52	i 10 19k	− 3	e 18 44	0	e 20 9	S_cS	—
Shawinigan Falls	N.	62·3	49	e 10 33	+ 7	—	—	—	—	—
Seven Falls	E.	62·8	47	—	—	e 18 54	− 4	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pennsylvania		63·9	56	i 10 43	+ 6	i 19 11	− 1	i 20 40	S_cS	—
Apia		65·0	175	e 10 53	+ 9	—	—	—	—	—
Washington		65·7	57	e 10 48	0	—	—	—	—	e 38·1
Harvard		65·8	51	i 10 48	− 1	—	—	—	—	e 31·8
Palisades		65·8	54	i 10 48 a	− 1	i 19 34	− 1	—	—	—
Fordham		65·9	54	i 10 52	+ 2	—	—	—	—	—
Philadelphia		65·9	55	e 10 51	+ 1	e 19 39	+ 2	e 14 19	PPP	e 29·9
Weston		66·1	51	i 10 49	− 2	—	—	—	—	—
Almata		66·5	311	i 10 50	− 4	—	—	—	—	—
Tacubaya		66·9	87	e 10 54	− 2	—	—	—	—	—
Columbia		67·1	63	—	—	e 19 50	− 1	—	—	e 31·1
Pulkovo		67·1	346	e 10 48	− 9	e 19 38	−13	—	—	—
Helsinki		67·5	349	—	—	e 19 55	− 1	e 20 47	S_cS	e 30·6
Frunse		68·0	312	e 10 59?	− 4	—	—	—	—	—
Naryn		68·4	310	e 11 0	− 6	—	—	—	—	—
Upsala	N.	68·6	353	—	—	e 19 59	−10	e 25 6	SS	e 31·6
Moscow		69·7	341	e 11 17	+ 3	e 20 15	− 7	—	—	—
Andijan		70·6	312	11 16?	− 3	20 25?	− 8	—	—	—
Tchimkent		70·7	314	i 11 25?	+ 5	20 25?	− 9	—	—	—
Fergana		71·2	312	e 11 19	− 4	e 20 31	− 9	—	—	—
Lunacharskoe		71·6	314	e 11 23	− 2	—	—	—	—	—
Tashkent		71·6	314	e 11 21	− 4	e 20 34	−10	—	—	—
Aberdeen		71·7	4	i 12 54	?	e 22 19	?	i 17 37	?	e 34·4
Copenhagen		73·0	355	e 11 40	+ 7	e 21 3	+ 3	26 16	SS	33·6
Obi-garm		73·5	312	i 11 32	− 4	i 11 38	pP	—	—	—
Samarkand		74·0	315	e 11 36	− 3	e 21 3	− 8	—	—	—
Stalinabad		74·1	313	i 11 35	− 5	i 21 1	−11	—	—	—
Durham		74·1	4	—	—	e 21 24	+12	i 26 8	SS	—
Rathfarnham Castle		75·3	7	e 11 42	− 5	e 21 32	+ 6	e 14 37	PP	e 33·6
Warsaw		75·7	350	—	—	e 21 42	+12	e 26 50	SS	—
De Bilt		76·9	0	—	—	e 21 34?	− 9	—	—	e 32·6
Bermuda		77·1	54	—	—	e 21 32	−14	e 26 49	SS	e 31·2
Collmberg	Z.	77·4	353	e 11 55	− 3	—	—	—	—	—
Kew		77·4	3	e 12 5	+ 7	e 21 50	+ 1	e 22 24	SKS	e 33·6
Jena		77·8	355	e 12 1?	0	e 22 1?	+ 8	e 12 9	pP	—
New Delhi		77·8	300	e 11 56	− 5	i 21 46	− 7	22 22	PS	31·3
Mary		77·9	316	i 11 58	− 3	—	—	—	—	—
Prague		78·5	353	e 12 16	+12	e 22 15	+14	e 15 17	PP	e 33·6
Cheb		78·6	355	—	—	e 21 40	−22	—	—	—
Grozny		78·9	330	e 12 12	+ 5	e 22 1	− 4	—	—	—
Ashkabad		79·1	319	e 12 6	− 2	—	—	—	—	—
Kishinev		79·7	343	i 12 8	− 3	—	—	—	—	—
Stuttgart		80·1	356	e 12 11	− 2	e 22 14	− 4	e 15 28	PP	e 33·6
Paris		80·2	1	e 12 13	− 1	i 22 15	− 4	22 56	PS	e 37·6
Baku		80·2	326	e 12 8	− 6	—	—	—	—	—
Strasbourg		80·3	357	e 12 11	− 3	e 22 18	− 2	e 15 36	PP	37·6
Budapest	E.	80·6	350	e 12 27	+11	e 22 19	− 4	e 39 4	Q	e 44·6
Gori		80·7	331	e 12 18?	+ 2	e 22 22?	− 2	—	—	—
Tiflis		80·7	330	e 12 14	− 2	e 22 18	− 6	—	—	—
Zugdidi		80·8	333	e 12 19	+ 2	—	—	—	—	—
Borzhomi		81·0	331	e 12 19	+ 1	e 22 26	− 1	—	—	—
Yalta		81·0	339	12 23	+ 5	—	—	—	—	—
Abastumanj		81·3	331	e 12 19	− 1	—	—	—	—	—
Basle		81·4	358	e 12 19	− 1	—	—	—	—	e 42·2
Zürich		81·5	358	e 12 20	− 1	e 22 29	− 3	—	—	—
Besançon		81·7	359	e 12 23	+ 1	—	—	e 12 36	pP	—
Leninakan		81·8	330	e 12 34?	+12	e 22 34?	− 1	—	—	—
Triest		83·0	353	e 22 50	S	(e 22 50)	+ 3	i 22 56	S_eS	e 42·8
Belgrade		83·1	348	e 12 25k	− 4	e 22 38	−10	e 16 20	PP	e 49·4
Brisbane	Z.	83·1	207	i 12 25k	− 4	—	—	—	—	—
Florence		85·0	355	e 12 39	+ 1	i 22 59	[− 2]	i 24 49	PPS	e 42·8
Istanbul		85·4	341	e 12 42	+ 2	e 23 6	− 5	—	—	—
Hyderabad		85·9	292	e 12 48	+ 5	23 5	[− 2]	29 10	SS	—
Rome		86·8	354	e 12 51	+ 4	i 23 14	[+ 1]	29 9	SS	—
Djakarta		86·9	256	e 12 44	− 4	e 23 30	+ 4	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Poona		87·6	297	i 12 48	− 3	23 25	− 7	18 13	PPP	—
San Juan		87·6	63	i 12 51	0	e 23 12	[− 6]	e 28 55	SS	e 35·9
Taranto		87·8	350	e 13 37	+45	e 24 12	+38	—	—	—
Bombay		87·9	298	e 12 48	− 5	i 23 38	+ 3	e 16 21	PP	—
Toledo		88·8	7	e 12 57	0	—	—	—	—	44·4
Athens		89·3	344	—	—	e 23 42	− 6	—	—	—
Riverview		89·6	206	—	—	e 23 28	[− 2]	e 23 50	S	e 41·1
Alicante		90·5	4	e 13 8	+ 3	24 2	+ 3	16 42	PP	e 44·9
Ksara		90·6	333	e 13 4	− 1	25 12	PS	16 48	PP	—
Granada		91·5	6	13 34 a	+24	24 18	+10	30 26	SS	47·9
Kodaikanal	E.	92·2	289	—	—	e 23 33	[−13]	—	—	—
Chinchina		92·6	78	i 13 5	−10	e 23 33	[−15]	—	—	e 33·6
Wellington		92·7	187	—	—	e 38 14	?	—	—	e 46·2
Fort de France		93·3	61	e 13 20	+ 2	e 23 49	[− 3]	—	—	—
Bogota		93·8	78	—	—	i 23 51	[− 3]	i 25 51	PS	48·6
Helwan		95·6	336	e 13 27	− 1	24 1	[− 3]	i 26 43	PS	—
Huancayo		106·0	89	e 18 37	PP	e 24 53	[− 2]	e 26 22	S	e 45·1
Tamanrasset	z.	106·1	358	17 24	?	e 23 0	SKP	e 18 34	PKP	—
La Paz		113·9	86	e 19 41	PP	i 25 27	[− 1]	i 26 34	SKKS	53·6
Pretoria	z.	148·5	315	i 19 46	[+ 1]	—	—	e 20 17	PKP_2	—
Pietermaritzburg	z.	150·7	308	i 19 52	[+ 4]	—	—	e 20 26	PKP_2	—
Grahamstown	z.	155·6	309	e 19 59	[+ 4]	—	—	20 38	PKP_2	e 77·1

Additional readings :—
College iP =4m.37s.
Sitka i =6m.48s.
Seattle eP_cP =9m.46s., eP_cS =12m.50s., eSS =15m.10s., eS_cS =17m.13s., and other unidentified readings.
Tokyo iN =7m.48s., PPP? =8m.52s., eN =10m.42s. and 12m.59s.
Kobe iEN =7m.49s.
Mineral eZ =8m.32s.
Resolute Bay PPP =9m.34s., P_cPZ =9m.44s., SS =16m.16s., SSS =16m.54s., S_cS = 17m.44s.
Hungry Horse eS_cS =17m.34s.
Reno eZ =8m.4s., eE =16m.7s., eN =17m.48s.
Fresno iZ =8m.8s., eZ =8m.22s., eE =12m.0s.
China Lake iZ =10m.0s. and 13m.59s.
Logan ePPP =10m.29s., eS_cS =18m.4s.
Pasadena iPPEN =9m.56s.
Perris iZ =14m.13s.
Rapid City eSSE =19m.16s.
Tucson i =9m.22s., iPP =11m.2s., eS_cS? =19m.0s., eSS? =20m.4s.
Nanking iPP? =10m.59s.
Scoresby Sund 21m.22s.
St. Louis i =10m.29s., 18m.14s., and 19m.47s., eSS =21m.37s.
Pennsylvania i =10m.49s., iZ =12m.5s. and 18m.48s., iE =19m.53s., iEN =20m.15s., iEZ =20m.26s. and 21m.3s.
Tacubaya i =11m.12s.
Helsinki eE =28m.2s.
Aberdeen iPSE =22m.50s., eEN =25m.54s.
Rathfarnham Castle eZ =12m.41s. and 13m.5s., eEN =22m.35s., eSSEN =26m.34s.
Warsaw eS =22m.7s., e =22m.21s., eSSS =30m.18s.
Collmberg eZ =13m.9s.
Kew ePSN =22m.50s., eSSEN =26m.52s., eSSSEN =30m.42s.
Jena eN =12m.13s., eEN =12m.29s., eN =15m.42s., eE =22m.47s., eN =22m.54s.?
New Delhi SSN =26m.39s.
Prague e =13m.23s. and 21m.21s., ePS? =23m.0s., eSS =27m.36s.
Stuttgart epP?Z =13m.10s., ePS =22m.56s., eSS =27m.58s.
Paris i =12m.18s. and 12m.26s., e =13m.20s. and 20m.39s., eSS? =27m.57s.?, eSSS? = 31m.27s.
Strasbourg eP =12m.18s., ePPP =17m.18s., iSKS =22m.35s., ePS =23m.4s., ePPS = 23m.30s., eSS =27m.55s., eSSS =31m.34s., e =33m.34s.
Budapest eN =12m.34s. and 22m.29s.
Belgrade e =18m.17s.
Rome iN =24m.37s., e =28m.22s.
Poona SKSE =23m.6s., SKKSE =23m.12s., PSE =24m.32s., PSSE =24m.59s., SSE = 29m.0s., SSSE =32m.45s.
San Juan i =12m.57s.
Bombay SKSEN =16m.14s.
Riverview eZ =23m.55s., ePSZ =25m.2s., eSSN =29m.29s., eSSE =29m.41s., eQE = 37·7m.
Alicante Q =38m.18s.
Granada Q =38·1m.

Continued on next page.

Huancayo ePS =27m.54s., eSS =33m.52s., eSSS =37m.52s.
Tamanrasset ePPZ =19m.2s., ePPPZ =21m.22s., ePKKP?Z =29m.52s.
La Paz iPS =29m.17s., PPS =30m.33s., iSS =35m.23s., SSS =39m.39s.
Pietermaritzburg iZ =19m.57s., eZ =20m.42s.
Grahamstown iZ =20m.20s.
Long waves were also recorded at Clermont-Ferrand, Potsdam, Bergen, and Halifax.

Nov. 22d. Readings also at 1h. (Tacubaya), 2h. (Ivigtut, Tamanrasset, Rome, and near Algiers Univ.), 4h. (Tacubaya), 6h. (College), 7h. (College, Overton, China Lake, Perris, and Tucson), 8h. (near Obi-garm), 9h. (Tucson, near Huancayo, La Paz, Almata, Fergana, Frunse, Lunacharskoe, Tashkent, near Andijan, and Tchimkent), 10h. (Collmberg, Pierce Ferry, College, and Honolulu), 11h. (Lick and College), 12h. (near Obi-garm), 13h. (Huancayo, La Paz, Palomar, Pasadena, Riverside, China Lake, Tinemaha, Tucson, Overton, Pierce Ferry, Lick, Reno, College, New Delhi, Fergana, Lunacharskoe, Obi-garm, Przhevalsk, Samarkand, Stalinabad, Tchimkent, near Almata, Andijan, Frunse, and Naryn), 14h. (near Obi-garm), 15h. (College and near Obi-garm), 16h. (near Obi-garm), 17h. (Kodaikanal, Tamanrasset, Pretoria, and Hungry Horse (2)), 18h. (China Lake, Shasta Dam, and Hungry Horse (2)), 19h. (near Obi-garm), 20h. (Bombay), 21h. (Almata, near Andijan, Frunse, and Naryn), 23h. (College and near Stalinabad).

Nov. 23d. Readings at 0h. (Stalinabad, near Obi-garm, and near Irkutsk), 1h. (Algiers Univ., Tamanrasset, Pasadena, China Lake, Tucson, Overton, Pierce Ferry, Shasta Dam, and Hungry Horse), 4h. (Bandong, Djakarta, Prague, Kodaikanal, Algiers Univ., Tamanrasset, Overton, Pierce Ferry, College, Fergana, Samarkand, Vladivostok, Irkutsk, Sverdlovsk, Andijan (2), and near Stalinabad), 5h. (Haiwee, China Lake, Santa Barbara, near Pasadena, Tinemaha, and near Irkutsk), 6h. (Kodaikanal, Pierce Ferry, Lick, Hungry Horse, and near Naryn), 7h. (Brisbane, China Lake, Overton, Pierce Ferry, Hungry Horse, and College), 8h. (Lunacharskoe, Samarkand, Tashkent, near Andijan, Obi-garm, and Stalinabad), 9h. (Bogota, Palomar, Pasadena, Riverside, Tinemaha, China Lake, Boulder City, Overton, Pierce Ferry, Hungry Horse, College (2), Bombay, near New Delhi, and near Apia), 10h. (Tamanrasset, near Algiers Univ., and near Seattle), 12h. (Lunacharskoe, Tashkent, near Andijan, Fergana, Obi-garm, Samarkand, Stalinabad, and near Malaga), 13h. (Lunacharskoe, near Andijan, Fergana, Obi-garm, Stalinabad, and Tchimkent, Overton, Shasta Dam, College, near Huancayo, and near Santa Clara), 14h. (Tucson, Boulder City, and Pierce Ferry), 15h. (Wellington, China Lake, Pasadena, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Reno, Hungry Horse, and College), 16h. (Lick and near Alicante (2)), 18h. (Tacubaya), 19h. (Kodaikanal, Lunacharskoe, Tashkent, Tchimkent, near Andijan, Fergana, Obi-garm, Samarkand, and Stalinabad), 21h. (Lick (2), Bandong, Djakarta, Stalinabad, near Andijan, Obi-garm (2), and near Granada), 22h. (College), 23h. (Besançon, Paris, Strasbourg, Stuttgart, near Basle, Neuchatel, and Zürich).

Nov. 24d. 3h. 12m. 37s. Epicentre 19°·4N. 105°·1W. (as on 1948, October 2d.).

A = −·2459, B = −·9113, C = +·3302 ; δ = −3 ; h = +5 ;
D = −·965, E = +·261 ; G = −·086, H = −·319, K = −·944.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		0·8	116	0 11	− 7	—	—	—	—	0·3
Guadalajara		2·1	52	0 35	− 2	—	—	—	—	1·0
Tacubaya		5·6	90	1 26	− 1	—	—	—	—	2·8
Puebla		6·5	92	1 36	− 3	—	—	—	—	3·2
Vera Cruz		8·4	90	e 2 36	?	—	—	—	—	—
Tucson		13·8	339	e 3 21	+ 2	—	—	i 3 28	PPP	8·4
Palomar	E.	17·4	325	i 4 15	PP	—	—	—	—	—
Riverside	z.	18·2	326	i 4 16	0	—	—	—	—	—
Pierce Ferry		18·4	337	e 4 19	+ 1	—	—	—	—	—
Boulder City		18·6	335	e 4 24	+ 3	—	—	—	—	—
Pasadena	z.	18·7	326	i 4 21	− 1	—	—	—	—	—
Overton	z.	18·9	336	e 4 25	+ 1	—	—	—	—	—
China Lake	z.	19·7	329	i 4 32	− 2	—	—	—	—	—
Tinemaha	z.	21·0	330	i 4 47	0	—	—	—	—	—
Lick	z.	23·0	324	e 5 7	0	—	—	—	—	—
Reno	z.	23·7	331	e 5 15	+ 1	—	—	—	—	—

Tucson gives also e =4m.38s., eS? =7m.34s.

Nov. 24d. 13h. 3m. 40s. Epicentre 15°·5S. 173°·0W. (as on 1948, January 9d.).

$A = -\cdot9569$, $B = -\cdot1175$, $C = -\cdot2656$; $\delta = +1$; $h = +6$;
$D = -\cdot122$, $E = +\cdot993$; $G = +\cdot264$, $H = +\cdot032$, $K = -\cdot964$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	i 0 31	− 6	0 49	−15	—	—	—
Kaimata	N.E.	30·1	204	e 6 15	+ 2	—	—	—	—	—
Brisbane		33·7	244	i 6 46k	+ 1	—	—	e 8 0	PP	e 12·3
Riverview		37·1	234	e 7 14	0	e 12 59	− 2	e 8 42	PP	e 17·6
Santa Clara	E.	71·2	41	—	—	e 25 13	SS	e 20 36	PS	e 30·1
Berkeley		71·3	41	e 11 37a	+14	e 20 43	+ 2	e 14 13	PP	e 29·4
Lick	Z.	71·4	41	e 11 27	+ 3	—	—	i 11 47	PcP	—
Ukiah		71·5	39	—	—	e 20 50	+ 7	—	—	e 29·6
Pasadena		71·8	46	e 11 28	+ 2	e 20 44	− 2	e 11 48	PcP	e 29·3
Fresno	Z.	72·2	43	e 11 31a	+ 2	—	—	—	—	—
Riverside	Z.	72·3	46	e 11 31	+ 2	—	—	e 11 50	PcP	—
Palomar	E.	72·3	47	e 11 29	0	—	—	—	—	—
Shasta Dam		73·0	38	e 11 33	0	—	—	—	—	—
China Lake	Z.	73·1	45	e 11 32	− 2	—	—	—	—	—
Mineral	Z.	73·2	39	e 11 33	− 2	—	—	e 14 8	PP	—
Tinemaha	Z.	73·4	43	e 11 43	+ 7	—	—	11 56	PcP	—
Reno		73·8	40	e 11 39a	+ 1	—	—	e 16 3	PPP	—
Boulder City		75·1	45	e 11 49	+ 3	—	—	—	—	—
Overton	Z.	75·7	45	e 11 50	+ 1	—	—	—	—	—
Pierce Ferry		75·7	46	i 11 51	+ 2	—	—	—	—	—
Tucson		76·1	51	e 11 52	+ 1	e 21 41	+ 6	e 22 22	PS	e 32·8
Vladivostok		77·1	322	i 11 58	+ 1	i 21 53	+ 7	—	—	—
Salt Lake City		79·6	43	—	—	e 22 2	−10	—	—	e 33·6
Hungry Horse		82·3	35	e 12 24	− 1	—	—	—	—	—
College		82·4	11	e 12 25	0	e 22 40	− 1	—	—	e 37·4
Florissant		94·0	51	—	—	e 24 1	[+ 5]	—	—	—
St. Louis		94·0	51	—	—	e 23 59	[+ 3]	e 24 32	S?	—
Huancayo		94·1	104	—	—	e 23 56	[0]	—	—	e 45·9
Irkutsk		97·7	323	e 13 39	+ 1	e 25 4	+ 3	—	—	—
La Paz		99·3	110	e 13 48	+ 3	i 24 30	[+ 6]	26 45	PS	47·3
Resolute Bay		101·7	15	—	—	e 25 38	+ 3	e 33 32	SSP	e 44·4
Palisades		106·8	51	—	—	e 34 16	SS	—	—	e 53·2
Tashkent		120·8	310	e 20 20?	PP	e 26 3	[+10]	i 30 5	SKSP	—
Stalinabad		121·5	307	e 20 28	PP	—	—	—	—	—
Sverdlovsk		122·4	329	i 20 33	PP	26 2	[+ 4]	27 32	SKKS	—
Pulkovo		132·6	344	e 21 40	PP	e 28 25	{−11}	e 22 44	PKS	—
Moscow		133·5	337	e 19 21	[+ 2]	22 49	PKS	21 45	PP	—
Baku		135·3	313	—	—	e 23 2	PKS	—	—	—
Rathfarnham C.	Z.	140·9	12	e 19 40	[+ 8]	—	—	e 22 48	PP	e 72·3
Warsaw		141·8	346	e 24 17	?	e 29 37	{+ 5}	e 32 53	PS	e 73·3
Lwow		143·1	341	e 19 35?	[− 1]	e 32 54?	SKSP	e 22 49?	PP	—
Yalta		143·1	327	e 19 30	[− 6]	—	—	—	—	—
De Bilt		143·5	3	i 21 24	?	e 41 38	SS	i 22 32	PP	e 60·3
Kew		143·7	7	e 19 39	[+ 2]	—	—	e 22 53	PP	e 71·3
Collmberg	Z.	144·0	354	e 19 38	[+ 1]	—		e 22 56	PP	—
Jena		144·5	354	e 19 42	[+ 4]	—	—	e 22 55	PP	—
Prague		145·0	352	e 19 43	[+ 4]	e 27 2	[+15]	e 29 44	SKKS	—
Paris		146·6	6	e 19 45	[+ 3]	e 35 48	PPS	e 23 5	PP	e 79·3
Karlsruhe	Z.	146·6	358	e 19 48	[+ 6]	—	—	—	—	—
Stuttgart		146·8	358	e 19 46a	[+ 4]	e 30 5	{+ 4}	e 33 25	PSKS	e 79·3
Strasbourg		147·0	359	e 19 49k	[+ 6]	e 42 20	SS	e 23 14	PP	e 80·3
Basle		148·0	0	e 19 50	[+ 6]	—	—	—	—	—
Istanbul		148·1	328	e 19 48	[+ 4]	—	—	e 23 5	PP	—
Ksara		148·2	310	e 19 50	[+ 5]	37 14	PPS	23 22	PP	—
Zürich		148·2	359	e 19 59	[+14]	—	—	—	—	—
Besançon		148·3	2	e 19 52	[+ 7]	—	—	—	—	—
Triest		149·4	351	e 19 52	[+ 6]	e 27 5	[+12]	e 23 34	PP	—
Florence		151·6	354	—	—	i 44 33	?	i 48 37	SSS	—
Rome		153·3	353	e 19 48	[− 4]	30 38	{+ 2}	23 38	PP	—
Helwan	Z.	153·5	307	19 56	[+ 4]	—	—	23 33	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Alicante		156·3	15	e 19 43	[−13]	—	—	—	—	e 96·5
Algiers Univ.	z.	158·5	9	e 20 38	PKP_2	—	—	24 17	PP	—
Tamanrasset	z.	172·6	7	e 20 16	[+ 5]	—	—	e 21 41	PKP_2	—

Additional readings :—
Riverview iZ =8m.49s., iE =13m.20s. and 13m.31s., eQE =15m.44s., eSSZ =16m.1s.
Berkeley eZ =12m.32s., eSSE =26m.2s.
Pasadena eZ =11m.57s.
Fresno eZ =12m.2s.
Riverside eZ =12m.2s.
China Lake eZ =11m.44s., iZ =11m.49s. and 11m.57s.
Reno eZ =12m.7s., eN =12m.22s., eE =16m.30s.
Tucson i =12m.9s.
Huancayo e =30m.27s. and 38m.8s.
Tashkent eSKKS =27m.25s.
Sverdlovsk ePPP =23m.11s., PS =30m.22s.
Warsaw ePPS =34m.39s., e =36m.42s. and 38m.38s.
Jena ePKP?N =19m.45s., eE =22m.18s.
Prague eE =19m.49s. and 21m.14s., eN =21m.46s., ePP =22m.48s., eSKSP =33m.8s., eSS =41m.38s., eSSS =46m.44s.
Stuttgart eZ =19m.57s. and 20m.35s., eSS =43m.44s.
Paris i =19m.52s. and 19m.58s., e =20m.25s. and 22m.7s.
Strasbourg e =19m.59s. and 20m.43s.
Besançon i =20m.3s., e =20m.37s.
Triest eSS =42m.42s.
Rome e =27m.36s., SS =42m.40s.?
Helwan eZ =20m.5s., PKP_2 =20m.17s., eZ =21m.8s.
Algiers Univ. eZ =21m.10s.
Tamanrasset ePPZ =25m.31s.
Long waves were also recorded at Wellington, Christchurch, Scoresby Sund, Granada, Tananarive, and at other North American stations.

Nov. 24d. 20h. 18m. 46s. Epicentre 15°·5S. 173°·0W. (as at 13h.).

A = −·9569, B = −·1175, C = −·2656 ; δ = +1 ; h = +6 ;
D = −·122, E = +·993 ; G = +·254, H = +·032, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	e 0 29k	− 8	0 47	−17	—	—	—
Kaimata	N.E.	30·1	204	e 6 14	+ 1	—	—	—	—	—
Riverview		37·1	234	e 7 17	+ 3	e 13 2	+ 1	e 9 39	P_cP	e 17·1
Honolulu		39·5	23	—	—	e 13 53	+16	—	—	e 17·7
Santa Clara	E.	71·2	41	—	—	e 20 41	+ 1	—	—	e 29·7
Berkeley		71·3	41	e 11 18a	− 5	e 20 38	− 3	e 25 4	SS	e 29·5
Lick	z.	71·4	41	e 11 26k	+ 2	—	—	—	—	—
Pasadena		71·8	46	e 11 26	0	e 20 57	+11	i 21 16	PS	e 29·8
Fresno		72·2	43	e 11 29k	0	—	—	e 11 45	P_cP	—
Riverside	z.	72·3	46	e 11 29	0	—	—	i 11 50	P_cP	—
Palomar		72·3	47	e 11 30	+ 1	—	—	—	—	—
Shasta Dam		73·0	38	e 11 33	0	—	—	—	—	—
China Lake	z.	73·1	45	i 11 33	− 1	—	—	i 11 55	P_cP	—
Mineral	z.	73·2	39	e 11 27	− 8	—	—	e 11 34	P	—
Tinemaha	z.	73·4	43	e 11 36	0	—	—	—	—	—
Reno		73·8	40	e 11 39k	+ 1	—	—	—	—	—
Boulder City		75·1	45	e 11 47	+ 1	—	—	—	—	—
Overton	z.	75·7	45	i 11 51	+ 2	—	—	—	—	—
Pierce Ferry		75·7	46	e 11 49	0	—	—	—	—	—
Tucson		76·1	51	e 11 52	+ 1	e 21 28	− 7	e 22 21	S_eS	33·1
Vladivostok		77·1	322	i 11 57	0	e 21 51	+ 5	—	—	—
Salt Lake City		79·6	43	—	—	e 22 10	− 2	—	—	e 33·6
Logan		80·1	42	e 12 14	+ 1	e 22 17	− 1	—	—	e 35·6
Butte	N.	81·9	38	—	—	e 22 39	+ 3	—	—	e 39·4
Hungry Horse		82·3	35	e 12 17	− 8	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		82·4	11	i 12 24	− 1	e 22 36	− 5	—	—	e 36·9
Bozeman		82·6	39	—	—	e 22 46	+ 3	—	—	e 40·2
Florissant		94·0	51	—	—	24 8	{− 3}	e 24 37	S	—
Huancayo		94·1	104	—	—	e 24 7	{− 5}	e 25 16	PS	e 40·1
Irkutst		97·7	323	e 13 38	0	e 25 3	+ 2	—	—	—
Chin China		98·4	87	e 26 42	PS	e 32 14	SSP	—	—	—
La Paz		99·3	110	17 50	PP	i 24 26	[+ 2]	32 5	SS	47·7
Bogota		99·8	88	—	—	e 25 49	+30	—	—	e 47·2
Resolute Bay		101·7	15	e 11 40	?	e 25 42	+ 7	32 27	SS	—
Philadelphia		105·7	53	—	—	e 24 50	[− 4]	e 27 47	PS	e 33·7
Palisades		106·8	51	—	—	e 25 7	[+ 8]	—	—	e 51·4
Bermuda		113·4	62	—	—	e 26 47	{+18}	e 29 37	PS	e 57·2
Tashkent		120·8	310	e 20 21	PP	—	—	—	—	—
Sverdlovsk		122·4	329	e 20 34	PP	e 37 15	SS	—	—	—
Pulkovo		132·6	344	e 22 47	PKS	—	—	—	—	—
Helsinki	N.	133·5	349	22 51	PKS	—	—	—	—	—
Baku		135·3	313	e 19 27	[+ 5]	—	—	e 23 5	PKS	—
Rathfarnham Castle		140·9	12	e 19 15	[−17]	e 40 20	SS	e 33 41	PS	—
Warsaw		141·8	346	e 23 19	SKP	e 29 19	{−12}	e 32 49	PS	e 75·2
Lwow		143·1	341	e 19 33	[− 3]	e 32 39	SKSP	e 22 43	PP	—
De Bilt		143·5	3	e 19 40	[+ 3]	e 26 44	[− 1]	e 22 40	PP	61·2
Kew		143·7	7	e 19 15	[−22]	e 41 43	SS	—	—	e 74·2
Collmberg	Z.	144·0	354	e 19 39	[+ 2]	—	—	—	—	—
Prague		145·0	352	e 19 43	[+ 4]	e 26 50	[+ 3]	e 33 44	PS	—
Paris		146·6	6	i 19 46	[+ 4]	e 23 21	SKP	i 23 15	PP	e 80·2
Karlsruhe	Z.	146·6	358	e 19 47	[+ 5]	—	—	—	—	—
Stuttgart		146·8	358	e 19 46a	[+ 4]	—	—	—	—	e 79·2
Strasbourg		147·0	359	e 19 49k	[+ 6]	e 33 44	PS	e 23 14	PP	e 71·2
Basle		148·0	0	e 19 53	[+ 9]	—	—	—	—	—
Istanbul		148·1	328	e 19 50	[+ 6]	—	—	e 23 5	PP	—
Ksara		148·2	310	19 54	[+ 9]	33 43	PSKS	23 22	PP	—
Zürich		148·2	359	e 19 47	[+ 2]	—	—	—	—	—
Triest		149·4	351	i 19 56	[+10]	e 33 37	PSKS	i 20 14	PKP_2	—
Rome		153·3	353	e 19 49	[− 3]	43 7	SS	e 23 47	PP	—
Helwan	Z.	153·5	307	e 20 4	[+11]	—	—	21 2	PKP_2	—
Alicante		156·3	15	—	—	—	—	21 58	PP	e 87·1
Algiers Univ.	Z.	158·5	9	e 20 37	[+38]	—	—	24 16	PP	—
Tamanrasset	Z.	172·6	7	e 20 15	[+ 4]	—	—	e 25 32	PP	—

Additional readings :—
Riverview ePPZ =8m.45s., ePPPZ =9m.4s., eZ =13m.8s., eN =13m.14s., eSSE = 13m.19s., iSSSN =15m.58s., iSSSZ =16m.3s.
Berkeley eZ =11m.43s. and 19m.40s.
Lick eZ =12m.17s.
Pasadena iZ =11m.34s., eZ =11m.43s.
China Lake iZ =11m.41s.
Mineral eZ =12m.18s.
Tinemaha eZ =11m.43s.
Reno eZ =12m.1s., eEN =12m.32s., eZ =15m.34s., eN =16m.53s.
College i =12m.27s.
Bozeman e =29m.30s.
Florissant e =30m.22s.
Huancayo e =31m.14s.
La Paz PS =26m.38s.
Rathfarnham Castle eZ =29m.21s.
Warsaw ePPS =34m.39s., eEN =36m.25s. and 38m.23s.
De Bilt eSS =41m.39s.
Kew ePPSEN =37m.11s., eSSEN =43m.3s.
Collmberg eZ =20m.29s.
Prague eE =19m.50s., e =19m.58s., 20m.16s., and 21m.17s., ePP =22m.44s., e = 25m.50s., eSS =41m.14s., eSSS =47m.2s.
Stuttgart eZ =20m.7s. and 20m.28s.
Paris i =19m.54s., 19m.59s., 20m.4s., 20m.14s., 20m.28s., and 20m.47s., ePPP =26m.42s.
Strasbourg i =19m.54s., e =20m.22s., 20m.42s., 21m.29s., and 22m.33s., ePPP = 26m.35s., e =27m.39s., eSS =41m.44s., eSSS =47m.14s.
Triest eSS =43m.0s.
Rome ePKPZ =19m.56s., eZ =25m.10s., e =28m.20s.
Helwan eZ =20m.23s. and 23m.50s., PPZ =24m.59s.
Tamanrasset ePKP$_2$Z =21m.44s.
Long waves were also recorded at Scoresby Sund, Ottawa, Harvard, Weston, Aberdeen, Granada, Christchurch, Wellington, and Brisbane.

Nov. 24d. 23h. Undetermined shock.
La Plata PE =24m.18s., SN =25m.36s., LN =27·1m.
La Paz P =24m.55s., S =28m.20s.
San Juan e =30m.1s.
Hungry Horse eP? =31m.26s.
College iP? =32m.35s.
Tucson eP =32m.45s., i =32m.59s.
Palomar iPZ =33m.9s., ipPZ =33m.23s.
Pierce Ferry iP =33m.12s., iPP =33m.24s.
Boulder City eP? =33m.14s.
Pasadena iPZ =33m.16s., ipPZ =33m.31s.
Overton iPZ =33m.16s., iZ =33m.29s.
Riverside iPZ =33m.13s., ipPZ =33m.27s.
China Lake iPZ =33m.20s., ipPZ =33m.34s.
Tinemaha iPZ =33m.28s., ipPZ =33m.42s.
Lick iPZ =33m.39s.k, ipPZ =33m.54s.
Shasta Dam eP =33m.51s.

Nov. 24d. Readings also at 0h. (Klyuchi), 1h. (College and near Manila), 2h. (College), 4h. (Kodaikanal, near Obi-garm, and near Istanbul), 5h. (Pierce Ferry, Puebla, and near Tacubaya), 6h. (Lick), 7h. (Pierce Ferry, Overton, College, near Bogota, and near Chinchina), 8h. (near Obi-garm), 9h. (near Bandong, and Djakarta), 10h. (Pierce Ferry, Overton, Perris (2), Palisades, Hungry Horse, Pasadena, and China Lake (2)), 11h. (Pierce Ferry, College, and near Apia), 13h. (Pierce Ferry, Overton (2), College (3), and near Apia (3)), 15h. (College), 16h. (Bogota, Hungry Horse, and Stuttgart), 18h. (Hungry Horse, College, and Shasta Dam), 20h. (Stuttgart, Prague, Overton, and China Lake), 21h. (Pierce Ferry, College, Hungry Horse, Jersey, Algiers Univ., and near Obi-garm), 22h. (College (2), Hungry Horse, Overton, Pierce Ferry, Shasta Dam, Mount Wilson, China Lake, Tinemaha, and Irkutsk), 23h. (Pierce Ferry, Hungry Horse, Shasta Dam, and Kodaikanal).

Nov. 25d. 5h. 21m. 14s. Epicentre 15°·5S. 173°·0W. (as on 24d.).
Intensity II at Apia.
Preliminary Seismological Bulletin, Apia Observatory, Western Samoa, Oct.-Dec., 1950, p.7.

$A = -·9569$, $B = -·1175$, $C = -·2656$; $\delta = +1$; $h = +6$;
$D = -·122$, $E = +·993$; $G = +·264$, $H = +·032$, $K = -·964$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	i 0 28	− 9	0 49	−15	—	—	—
Riverview		37·1	234	—	—	e 13 14	+13	—	—	e 16·0
Berkeley		71·3	41	e 11 32	pP	20 45	+ 4	—	—	e 29·9
Lick	z.	71·4	41	e 11 24k	0	—	—	—	—	—
Pasadena	z.	71·8	46	e 11 26	0	—	—	—	—	—
Fresno	z.	72·2	43	e 11 28a	− 1	—	—	—	—	—
Riverside	z.	72·3	46	e 11 28	− 1	—	—	—	—	—
Palomar	E.	72·3	47	e 11 29	0	—	—	—	—	—
Shasta Dam		73·0	38	e 11 25	− 8	—	—	—	—	—
China Lake	z.	73·1	45	e 11 33	− 1	—	—	—	—	—
Mineral	z.	73·2	39	e 11 27	− 8	—	—	—	—	—
Tinemaha	z.	73·4	43	e 11 40	+ 4	—	—	—	—	—
Reno		73·8	40	e 11 40k	+ 2	—	—	e 11 52	pP	—
Boulder City		75·1	45	e 11 45	− 1	—	—	—	—	—
Overton	z.	75·7	45	i 11 49	0	—	—	—	—	—
Pierce Ferry		75·7	46	e 11 48	− 1	—	—	—	—	—
Tucson		76·1	51	e 11 52	+ 1	e 22 26	S_cS	—	—	e 40·4
Vladivostok		77·1	322	e 11 58	+ 1	e 21 52	+ 6	—	—	—
Hungry Horse		82·3	35	e 12 14	−11	—	—	—	—	—
College		82·4	11	e 12 23	− 3	—	—	—	—	—
Huancayo		94·1	104	—	—	e 24 16	−15	26 10	PPS	e 46·2
Paris		146·6	6	e 19 45	[+ 3]	—	—	—	—	—
Stuttgart		146·8	358	e 19 36	[− 6]	—	—	e 19 46	PKP	e 105·8
Strasbourg		147·0	359	e 19 49	[+ 6]	—	—	—	—	—
Ksara		148·2	310	i 19 51	[+ 6]	—	—	23 23	PP	—
Rome	z.	153·3	353	e 19 59	[+ 7]	—	—	e 23 47	PP	—
Helwan	z.	153·5	307	e 19 59	[+ 6]	—	—	e 23 49	PP	—
Tamanrasset	z.	172·6	7	e 20 16	[+ 5]	—	—	—	—	—

Additional readings :—
Berkeley eZ =12m.2s.
Mineral eZ =11m.47s.
Overton iZ =12m.4s.
Tucson e =14m.2s.
Strasbourg e =21m.7s.
Long waves were also recorded at Christchurch, Wellington, and Harvard.

Nov. 25d. 17h. 18m. 48s. Epicentre 37°·0N. 42°·3E.

$A = +\cdot5921$, $B = +\cdot5388$, $C = +\cdot5992$; $\delta = -7$; $h = -1$;
$D = +\cdot673$, $E = -\cdot740$; $G = +\cdot443$, $H = +\cdot403$, $K = -\cdot801$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		3·6	28	e 1 3	P*	2 1	S_g	—	—	—
Leninakan		4·0	17	e 1 4	0	2 6	S*	—	—	—
Borzhomi		4·9	9	1 18	+ 1	2 30	S*	—	—	—
Tiflis		5·1	21	e 1 18	− 2	e 2 32	S*	—	—	—
Zugdidi		5·5	0	e 1 34	P*	—	—	—	—	—
Shemakla		6·1	52	1 46	P*	i 3 18	S_g	—	—	—
Ksara		6·1	241	i 1 37	+ 3	3 25?	S_g	—	—	—
Grozny		6·8	21	e 1 46	+ 2	e 3 16	+13	—	—	—
Sotchi		6·9	344	e 1 58	P*	—	—	—	—	—
Piatigorsk		7·1	5	e 2 3?	P*	3 50?	S_g	—	—	—
Yalta		9·7	323	e 2 29	+ 7	4 43	SSS	—	—	—
Istanbul		11·1	296	e 2 41	− 2	i 6 10	L	—	—	(i 6·2)
Helwan		11·6	235	i 2 53k	+ 3	e 5 57	+56	3 15	PPP	—
Kishinev		14·1	319	e 3 21	− 2	6 19	SS	—	—	—
Bucharest		14·3	306	e 3 38	PP	e 6 22	SS	e 3 42	PPP	—
Sofia		15·6	296	e 3 45	+ 2	—	—	—	—	—
Timisoara	N.	18·0	304	e 5 0	+47	—	—	—	—	—
Belgrade		18·2	301	e 4 17k	+ 1	e 7 54	SS	—	—	—
Lwow		18·4	319	e 4 18	0	—	—	—	—	—
Moscow		19·1	352	e 4 23	− 4	e 8 5	+ 8	—	—	—
Taranto		19·8	287	4 27	− 8	—	—	—	—	e 11·3
Ogyalla		20·8	309	e 5 29	PPP	—	—	—	—	e 9·9
Tashkent		21·3	70	i 4 48	− 2	i 8 48	+ 5	—	—	—
Lunacharskoe		21·4	70	e 4 48	− 3	—	—	—	—	—
Warsaw		21·4	322	e 4 55	+ 4	e 8 50	+ 5	e 5 25	PP	e 11·2
Raciborzu	z.	21·7	315	e 4 57	+ 2	—	—	—	—	—
Triest		23·0	302	e 5 8	+ 1	e 9 26	+12	—	—	e 16·0
Sverdlovsk		23·3	26	i 5 7	− 3	9 17	− 3	—	—	—
Rome	z.	23·5	291	i 5 11k	− 1	e 9 43	+20	e 5 59	PPP	—
Prague		23·9	313	e 5 16	0	e 9 39	+ 9	e 5 47	PP	—
Pulkovo		24·1	345	i 5 17	− 1	i 9 40	+ 6	—	—	—
Florence		24·5	296	—	—	i 9 29	−11	—	—	—
Cheb		25·1	311	e 6 4	PP	e 10 0	+ 9	—	—	e 10·2
Collmberg	z.	25·2	314	e 5 27	− 2	—	—	—	—	—
Helsinki		25·7	340	—	—	e 10 19	+18	—	—	e 14·2
Jena		25·9	312	e 5 25	−10	e 10 14?	+10	e 5 57	PP	—
Stuttgart		26·8	307	e 5 40	− 4	e 10 27	+ 8	e 12 7	SS	e 15·2
Copenhagen		27·5	323	i 5 49	− 1	e 11 6	+36	—	—	15·2
Strasbourg		27·6	306	e 6 43?	PP	e 11 42	SS	—	—	—
Besançon		28·6	303	e 5 58	− 2	—	—	—	—	—
Paris		31·1	305	e 6 17	− 5	e 13 32	SSS	—	—	e 16·2
Tamanrasset	z.	34·7	257	i 6 53k	− 1	—	—	—	—	—
Pretoria	z.	63·8	194	e 10 34?	− 2	—	—	—	—	—
College		78·2	4	e 11 59	− 4	—	—	—	—	—
Hungry Horse		92·5	345	i 13 11	− 3	—	—	—	—	—
China Lake	z.	105·2	343	i 17 17	PP	—	—	—	—	—

Additional readings :—
Helwan eE =4m.34s., SSEN =6m.24s.
Bucharest eE =6m.27s., iN =10m.21s. and 11m.23s.
Belgrade e =5m.12s., 14m.3s., and 19m.2s.
Ogyalla e =6m.0s., 6m.35s., and 9m.36s.
Warsaw eE =5m.13s. and 9m.0s., eN =9m.9s., eSSEN =9m.45s., eSSSEN =9m.58s.
Triest eSS? =11m.35s.
Rome eSSN =10m.46s.
Prague e =5m.29s., 5m.41s., 5m.59s., 6m.14s., 6m.23s., 6m.47s., 6m.51s., and 8m.18s.
Collmberg eZ =5m.48s. and 6m.33s.
Strasbourg e =7m.38s. and 10m.57s.
Paris e =14m.11s.
Tamanrasset eZ =7m.13s. and 7m.44s.
Long waves were also recorded at Upsala, De Bilt, and Kew.

Nov. 25d. Readings also at 0h. (near Huancayo), 1h. (Mount Wilson, Perris, China Lake, Tinemaha, Pierce Ferry, Overton, Tucson, and College), 2h. (Apia), 3h. (Pierce Ferry, Overton, College (2), Ksara, and near Apia), 4h. (La Paz), 5h. (Apia), 10h. (Chinchina, Tucson, Bogota, Huancayo, La Paz (2), San Juan, and Tacubaya), 11h. (near Chur, Zürich, Basle, Ravensburg, and Stuttgart), 12h. (Huancayo, La Paz (2), San Juan, Tucson, Pierce Ferry, Perris, Boulder City, Overton, Riverside, Pasadena, China Lake, Lick, and Hungry Horse), 13h. (College, Rome, Algiers Univ., Tamanrasset, and near Tunis), 20h. (Nanking and Hungry Horse), 22h. (College, La Paz, Lick, near Collmberg, and Jena). 23h. (Ksara).

Nov. 26d. Readings at 0h. (College), 1h. (Kodaikanal, China Lake, Hungry Horse, Overton, Pierce Ferry, Tucson, and near Stalinabad), 2h. (Lick, Mount Wilson, China Lake, Pierce Ferry, Ksara, Algiers Univ., Stuttgart (2), Copenhagen, Florence, Rome, Triest, Warsaw, Borzhomi, Zugdidi, near Tiflis, and near Istanbul), 3h. (Merida, Tacubaya, Puebla, College (3), Hungry Horse (2), Shasta Dam, Mount Wilson (2), China Lake (2), Perris, Boulder City, Overton, Pierce Ferry (2), Tucson (2), De Bilt, near Apia and near Ashkabad (2)), 4h. (Stuttgart, China Lake, College, Pierce Ferry, and Tucson), 5h. (Samarkand, Fergana, Andijan, Lunacharsloe, near Obi-garm, and Stalinabad), 6h. (College (3), Hungry Horse, Shasta Dam (2), Mineral, Fresno, Lick (2), Pasadena, Riverside (2), Palomar, China Lake (2), Perris, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson (2), Copenhagen, and Tamanrasset), 7h. (La Paz and Brisbane), 8h. (Ksara and near Alicante), 9h. (Auckland, Christchurch, Kaimata, Tuai, Wellington, and near Alicante), 10h. (Mount Wilson, China Lake, Boulder City, Overton, Pierce Ferry, Tucson, and near Alicante), 12h. (near Andijan), 13h. (New Plymouth, Christchurch, near Tuai, Wellington, and Kaimata), 14h. (Tacubaya and Christchurch), 15h. (Pierce Ferry and near Overton), 16h. (Athens), 17h. (Tacubaya, Pierce Ferry, Tucson, Bucharest, and near Obi-garm), 18h. (Stuttgart, Rome, and near Messina), 19h. (Mount Wilson and China Lake), 20h. (College), 21h. (Ksara), 22h. (Pierce Ferry, near Overton, Pasadena, Palomar, Tucson, and near Tacubaya (2)), 23h. (Berkeley, Fresno, Overton, and Hungry Horse).

Nov. 27d. 2h. 1m. 27s. Epicentre 15°·5S. 173°·0W. (as on 25d.).

$A = -\cdot 9569$, $B = -\cdot 1175$, $C = -\cdot 2656$; $\delta = +1$; $h = +6$;
$D = -\cdot 122$, $E = +\cdot 993$; $G = +\cdot 264$, $H = +\cdot 032$, $K = -\cdot 964$.

		△	Az.	P.	O−C.	S.	O−C.		Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	0 34	− 3	0 53	−11	—	—	—
Wellington		27·8	201	e 13 3	P_cS	—	—	—	—	—
Riverview		37·1	234	—	—	e 13 12	+11	—	—	e 15·8
Lick	z.	71·4	41	e 11 25k	+ 1	—	—	—	—	—
Pasadena	z.	71·8	46	e 11 26	0	—	—	e 11 46	P_cP	—
Fresno	z.	72·2	43	e 11 39	+10	—	—	e 11 52	P_cP	—
Riverside	z.	72·3	46	e 11 28	− 1	—	—	—	—	—
Perris	z.	72·3	47	e 11 28	− 1	—	—	—	—	—
Shasta Dam		73·0	38	e 11 33	0	—	—	—	—	—
China Lake	z.	73·1	45	i 11 33	− 1	—	—	i 11 51	P_cP	—
Boulder City		75·1	45	i 11 47	+ 1	—	—	—	—	—
Overton	z.	75·7	45	i 11 49	0	—	—	—	—	—
Pierce Ferry		75·7	46	i 11 50	+ 1	—	—	—	—	—
Tucson		76·1	51	e 11 52	+ 1	—	—	—	—	—
Vladivostok		77·1	322	e 11 57	0	e 21 58	+12	—	—	—
Hungry Horse		82·3	35	i 12 24	− 1	—	—	—	—	—
College		82·4	11	i 12 24	− 1	—	—	i 12 35	P_cP	—
Huancayo		94·1	104	—	—	e 23 44	[−12]	e 31 10	SSP	e 57·0
Collmberg	z.	144·0	354	e 19 39	[+ 2]	—	—	—	—	—
Paris		146·6	6	i 19 49	[+ 7]	—	—	—	—	—
Stuttgart	z.	146·8	358	e 19 45	[+ 3]	—	—	—	—	—
Strasbourg		147·0	359	e 19 48	[+ 5]	—	—	—	—	—
Ksara		148·2	310	i 19 51	[+ 7]	—	—	23 22	PP	—
Besançon		148·3	2	e 19 50	[+ 5]	—	—	e 20 0	PKP_2	—
Tamanrasset	z.	172·6	7	e 20 14	[+ 3]	—	—	—	—	—

Additional readings :—
Stuttgart eZ = 19m.55s.
Paris i = 19m.59s. and 20m.23s.
Strasbourg e = 20m.18s.
Long waves were also recorded at Christchurch and Berkeley.

Nov. 27d. 3h. 28m. 25s. Epicentre 15°·5S. 173°·0W. (as at 2h.).

A = −·9569, B = −·1175, C = −·2656 ; δ = +1 ; h = +6 ;
D = −·122, E = +·993 ; G = +·264, H = +·032, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	0 32	− 5	0 50	−14	—	—	—
Lick	z.	71·4	41	e 11 27a	+ 3	—	—	—	—	—
Pasadena	z.	71·8	46	e 11 29	+ 3	—	—	—	—	—
Riverside	z.	72·3	46	e 11 30	+ 1	—	—	—	—	—
Perris	z.	72·3	47	e 11 31	+ 2	—	—	—	—	—
Shasta Dam		73·0	38	e 11 39	+ 6	—	—	—	—	—
China Lake	z.	73·1	45	e 11 30	− 4	—	—	—	—	—
Tinemaha	z.	73·4	43	e 11 40	+ 4	—	—	—	—	—
Reno	z.	73·8	40	e 12 4k	+26	—	—	—	—	—
Boulder City		75·1	45	e 11 45	− 1	—	—	—	—	—
Overton	z.	75·7	45	e 11 49	0	—	—	—	—	—
Pierce Ferry		75·7	46	e 11 47	− 2	—	—	—	—	—
Tucson		76·1	51	e 11 53	+ 2	—	—	—	—	—
Hungry Horse		82·3	35	e 12 20	− 5	—	—	—	—	—
College		82·4	11	e 12 22	− 3	—	—	—	—	—
Collmberg	z.	144·0	354	e 19 37	[0]	—	—	—	—	—
Stuttgart	z.	146·8	358	e 19 43	[+ 1]	—	—	—	—	—
Strasbourg		147·0	359	e 19 47	[+ 4]	—	—	—	—	—
Ksara		148·2	310	e 19 54	PKP_2	30 15	(+ 7)	23 28	PP	—
Besançon		148·3	2	e 19 51	[+ 6]	—	—	—	—	—

Additional readings :—
China Lake iZ = 11m.36s.
Strasbourg e? = 19m.53s. and 20m.4s.
Long waves were also recorded at Wellington and Christchurch.

Nov. 27d. 17h. 10m. 1s. Epicentre 15°·5S. 173°·0W. (as at 3h.).
Intensity III at Apia.
Preliminary Seismological bulletin, Apia Observatory, Western Samoa, October-December, 1950, page 8.

A = −·9569, B = −·1175, C = −·2656 ; δ = +1 ; h = +6 ;
D = −·122, E = +·993 ; G = +·264, H = +·032, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	i 0 35	− 2	0 55	− 9	—	—	—
Lick	z.	71·4	41	i 11 24a	0	—	—	e 11 48	P_cP	—
Mount Wilson	z.	71·9	46	e 11 27	0	—	—	e 11 38	P_cP	—
Fresno	z.	72·2	43	e 11 29a	0	—	—	—	—	—
Shasta Dam		73·0	38	i 11 32	− 1	—	—	i 11 43	P_cP	—
China Lake	z.	73·1	45	e 11 34	0	—	—	e 11 46	P_cP	—
Tinemaha	z.	73·4	43	e 11 46	+10	—	—	—	—	—
Reno	z.	73·8	40	e 11 39a	+ 1	—	—	—	—	—
Boulder City		75·1	45	e 11 46	0	—	—	—	—	—
Overton	z.	75·7	45	i 11 51	+ 2	—	—	—	—	—
Pierce Ferry		75·7	46	e 11 50	+ 1	—	—	—	—	—
Tucson		76·1	51	e 11 53	+ 2	—	—	e 12 10	P_cP	—
Hungry Horse		82·3	35	e 12 34	P_cP	—	—	—	—	—
College		82·4	11	e 12 22	− 3	—	—	i 12 35	P_cP	—
Rathfarnham C.	z.	140·9	12	e 25 12	PPP	—	—	—	—	—
Stuttgart	z.	146·8	358	e 19 48	[+ 6]	—	—	e 19 57	PKP_2	—
Strasbourg		147·0	359	e 19 56	PKP_2	—	—	—	—	—
Besançon		148·3	2	e 20 2	PKP_2	—	—	—	—	—

Additional readings :—
Rathfarnham Castle eZ = 31m.2s. and 45m.2s.

Nov. 27d. Readings also at 0h. (near Fergana), 1h. (near Ashkabad), 4h. (College, Palomar, near La Jolla, Pasadena, Tucson, Pierce Ferry, and Overton), 9h. (Ashkabad), 12h. (Christchurch, Kaimata, and Wellington), 14h. (near Andijan, near Djakarta, Bandong, College, Shasta Dam, and Hungry Horse), 15h. (College), 17h. (Almata, Frunse, and near Naryn), 18h. (near Adak, College, Shasta Dam, Mineral, Hungry Horse, Reno, Lick, Fresno, Tinemaha, Haiwee, Mount Wilson, Riverside, Overton, Boulder City, Pierce Ferry, Palomar, Tucson, Ottawa, Weston, and San Juan), 19h. (Ksara), 20h. (near Balboa Heights), 21h. (near Abastumanj, Leninakan, Tiflis, Gori, and Borzhomi), 22h. (Honolulu), 23h. (Jena).

Nov. 28d. 17h. 53m. 18s. Epicentre 39°·9N. 27°·9E.

Intensity II at Mytilini. Epicentre as adopted (Strasbourg).

A. Galanopoulos.
Seismological Institute Bulletin, 1950, Athens, 1951, p. 23.

$A = +\cdot6799$, $B = +\cdot3600$, $C = +\cdot6389$; $\delta = +6$; $h = -2$;
$D = +\cdot468$, $E = -\cdot884$; $G = +\cdot565$, $H = +\cdot299$, $K = -\cdot769$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		1·5	37	i 0 24	− 4	i 0 50	S_g	—	—	—
Athens		3·8	240	e 0 58	− 3	e 1 32	−15	i 1 11	P*	i 2·0
Sofia		4·4	310	e 1 18	P*	e 2 5	+ 3	2 19	S*	—
Yalta		6·5	44	i 1 37	− 2	i 2 49	− 6	—	—	—
Kishinev		7·2	5	i 1 48	− 1	3 13	0	—	—	—
Belgrade		7·4	314	e 2 5	P*	i 3 36	S*	—	—	—
Theodosia		7·5	45	e 1 45	− 8	e 3 15	− 5	—	—	—
Timisoara		7·6	322	e 2 23	P*	4 21	S_g	e 2 31?	P_g	—
Ksara		8·8	131	e 3 13	?	e 4 53	S_g	—	—	—
Kalossa		9·3	318	e 4 51	S*	e 5 1	S_g	—	—	6·2
Budapest		9·9	323	2 30	+ 5	e 5 10	S*	i 5 36	S_g	6·2
Helwan	z.	10·4	163	e 2 35	+ 1	i 4 30	− 2	e 2 16	?	—
Zugdidi		10·9	72	e 2 58	+18	—	—	—	—	—
Rome		11·8	285	—	—	e 5 8	+ 2	—	—	e 6·6
Triest		11·9	303	e 4 33	?	—	—	—	—	i 6·6
Gori		12·4	75	e 2 58	− 3	—	—	—	—	—
Tiflis		12·9	77	e 3 7	0	—	—	—	—	—
Bologna		13·2	296	e 3 22	PP	—	—	—	—	e 7·2
Warsaw		13·2	341	e 3 22	PP	e 5 49	+ 9	—	—	e 6·7
Grozny		13·8	70	e 3 23	+ 4	—	—	—	—	—
Prague		13·9	321	e 3 34	PP	e 6 14?	+17	—	—	e 7·7
Collmberg		15·4	322	e 3 42	+ 2	e 6 18	−14	e 4 16	?	e 8·5
Jena		15·9	319	e 4 16	PPP	e 7 7	SS	—	—	e 9·2
Stuttgart		16·0	310	e 3 53	+ 5	—	—	—	—	e 8·2
Strasbourg		16·8	308	e 4 4	+ 6	—	—	e 4 27	PPP	e 8·7
Moscow		17·1	18	e 4 0	− 2	—	—	—	—	—
Besançon		17·5	303	e 4 45	?	—	—	—	—	—
De Bilt		19·9	317	—	—	e 8 6	− 9	—	—	e 9·7
Pulkovo		20·0	3	e 4 37	0	—	—	—	—	—
Paris		20·2	305	i 4 39	0	—	—	i 3 55	?	e 10·7
Alicante		22·0	275	e 5 34	PPP	e 9 8	+12	6 2	?	—
Kew		22·7	310	e 5 57	PPP	e 9 21	+12	—	—	e 11·7
Ashkabad		23·7	85	e 5 11	− 3	—	—	—	—	—
Toledo	z.	24·4	279	e 5 23	+ 2	e 9 32	− 7	e 6 17	PPP	—
Granada		24·7	274	i 5 18a	− 6	i 9 54	+10	5 57	PP	13·4
Tamanrasset	z.	25·5	234	e 5 26	− 6	—	—	e 6 5	PP	—
Mary		26·5	83	e 5 35	− 6	—	—	—	—	—
Rathfarnham Castle		26·8	312	e 5 44	0	—	—	—	—	e 10·9
Sverdlovsk		27·2	40	e 5 51	+ 4	e 10 24	− 1	—	—	—
Samarkand		29·9	78	e 6 3	− 9	—	—	—	—	—
Pretoria	z.	65·3	179	e 10 38	− 8	—	—	—	—	—
College		75·5	358	e 11 45	− 3	—	—	—	—	—
Hungry Horse		85·9	336	i 12 42	− 1	—	—	—	—	—

For Notes see next page.

NOTES TO NOVEMBER 28d. 17h. 53m. 18s.

Additional readings :—
Sofia i = 2m.39s.
Belgrade e = 2m.45s., i = 4m.19s. and 4m.59s.
Timisoara eE = 4m.24s., iE = 4m.44s., iN = 4m.47s.
Kalossa eE = 5m.21s., eN = 5m.35s. and 6m.7s.
Budapest eN = 4m.42s., eE = 5m.42s.?, iN = 5m.56s.
Helwan iEZ = 4m.5s., iZ = 4m.54s.
Triest e = 5m.53s., i = 6m.21s.
Warsaw eP?N = 3m.25s., eN = 6m.26s.
Prague e = 4m.2s., 4m.38s., and 7m.33s.
Strasbourg e = 4m.45s., 6m.13s., and 8m.8s.
Paris e = 4m.7s., ePP? = 4m.52s., i = 5m.27s., e = 7m.6s.
Toledo eZ = 6m.51s.
Tamanrasset eZ = 5m.40s., ePPPZ = 6m.34s., eZ = 8m.25s., eP_cPZ = 8m.59s.
Long waves were also recorded at Aberdeen, Copenhagen, Upsala, Potsdam, Florence, Padova, Pavia, and Tortosa.

Nov. 28d. Readings also at 0h. (College, Obi-garm, Tashkent, Frunse, near Stalinabad, Andijan, Lunacharskoe, Samarkand, and near Resolute Bay), 1h. (Grozny, Erevan, Gori, near Tiflis, Borzhomi, and Leninakan), 2h. (Hungry Horse, Shasta Dam, Mineral, Lick, Reno, Pasadena, Riverside, Perris, Boulder City, Overton, Pierce Ferry, Tucson, Huancayo, and near La Paz), 4h. (Perris, Hungry Horse, near Athens, near Obi-garm, Stalinabad, and Andijan), 5h. (College, Pierce Ferry, Samarkand, near Obi-garm, Stalinabad, Fergana, Andijan, and near Naryn), 6h. (Hungry Horse, Kodaikanal, and near Ashkabad), 9h. (La Paz, Overton, Pierce Ferry, Mount Wilson, Perris, Shasta Dam, Hungry Horse, College, and near Mizusawa), 10h. (College, Przhevalsk, Andijan, Fergana, Obi-garm, Frunse, Lunacharskoe, Tashkent, near Naryn, and Almata), 11h. (Brisbane, and College), 12h. (Strasbourg, Stuttgart, College, Hungry Horse, Mineral, Pasadena, Riverside, Perris, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and near Apia), 17h. (Ottawa and Huancayo), 18h. (Yalta), 20h. and 21h. (College), 23h. (College (2), Hungry Horse, and Shasta Dam).

Nov. 29d. 1h. 37m. 51s. Epicentre 21°·6N. 143°·4E. (as on 1949, Jan. 2d.).

A = −·7471, B = +·5548, C = +·3660 ; δ = −8 ; h = +4 ;
D = +·596, E = +·803 ; G = −·294, H = +·218, K = −·931.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		8·2	171	2 5	+ 2	4 5	S*	—	—	—
Mizusawa		17·7	354	4 10	0	5 53	?	—	—	—
Vladivostok		23·5	339	e 5 10	− 2	—	—	—	—	—
Nanking		24·2	300	4 43a	−36	e 8 59	−36	—	—	—
Irkutsk		42·9	326	e 8 1	− 1	e 14 27	0	—	—	—
Djakarta		45·3	237	e 8 20	− 1	e 15 7	+ 5	—	—	—
Naryn		59·3	307	10 7	+ 1	—	—	—	—	—
College		61·7	27	e 10 18	− 4	e 18 45	+ 1	—	—	e 26·0
Lunacharskoe		64·3	307	—	—	e 19 28?	+11	—	—	—
Obi-garm		64·4	304	10 39	− 1	e 19 25	+ 7	—	—	—
Tashkent		64·4	307	e 10 39	− 1	e 19 22	+ 4	—	—	—
Sitka		67·4	36	—	—	e 20 52	S_cS	—	—	e 33·3
Sverdlovsk		68·3	325	i 11 2	− 3	—	—	—	—	—
Mary		70·7	305	e 11 20	0	—	—	—	—	—
Victoria	z.	76·2	44	e 11 53	+ 1	—	—	—	—	—
Resolute Bay		77·1	15	e 11 55	− 2	e 22 29	PS	—	—	e 45·8
Seattle		77·1	44	e 12 1	+ 4	—	—	—	—	—
Shasta Dam		79·3	51	i 12 8	− 1	—	—	—	—	—
Mineral	z.	80·0	51	e 12 11	− 2	—	—	e 15 5	PP	—
Berkeley		80·3	54	i 12 14a	0	—	—	—	—	e 37·8
Lick	z.	81·0	54	e 12 17k	− 1	—	—	i 12 26	P_cP	—
Reno	z.	81·6	52	e 12 20k	− 1	—	—	—	—	—
Hungry Horse		82·1	41	i 12 23	− 1	—	—	—	—	—
Fresno	z.	82·6	54	e 12 26k	0	—	—	—	—	—
Tinemaha	z.	83·6	53	e 12 32	+ 1	—	—	—	—	—
Haiwee	z.	84·2	54	e 12 36	+ 2	—	—	—	—	—
Pasadena	z.	84·8	56	i 12 36	− 1	—	—	i 12 43	P_cP	—
Riverside	z.	85·4	56	e 12 39	− 1	—	—	—	—	—
Palomar	n.	86·1	56	e 12 44	0	—	—	—	—	—
Boulder City		86·6	53	e 12 46	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Overton	z.	86·6	52	i 12 46	0	—	—	—	—	—
Pierce Ferry		87·1	53	i 12 49	0	—	—	—	—	—
Tucson		91·1	53	i 13 8	0	—	—	e 17 11	PP	—
Ksara		91·8	307	e 25 0	PS	e 35 46	Q	—	—	(e 35·8)
Stuttgart	z.	98·9	332	e 17 41	PP	—	—	—	—	—
La Paz		149·8	85	i 19 54	[+ 7]	26 51	[− 3]	23 26	PP	—

Additional readings :
Seattle e = 12m.20s. and 12m.48s.
Mineral eNZ = 12m.43s.
Lick iZ = 12m.34s. and 12m.44s.
Tinemaha eZ = 12m.49s.
Pierce Ferry i = 13m.6s.
La Paz PKP_2 = 20m.9s., SKKS = 30m.19s., ePPS = 36m.24s.
Long waves were also recorded at Taranto.

Nov. 29d. 18h. 35m. 46s. Epicentre 4°·0S. 128°·5E. (as on Oct. 8d.).

$A = -·6210$, $B = +·7807$, $C = -·0693$; $\delta = -6$; $h = +7$;
$D = +·783$, $E = +·623$; $G = +·034$, $H = -·054$, $K = -·998$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila	19·9	338	e 3 52	?	—	—	—	—	—
Bandong	21·0	262	i 4 55	+ 8	e 8 58	+21	—	—	—
Djakarta	21·7	264	e 4 55	0	e 8 57	+ 6	—	—	—
Brisbane	33·1	138	i 6 40k	0	i 11 58	− 1	—	—	—
Riverview	36·4	148	i 7 10a	+ 2	e 12 53	+ 3	—	—	e 19·5
Vladivostok	47·0	4	e 8 36	+ 1	—	—	—	—	—
Bombay	59·3	295	e 10 2	− 4	—	—	—	—	—
Irkutsk	59·7	343	e 10 8	− 1	—	—	—	—	—
Frunse	67·4	320	i 10 59	0	—	—	—	—	—
Andijan	67·8	316	11 1	− 1	—	—	—	—	—
Fergana	68·1	316	e 11 2	− 2	—	—	—	—	—
Obi-garm	68·8	314	i 11 7	− 1	—	—	—	—	—
Tashkent	70·2	316	e 11 13?	− 4	e 20 20?	− 8	—	—	—
Mary	74·2	311	i 11 39	− 1	—	—	—	—	—
Sverdlovsk	81·4	329	i 12 19	− 1	e 22 25	− 6	—	—	—
College	90·9	25	e 13 6	− 1	—	—	—	—	—
Hungry Horse	111·0	39	e 18 23	[−12]	—	—	—	—	—
Overton	z. 114·0	51	e 18 45	[+ 4]	—	—	—	—	—
Pierce Ferry	114·4	51	e 18 46	[+ 4]	—	—	—	—	—
Tucson	117·9	55	e 18 53	[+ 4]	—	—	e 16 21	?	—
Huancayo	151·4	124	e 19 54	[+ 4]	—	—	—	—	—
La Paz	153·8	141	19 50	[− 3]	27 14	[+16]	23 52	PP	71·7
San Juan	159·8	43	e 20 43	PKP_2	—	—	—	—	—

La Paz gives also iPKPZ = 20m.0s., iSS = 43m.26s.

Nov. 29d. Readings also at 1h. (College, Overton, and near Apia), 2h. (College and near Budapest), 3h. (near Istanbul), 5h. (near Boulder City, Overton, and Pierce Ferry), 7h. (Hungry Horse, Overton, Pretoria, and near Mary), 8h. (College (2)), 10h. (Hungry Horse, Ottawa, La Paz, San Juan (2), and near Fort de France), 11h. College, Mizusawa, Borzhomi, Leninakan, near Tiflis, Grozny, Gori, and Erevan, Andijan, Lunacharskoe, Tashkent, near Naryn, Almata, and Frunse), 13h. (College, Hungry Horse, Boulder City, Overton, Pierce Ferry, Tucson, Tacubaya, Vera Cruz, Puebla, and near Oaxaca), 14h. (Stuttgart), 19h. (College and Ksara), 21h. (College), 22h. (Merida, Tacubaya, Tucson, Boulder City, Overton, Pierce Ferry, China Lake, and College).

Nov. 30d. Readings at 5h. (near Zugdidi), 8h. (Bogota, La Paz, Pretoria, and Granada), 11h. (La Paz, College, Overton, Pierce Ferry, and near Tiflis), 12h. (College (2) and near Tacubaya), 15h. (Irkutsk), 17h. (Raciborzu), 18h. (Ottawa, Kew, and near Sofia), 19h. (near Istanbul), 20h. (College), 21h. (College, Overton, Pierce Ferry, Tucson, Tacubaya, and near Istanbul), 23h. (College, Boulder City, Overton (2), Pierce Ferry (2), Tucson, Riverside, Merida, Guadalajara, near Oaxaca, Puebla, and Tacubaya).

Dec. 1d. 14h. 51m. 5s. Epicentre 14°·4N. 47°·3W. Depth of focus 0·010.

A = +·6571, B = −·7121, C = +·2471; δ = −7; h = +6;
D = −·735, E = −·678; G = +·168, H = −·182, K = −·969.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		13·5	273	i 3 3	− 6	i 5 29	− 8	—	—	e 6·4
San Juan		18·5	285	e 4 8	− 3	i 7 31	+ 1	—	—	e 9·0
Bermuda		23·9	321	i 5 3	− 3	i 9 3	− 9	i 5 33	PP	e 10·7
Port au Prince		24·2	283	e 5 22	pP	e 9 48	sS	5 55	PP	e 12·4
Guantanamo Bay		27·1	285	i 5 35	− 1	—	—	—	—	—
Bogota		28·1	252	i 5 48	+ 3	e 10 54	sS	i 6 28	PP	—
Balboa Heights		32·0	264	e 6 22	+ 3	e 11 39	+17	—	—	—
Halifax		33·2	339	6 29	− 1	11 51	+10	7 33	PP	—
Weston		34·7	328	i 6 43	+ 1	e 12 16	+12	i 7 51	PP	i 26·2
Harvard		35·0	328	i 6 45	0	e 12 19	+10	i 7 55	PP	i 14·4
City College, N.Y.		35·1	325	e 6 46	0	i 12 31	+21	—	—	—
Fordham		35·1	325	e 6 45	− 1	i 12 23	+13	—	—	—
Palisades		35·2	325	i 6 47a	0	i 12 27	+15	i 8 0	PP	e 16·0
Philadelphia		35·3	321	i 6 48	+ 1	e 12 24	+10	i 8 3	PP	i 14·4
Washington		35·8	319	i 6 54	+ 2	e 12 34	+13	i 8 10	PP	e 14·3
Columbia		36·2	309	e 6 57	+ 2	e 12 35	+ 8	e 8 9	PP	e 14·7
La Paz		37·0	214	i 7 1k	− 1	i 12 37	− 3	i 7 7	pP	17·9
Pennsylvania		37·4	321	i 7 6	+ 1	i 12 50	+ 4	i 8 26	PP	e 14·8
Seven Falls	E.	38·1	334	i 7 10	− 1	i 13 38	sS	i 8 44	PP	—
Huancayo		38·2	228	i 7 10	− 2	i 13 10	+12	i 8 37	PP	—
New Kensington	E.	38·4	319	i 7 10	− 3	i 13 0	− 1	i 8 35	PP	e 15·9
Pittsburgh	Z.	38·5	319	i 7 16	+ 2	—	—	i 8 44	PP	—
Shawinigan Falls	N.	38·5	333	i 7 9	− 5	e 13 7	+ 5	e 8 28	PP	—
Ottawa		39·1	328	e 7 17	− 2	13 24	+13	7 44	pP	—
Cleveland		40·1	319	e 7 28	0	i 13 38	+12	i 9 7	PP	—
Merida		40·8	285	e 7 40	+ 7	e 13 49	+12	i 9 45	PPP	e 16·8
Cincinnati		40·9	314	i 5 43?	?	i 9 49?	?	—	—	—
Lisbon		41·4	47	7 37a	− 1	i 13 50	+ 4	9 30	PP	18·3
Chicago		44·2	317	e 8 4	+ 3	i 14 37	+11	i 18 1	ScS	e 17·0
Malaga	Z.	44·2	52	i 8 1k	0	i 14 41	+15	i 10 1	PP	21·4
Granada		44·9	52	(i 8 9a)	+ 2	i 14 53	+16	(8 19)	pP	i 21·5
St. Louis		44·9	311	i 8 5	− 2	i 14 45	+ 8	i 8 21	pP	—
Florissant		45·0	311	e 8 8	+ 1	i 14 47	+ 9	—	—	—
Toledo		45·5	48	i 8 8	− 3	i 14 51	+ 6	e 10 4	PP	19·8
Ivigtut		46·7	359	i 8 20	− 1	15 14	+12	10 1	PP	22·5
Vera Cruz		46·9	283	e 10 21	PP	e 15 15	+10	—	—	—
Alicante		47·6	51	8 29	+ 1	15 26	+11	10 39	PP	—
Lome		48·4	95	e 8 51	pP	e 15 40	+14	e 18 29	ScS	e 20·5
Puebla		48·8	284	e 9 12	pP	e 16 13	sS	—	—	—
Tortosa		49·1	49	i 8 42	+ 3	i 15 42	+ 6	10 34	PP	21·7
Tacubaya		49·8	284	e 9 1	+16	e 16 0	+14	—	—	—
Algiers Univ.	Z.	49·9	55	e 8 42	− 4	—	—	e 9 19	pP	—
Buenos Aires		49·9	192	i 8 43	− 3	e 15 49	+ 2	i 10 38	PP	e 24·3
La Plata	N.	50·1	192	8 42	− 5	15 43	− 7	10 37	PP	23·2
Lincoln	E.	50·2	312	e 8 48	0	i 16 5	+14	e 10 37	PP	e 18·7
Barcelona		50·5	48	8 46	− 4	i 16 6	+11	10 44	PP	e 21·0
Rathfarnham Castle		50·5	31	i 8 47	− 3	e 16 0	+ 5	i 9 12	pP	e 21·4
Tamanrasset	Z.	50·5	73	e 8 47	− 3	—	—	e 9 14	pP	—
Jersey	E.	50·6	37	e 9 4	+13	e 16 12	+15	e 20 55?	Q	e 25·0
Clermont-Ferrand		52·5	43	i 9 8	+ 3	i 16 31	+ 8	i 12 9	PPP	e 26·8
Santiago		52·5	204	e 9 3	− 2	e 16 25	+ 2	—	—	—
Kew		52·7	35	i 9 4	− 3	i 16 32	+ 7	e 11 7	PP	e 21·9
Reykjavik	E.	52·7	13	—	—	—	—	e 22 25	Q	e 27·2
Paris		53·1	39	i 9 12	+ 2	i 16 41	+10	i 9 33	pP	e 23·9
Edinburgh	E.	53·4	29	i 14 55	?	16 10	−25	17 15	sS	—
Durham		53·6	32	—	—	i 16 46	+ 8	i 17 15	sS	—
Guadalajara		53·6	286	—	—	e 16 50	+12	e 18 50	ScS	—
Aberdeen		54·6	28	10 5	pP	i 17 2	+11	i 17 30	PS	26·5
Besançon		54·9	42	e 9 15	− 8	—	—	e 9 33	pP	—
Neuchatel		55·4	42	e 9 26	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tunis		55·5	55	e 10 39	P_cP	—	—	—	—	—
Rapid City	E.	55·7	314	i 9 30	+ 1	i 17 22	+16	e 20 43	SS	e 25·4
Basle		56·0	42	e 9 33	+ 2	—	—	—	—	—
De Bilt		56·1	36	e 9 35	+ 3	e 17 23	+12	e 12 54	PPP	e 23·9
Pavia		56·4	45	e 9 43a	+ 9	e 17 40	PS	e 17 52	PPS	e 27·4
Strasbourg		56·4	41	e 9 32	− 2	e 17 23	+ 8	i 9 51	pP	—
Zürich		56·6	42	e 9 33a	− 2	e 17 21	+ 3	e 10 39	P_cP	—
Karlsruhe		56·9	40	i 9 40	+ 3	e 17 38	+16	—	—	e 26·9
Chur		57·1	44	e 9 37	− 2	e 17 35	+11	—	—	—
Stuttgart		57·4	41	e 9 36	− 5	e 17 37	+ 9	e 9 51	pP	27·2
Prato		57·5	47	e 9 39	− 2	e 17 39	+10	—	—	—
Florence		57·6	47	i 9 44	+ 2	i 17 44	+13	i 21 22	SS	—
Bologna		57·8	46	e 9 47	+ 3	e 17 48	+15	—	—	—
Padova		58·1	46	9 50	+ 4	17 52	+15	12 3	PP	28·0
Rome		58·1	50	i 9 48k	+ 2	i 17 51	+14	11 40	PP	—
Scoresby Sund		58·2	9	i 9 47	+ 1	i 17 53	+15	—	—	24·9
Jena		59·5	39	i 9 55	0	e 18 2	+ 7	e 10 15	pP	e 24·6
Bergen	N.	59·6	27	—	—	e 18 4	+ 7	e 22 14	SS	24·8
Cheb	N.	59·7	40	e 9 57	0	e 18 8	+10	e 10 15	pP	—
Triest		59·7	45	i 9 55	− 2	i 18 11	+13	i 12 8	PP	—
Messina		60·0	54	e 10 10	+11	e 18 21	+19	—	—	—
Saskatoon		60·1	322	i 10 0	+ 1	—	—	13 42	PPP	—
Tucson		60·2	299	i 10 0	0	i 18 22	+18	i 10 13	pP	e 24·0
Collmberg		60·4	39	e 9 58	− 3	e 18 19	+12	e 12 23	PP	25·0
Potsdam		60·7	37	i 10 13	+10	i 18 23	+12	i 10 27	pP	e 24·9
Prague		61·0	40	e 10 5	− 1	i 18 25	+10	e 10 25	pP	—
Copenhagen		61·3	34	e 10 6	− 2	18 27	+ 9	20 1	S_cS	—
Bozeman		61·5	314	e 10 10	+ 1	i 18 34	+13	e 10 29	pP	e 25·2
Salt Lake City		61·5	309	e 10 12	+ 3	i 18 32	+11	e 12 22	PP	e 24·1
Taranto		61·5	52	10 23	pP	18 23	+ 2	—	—	—
Logan		61·6	310	e 10 7	− 3	i 18 32	+10	e 12 27	PP	e 25·5
Butte	N.	62·6	315	e 10 51	P_cP	e 18 47	+12	e 20 13	S_cS	e 25·4
Pierce Ferry		62·9	303	—	—	e 18 57	+18	—	—	—
Ogyalla		63·0	43	e 10 31	+12	e 18 54	+14	e 10 45	pP	e 28·4
Overton	Z.	63·3	304	i 10 21	0	e 19 9	sS	i 12 41	PP	—
Kalossa	N.	63·4	45	e 10 26	+ 4	e 19 2	+17	e 19 36	PPS	e 29·9
Raciborzu		63·4	41	e 10 20	− 2	e 18 43	− 2	e 10 51	pP	29·9
Boulder City		63·6	303	e 10 24	+ 1	e 19 2	+15	—	—	—
Budapest		63·6	44	10 24	+ 1	18 56	+ 9	12 46	PP	28·9
Hungry Horse		63·9	317	e 10 22	− 3	—	—	—	—	—
Belgrade		64·2	47	10 24	− 3	i 19 9	+14	e 23 35	SS	e 33·7
Skalnate Pleso		64·6	42	e 10 34	+ 5	19 9	+ 9	e 10 56	pP	—
Timisoara		64·9	47	e 10 43	+12	e 19 17	+14	e 23 13	SS	e 30·9
Upsala		65·1	30	e 10 34	+ 2	i 19 14	+ 8	e 20 26	S_cS	e 27·9
Palomar		65·3	301	e 10 39	+ 5	—	—	—	—	—
Warsaw		65·5	39	e 10 37	+ 2	19 21	+10	e 13 9	PP	e 27·9
Resolute Bay		65·7	348	10 36	0	19 27	+14	13 15	PP	—
Riverside		65·7	302	e 10 37	+ 1	e 19 28	+15	—	—	—
China Lake	Z.	65·8	304	e 10 38	+ 1	—	—	—	—	—
Sofia		66·2	49	e 10 43	+ 3	i 19 32	+13	—	—	—
Pasadena		66·3	302	e 10 40	0	e 19 24	+ 4	i 11 0	pP	e 26·9
Tinemaha		66·3	305	e 10 42	+ 2	e 19 38	+18	e 39 16	P′P′	—
Athens		66·4	55	e 10 45	+ 4	e 19 26	+ 4	i 19 43	PS	—
Lwow		67·1	42	i 10 44	− 1	i 19 42?	+12	i 11 7	pP	—
Reno		67·5	308	e 10 49a	+ 1	e 20 5	sS	e 13 31	PP	—
Fresno		67·6	305	e 10 49a	+ 1	e 19 53	+17	e 11 15	pP	—
Bucharest		68·2	47	e 10 57	+ 5	19 40	− 3	e 20 48	S_eS	32·9
Helsinki		68·8	30	e 10 58	+ 2	i 19 58	+ 8	e 24 24	SS	—
Mineral		68·9	309	e 10 55	− 1	e 20 8	+16	e 13 44	PP	—
Lick		69·0	306	i 10 59k	+ 2	e 20 12	+19	e 39 10	P′P′	e 31·9
Santa Clara		69·3	306	e 10 49	−10	i 20 19	+23	—	—	e 36·8
Seattle		69·4	316	e 11 5	+ 5	e 20 10	+13	e 11 25	pP	e 28·9
Berkeley		69·5	306	e 11 1	+ 1	i 20 17	+18	e 13 25	PP	—
Shasta Dam		69·5	309	i 10 58	− 2	—	—	—	—	—
Kishinev		70·2	44	11 3	− 1	20 15	+ 8	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ukiah		70·2	307	e 11 27	pP	e 20 32	sS	e 21 20	PPS	e 28·1
Victoria		70·2	317	e 11 5	+ 1	20 17	+10	—	—	—
Istanbul		70·5	51	e 11 3	− 3	e 20 32	sS	—	—	—
Pulkovo		71·4	32	e 11 5	− 7	i 20 29	+ 9	—	—	—
Helwan		73·3	63	i 11 24 a	+ 1	20 53	+11	—	—	—
Yalta		74·0	48	11 28	+ 1	20 56	+ 6	—	—	—
Moscow		75·4	35	e 11 36	+ 1	e 21 18	+13	—	—	—
Ksara		76·5	59	e 11 46?	+ 5	e 21 35?	+18	—	—	—
Sitka		77·0	326	e 11 40	− 4	i 21 37	+14	e 12 1	pP	e 31·2
Sotchi		78·1	47	e 11 51	+ 1	—	—	—	—	—
Zugdidi		79·8	49	e 11 57	− 2	e 22 6	+13	—	—	—
College		81·5	335	e 12 6	− 2	i 22 18	+ 8	e 12 34	pP	e 31·8
Tiflis		82·1	49	e 12 12	+ 1	—	—	—	—	—
Grozny		82·5	47	e 12 16	+ 3	—	—	—	—	—
Grahamstown	z.	84·8	126	i 12 26	+ 1	—	—	e 12 59	pP	—
Shemakla		85·2	49	i 12 31?	+ 4	—	—	17 55?	PPP	—
Lenkoran		85·8	51	12 35	+ 5	23 57	PS	—	—	—
Baku		86·2	49	i 12 39	+ 7	—	—	—	—	—
Sverdlovsk		87·6	31	i 12 40	+ 2	23 8	[+13]	23 24	S	—
Mary		95·9	50	i 13 26	+ 9	—	—	—	—	—
Tananarive		99·0	107	15 28	?	24 13	[+14]	31 39	SS	47·4
Tashkent		99·4	43	e 13 38	+ 5	i 24 14	[+13]	i 17 42	PP	—
Lunacharskoe		99·5	43	e 13 42	+ 9	e 24 16	[+14]	—	—	—
Stalinabad		100·4	46	e 13 44	+ 7	i 24 18	[+12]	—	—	—
Obi-garm		101·0	45	e 13 51	+11	24 29	[+20]	e 17 56	PP	—
Andijan		101·8	43	e 13 53	+ 9	i 24 24	[+11]	18 4	PP	—
Frunse		102·1	40	e 13 55	+10	i 24 31	[+17]	e 18 1	PP	—
Honolulu		103·2	297	—	—	e 29 39	?	e 36 28	SSS	e 47·4
Almata		103·3	38	e 18 0	PP	—	—	—	—	—
Naryn		103·7	40	e 14 1	+ 9	e 24 38	[+17]	18 7	PP	—
Irkutsk		109·2	18	e 14 25	P	i 24 59	[+14]	e 18 53	PP	—
New Delhi	N.	111·4	51	e 19 7	PP	i 25 8	[+14]	26 7	SKKS	—
Bombay		112·4	62	e 19 17	PP	25 13	[+15]	26 12	SKKS	45·8
Poona	E.	113·4	62	e 18 20	[− 7]	25 0	[− 2]	19 3	PP	43·4
Hyderabad	N.	117·8	61	e 19 46	PP	e 27 43	?	—	—	—
Vladivostok		122·8	1	—	—	i 25 53	[+18]	e 27 20	SKKS	—
Calcutta	E.	123·1	50	e 18 34	[−11]	25 37	[0]	20 27	PP	58·4
Colombo	E.	123·5	72	e 24 16	?	37 38	PSS	—	—	58·9
Nanking	z.	131·9	17	19 10	[+ 8]	i 22 32	PKS	—	—	—
Wellington		134·7	226	e 22 0	PP	e 22 47	PKS	33 55	PPS	62·7
Christchurch		135·2	222	e 19 10	[+ 2]	25 55	[−13]	21 49	PP	e 63·9
Manila		149·0	22	18 27?	[−66]	—	—	—	—	—
Riverview		154·4	218	i 19 44k	[+ 4]	e 36 53	PPS	i 20 7	pPKP	e 71·4
Brisbane		157·0	233	i 20 20k	pPKP	—	—	e 23 59	PP	—

Additional readings :—
San Juan i =4m.16s. and 4m.57s.
Bermuda i =5m.57s.
Port au Prince PPP? =6m.8s., SS =10m.49s.
Bogota eSS =12m.19s.
Philadelphia iS =12m.27s.
La Paz iPPZ =8m.26s., iPPP =8m.43s., iP_cP =9m.15s., iZ =9m.31s., iSS =15m.1s., iSSS =15m.21s., iS_cS =17m.3s.
Pennsylvania iZ =7m.37s., iP_cPZ =9m.15s., iEN =9m.44s., iN =11m.44s., iEN = 12m.16s., iZ =13m.5s.
Huancayo e =7m.49s.
Ottawa PP =8m.51s., SS =16m.5s., i =16m.35s.
Cleveland iPN =7m.32s., eSN =13m.43s., iSSEN =16m.40s.
Merida e =10m.58s.
Lisbon iPEZ =7m.41s., Z =8m.26s., iSS?N =17m.1s.
Chicago iP =8m.7s., ePP =9m.46s., ePPP? =10m.49s.
Malaga PPPZ =10m.43s., S_cPZ =13m.17s., SSZ =17m.51s.
Granada P_cP =9m.25s., iPPP =10m.27s., pPPP =11m.3s., P_cS =13m.37s., sS =15m.7s., PS =16m.5s., iSS =18m.7s., SSS =19m.55s. ; times of P and pP given 5 minutes early.
St. Louis i =8m.10s., 9m. 46s., and 11m.51s., isS =15m.16s.
Toledo S_cS =18m.3s., SS =18m.27s.
Ivigtut 18m.44s.

Continued on next page,

Alicante PPP =11m.31s., P_cS =14m.7s., PPS =15m.51s., SS =19m.2s., Q =19m.51s., SSS =20m.24s.
Lome eSS =19m.10s.
Tortosa PSEN =15m.49s., PPSEN =16m.2s., SSN =19m.13s.
Algiers Univ. iZ =8m.51s., ePPZ =10m.40s., cpPPZ =10m.59s., ePPPZ =11m.36s.
La Plata PPE =10m.1s., N =12m.31s., E =12m.49s., iSE =15m.53s., SSE =19m.25s., QE =22m.19s.
Barcelona PPP =11m.25s., SS? =19m.13s.
Rathfarnham Castle esPZ =9m.41s., ePPEN =10m.33s., eEN =11m.6s., eS_cP =13m.41s., eZ =16m.47s., eS_cS?EN =18m.33s., eSSEN =19m.46s.
Tamanrasset iZ =8m.52s., eP_cPZ =10m.21s., iPPZ =10m.47s., epPPZ =11m.6s.
Clermont-Ferrand iP_cS =14m.10s., iPS =17m.30s., iQ =20m.31s., and many unidentified readings.
Kew iZ =9m.8s., eS_cSEN =19m.27s., eSSEN =20m.14s.
Paris i =9m.24s., iP_cP =10m.12s., iPP =11m.17s., iPPP? =12m.2s., iP_cS =14m.36s., iPS =16m.57s., ePPS? =17m.4s., iS_cS =19m.5s., eSS =20m.20s., iSSS =22m.20s.
Edinburgh PSE =16m.47s., PPSE =16m.56s., S_cSE =18m.31s., SSE =20m.3s., SSSE =21m.51s.
Durham iEN =19m.10s. and 20m.41s.
Aberdeen iN =14m.12s., iSSEN =20m.55s., iSSSEN =22m.4s., iN =23m.28s. and 26m.18s.
Besançon e =9m.20s., $ePcP$ =10m.13s., e =10m.43s., ePP? =11m.13s.
Tunis e =18m.15s. and 18m.43s.
Rapid City ePP?E =12m.5s., ePPP?E =13m.9s.
Basle e =10m.46s. and 15m.15s.
De Bilt ePS =17m.30s., eSS =21m.15s.
Pavia eE =11m.31s., ePPZ =11m.51s., e =18m.28s.
Strasbourg i =9m.42s. and 9m.56s., iP_cP =10m.33s., iPP? =11m.22s., e =12m.3s. and 12m.37s., iPPP =12m.43s., e =13m.24s., eP_cS =14m.24s., iS =17m.26s., iPS =17m.35s., i =18m.18s., iS_cS =19m.24s., iSS =20m.44s. and 21m.2s., iSSS =23m.8s., i =25m.55s.
Stuttgart iPZ =9m.41s., eP_cP =10m.45s., e =11m.23s., ePP =12m.5s., eP_cS =14m.41s., eSS =21m.19s., eSSS =23m.35s., eQ =26·9m.
Padova e =10m.46s.
Rome eSS =21m.48s.
Jena eN =10m.45s. and 11m.15s., eE =14m.42s., eSE =18m.5s., eSS?E =22m.28s.
Cheb esPN =10m.33s., eN =12m.39s., esS =18m.40s., eN =19m.57s., eSS =22m.37s.
Triest iZ =10m.12s., iPPP =13m.46s., iSP =18m.36s., iS_cS =18m.48s., iSS =21m.58s., iSSS =24m.35s.
Messina e =22m.31s. and 31m.28s.
Saskatoon eN =21m.14s., eEN =21m.33s.
Tucson isP =10m.18s., iP_cP =10m.50s., iPP? =11m.35s., ePPP =13m.33s., eSS =22m.31s.
Collmberg iEZ =10m.2s., eN =10m.14s. and 12m.44s., eE =18m.22s., eS_cS?N =20m.0s.
Potsdam epPN =10m.32s., eE =11m.31s., eN =11m.34s., epPP?EN =12m.49s., eE =15m.7s., iSKSEN =19m.57s., iE =20m.57s., eE =22m.1s.
Prague eZ =10m.15s., esP =10m.43s., eP_cPZ =10m.50s., eZ =11m.5s. and 11m.26s., ePPZ =12m.16s., ePP =12m.24s., eZ =13m.3s. and 13m.25s., e =13m.36s., eSE =18m.28s., eS_cS? =19m.59s., eSS =22m.31s., e =23m.55s., eSSS =25m.7s.
Bozeman ePP =12m.27s., ePPP =13m.49s., iS_cS =20m.3s., eSS =22m.15s.
Salt Lake City e =11m.12s.
Taranto e =13m.45s. and 27m.25s.
Logan e =11m.9s., ePPP =13m.57s., iS_cS =19m.16s., eSS =22m.23s.
Butte eSSN =22m.10s.
Ogyalla e =10m.41s., 11m.43s., and 12m.9s., ePP =12m.35s., e =14m.55s., eE =18m.31s., eN =20m.15s., e =22m.1s., eSS =23m.25s.
Overton ePKP,PKPZ =39m.12s.
Kalossa P_cPE =10m.44s., P_cPN =10m.47s., eN =11m.32s., eSE =19m.5s., eE =19m.26s., SSN =23m.4s., eN =24m.21s., eE =25m.37s.
Raciborzu eSN =18m.49s.
Budapest iP_cPE =10m.45s., eE =14m.24s., eN =14m.38s., eE =18m.38s., ePSE =19m.9s., PSN =19m.15s., cPPSE =19m.21s., ePPSN =19m.34s., S_cS =20m.20s., SSE =22m.55s.?, SSN =23m.3s., eSSSE =25m.38s., SSSN =25m.56s.
Belgrade i =10m.34s., e =12m.30s.
Skalnate Pleso eN =10m.48s., eP_cP =11m.5s., ePPN =13m.4s., eE =14m.7s., e =15m.17s., esS? =19m.39s., eS_cSE =20m.14s., ePSN =20m.33s., eN =22m.37s., eSSE =23m.34s.
Upsala ePP?E =13m.21s., eN =23m.8s., eSSE =23m.23s., eSSSN =26m.19s.
Warsaw e =10m.44s. and 10m.55s., pPPPEZ =15m.2s., sPPPE =15m.17s., eE =16m.29s., iEN =20m.44s., sS_cS =21m.3s., SS =23m.26s., sSS =24m.13s., SSS =26m.28s., sSSS =26m.59s.
Resolute Bay eE =12m.25s., PPP =14m.43s., e =17m.5s. and 19m.46s., PS =19m.55s., e =20m.31s., S_cS =20m.37s.
Riverside i =10m.43s., eZ =39m.11s., iPKP,PKPZ =39m.22s.
China Lake iZ =10m.45s. and 11m.57s., ePKP,PKPZ =39m.15s., iZ =39m.24s.
Pasadena iZ =10m.47s., iSEN =19m.35s., eSSEN =24m.1s., iPKP,PKPZ =39m.21s.
Tinemaha i =10m.48s.
Lwow ePP =13m.12s., ePPP =14m.51s., iS_cS =20m.43s., eSS =24m.2s.

Continued on next page.

Reno eE =11m.6s. and 12m.0s., eZ =32m.55s., ePKP,PKPZ =39m.13s.
Fresno eZ =10m.54s., 11m.31s., and 13m.15s., eN =14m.43s. and 16m.48s., eZ =33m.13s.
Bucharest eEN =14m.32s., iS?E =19m.58s., iN =20m.7s., iE =20m.16s.
Helsinki iZ =11m.14s.
Mineral eZ =11m.3s., 11m.46s., and 12m.5s., eN =16m.58s., eZ =36m.55s., ePKP,PKPZ =39m.14s.
Lick iZ =11m.7s., eZ =13m.29s., eE =34m.25s., eZ =37m.55s.
Seattle e =12m.24s., 12m.39s., and 23m.17s., eSS =25m.0s., e =26m.25s. and 26m.47s.
Victoria S =19m.26s., sS =19m.43s., SS =26m.55s.
Sitka ePP =14m.43s., eScS =22m.16s., eSS =26m.27s.
College iP =12m.9s., ePP? =15m.29s., esS? =23m.0s., eSS =28m.13s., eSKP,PKP =43m.25s.
Sverdlovsk iP_cP =12m.47s., PP =16m.7s., PPP =18m.1s., PS =24m.24s., SS =29m.6s., SSS =32m.31s.
Tananarive Q =40m.25s.
Tashkent ePS =26m.34s., iSS =31m.54s.
Frunse ePPP =20m.11s., iPS =27m.9s.
Irkutsk ePPP =21m.15s.?, PS =28m.17s., SS =33m.54s.?
New Delhi SKS_2N =25m.27s., iN =26m.50s., iPSN =28m.38s., PPSN =29m.46s., PKKSN =33m.2s., SSN =34m.38s., SSPN =34m.56s., SSSN =39m.0s.
Bombay ePPPEN =21m.45s., SKKSE =26m.20s., PSEN =26m.50s., SSEN =34m.30s., SSSN =38m.42s., QE =45m.37s.
Poona PPPE =21m.21s., PKSE =22m.0s., SKKSE =25m.38s., SKKKSE =26m.0s., PSE =28m.21s., PPSE =29m.41s., SSE =34m.34s., SSSE =38m.13s.
Vladivostok PS =30m.24s., iSS =37m.12s., iSSS =41m.49s.
Calcutta PKSE =22m.16s., PPPE =23m.14s., SKS_2E =25m.50s., SKKSE =27m.26s., SKKKSE =27m.39s., $PKKP_2E$ =28m.26s., PSE =30m.30s., PKKSE =32m.30s., $SKKS_2E$ =35m.44s. and 36m.3s., SSE =37m.24s., SSPE =37m.38s., $SKKKS_2E$ =38m.41s., SSSE =41m.50s.
Wellington eS_cSP? =30m.40s.. eSKSP? =31m.50s., e =35m.0s., eSKKKS? =37m.55s., i =39m.55s., iPKP,PKS? =40m.45s., eSSS =44m.54s., Q =56·4m.
Christchurch PKS =22m.45s., PPP =24m.35s., eSKKSEZ =28m.47s., ePS? =31m.40s., PPS =33m.59s., e =36m.35s., SS =39m.54s., eSSSEZ =44m.45s., eQEN =55m.15s.
Riverview iZ =20m.31s., $isPKP_2Z$ =20m.53s., iPPZ =23m.44s., ipPPN =24m.7s., isPPZ =24m.29s., iZ =25m.37s., ipPPPN =27m.37s., iN =28m.58s., ePSKS?N =33m.51s., iE =33m.54s., iN =33m.59s., iPPSN =37m.0s., eSS?EN =43m.37s., eSSS?EZ =49m.37s., eQE =64·2m.

Dec. 1d. 17h. Undetermined shock.

Djakarta eP =20m.58s., eS =23m.16s.
Brisbane iPZ =27m.13s.k.
Poona iPZ =27m.59s., iE =29m.57s., eE =34m.48s.
Perth i =28m.10s. and 36m.45s.
Grahamstown iZ =31m.3s.
Riverview iN =37m.0s., iE =37m.4s., eLEN =40·9m.
Tinemaha iP?Z =38m.29s.
China Lake iP?Z =38m.31s.
Pasadena iP?Z =38m.31s.
Riverside iP?Z =38m.33s.
Overton ePKPZ =38m.36s.
Pierce Ferry ePKP =38m.37s.
Boulder City ePKP =38m.39s.
Tucson iPKP =38m.47s.
Ottawa iZ =38m.58s.k, e =39m.10s.
Harvard iPKP =39m.9s.
Palisades iPKP =39m.12s.
San Juan ePKP =39m.30s.
Christchurch e =50m.?

Dec. 1d. Readings also at 0h. (College, Almata, Tashkent, Lunacharskoe, near Naryn, Andijan, Fergana, Frunse, Przhevalsk, and Obi-garm), 1h. (near Alicante, near Gandzha, Stepanavan, and Tsikhlis-Dzhvari), 3h. (College), 5h. (near Ashkabad), 6h. (College and Tucson), 8h. (Logan and near Obi-garm), 9h. (College), 10h. (Brisbane, College (2), Tucson, Huancayo, near Prague, Samarkand, near Obi-garm, Stalinabad, Fergana, Andijan, Lunacharskoe, and Tashkent), 11h. (Hungry Horse (2), Overton, and Shasta Dam), 12h. (College, Apia, and near Zürich), 15h. (Fort de France), 17h. (College (3), Hungry Horse, Shasta Dam, Mineral, Reno, Lick, Pasadena, Riverside, China Lake, Tinemaha, Boulder City, Overton (2), Pierce Ferry, Tucson (3), and near Adak), 18h. (China Lake, Tinemaha, College (2), Huancayo, Paris, Oaxaca, Puebla, Vera Cruz, near Tacubaya, and near Dzhergetal), 19h. (College, Victoria, Hungry Horse, Mineral, Reno, Lick, Mount Wilson, China Lake, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, Puebla, Vera Cruz, near Oaxaca, and Tacubaya), 20h. (Santa Clara), 22h. (Djakarta and near Dzhergetal).

Dec. 2d. 8h. 30m. 31s. Epicentre 26°·0S. 70°·2W. Depth of focus 0·015.
(as on 1950, July 20d.).
Approximate.

A = +·3049, B = −·8468, C = −·4360; δ = +13; h = +3;
D = −·941, E = −·339; G = −·148, H = +·410, K = −·900.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		9·6	12	i 2 15	− 1	i 4 21	+19	i 4 39	SSS	5·2
La Plata		13·8	133	3 1	−10	5 59	+17	3 11	P	7·2
Huancayo		14·7	340	e 3 21	− 2	e 6 5	+ 3	—	—	—
San Juan		44·3	7	i 8 12	+13	—	—	—	—	—
Weston		68·0	359	i 11 5	+18	—	—	—	—	—
Harvard		68·2	359	i 11 6	+17	—	—	—	—	—
Tucson		69·7	324	i 10 58	0	—	—	i 11 17	pP	—
Ottawa	z.	71·2	356	i 11 24k	+17	—	—	—	—	—
Pierce Ferry		74·3	324	i 11 26	+ 1	—	—	—	—	—
Perris	z.	74·4	321	i 11 25	− 1	—	—	i 11 43	pP	—
Riverside	z.	74·6	321	i 11 27k	0	—	—	i 11 44	pP	—
Boulder City		74·7	323	i 11 28	+ 1	—	—	i 11 47	pP	—
Overton	z.	74·9	324	i 11 29	+ 1	—	—	—	—	—
Pasadena	z.	75·2	321	i 11 30	0	—	—	e 11 47	pP	—
China Lake	z.	76·0	323	i 11 35	0	—	—	e 11 51	pP	—
Tinemaha	z.	77·3	322	e 11 43	+ 1	—	—	e 12 0	pP	—
Lick	z.	79·4	321	e 11 54k	+ 1	—	—	i 12 12	pP	—
Grahamstown	z.	81·4	122	e 12 6	+ 2	—	—	i 12 24	PcP	—
Mineral	z.	81·5	322	e 12 4	0	—	—	e 13 47	?	—
Shasta Dam		82·2	323	i 12 7	− 1	—	—	i 12 25	pP	—
Hungry Horse		83·8	333	i 12 17	+ 1	—	—	e 12 33	pP	—
Algiers Univ.	z.	93·0	51	13 50	PcP	—	—	—	—	—
College		108·2	334	e 30 4	PKKP	—	—	—	—	—

Additional readings :—
La Plata PN = 3m.6s., SSN = 6m.41s.
Mineral eZ = 19m.46s.
Riverside iZ = 11m.52s.
Tucson i = 12m.33s.

Dec. 2d. 15h. 19m. 22s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·100.
(as on 1950, September 18d.).

A = +·3223, B = −·9360, C = −·1417; δ = +5; h = +7;
D = −·946, E = −·326; G = −·046, H = +·134, K = −·990.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo	5·7	228	i 1 42	0	i 3 2	− 2	—	—	—
La Paz	8·7	162	i 2 10k	+ 2	i 3 58	+ 8	i 4 10	SS	4·8
Bogota	13·1	346	i 2 50	+ 1	i 5 5	0	—	—	—
Balboa Heights	19·0	335	i 3 43	− 1	i 6 44	+ 1	e 13 55	ScS	—
Fort de France	24·8	24	i 4 35	0	i 8 10	− 5	—	—	—
San Juan	26·9	10	i 4 51	− 3	i 8 40	− 8	i 7 46	PcP	—
Buenos Aires	28·7	157	e 5 10	+ 1	i 9 13	− 3	12 7	SSS	—
La Plata	29·1	157	5 10	− 2	9 20	− 2	6 20	PP	—
Merida	34·3	328	i 6 4k	+ 8	i 10 46	+ 5	i 15 13	ScS	—
Oaxaca	35·7	317	e 6 12	+ 5	e 11 6	+ 4	—	—	—
Vera Cruz	36·8	319	i 6 21k	+ 5	i 11 32	+14	—	—	—
Puebla	38·1	316	e 6 32	+ 5	e 11 43	+ 6	—	—	—
Tacubaya	39·0	316	i 6 38	+ 4	i 11 54	+ 4	i 11 20	ScP	—
Bermuda	40·8	9	i 6 50	+ 2	i 12 16	+ 1	i 15 41	SS	—
Guadalajara	42·8	313	e 7 2	− 2	e 12 38	− 6	—	—	—
Columbia	43·0	348	e 7 5	− 1	e 12 44	− 2	i 15 55	ScS	e 16·3
Washington	47·2	355	i 7 36	− 2	—	—	—	—	—
Cincinnati	48·7	347	i 4 50?	?	i 8 40?	?	—	—	—
City College, N.Y.	48·8	359	i 7 49	0	—	—	—	—	—
Fordham	48·9	359	i 7 48	− 2	i 14 6	− 1	—	—	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pittsburgh		49·1	351	i 7 52	0	i 14 29	+19	—	—	—
New Kensington	E.	49·2	351	e 7 52	0	i 14 11	− 1	i 16 35	S_cS	e 21·5
Pennsylvania		49·2	353	i 7 51	− 1	i 14 1	−11	e 9 1	P_cP	—
St. Louis		49·9	341	i 7 55	− 2	i 14 17	− 4	—	—	—
Weston		50·3	1	i 7 59	− 1	i 14 26	0	i 9 58	pP	—
Cleveland		50·4	351	i 7 59k	− 2	i 14 24	− 4	i 9 54	pP	—
Harvard		50·5	1	i 8 0	− 2	i 14 27	− 2	e 9 56	pP	e 22·3
Lubbock		50·8	328	8 5	+ 1	15 35	+62	10 15	PP	—
Buffalo		51·4	353	i 8 8	0	i 14 40	− 1	9 13	P_cP	—
Chicago		52·0	345	e 8 7	− 5	i 14 40	− 9	e 10 33	PP	e 21·9
Halifax		53·0	8	—	—	i 15 3	+ 1	i 17 2	S_cS	—
Ottawa		53·5	357	t 8 21k	− 2	i 15 7	− 1	9 20	P_cP	—
Lincoln	E.	54·2	337	e 8 28	0	i 15 14	− 4	i 17 9	S_cS	—
Shawinigan Falls	N.	54·5	359	e 8 25	− 5	—	—	—	—	—
Seven Falls	E.	55·1	1	i 8 33	− 1	i 15 27	− 2	i 17 25	S_cS	e 22·6
Tucson		55·3	320	i 8 34	− 2	e 15 34	+ 2	i 10 36	pP	—
Pierce Ferry		59·8	321	i 9 5	− 1	i 16 32	+ 4	i 11 8	pP	—
Palomar		60·0	317	i 9 7k	0	i 16 35	+ 4	i 11 2	pP	—
Boulder City		60·2	320	i 9 9	+ 1	e 16 39	+ 5	i 11 17	pP	—
Overton	Z.	60·3	321	i 9 10	+ 1	i 16 52	+17	e 40 55	pP'P'	—
Perris	Z.	60·5	317	i 9 10	0	—	—	i 11 10	pP	—
Riverside		60·8	317	i 9 11k	− 1	e 16 37	− 4	i 11 15	pP	—
Pasadena		61·4	317	i 9 15k	− 1	i 16 47	− 1	i 11 18	pP	e 35·6
Salt Lake City		61·5	327	i 9 19	+ 2	i 16 52	+ 3	e 11 34	pP	—
China Lake	Z.	61·9	318	i 9 19k	0	—	—	i 37 46	PKP,PKP	—
Logan		62·2	327	i 9 18	− 3	i 16 56	− 2	e 11 56	pP	e 24·7
Tinemaha		63·1	319	i 9 26k	− 1	e 17 11	+ 2	11 32	pP	—
Fresno		63·9	318	e 9 30a	− 2	e 17 18	0	e 11 44	pP	—
Bozeman		64·5	331	i 9 36	0	i 17 30	+ 5	e 21 42	sS	—
Butte	N.	65·5	331	i 9 43	+ 1	e 22 21	SS	i 10 15	P_cP	—
Lick		65·5	318	i 9 42k	0	e 17 42	+ 5	11 49	pP	—
Santa Clara		65·7	318	i 9 48	+ 5	e 18 33	+53	i 10 23	pP	—
Berkeley		66·2	318	i 9 46k	0	i 17 47	+ 2	e 11 56	pP	—
Mineral	Z.	67·1	320	i 9 52k	0	e 17 59	+ 3	i 11 59	pP	—
Saskatoon		67·4	337	i 9 58	+ 5	i 17 57	− 2	—	—	—
Ukiah		67·5	319	e 10 1	+ 7	e 18 8	+ 8	e 23 22	SS	—
Hungry Horse		67·8	331	i 9 56	0	i 18 6	+ 2	e 12 40	PP	—
Shasta Dam		67·8	320	i 9 54	− 2	e 18 1	− 3	i 37 19	PKP,PKP	—
Ivigtut		71·5	12	i 10 16	− 2	i 18 44	− 2	23 34	SS	—
Seattle		71·7	327	i 10 19k	0	i 18 54	+ 6	12 8	pP	—
Victoria		72·8	327	i 10 24k	− 1	i 19 4	+ 4	12 34	pP	—
Malaga	Z.	76·6	49	i 10 55k	+ 9	i 19 51	+11	i 13 5	pP	—
Granada		77·4	49	10 7a	−43	i 19 58	+ 9	—	—	—
Toledo		78·0	47	i 10 56	+ 3	i 20 1	+ 6	i 13 9	pP	—
Alicante		80·1	49	i 11 1	− 3	i 20 22	+ 6	14 14	PP	38·9
Tamanrasset	Z.	80·9	65	i 11 12a	+ 4	e 20 36	+12	i 13 26	pP	—
Reykjavik		81·0	19	—	—	i 20 33	+ 8	—	—	—
Tortosa		81·6	47	i 11 17	+ 5	i 20 35	+ 4	13 37	pP	—
Rathfarnham Castle		81·9	33	i 11 15	+ 2	i 20 38	+ 4	i 13 31	pP	—
Algiers Univ.	Z.	82·3	51	i 11 17k	+ 2	e 20 36	− 2	e 13 31	pP	—
Jersey	E.	82·7	38	e 11 20	+ 3	e 20 40	− 2	—	—	—
Resolute Bay		84·0	353	11 18	− 6	—	—	39 55	P'P'	—
Kew		84·6	36	i 11 27	0	e 21 2	+ 2	i 13 44	pP	—
Clermont-Ferrand		84·9	43	i 11 45	+17	i 14 53	sP	i 13 50	pP	—
Scoresby Sund		85·1	15	i 11 31	+ 2	i 14 48	sP	i 13 50	pP	—
Paris		85·4	39	i 11 33	+ 2	i 21 13	+ 6	i 13 48	pP	—
Besançon		87·2	42	i 11 40	+ 1	—	—	13 57	pP	—
Neuchatel		87·8	42	−	−	e 21 14	[+ 7]	—	—	—
De Bilt		88·0	37	—	—	i 21 33	+ 2	e 25 38	sS	—
Basle		88·4	42	e 11 46k	+ 1	e 21 38	+ 3	e 21 16	SKS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Strasbourg		88·7	41	i 11 47	+ 1	i 21 49	+12	e 14 4		pP	—
Pavia		88·9	44	e 12 51	+64	—	—	e 14 5		pP	—
Zürich		89·0	42	e 11 48k	+ 1	e 21 19	[+ 5]	e 14 5a		pP	—
Karlsruhe		89·2	40	e 11 51	+ 3	e 21 23	[+ 7]	—		—	—
Stuttgart	z.	89·7	41	e 11 52k	+ 1	e 21 23	[+ 5]	e 14 8		pP	—
Prato		89·9	46	e 11 54	+ 3	i 21 54	+ 6	—		—	—
Florence		90·1	46	i 15 49	PP	i 21 52	+ 2	—		—	—
Honolulu		90·3	291	e 11 56	+ 3	—	—	i 12 8		?	—
Padova		90·6	45	e 11 58	+ 3	i 22 2	+ 8	i 21 34		SKS	—
Rome		90·6	48	e 11 56	+ 1	i 21 30	[+ 6]	14 14		pP	—
Jena		91·7	39	e 12 1	+ 1	e 21 37	[+ 7]	e 14 19		pP	—
Grahamstown	z.	91·8	124	i 12 2	+ 2	—	—	e 14 20		pP	—
College		91·8	335	i 12 0	0	i 22 2	− 2	i 14 27		pP	—
Triest		92·1	44	e 14 20	pP	i 22 11	+ 4	i 21 37		SKS	—
Collmberg		92·6	39	e 12 6	+ 2	e 21 42	[+ 7]	e 14 24		pP	—
Potsdam		92·8	37	—	—	i 22 21	+ 8	i 21 38		SKS	—
Prague		93·3	39	e 12 10	+ 3	e 22 25	+ 8	e 14 32		pP	—
Taranto		93·9	50	e 13 9	+59	i 21 54	[+12]	—		—	—
Raciborzu		95·7	39	e 12 21	+ 3	—	—	14 43		pP	—
Kalossa	N.	95·9	43	e 16 28	PP	e 22 0	[+ 8]	e 26 7		PPS	—
Upsala		96·3	30	—	—	i 21 55	[+ 1]	i 22 47		S	e 46·6
Belgrade		96·7	46	e 12 38k	+15	e 24 21	SP	—		—	—
Skalnate Pleso		97·0	41	—	—	e 22 3	[+ 5]	e 23 0		S	—
Warsaw		97·7	38	—	—	e 22 7	[+ 6]	e 23 2		S	—
Helsinki	N.	100·0	29	—	—	e 23 15	+ 2	—		—	—
Wellington		102·3	225	i 12 9	−38	i 23 26	− 6	i 19 37		PPP	—
Pulkovo		102·7	29	e 18 22	?	i 22 28	[+ 3]	e 31 6		SS	—
Istanbul		102·9	49	e 15 54	pP	—	—	e 27 32		PPS	—
Christchurch		102·9	222	—	—	e 22 28	[+ 2]	e 26 40		PS	—
Helwan	E.	104·7	61	—	—	e 22 41	[+ 7]	—		—	—
Yalta		106·5	46	e 17 42	PP	e 22 44	[+ 2]	e 19 48		pPP	—
Moscow		107·2	33	e 17 56	PP	e 23 1	[+16]	32 23		SS	—
Ksara		108·5	57	e 17 4	[−11]	—	—	e 20 29		PPP	—
Zugdidi		112·3	48	—	—	e 23 16	[+10]	—		—	—
Abastumanj		113·0	48	e 18 29	PP	e 23 16	[+ 8]	—		—	—
Tiflis		114·6	47	e 17 32	[+ 6]	e 23 24	[+ 9]	e 18 40		PP	—
Grozny		115·0	45	e 18 41	PP	e 23 34	[+18]	—		—	—
Lenkoran		118·2	50	19 6?	PP	25 1	SKKS	—		—	—
Sverdlovsk		118·7	27	e 19 11	PP	e 24 59	SKKS	i 27 53		SKSP	—
Riverview		122·2	221	—	—	e 23 46	[+ 5]	e 25 25		SKKS	—
Ashkabad		125·7	48	e 17 53	[+ 6]	—	—	—		—	—
Mary		128·4	47	i 17 58	[+ 5]	—	—	i 20 20		pPKP	—
Samarkand		131·1	43	e 18 4	[+ 6]	—	—	i 20 34		PP	—
Lunacharskoe		131·8	39	e 18 5	[+ 5]	—	—	i 20 33		PP	—
Tashkent		131·8	39	i 18 2	[+ 2]	26 13	SKKS	i 20 31		PP	—
Stalinabad		132·9	42	i 18 4	[+ 2]	26 32	SKKS	i 20 33		PP	—
Obi-garm		133·4	42	—	—	24 2?	[− 9]	i 20 36		PP	—
Fergana		133·9	39	e 18 5	[+ 1]	e 26 36	SKKS	e 20 34		PP	—
Frunse		134·1	35	i 18 9	[+ 5]	e 30 48	PS	—		—	—
Andijan		134·1	39	e 18 8	[+ 4]	e 26 39	SKKS	e 20 35		pPKP	—
Almata		135·2	32	i 17 59	[− 7]	e 24 13	[− 1]	20 37		PP	—
Irkutsk		135·9	4	e 18 13	[+ 6]	34 32	PPS	e 20 39		pPKP	—
Naryn		135·9	34	e 18 11	[+ 4]	—	—	e 20 38		pPKP	—
Vladivostok		139·8	333	i 18 11	[− 3]	e 24 28	[+ 7]	i 20 54		PP	—
New Delhi		143·8	51	18 27	[+ 5]	—	—	i 18 36		?	—
Poona		144·4	69	18 25	[+ 2]	i 27 31	SKKS	i 21 53		PP	—
Kodaikanal	E.	148·8	82	e 21 6	PP	—	—	—		—	—
Hyderabad	E.	148·9	69	21 3	PP	28 2	SKKS	—		—	—
Nanking	Z.	154·6	341	18 42k	[+ 5]	—	—	i 22 46		PP	—
Calcutta	E.	155·6	51	e 20 59	pPKP	44 52	SS	25 6		PP	—
Manila		166·7	299	e 19 9?	[+19]	—	—	—		—	—

For Notes see next page.

NOTES TO DECEMBER 2d. 15h. 19m. 22s.

Additional readings :—
La Paz i =2m.14s.
San Juan i =6m.27s., eS$_c$P =10m.27s., eP$_c$S? =11m.23s., eP$_c$S =11m.44s., iS$_c$S=14m.25s.
La Plata PE =4m.12s., E =6m.44s., SN =9m.17s., N =10m.26s., E =12m.14s., N = 12m.22s. and 14m.37s.
Merida i =12m.16s.
Bermuda isP =9m.49s.
Pennsylvania iN =8m.11s., isPZ =10m.55s., isPPN =13m.0s., iE =16m.33s., iN = 16m.38s., isSEN =17m.38s., iN =17m.57s., iE =19m.50s.
St. Louis i =16m.39s.
Cleveland iPE =8m.2s., eN =14m.27s., iN =16m.42s., esSN =18m.17s.
Harvard iP$_c$P =8m.57s., ePP =10m.13s., isP =11m.20s., iS$_c$S =16m.40s., esS =18m.18s., eSS? =19m.18s.
Buffalo i =9m.11s.
Chicago iS$_c$S =16m.51s.
Ottawa i =17m.4s., e =19m.0s.
Lincoln eSS?E =20m.1s.
Seven Falls iE =19m.3s.
Tucson iP$_c$P =9m.28s., iPP =10m.51s., esP =11m.40s., i =11m.47s., eP$_c$S? =13m.4s., iS$_c$S =16m.56s., i =17m.14s., esS =19m.7s., eSS =20m.8s., eSKP,PKP =40m.59s.
Pierce Ferry eSKKP =31m.2s., ePKP,PKP =37m.56s.
Palomar iS$_c$SE =17m.55s., iE =22m.6s.
Perris iZ =9m.48s., ePKP,PKPZ =37m.52s., eZ =40m.56s.
Riverside iPPZ =11m.38s.
Pasadena iP$_c$PZ =9m.42s., iPP =11m.38s., esPEN =12m.24s., ipPP =13m.28s., eZ = 16m.39s., iS$_c$SE =18m.1s., esSEN =20m.33s., eEN =21m.9s., isS$_c$S?Z =22m.10s., eEN =22m.55s. and 24m.38s., ePKP,PKPZ =37m.49s., eZ =40m.46s.
Salt Lake City iS$_c$S =18m.6s., esS =20m.12s., eSS =21m.8s.
China Lake iZ =9m.45s., eZ =40m.42s.
Logan i =9m.37s., esP =12m.16s., i =17m.27s., iS$_c$S =18m.10s., esS =20m.49s., eSS = 21m.11s.
Tinemaha iZ =9m.58s.
Fresno iZ =9m.44s., eZ =10m.16s. and 11m.22s., ePPZ =12m.7s., eN =12m.16s., eZ = 17m.29s., and 20m.16s., esSZ =21m.11s., eSKP,PKPZ =40m.48s., eZ =41m.38s.
Bozeman eS =17m.18s., eSS =21m.58s.
Butte eS?N =17m.8s.
Lick iZ =12m.4s., iPPZ =12m.23s., isPZ =12m.53s., eSKP,PKPZ =40m.33s.
Berkeley iPPZ =12m.28s., isPZ =13m.3s., eSSE =22m.32s., eSKP,PKPZ =40m.36s.
Mineral iZ =10m.0s., iP$_c$PZ =10m.17s., eE =10m.34s., eZ =10m.50s. and 12m.21s., ePPZ =12m.37s., esPZ =13m.6s., eS$_c$P?Z =13m.27s., eZ =18m.15s.
Hungry Horse ePKP,PKP =37m.17s., iSKP,PKP =40m.30s.
Shasta Dam i =38m.8s., eSKP,PKP =40m.31s.
Ivigtut i =12m.25s. and 19m.22s., SS =22m.32s.
Seattle i =10m.22s., 10m.36s., 10m.50s., 11m.14s., 11m.29s., and 12m.28s., iSP =19m.47s. isS? =22m.1s.
Malaga SKSZ =20m.9s.
Toledo sSE =23m.59s.
Alicante PPP =16m.20s., PS =22m.42s., SS =25m.59s., SSS =29m.34s., Q =33m.44s.
Tamanrasset iPPZ =14m.29s., epPPZ =16m.21s., iPPPZ =16m.36s., eSPZ =21m.23s., PKP,PKPZ =37m.46s., eSKP,PKPZ =40m.10s.
Tortosa eN =20m.8s., PPSN =21m.58s.
Rathfarnham Castle ePPZ =14m.43s., e =19m.34s., eSKS =20m.16s., eSS =29m.54s., e =35m.12s.
Algiers Univ. isPZ =14m.36s., iPPZ =14m.41s., epPPZ =16m.24s., iPPPZ =16m.35s., esPPZ =17m.36s., iZ =20m.48s., ePKP,PKPZ =37m.42s., eSKP,PKP?Z =40m.6s.
Kew iSKSEZ =20m.50s., eSPEN =22m.4s., eSSSEN =25m.58s. and 30m.32s., eEN = 33m.54s.
Clermont-Ferrand e =20m.49s.
Scoresby Sund i =21m.8s.
Paris i =11m.42s. and 12m.24s., e =13m.6s., ipP? =13m.40s., i =14m.16s., isP? = 14m.42s., isP =14m.54s., iPP =15m.2s., ipPP =16m.52s., eSKS =21m.1s., iSP = 22m.16s., isS =24m.49s., e =26m.4s., eSS? =27m.19s., e =28m.15s.
Besançon epP =13m.50s., ePP =15m.19s.
Strasbourg e =12m.18s., and 14m.18s., esP =15m.8s., ePP =15m.49s., eSKS =21m.8s., iSP =22m. 52s. isS =25m.47s., i =26m.39s., eSS =27m.59s., e =30m.25s. and 34m.26s.
Pavia e =20m.18s.
Zürich eS =21m.45s.
Stuttgart eZ =13m.7s., ePPZ =15m.9s., eS =21m.53s., ePS =23m.2s.
Rome PP =15m.18s., e =22m.2s. and 23m.16s., sS =26m.14s.
Jena ePP?N =15m.53s., ePP?E =16m.5s., eE =18m.50s., eSEN =22m.8s.
College iPP =15m.46s., esS =26m.7s.
Triest iPP =15m.53s., ipSKS =25m.0s., isS =26m.15s., ipSP =27m.21s.
Collmberg ePPZ =15m.58s., eSEN =22m.22s.
Potsdam iE =21m.41s.
Prague i =12m.27s. and 12m.34s., e =13m.19s., 13m.39s., 14m.54s., and 16m.3s., ePPZ =16m.8s., epPP =17m.58s., e =21m.33s., eSKS =21m.45s., e =23m.14s.
Taranto e =26m.39s. and 40m.38s.
Kalossa e =16m.39s. and 17m.21s., eSE =21m.57s., eE =22m.59s.

Continued on next page.

Belgrade i = 17m.31s., e = 22m.12s.
Skalnate Pleso eN = 22m.7s.
Warsaw eSKS?N = 22m.21s., ePSE = 25m.57s., esS = 26m.53s., e = 28m.1s., eN = 28m.39s., eSS = 29m.57s.
Wellington iSKKS = 22m.38s., eSP = 25m.23s., ePS = 26m.41s., iPKKP? = 27m.44s., eSS? = 31m.29s.
Christchurch ePSE = 28m.34s., ePPSE = 30m.28s., eSS?EN = 34m.38s.
Helwan eE = 23m.29s., eN = 24m.6s.
Yalta eSP = 26m.2s., ePS = 27m.23s., eSS = 31m.53s.
Moscow S = 24m.27s., ePS = 29m.21s.
Sverdlovsk eSS = 34m.31s.
Riverview ePS?NZ = 29m.50s., eSSS?E = 39m.18s.
Tashkent eSS = 37m.18s.
Stalinabad SS = 37m.2s.
Andijan PP = 20m.40s., ePKS = 21m.49s.?.
Almata eSKSP = 29m.44s., eSS = 36m.56s.
Irkutsk iPP = 20m.57s.
Vladivostok iPKS = 21m.58s.?.
Poona eE = 20m.53s., 21m.10s., and 28m.5s.
Nanking i = 18m.51s., ipP? = 19m.7s., i = 19m.28s.
Calcutta PKPZ = 21m.33s., PKSE = 24m.25s., SKS_2E = 27m.53s., PPPE = 28m.42s., SKKSE = 31m.42s., PPSE = 38m.6s.

Dec. 2d. 16h. 17m. 9s. Epicentre 17°·3S. 168°·6E.

$A = -\cdot 9365$, $B = +\cdot 1888$, $C = -\cdot 2955$; $\delta = 0$; $h = +5$;
$D = +\cdot 198$, $E = +\cdot 980$; $G = +\cdot 290$, $H = -\cdot 058$, $K = -\cdot 955$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Brisbane		17·6	232	i 4 9k	+ 1	i 7 24	+ 1	—		—	—
Apia		19·2	83	4 32	+ 4	—	—	e 5 6	PPP		—
Riverview		22·7	220	i 5 3k	− 1	i 8 59	−10	i 9 4	P_cP	e 11·2	
Wellington		24·5	168	—	—	i 9 21	−19	—		—	—
Berkeley	z.	84·9	48	i 12 39a	+ 1	—	—	—		—	—
Lick	z.	85·1	48	i 12 39a	0	—	—	—		—	—
Shasta Dam		86·1	45	i 12 44	0	—	—	—		—	—
Fresno		86·2	50	i 12 45a	+ 1	—	—	—		—	—
Pasadena		86·4	53	i 12 45	0	—	—	—		—	—
Mineral	z.	86·5	46	e 12 46	0	—	—	—		—	—
Perris	z.	86·9	53	i 12 48a	0	—	—	—		—	—
Riverside	z.	86·9	53	i 12 47	− 1	—	—	—		—	—
Palomar		87·0	54	i 12 48a	0	—	—	—		—	—
Tinemaha	z.	87·5	50	i 12 51a	0	—	—	—		—	—
College		88·4	17	e 12 52	− 3	—	—	—		—	—
Boulder City		89·6	52	e 13 2	+ 1	—	—	—		—	—
Overton	z.	90·1	52	i 13 3	0	—	—	—		—	—
Pierce Ferry		90·3	52	i 13 4	0	—	—	—		—	—
Tucson		91·4	57	i 13 9	0	—	—	—		—	—
Hungry Horse		94·6	41	e 13 23	− 1	—	—	—		—	—
Collmberg	z.	140·9	334	e 19 24	[− 8]	—	—	—		—	—
Prague		141·3	333	e 21 3	?	—	—	e 23 0	PP		—
Stuttgart	z.	144·4	336	i 19 36a	[− 2]	—	—	e 23 2	PP		—
Triest	z.	144·8	329	i 19 38	[− 1]	—	—	—		—	—
Strasbourg		145·1	337	i 19 38	[− 1]	—	—	—		—	—
Chur		145·8	333	e 19 39k	[− 2]	—	—	—		—	—
Zürich		145·8	336	e 19 35a	[− 6]	—	—	—		—	—
Basle		146·0	337	e 19 40	[− 1]	—	—	—		—	—
Paris		146·6	343	i 19 47	[+ 5]	—	—	—		—	—
Besançon		146·9	338	e 19 41	[− 1]	—	—	—		—	—
Pavia	z.	147·3	332	i 19 45	[+ 2]	—	—	—		—	—
Algiers Univ.	z.	156·8	330	e 19 55	[− 2]	e 24 4	PP	e 20 27	PKP_2		—

Additional readings :—
Riverview iZ = 9m.8s., iSSE = 9m.40s.
Berkeley iZ = 12m.45s.
Lick iZ = 12m.43s.
Fresno eN = 13m.26s.
Mineral eZ = 13m.30s. and 14m.4s.
College e = 13m.29s.
Tucson i = 13m.25s.
Stuttgart eZ = 19m.52s.
Strasbourg e = 20m.8s. and 20m.45s.
Paris e = 19m.54s. and 20m.8s.
Besançon i = 19m.44s., e = 19m.57s.

Dec. 2d. 19h. 51m. 46s. Epicentre 18°·0S. 167°·7E. (as on 1946, Oct. 22d.).

Felt at Thio, Bourail, Nouméa (New Caledonia). Epicentre 18°·25S. 167°·5E. (Gutenberg). Depth 60km.
Letter from the station at Nouméa.

$A = -·9299$, $B = +·2027$, $C = -·3071$; $\delta = +11$; $h = +5$;
$D = +·213$, $E = +·977$; $G = +·300$, $H = -·065$, $K = -·952$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·5	232	i 3 48k	− 6	i 6 44	−14	i 3 56	PP	—
Auckland	N.	19·8	162	i 4 34	− 1	i 9 5	SSS	i 5 0	PP	—
Apia		20·2	82	4 42	+ 3	e 9 29	SSS	—	—	e 12·4
Riverview		21·6	219	i 4 51k	− 3	i 8 48	− 1	i 4 59	pP	10·2
New Plymouth	E.	21·7	166	i 5 3	+ 8	—	—	—	—	—
Wellington		24·0	167	i 5 17	0	i 9 35	+ 3	i 5 59	PP	11·7
Kaimata	N.E.	24·6	174	e 5 24	+ 1	e 9 26	−16	—	—	—
Christchurch		25·8	171	5 30	− 4	e 9 54	− 8	6 13	PP	—
Perth		48·6	242	9 18	+31	16 34	+45	10 54	PP	—
Honolulu		51·6	43	e 9 10	0	e 16 22	− 9	11 6	PP	i 17·4
Manila		55·3	302	i 9 42	+ 4	e 17 7	−14	—	—	—
Osima		59·0	335	e 10 23	+19	e 18 28	+18	e 22 31	SS	—
Omaesaki		59·3	333	e 10 31	+25	e 19 17	+63	—	—	—
Bandong		59·4	274	e 9 5	−61	e 18 14	− 1	—	—	—
Shizuoka		59·6	332	10 7	− 1	e 18 36	+19	—	—	—
Owase		59·8	331	10 8	− 1	18 26	+ 6	—	—	—
Tukubasan		59·9	336	10 10	0	e 18 26	+ 5	—	—	—
Hunatu		59·9	334	10 5	− 5	e 18 46	+25	—	—	e 27·2
Mito		59·9	336	10 10	0	e 18 49	+28	i 14 49	PcS	—
Kumagaya		60·1	335	10 10	− 1	18 44	+20	12 46	PP	26·0
Djakarta		60·4	274	i 10 9	− 4	i 18 21	− 7	—	—	—
Simidu		60·4	326	e 10 25	+12	e 18 40	+12	—	—	e 29·1
Nagoya		60·4	332	e 10 21	+ 8	e 18 49	+21	e 39 45	P'P'	—
Maebasi	E.	60·5	336	i 10 17	+ 3	—	—	—	—	—
Osaka		60·6	330	e 10 17	+ 2	e 19 0	+30	—	—	e 30·5
Sumoto		60·7	330	10 15k	0	i 18 36	+ 4	e 12 15	PP	28·3
Gihu		60·7	332	10 14	− 1	19 2	+30	12 34	PP	29·0
Hikone		60·8	331	e 10 18	+ 2	—	—	e 17 26	?	28·9
Kôti		60·8	327	e 10 15	− 1	e 18 41	+ 8	e 22 16	SS	26·3
Kobe		60·8	330	e 10 16	0	e 18 49	+16	e 12 32	PP	—
Matusiro		61·0	334	i 10 16	− 2	18 56	+21	14 6	PPP	29·9
Hukusima		61·1	337	10 18	0	e 18 41	+ 4	—	—	26·2
Nagano		61·1	334	e 10 18	0	e 19 6	+29	e 14 18	PPP	29·9
Sendai		61·4	337	10 19a	− 1	18 47	+ 7	10 48	PcP	—
Ooita		61·5	327	e 10 22	+ 1	e 18 40	− 2	—	—	—
Toyooka		61·7	331	10 24	+ 2	18 44	0	—	—	—
Kumamoto		61·7	326	e 10 17	− 5	18 46	+ 2	—	—	26·4
Niigata		61·8	336	e 10 19	− 4	e 19 2	+16	e 11 1	PcP	—
Nagasaki		62·1	324	i 10 21a	− 4	19 18	+29	—	—	e 26·2
Aikawa		62·2	336	e 10 30	+ 4	—	—	—	—	24·1
Miyako		62·2	339	10 24	− 2	e 18 52	+ 1	—	—	—
Wazima		62·3	334	e 10 26	0	e 18 56	+ 4	—	—	e 26·6
Hukuoka		62·4	325	10 26a	− 1	18 53	0	e 23 29	SS	29·6
Morioka		62·5	338	e 10 27a	− 1	e 19 1?	+ 7	—	—	—
Akita		62·9	337	10 48	+18	23 22	SS	14 30	PPP	e 26·5
Hatinohe		63·1	339	10 41	+ 9	19 29	+27	13 6	PP	30·0
Aomori		63·6	338	10 48	+13	e 19 25	+17	—	—	—
Nemuro		64·3	343	e 10 50	+11	e 19 34	+17	e 27 32	Q	32·5
Mori		64·8	339	e 10 53	+10	e 19 46	+23	—	—	28·4
Sapporo		65·4	340	e 10 47	0	—	—	e 29 2	Q	e 32·1
Zi-ka-wei	E.	66·1	318	e 10 52	+ 1	19 42	+ 3	—	—	—
Nanking		68·3	317	i 11 3a	− 2	i 20 10	+ 4	i 13 25	PP	—
Vladivostok		69·2	332	i 11 7	− 3	i 20 41	PS	i 21 12	SeS	—
Adak		70·9	11	i 11 21	0	—	—	i 15 0	PP	—
Klyuchi		74·3	357	11 42	+ 1	i 21 24	+ 9	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Clara		86·0	48	i 12 48	+ 5	i 23 12	− 5	—	—	e 37·4
Berkeley		86·0	48	i 12 45a	+ 2	e 23 42	+25	e 23 9	SKS	e 39·6
Lick		86·2	48	i 12 47a	+ 3	e 23 12	[+ 3]	i 38 52	P'P'	e 43·9
Santa Barbara		86·4	53	e 12 47	+ 2	—	—	—	—	—
Shasta Dam		87·2	45	i 12 51	+ 2	e 23 16	[+ 1]	—	—	—
Fresno		87·3	50	i 12 51a	+ 1	e 23 17	[+ 1]	e 38 39	P'P'	e 40·5
Calcutta	E.	87·4	294	i 12 46	− 4	23 3	[−14]	i 16 15	PP	—
Pasadena		87·5	53	i 12 51a	0	i 23 12	[− 5]	i 16 12	PP	i 35·5
Mineral		87·6	47	e 12 52	+ 1	e 23 24	− 8	e 23 12	SKS	—
La Jolla	E.	87·7	54	e 12 53	+ 1	—	—	—	—	—
Perris	Z.	88·0	54	i 12 55	+ 2	—	—	—	—	—
Riverside		88·0	53	i 12 54a	+ 1	i 23 21	−15	e 38 44	P'P'	—
Palomar		88·1	54	i 12 56	+ 2	i 23 37	0	e 38 49	P'P'	—
Reno		88·5	48	e 24 42	PS	e 23 18	[− 6]	e 38 49	P'P'	—
China Lake		88·6	52	i 12 57a	+ 1	—	—	—	—	—
Tinemaha		88·6	50	i 12 58a	+ 2	e 23 30	[+ 6]	e 38 55	P'P'	—
Sitka		88·8	27	i 12 56	− 1	i 23 26	[+ 1]	e 13 15	pP	i 37·0
Irkutsk		88·9	326	12 56	− 2	23 51	+ 7	—	—	—
College		89·3	17	i 12 57	− 2	i 23 34	[+ 5]	i 13 11	pP	e 36·6
Victoria		90·1	38	i 13 4a	+ 1	i 23 38	[+ 5]	i 13 29	pP	—
Colombo	E.	90·1	277	13 3	0	23 33	[0]	—	—	50·4
Seattle		90·3	40	i 13 7a	+ 3	i 23 39	[+ 4]	i 16 45	PP	e 38·2
Boulder City		90·7	52	i 13 9	+ 3	e 23 38	[+ 1]	e 13 28	pP	—
Overton	Z.	91·2	52	i 13 10	+ 2	e 23 39	[− 1]	i 13 21	pP	—
Pierce Ferry		91·4	52	i 13 11	+ 2	i 23 48	[+ 7]	i 13 24	pP	—
Tucson		92·5	56	i 13 16	+ 2	e 24 23	+ 6	i 13 32	pP	e 38·1
Kodaikanal	E.	93·3	279	i 13 9	− 9	i 24 23	− 1	26 13	PPS	43·4
Manzanillo		93·9	71	e 13 38	+17	e 24 42	+13	—	—	—
Hyderabad	E.	94·6	286	i 13 21	− 3	i 24 28	− 7	23 45	SKS	45·0
Salt Lake City		94·6	48	e 13 28	+ 4	i 24 42	+ 7	i 24 1	SKS	e 37·8
Logan		94·9	47	e 13 25	0	i 24 2	[+ 1]	i 13 53	pP	e 38·6
Guadalajara		95·3	69	e 20 38	?	e 24 6	[+ 3]	e 24 59?	S	—
Hungry Horse		95·7	41	i 13 29	0	e 23 43	[−22]	e 17 33	PP	—
Butte	N.	95·9	43	e 14 7	+37	e 24 10	[+ 4]	e 31 11	SS	40·1
Bozeman		96·8	44	e 13 51	+17	i 24 13	[+ 2]	e 14 45	pP	e 39·4
Tacubaya		98·6	73	14 5	pP	24 20	{−24}	—	—	—
New Delhi	N.	98·8	297	e 13 43	0	i 24 22	[+ 1]	17 24	PP	i 41·8
Poona		99·1	287	i 13 41	− 3	24 22	[− 1]	i 25 9	S	45·1
Puebla		99·4	73	—	—	e 24 17	[− 7]	i 24 46	SKKS	—
Bombay		100·1	286	e 13 46	− 3	i 24 37	[+10]	32 49	SS	46·2
Saskatoon		101·4	39	14 4	+ 9	24 32	[− 2]	27 26	PS	—
Vera Cruz		101·4	74	—	—	25 32	0	—	—	—
Rapid City	E.	101·7	47	e 14 10	+14	24 32	[− 3]	18 4	PP	e 43·4
Semipalatinsk		102·1	320	e 13 59	+ 1	—	—	—	—	—
Almata		102·7	312	e 13 56	− 4	—	—	—	—	—
Naryn		102·9	310	e 13 59	− 2	—	—	e 17 48	PKP	—
Frunse		104·3	311	e 14 7?	− 1	—	—	e 18 35	PP	—
Andijan		105·5	308	e 14 11	− 2	—	—	e 18 32	PP	—
Lincoln	E.	105·7	52	e 14 37	+23	e 24 41	[−13]	e 27 59	PS	e 45·3
Fergana		105·9	308	e 14 13	− 2	e 26 1?	{+24}	—	—	—
Dzhergetal		106·1	307	e 14 18	+ 3	—	—	—	—	—
Kulyab		107·0	305	e 14 24	P	—	—	—	—	—
Obi-garm		107·2	307	e 14 18	P	—	—	—	—	—
Merida		107·7	74	e 19 39	?	e 24 12	?	e 25 18	?	—
Stalinabad		107·8	307	i 14 22	P	e 25 26	[+23]	—	—	—
Tashkent		107·9	308	i 14 21	P	i 21 34	PKS	18 59	PP	—
Resolute Bay		109·2	17	e 14 26	P	33 55	SS	e 19 21	PP	—
Samarkand		109·4	307	e 14 45	P	—	—	e 18 14	PKP	—
St. Louis		110·3	54	e 14 41	P	i 26 13	{+ 6}	e 24 59	SKS	—
Tananarive		110·7	241	e 19 47	PP	25 57	{−13}	29 30	PPS	52·2

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		111·0	110	e 15 1	P	e 25 24	[+ 8]	e 19 29	PP	i 46·3
La Plata		111·8	141	18 32?	[− 5]	25 20	[0]	19 26	PP	56·2
Chicago		112·6	51	e 15 3	P	e 26 17	{− 6}	e 34 57	SS	e 47·4
Mary		113·1	304	e 14 52	P	—	—	—	—	—
Sverdlovsk		114·2	325	14 51	P	i 29 31	PS	i 19 41	PP	—
Balboa Heights		114·3	88	e 19 23	[+41]	—	—	—	—	—
La Paz		115·2	119	i 18 44	[+ 1]	i 25 44	[+11]	i 15 0	P	55·0
Ashkabad		115·9	304	e 18 41	[− 4]	—	—	—	—	—
Grahamstown	Z.	116·9	217	i 18 46	[− 1]	—	—	e 19 49	PP	—
Chinchina		116·9	93	e 18 47	[0]	e 36 40	SSP	e 15 47	P	—
Cleveland		117·1	53	i 18 47	[0]	i 25 41	[+ 1]	—	—	—
Columbia		117·2	60	e 18 32	[−15]	e 25 32	[− 8]	e 29 48	PS	e 48·5
Bogota		118·2	95	e 19 3	[+14]	e 27 2	{+ 1}	e 15 43	P	—
Pittsburgh		118·3	54	e 18 50	[+ 1]	i 25 50	[+ 6]	i 27 7	SKKS	—
New Kensington	E.	118·5	53	e 19 51	[+61]	e 25 59	[+14]	e 27 2	SKKS	e 57·1
Pennsylvania		119·9	52	i 18 41	[−12]	i 25 54	[+ 4]	i 30 1	PS	—
Washington		120·6	55	i 18 56	[+ 2]	e 30 23	PS	e 15 48	P	e 51·3
Ottawa		121·2	46	i 18 54	[− 1]	25 56	[+ 2]	27 24	SKKS	—
Philadelphia		122·0	53	e 19 20	[+23]	i 27 29	{+ 2}	e 30 23	PS	e 48·6
Baku		122·5	307	i 19 1	[+ 3]	—	—	—	—	—
Fordham		122·9	52	e 18 58	[0]	i 25 59	[0]	e 15 56	P	52·1
Palisades		122·9	52	i 18 58	[0]	25 57	[− 2]	e 15 43	P	e 57·3
Shawinigan Falls	N.	123·1	45	i 19 4	[+ 5]	—	—	e 20 34	PP	—
Shemakha		123·4	308	19 33	[+34]	—	—	—	—	—
Lenkoran		123·4	305	18 35	[−24]	27 29	{− 8}	—	—	—
Seven Falls	E.	124·3	45	18 56	[− 5]	27 41	{− 2}	e 30 58	PS	—
Harvard		124·5	50	i 19 0	[− 1]	i 27 46	{+ 2}	i 22 26	PKS	—
Weston		124·7	50	i 19 2	[0]	—	—	—	—	—
Grozny		125·3	311	e 19 5	[+ 2]	—	—	—	—	—
Tiflis		126·2	309	e 19 5	[0]	—	—	—	—	—
Erevan		126·6	308	e 19 14	[+ 9]	—	—	—	—	—
Moscow		126·9	327	e 19 3?	[− 3]	e 25 44	[−28]	e 21 1	PP	—
Leninakan		127·0	309	e 19 9	[+ 3]	—	—	—	—	—
Piatigorsk		127·1	313	19 8	[+ 2]	e 26 2	[−10]	i 21 43	PP	—
Scoresby Sund		127·1	5	i 19 6	[0]	—	—	i 21 2	PP	—
Abastumanj		127·7	310	e 19 11	[+ 3]	—	—	—	—	—
Zugdidi		128·2	311	e 19 12	[+ 3]	—	—	—	—	—
Pulkovo		128·3	335	i 19 8	[− 1]	i 22 34	PKS	i 21 18	PP	—
San Juan		129·0	80	i 19 9	[− 1]	e 27 42	{−31}	e 21 37	PP	e 54·7
Halifax		129·8	46	21 39	PP	28 27	{+ 8}	22 35	PKS	—
Ivigtut		130·0	22	e 19 10	[− 2]	26 15	[− 5]	38 56	SS	—
Helsinki		130·1	338	i 19 12	[0]	26 13	[− 7]	i 22 32	PKS	e 57·2
Bermuda		130·8	62	e 19 7	[− 7]	i 26 4	[−17]	i 38 40	SS	i 54·5
Theodosia		132·1	316	e 19 31?	[+15]	22 58	PKS	—	—	—
Upsala		133·0	340	e 19 19	[+ 1]	e 22 48	PKS	e 24 39	PPP	e 55·2
Fort de France		133·1	87	i 19 19	[+ 1]	i 22 49	PKS	—	—	—
Yalta		133·1	315	i 19 16	[− 2]	—	—	—	—	—
Reykjavik		133·4	7	i 19 23	[+ 5]	i 26 32	[+ 4]	i 22 14	PP	68·3
Ksara		134·3	299	e 16 21	P	—	—	e 20 11	?	—
Kishinev		135·6	323	i 19 19	[− 3]	—	—	i 22 3	PP	—
Bergen		135·8	347	19 36	[+13]	e 39 8	SS	e 22 27	PP	58·2
Lwow		136·9	327	i 19 25	[0]	32 32	SKSP	i 22 8	PP	—
Warsaw		137·0	331	e 19 28k	[+ 3]	26 37	[+ 3]	29 10	SKKS	e 62·2
Istanbul		137·8	313	e 19 25	[− 2]	e 26 35	[− 1]	—	—	—
Copenhagen		138·0	340	i 19 28	[+ 1]	26 41	[+ 5]	22 24	PP	63·2
Bucharest		138·5	318	e 19 33	[+ 5]	i 29 4	{− 8}	i 22 31	PP	45·2
Helwan	E.	138·6	295	e 19 30	[+ 2]	32 34	PSKS	22 26	PP	—
Skalnate Pleso		139·3	328	e 19 32	[+ 3]	e 29 13	{− 4}	e 40 53	SS	e 57·2
Raciborzu		139·7	331	e 19 24	[− 6]	e 23 6	PKS	e 28 50	PKKP	—
Aberdeen		140·2	251	i 19 40	[+ 9]	i 23 1	PKS	i 41 40	SS	59·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Potsdam		140·3	336	e 19 32	[+ 1]	i 23 13	PKS	i 20 4	pPKP		e 57·2
Timisoara		140·8	322	e 19 35	[+ 3]	—	—	e 23 15	PKS		—
Budapest	N.	141·0	327	19 34	[+ 2]	e 33 11	PS	26 0	PPP		59·2
	E.	141·0	327	19 32	[0]	41 19	SS	35 16	S_cSPKP		—
Sofia		141·1	317	19 38	[+ 6]	i 23 10	PKS	21 59	PP		—
Ogyalla		141·2	328	e 19 33	[0]	e 32 44	SKSP	e 46 38	SSS		e 59·7
Collmberg		141·2	334	e 19 26	[− 7]	e 25 39	[−62]	e 22 46	PP		e 64·3
Edinburgh	E.	141·5	352	19 33	[0]	26 41	[0]	33 13	PS		—
Prague		141·5	332	e 19 30	[− 3]	e 26 35	[− 6]	e 22 14	PP		e 59·2
Kalossa	E.	141·6	326	19 35	[+ 2]	23 16	PKS	e 22 46	PP		e 41·2
Belgrade		141·8	322	e 19 26a	[− 8]	—	—	—	—		e 68·4
Jena		142·0	334	e 19 26	[− 8]	e 29 49	{+16}	e 22 42	PP		e 59·2
Durham		142·4	350	i 19 49	[+14]	—	—	i 22 44	PP		—
Cheb		142·4	334	e 19 34	[− 1]	e 26 55	[+12]	e 22 38	PP		—
Athens		142·8	310	i 19 25	[−10]	e 26 46	[+ 2]	i 23 0	PKS		—
De Bilt		143·3	342	i 19 33a	[− 3]	e 33 32	PS	i 23 0	PP		e 63·2
Rathfarnham Castle		144·5	354	i 19 39	[+ 1]	e 41 24	SS	e 26 15	PPP		e 56·1
Stuttgart		144·7	335	i 19 38a	[− 1]	i 29 33	{−15}	i 19 50	pPKP		e 67·2
Karlsruhe		144·8	337	i 19 37	[− 2]	—	—	—	—		e 67·2
Triest		145·0	328	i 19 38	[− 1]	i 26 56	[+ 9]	30 7	SKKKS		e 58·7
Kew		145·3	347	i 19 40a	[0]	e 40 59	SS	e 23 20	PKS		e 58·2
Strasbourg		145·4	335	i 19 40a	[0]	i 27 11	[+24]	i 33 46	PS		e 61·6
Zürich		146·0	335	e 19 40a	[− 1]	e 29 46	{−10}	e 23 20	PKS		—
Taranto		146·1	318	19 46	[+ 5]	29 46	{−11}	47 46	SSS		e 66·8
Chur		146·1	334	e 19 41a	[0]	—	—	i 23 19	PKS		—
Basle		146·3	335	e 19 32a	[− 9]	e 23 20	SKP	e 23 4	PP		—
Padova		146·7	329	i 19 43	[+ 1]	e 23 15	SKP	—	—		—
Bologna		147·0	330	i 19 47?a	[+ 4]	23 25	SKP	—	—		e 65·1
Neuchatel		147·0	335	e 19 42	[− 1]	—	—	—	—		—
Paris		147·0	342	i 19 44k	[+ 1]	i 27 26	[+36]	i 23 26	PP		e 61·2
Besançon		147·2	337	i 19 42	[− 1]	e 26 57	[+ 7]	i 26 41	PPP		—
Pavia		147·5	332	e 19 43	[0]	e 26 47	[− 3]	—	—		—
Florence		147·5	328	i 19 45a	[+ 2]	26 48	[− 2]	i 23 20	SKP		—
Prato		147·5	328	i 19 42	[− 1]	i 32 14	PKKS	—	—		—
Jersey	E.	147·8	347	e 19 50	[+ 6]	e 34 14?	PS	e 23 26	PP		62·2
Rocca di Papa		148·1	323	e 19 45	[+ 1]	i 23 26	SKP	—	—		—
Rome		148·2	323	i 19 42a	[− 3]	i 23 25	SKP	e 33 43	PS		—
Messina		148·4	316	e 19 45k	[0]	i 23 27	SKP	e 33 46	PS		—
Clermont-Ferrand		149·5	338	i 19 48	[+ 1]	i 23 9	SKP	i 23 30	PP		e 70·9
Tunis		152·8	319	e 20 0	[+ 8]	e 29 54	{−40}	e 27 0	PPP		e 64·2
Barcelona		153·6	336	20 13	[+20]	25 27	?	—	—		e 66·4
Tortosa		154·7	336	i 19 53	[− 1]	30 36	{ − 8}	23 53	PP		62·8
Algiers Univ.	z.	156·9	328	i 20 7a	[+10]	e 26 53	[− 8]	e 27 50	PPP		—
Toledo	z.	157·1	343	e 19 59	[+ 2]	e 24 5	PP	27 44	PPP		—
Alicante		157·3	337	20 2	[+ 4]	27 28	[+26]	31 11	SKKS		e 76·6
Lisbon		159·2	353	20 0a	[0]	38 14	PPS	24 16	PP		76·2
Granada		159·4	340	i 20 17a	[+17]	31 20	{+11}	20 50	pPKP		i 69·5
Malaga	z.	160·1	341	i 20 6k	[+ 5]	—	—	28 21	PPP		77·7
Lome		162·3	232	i 20 8	[+ 5]	i 26 50	[−17]	e 45 9	SS		e 68·9
Tamanrasset	z.	162·7	290	i 20 3k	[0]	e 35 14	SKSP	i 28 23	PPP		—

Additional readings :—
Brisbane iSSEN = 6m.57s.
Auckland iN = 6m.50s. and 13m.22s.
Apia e = 4m.54s. and 8m.39s.
Riverview iEN = 5m.8s. and 5m.32s., iN = 8m.28s., isSN = 9m.2s., iSSE = 9m.30s., iSSSN = 9m.43s.
Wellington P_cP? = 9m.10s.
Christchurch iPEN = 5m.33s., e = 7m.4s. and 9m.28s., eSN = 10m.14s.
Perth i = 14m.59s.
Shizuoka e = 12m.58s. and 15m.18s.
Kumagaya SSE = 23m.5s.
Nagoya eL? = 23m.2s.
Macbasi e = 13m.20s. and 17m.38s.
Sumoto iEN = 10m.46s., eEN = 13m.54s.
Gihu i = 10m.27s., PPP = 14m.21s., S_cS = 20m.38s., SS = 22m.42s.

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Koti ePP? =12m.54s.
Kobe eEN =10m.46s., eSEN =18m.56s., e =23m.16s., eN =23m.51s.
Matusiro SS =23m.18s., SSS =25m.46s.
Nagano P_cPN =11m.2s., PPN =11m.23s., eS_cSN =20m.13s., eSSN =23m.41s., Q = 26m.58s.
Sendai PPP? =16m.2s., S_cSN =19m.30s., SS? =22m.34s., SSSN =25m.58s., eN = 39m.49s.
Hukuoka e =10m.53s. and 12m.49s., Q =26m.48s.
Akita e =18m.50s.
Hatinohe SS =23m.57s.
Sapporo e =18m.37s. and 22m.11s.
Nanking i =12m.15s. and 14m.3s., iPS?N =20m.30s.
Berkeley eZ =21m.54s., eQN =35m.50s.
Lick iEN =13m.14s., eZ =23m.17s.
Fresno iNZ =13m.4s., iEZ =13m.17s., eZ =39m.18s.
Calcutta PPPE =17m.59s., SKS_2E =23m.11s., SE =23m.30s., PSE =24m.22s., PPSE = =24m.48s., SSE =29m.24s., SSSE =32m.23s., SPKKSE =33m.55s., $SKKS_2E$ = 35m.39s.
Pasadena iZ =13m.1s., 13m.5s., and 13m.23s., iSNZ =23m.22s., ePKP,PKP_2 =38m.50s., ePKP,PKP,PKPZ =59m.28s.
Mineral iZ =13m.16s., eN =14m.36s., ePKP,PKPZ =38m.51s.
Riverside iZ =13m.5s.
Palomar iZ =13m.21s.
Reno eZ =23m.30s., eN =24m.55s. and 36m.44s., eZ =40m.50s., eE =41m.32s., eN = 42m.50s.
Tinemaha iZ =13m.9s., ePKP,PKP,PKPZ =59m.33s.
Sitka iPP? =16m.54s., i =19m.37s., eSS =29m.14s.
College eS =23m.25s., ePS =26m.34s., eSS =29m.21s., iPKP,PKP =38m.23s., iSKP, PKP =42m.38s., ePKP,PKP,PKP =59m.35s.
Victoria PP =16m.41s., e =22m.34s., 24m.8s., and 24m.40s., PS =25m.43s., SS =32m.20s.
Seattle i =13m.34s., 14m.2s., and 18m.5s., iPPP =18m.51s., eSKS =23m.29s., i = 24m.14s., iPPS =25m.19s., i =26m.4s. and 27m.4s., iSS =28m.22s.
Boulder City i =15m.53s.
Overton ePKKP?Z =31m.9s.
Tucson ePP =16m.45s., eSKS =23m.37s., ePPS =26m.25s., i =26m.37s., eSSS? = 34m.46s.
Kodaikanal PPE =16m.41s., PPPE =18m.35s., PSE =25m.46s., SSPE =30m.55s., SSSE =34m.23s., QE =38m.53s.
Hyderabad PPE =17m.50s., PSE =26m.42s., SSN =30m.22s.
Salt Lake City ePP =17m.18s., iPS =25m.20s., eSS =30m.19s.
Logan i =13m.58s., e =17m.9s., ePP =17m.35s., ePPP =19m.20s., i =19m.41s., eS = 23m.55s., iS =25m.6s., eSS =32m.3s., eSSS? =35m.16s.
Butte ePP?N =18m.35s., eSN =25m.27s., eSSN =35m.11s.
Bozeman eSS? =32m.5s., eSSS =35m.21s.
Tacubaya e =19m.13s.
New Delhi iN =14m.16s., PPPN =19m.19s., iSN =24m.46s., iPSN =25m.53s., iN = 27m.27s. and 28m.11s., SSN =31m.17s., iN =32m.23s.
Poona PPEN =17m.30s., PPPEN =19m.32s., SKS_2EN =24m.38s., PSEN =26m.43s., PPSEN =27m.21s., PKKPEN =30m.13s., SSEN =31m.27s., PKKSEN =33m.22s., SSSEN =35m.46s., QN =40m.40s.
Bombay iPPE =17m.24s., iSE =24m.59s., iPSE =27m.26s., iPSN =27m.29s., QEN = 41m.0s.
Saskatoon PP =18m.38s., SS =36m.44s.
Rapid City ePSE =27m.24s., eSSE =33m.8s.
Frunse ePKP =17m.38s.
Lincoln ePPE =17m.55s., eSS?E =34m.6s., eSSSE =37m.46s.
Tashkent ePKP =17m.45s.
Resolute Bay eZ =18m.2s., e =18m.50s. and 21m.10s., eN =38m.2s.
St. Louis i =15m.0s., e =17m.57s., i =20m.14s.
Tananarive PS =28m.57s., SS =34m.52s., SSS =38m.45s., LQ =45m.22s.
Huancayo e =18m.35s. and 19m.41s., ePS? =28m.23s., iSS =34m.17s., iSSS =39m.14s.
La Plata PPPN =19m.38s.?, PPPE =21m.56s., SKKSN =25m.50s., PSE =28m.44s., PPS?N =29m.2s., SSN =34m.44s.?, SSSE =38m.44s.?, SSSN =39m.2s.?, QN = 45m.32s. and several other unidentified readings.
Chicago ePP =19m.41s., eS =27m.6s., iPS =29m.5s., eSSS =39m.22s.
Sverdlovsk PKP =18m.13s., PPP =22m.25s., SS =35m.56s., SSS =39m.50s.
La Paz iPPZ =19m.50s., iZ =20m.14s., PKS =22m.18s., iSKKS =26m.46s., iPS = 29m.16s., i =30m.14s.?, iSS =35m.54s., SSS =40m.4s., i =43m.50s., Q =49m.2s.
Grahamstown iZ =18m.58s.
Chinchina eSKP =20m.20s., eSKSEN =24m.40s., ePPS =30m.12s.
Cleveland iPKPZ =18m.58s.
Columbia iPKP =18m.44s., ePP =20m.4s., eSS =36m.18s., eSS =40m.28s.
Bogota ePPEN =20m.40s., eSKKSEN =27m.32s., eSPEN =30m.3s., eSSEN =37m.48s.
Pittsburgh i =30m.8s.
New Kensington ePPE =20m.35s., ePSE =30m.5s., eSSE =36m.29s.
Pennsylvania iN =19m.34s., iE =20m.20s., iPP =20m.34s., iN =21m.57s. and 26m.22s., iSKKSN =26m.55s., iN =27m.15s.
Washington ePP =20m.33s., iPPS =32m.56s.

Continued on next page.

Ottawa PP =20m.43s., e =22m.32s., PS =30m.24s., SS =37m.24s.
Philadelphia ePP =20m.22s., i =21m.0s., eSKS =26m.20s., iSKS =26m.30s., ePPS = 32m.9s., eSS =37m.3s., i =37m.38s., eSSS =41m.49s.
Fordham epPP? =20m.50s., iSKKS? =27m.36s.
Palisades iPP =20m.46s., iPKS =22m.38s., iSKKS =27m.40s., ePS? =30m.30s., ePPS = 32m.17s., eSS =37m.42s.
Shawinigan Falls eN =20m.34s.
Seven Falls PPE =19m.11s., SKSE =25m.26s., SSS =38m.8s.
Harvard ePP =20m.54s., i =21m.56s. and 23m.54s., eSS =38m.12s., eSSS =42m.33s.,
San Juan e =19m.47s., iSS =38m.22s., ePKP,PKP =40m.3s.
Halifax i =22m.48s., PPP =24m.40s., SS =39m.38s.
Ivigtut e =19m.35s., i =21m.48s., 22m.40s., 22m.55s., and 23m.23s.
Helsinki iZ =19m.25s., 19m.42s., 20m.42s., 21m.56s., 23m.14s., and 23m.27s., iEN = 23m.32s., eE =24m.9s., 24m.38s. and 32m.30s., eN =41m.33s., eE =43m.13s. and 46m.21s.
Bermuda iPKS =22m.27s., iPS =32m.33s., iPPS =33m.38s.
Upsala ePP =21m.45s., eE =22m.5s., ePKSN =22m.42s., i =23m.7s. and 23m.42s., eN =27m.14s., eE =27m.44s., eN =31m.39s. and 34m.14s.?, eE =35m.14s.?, eSSSN =44m.39s.
Reykjavik eN =21m.20s., eSKPEN =23m.16s., eEN =29m.42s., eN =34m.23s. and 40m.40s.
Bergen PPEN =23m.4s., PKSEN =23m.59s., eN =25m.6s.?, PPPE =26m.19s., PPPN = 26m.27s., P_cP,PKP?N =27m.53s., eN =31m.14s., SKKSN =34m.52s., SSN = 46m.6s.?, eN =52m.44s.
Warsaw eZ =19m.37s., $ePKP_2$ =19m.53s., iNZ =20m.11s., iZ =20m.24s., PP =22m.16s., SKP =23m.1s., i =23m.37s. and 24m.33s., PPP =25m.22s., iEN =27m.33s., i = 28m.31s., PS =32m.25s., iEZ =33m.46s., PPSEN =34m.31s., SS =40m.28s., SSS = 45m.23s.
Bucharest eN =19m.43s. and 20m.18s., iE =23m.3s., iEN =23m.27s., iN =24m.48s., iE =25m.43s. and 28m.21s., iN =29m.31s.
Helwan eE =20m.5s. and 20m.32s., SKSN =22m.58s., PSN =35m.5s.
Skalnate Pleso e =19m.50s. and 20m.23s., eN =21m.4s., ePP =22m.18s., eE =22m.29s., iN =23m.3s., iSKP =23m.16s., e =23m.34s., i =24m.16s., ePPP =25m.51s., eSKSN = 26m.39s., eE =27m.40s., eSKSP =32m.53s., eE =34m.31s., eSSS =45m.44s.
Raciborzu $ePKP_2$N =20m.9s., ePPE =22m.2s., ePPPE =25m.13s., eSKSEN =26m.2s., eP_cP,PKPE =27m.14s., eSKKSE =29m.2s.
Aberdeen iE =23m.25s., iSKSEN =27m.49s., iE =29m.27s., iPSKSE =33m.30s., iN = 35m.6s.
Potsdam ePKPN =19m.35s., ipPKP?N =20m.8s., iSKPEN =22m.48s., iE =23m.16s. and 28m.10s., iN =28m.13s., ePS =33m.14s., eN =33m.50s., iE =39m.7s.
Timisoara eN =23m.19s.?.
Budapest N. PP =22m.48s., PKS =23m.14s. and 23m.48s., SKKS =29m.46s., ePPS = 35m.16s., SS =42m.8s., eSSS =46m.14s.?.
Budapest E. e =22m.52s., PP =23m.5s., e =24m.6s., SKKS =29m.54s., eSSS =46m.38s.
Sofia e =19m.59s.
Ogyalla e =19m.58s., 20m.25s., 20m.49s. and 21m.26s., ePP =22m.14s., e =24m.8s., 25m.2s., and 26m.0s., eSKS? =26m.22s., e =27m.24s., 28m.30s., 29m.49s., and 30m.58s., ePPS =35m.20s., e =35m.32s., and 38m.27s., eSS =40m.14s., e =42m.50s.
Collmberg ePPPE =26m.12s., eSKSPE =33m.8s., ePPSE =35m.33s., eSSE =41m.19s. and many unidentified readings.
Edinburgh PPE =22m.41s., PPPE =25m.49s., PKKPE =28m.47s., SKKSE =29m.31s., PPSE =35m.4s., SSE =41m.11s., SSPE =41m.46s.
Prague $ePKP_2$ =19m.58s., eSKP =23m.3s., eSKKS? =28m.49s., eSKSP =33m.4s., ePS =33m.47s., ePPS =35m.14s., eSS =40m.58s., eSSS =46m.44s. and many other unidentified e readings.
Kalossa iN =20m.6s., PKSN =23m.46s., PKSE =23m.52s., eE =24m.35s., iN =24m.48s., ePPPN =25m.59s.
Belgrade i =19m.34s., iPKP =22m.11s., iPKS =25m.54s., ePPP =28m.13s., eQ = 46m.53s.
Jena ePKPE =19m.30s., iPKPZ =19m.33s., ePPE =22m.17s., ePKS?Z =22m.48s. and many unidentified readings.
Durham iN =20m.6s., iEN =20m.42s.
Cheb e =20m.8s., iN =21m.3s., eN =21m.56s., eSKPN =23m.32s., eN =25m.38s., 27m.58s., and 28m.40s., ePSN =34m.9s., eN =34m.50s., ePPS?N =35m.39s., eSSN =41m.2s., eN =45m.8s.
Rathfarnham Castle iEN =20m.4s., ePP =22m.43s., e =28m.28s., eEN =32m.45s., ePPSEN =35m.14s., eSSSEN =46m.23s.
Stuttgart ipPKP? =20m.10s., i =20m.25s. and 21m.8s., iPP =22m.9s., ipPP =22m.24s., iSKP =23m.16s. and 23m.20s., iPSKS =33m.24s., iPS =34m.32s., i =38m.54s., e =43m.46s. and 44m.12s.
Triest $iPKP_2$Z =19m.51s., iPP =23m.16s., iSKP =23m.30s., iPPP =26m.40s., iSKKS = 29m.34s., iSKKP =30m.27s., iPS =33m.35s., iPPS =36m.33s., iSS =42m.5s., iPSS = 43m.20s., iSSS =48m.10s.
Kew $iPKP_2$ =20m.4s., ePPP =26m.39s., ePKKP? =28m.33s., ePSEN =33m.26s., ePPS =42m.21s.
Strasbourg iPKS =22m.53s., iPP =23m.18s., iSKS =27m.15s., iPP_2 =28m.11s., $iPPP_2$ =34m.19s., ePKP,PKP =36m.52s., eSS =42m.20s., iSSP? =43m.11s., iSSS = 48m.7s., eSSS =48m.20s. and many unidentified readings.

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Taranto e =25m.46s., 39m.46s., and 55m.46s.
Chur i =20m.26s.
Padova i =21m.44s., e =30m.14s.
Bologna iZ =20m.29s., e =21m.44s. and 24m.7s.
Paris iPPP =26m.46s., iPPS =36m.40s. and many other i readings.
Besançon i =27m.17s., e =30m.32s. and 32m.27s., ePS =34m.18s.
Pavia iZ =19m.46s., 20m.20s., and 21m.55s., i =22m.50s., e =25m.26s. and 27m.39s.
Florence iZ =20m.15s., i =23m.26s.
Jersey eE =20m.11s., 20m.29s., and 28m.14s.?, eSS?E =43m.18s.
Rocca -di -Papa i =20m.4s. and 20m.21s.
Rome i =19m.45s. and 21m.22s.
Messina iZ =19m.50s. and 20m.55s., i =27m.19s.
Clermont-Ferrand i =20m.16s., 20m.24s., 21m.13s., and 22m.22s., iSKS? =27m.28s.
Tunis i =20m.42s., ePP =24m.7s.
Tortosa iPKP$_2$EN =20m.20s., iE =24m.39s., PPP?N =27m.25s., PPSE =36m.49s., SS?N =43m.42s., QN =57m.13s.
Algiers Univ. ePKP$_2$Z =20m.27s., ePKSZ =23m.29s., ePPZ =24m.5s.
Toledo iZ =20m.32s. and 24m.37s.
Alicante PKP$_2$ =20m.36s., PP =24m.24s., PPP =28m.14s., PPS =39m.3s., SS =45m.58s., SSP =46m.50s., SSS =52m.48s., Q =68m.20s.
Lisbon PKP$_2$EZ =20m.37s., E =21m.9s., Z =24m.57s., SSN =45m.2s., SSSN =50m.56s., E =56m.14s., Q?EN =64m.14s.
Granada PKP$_2$ =21m.2s., iPP =24m.42s., pPP =25m.35s., SKS =27m.14s., sSKS =28m.2s., sSKKS =32m.38s., SKSP =35m.26s., iSS =44m.47s., SSS =50m.41s., Q =58m.8s.
Malaga PKP$_2$Z =20m.58s., iZ =24m.18s., iPPZ =24m.57s.
Lome iPKP$_2$ =21m.2s., eSSP? =46m.48s. and many unidentified readings.
Tamanarsset iPKP$_2$Z =21m.6s., ePPZ =24m.56s., eP$_c$P,PKPZ =32m.31s., ePPSZ =38m.8s., eSSZ =44m.26s., eSSS?Z =51m.50s.

Dec. 2d. Many aftershocks from the epicentre of 19h. were noted throughout the world, particularly in California. Following is the list of these aftershocks as recorded in California, the reading given being that for P at China Lake.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
20	4	43	21	8	20	21	59	38	23	9	0
20	8	21	21	13	23	22	4	25	23	14	34
20	17	15	21	17	44	22	18	3	23	28	11
20	30	8	21	22	26	22	22	5	23	34	59
20	34	26	21	28	5	22	27	16	23	38	27
20	40	40	21	29	16	22	31	3	23	47	24
20	44	47	21	31	23	22	41	12	23	52	7
20	15	31	21	38	48	22	45	51	23	55	43
21	4	33	21	52	13						

Dec. 2d. Readings also at 1h. (near Dzhergetal), 2h. (near Prague and near Istanbul), 3h. (near Istanbul), 4h. (Sofia, near New Delhi, near Istanbul, and Yalta), 5h. (near Huancayo), 6h. (Moscow), 7h. (College, near Apia, and near Grahamstown), 8h. (near Dzhergetal), 9h. (College and near Dzhergetal), 10h. (Puebla and Vera Cruz), 12h. (near Gandzha, Stepanavan, and Tsikhlis-Dzhvari), 13h. (near Dzhergetal), 15h. (Stuttgart, near Dzhergetal (3), and near Klyuchi), 16h. (Tucson, Overton, Pierce Ferry, College, and near Klyuchi (3)), 17h. (Brisbane, Christchurch, Wellington, Overton, Pierce Ferry, Shasta Dam, and College), 18h. (Huancayo, La Paz, San Juan, Palomar, Pasadena, Perris, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Mineral, Shasta Dam, and Hungry Horse), 19h. (near Klyuchi and near Dzhergetal), 23h. (near Stuttgart).

Dec. 3d. 6h. 26m. 52s. Epicentre 29°·0N. 96°·0E. (as on 1950, November 21d.).

$A = -·0916$, $B = +·8712$, $C = +·4823$; $\delta = -1$; $h = +2$;
$D = +·995$, $E = +·105$; $G = -·051$, $H = +·480$, $K = -·876$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	9·5	229	e 2 14	− 6	i 3 52	−18	—	—	—
New Delhi		16·5	273	i 3 48	− 6	i 6 37	−21	4 1	PP	7·4
Przhevalsk		19·6	317	i 4 34	+ 2	8 15	+ 7	—	—	—
Hyderabad		19·8	238	i 4 33	− 2	i 8 7	− 6	—	—	10·2
Nanking		19·9	74	4 37	+ 1	e 8 19	+ 4	—	—	e 10·0
Naryn		20·5	318	i 4 42	0	8 30	+ 3	—	—	—
Almata		20·9	318	i 4 47	+ 1	e 8 35	0	—	—	—
Frunse		22·1	314	i 5 0	+ 1	i 10 2	+64	—	—	—
Andijan		22·6	307	5 4	+ 1	9 7	0	—	—	—
Dzhergetal		22·8	304	e 5 4	− 1	—	—	—	—	—
Poona		22·8	247	i 5 3	− 2	i 8 58	−13	5 26	PP	10·2
Fergana		22·9	306	i 5 6	0	—	—	—	—	—
Bombay		23·4	249	i 5 14	+ 3	i 9 22	+ 1	—	—	—
Kulyab		23·6	299	e 5 14	+ 1	e 9 27	+ 2	—	—	—
Obi-garm		23·8	301	i 5 16	+ 1	i 9 27	− 1	—	—	—
Irkutsk		24·1	12	i 5 22	+ 4	9 41	+ 7	—	—	—
Semipalatinsk		24·5	336	e 5 22	0	—	—	—	—	—
Stalinabad		24·5	301	i 5 22	0	i 9 38	− 2	—	—	—
Lunacharskoe		25·0	306	i 5 29	+ 2	—	—	—	—	—
Tashkent		25·0	306	i 5 26	− 1	i 9 45	− 4	—	—	—
Kodaikanal	E.	25·5	227	i 5 32	0	i 9 52	− 5	10 45	Q	12·0
Samarkand		26·1	301	i 5 40	+ 3	—	—	—	—	—
Mary		29·7	297	i 6 9	− 1	—	—	—	—	—
Vladivostok		32·0	55	—	—	e 11 25	−17	—	—	—
Ashkabad		32·5	297	6 35	+ 1	—	—	—	—	—
Djakarta		36·5	162	i 7 8	− 1	e 12 51	0	—	—	—
Sverdlovsk		37·3	328	i 7 17	+ 1	13 4	0	—	—	—
Bandong		37·4	160	e 7 14	− 2	—	—	—	—	—
Baku		39·2	300	e 7 33	+ 2	—	—	—	—	—
Shemakia		40·1	300	7 40	+ 1	—	—	—	—	—
Grozny		42·4	304	e 8 0	+ 2	—	—	—	—	—
Sotchi		46·8	305	e 8 37	+ 4	—	—	—	—	—
Moscow		48·9	321	i 8 47	− 3	i 15 48	− 5	—	—	—
Yalta		50·8	306	e 9 3	− 1	—	—	—	—	—
Ksara		50·9	291	e 9 5	0	e 16 21	0	—	—	—
Pulkovo		53·2	326	i 9 24	+ 2	—	—	—	—	—
Istanbul		54·9	302	e 9 33	− 2	—	—	—	—	—
Lwow		57·1	313	—	—	e 23 37	SSS	—	—	—
Copenhagen		63·0	322	e 10 31	0	—	—	—	—	33·1
Prague		63·2	315	—	—	e 18 44	−15	—	—	e 27·1
Collmberg		63·7	315	e 10 35	− 1	—	—	c 12 22	PP	e 37·1
Jena	E.	64·7	315	e 10 41	− 1	—	—	—	—	—
Triest	Z.	64·8	310	i 10 41	− 2	—	—	—	—	—
Messina		65·7	302	e 10 48	0	e 19 28	− 6	—	—	—
Rome		66·7	306	e 10 53	− 2	—	—	—	—	—
Stuttgart		66·8	314	i 10 54a	− 2	e 15 38	P_cS	—	—	e 36·1
Karlsruhe	Z.	67·2	316	i 10 47	−11	—	—	—	—	—
Strasbourg		67·8	315	e 11 1	− 1	—	—	e 11 22	P_cP	37·1
De Bilt		68·2	319	—	—	e 20 8	+ 4	—	—	e 37·1
Besançon		69·3	314	i 11 11	0	—	—	—	—	—
Paris		70·9	316	e 11 20	− 1	—	—	i 11 44	P_cP	e 40·1
Kew		71·6	320	i 11 24	− 1	e 20 59	+15	—	—	e 38·1
Rathfarnham Castle		74·1	323	i 11 41	+ 1	—	—	e 14 46	PP	e 39·6
College		74·3	23	e 11 40	− 1	e 20 49	−26	e 25 32	SS	e 30·7
Algiers Univ.	Z.	75·5	305	e 11 46	− 2	—	—	e 14 26	PP	—
Resolute Bay	Z.	76·3	4	11 52	0	—	—	—	—	—
Brisbane	Z.	78·3	130	i 12 13a	+10	—	—	—	—	—
Tamanrasset	Z.	79·7	290	e 12 11	0	—	—	e 15 12	PP	—
Riverview		81·4	136	i 12 30a	+10	i 22 35	+ 4	—	—	—
Hungry Horse		98·4	19	i 13 43	+ 2	—	—	i 17 44	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		98·5	101	(13 10)	−32	13 10	P	—	—	—
Tinemaha	z.	106·9	28	e 18 46	PP	—	—	—	—	—
China Lake	z.	108·2	28	e 18 56	PP	—	—	—	—	—
Overton	z.	108·8	24	e 19 2	PP	—	—	—	—	—
Boulder City		109·2	26	e 15 49	P	—	—	e 19 0	PP	—
Pasadena	z.	109·4	29	e 18 57	PP	—	—	e 28 34	PKKP	—
Riverside	z.	109·8	29	e 19 7	PP	—	—	—	—	—
Tucson		114·0	25	e 18 52	[+11]	—	—	—	—	—
Bogota		145·2	343	i 19 42	[+ 2]	—	—	—	—	58·1
Chinchina		145·3	345	(i 19 44)	[+ 4]	—	—	—	—	—
La Paz		160·8	308	e 20 31	[+29]	—	—	—	—	—

Additional readings and note :—
New Delhi PPPEN =4m.7s., QEN =6m.33s., SSN =6m.54s., SSSN =7m.5s.
Nanking iN =8m.29s.
Poona PPPE =5m.36s., QE =9m.10s., SSE =9m.37s., SSSE =9m.53s., S_cPE =12m.30s.
S_cSE =16m.10s.
Jena eEN =10m.52s., eE =11m.23s. and 11m.57s.
Stuttgart eZ =11m.4s.
Strasbourg e =11m.11s. and 12m.53s., ePP =13m.41s., e =14m.8s.
Besançon eP? =11m.1s., e =11m.56s.
Paris i =11m.28s., iPP =14m.11s., i =14m.26s.
Kew iZ =11m.33s.
Rathfarnham Castle eZ =12m.8s. and 25m.11s.
Hungry Horse i =13m.48s.
Pasadena iZ =19m.4s.
Bogota i =19m.51s.
Chinchina reading has been increased by 2m.
Long waves were also recorded at Upsala, Warsaw, Cheb, Potsdam, Florence, and other American stations.

Dec. 3d. 7h. 47m. 33s. Epicentre 18°·0S. 167°·7E. (as on 2d.).

$A = -·9299$, $B = +·2027$, $C = -·3071$; $\delta = +11$; $h = +5$;
$D = +·213$, $E = +·977$; $G = +·300$, $H = -·065$, $K = -·952$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Brisbane		16·5	232	i 3 51a	− 3	e 6 49	− 9	—	—	i 8·6
Auckland	N.	19·8	162	i 4 44	+ 9	i 8 28	+15	5 4	PP	10·4
Apia		20·2	82	e 5 38	+59	e 7 27	−54	e 5 51	PP	—
Riverview		21·6	219	i 4 53k	− 1	i 8 56	+ 7	i 5 22	PP	e 10·0
Tuai	N.	22·3	161	e 4 59	− 2	9 8	+ 6	—	—	—
Wellington		24·0	167	i 5 18	+ 1	e 9 45	+13	i 5 41	pP	15·3
Kaimata	N.E.	24·6	174	e 5 27	+ 4	—	—	e 5 51	PP	—
Christchurch		25·8	171	i 5 34	0	10 1	− 1	i 6 6	PP	e 12·6
Perth		48·6	242	—	—	i 18 29	?	i 19 50	SS	i 23·8
Bandong		59·4	274	e 10 15	+ 9	—	—	—	—	—
Djakarta		60·4	274	e 9 58	−15	e 18 4	−24	—	—	—
Vladivostok		69·2	332	i 11 10	0	i 20 14	− 2	—	—	—
Ukiah		85·9	47	—	—	e 22 4	?	—	—	e 39·8
Berkeley		86·0	48	i 12 46k	+ 3	e 23 13	− 4	—	—	e 39·6
Lick	z.	86·2	48	i 12 47k	+ 3	—	—	i 12 57	pP	—
Shasta Dam		87·2	45	i 12 49	0	—	—	—	—	—
Fresno		87·3	50	e 12 51a	+ 1	—	—	e 16 26	PP	—
Pasadena		87·5	53	e 12 51	0	—	—	—	—	e 40·0
Mineral	z.	87·6	47	e 12 54	+ 3	—	—	—	—	—
Riverside	z.	88·0	53	i 12 50	− 3	—	—	i 13 2	pP	—
Palomar	z.	88·1	54	i 12 53	− 1	—	—	e 13 8	pP	—
Reno	z.	88·5	48	e 12 53a	− 3	—	—	—	—	—
China Lake	z.	88·6	52	i 12 55	− 1	—	—	i 13 7	pP	—
Tinemaha	z.	88·6	50	e 12 56	0	—	—	—	—	—
Sitka		88·8	27	—	—	e 23 51	+ 7	—	—	e 39·1
College		89·3	17	i 12 56	− 3	e 23 8	[−21]	i 13 9	pP	e 35·8
Victoria	z.	90·1	38	e 13 1	− 2	—	—	—	—	—
Seattle		90·3	40	e 13 6	+ 2	e 23 57	0	i 13 50	pP	—
Boulder City		90·7	52	e 13 6	0	—	—	i 13 18	pP	—
Overton	z.	91·2	52	i 13 9	+ 1	—	—	i 13 21	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		91·4	52	i 13 9	0	—	—	i 13 21	pP	—
Tucson		92·5	56	i 13 14	0	—	—	i 13 27	pP	—
Kodaikanal	E.	93·3	279	—	—	e 23 54	[+ 2]	—	—	—
Salt Lake City		94·6	48	—	—	e 23 57	[− 2]	e 26 3	PS	e 43·8
Logan		94·9	47	e 14 28	?	e 24 1	[0]	—	—	e 45·0
Hungry Horse		95·7	41	e 13 24	− 5	—	—	—	—	—
Bozeman		96·8	44	—	—	e 24 12	[+ 1]	—	—	e 42·8
Bombay		100·1	286	e 17 27?	PP	e 24 33	[+ 6]	e 26 57	PS	—
Rapid City	E.	101·7	47	—	—	e 24 28	[− 7]	—	—	e 50·6
Lincoln	E.	105·7	52	—	—	e 27 37	PS	—	—	—
La Plata		111·8	141	17 51	[−46]	25 3	[−17]	19 29	PP	56·4
La Paz		115·2	119	18 56	[+13]	i 25 42	[+ 9]	19 50	PP	55·0
Pennsylvania	E.	119·9	52	—	—	i 30 6	PS	—	—	—
Ottawa	Z.	121·2	46	e 18 53	[− 2]	—	—	—	—	—
Philadelphia		122·0	53	—	—	e 37 55	SS	—	—	e 54·9
Harvard		124·5	50	e 19 2	[+ 1]	—	—	—	—	e 61·0
Weston		124·7	50	i 19 1	[− 1]	—	—	—	—	—
San Juan		129·0	80	i 19 8	[− 2]	e 33 32	PPS	e 22 32	PKS	—
Bermuda		130·8	62	e 22 27	PKS	e 33 26	PPS	—	—	e 58·6
Ksara		134·3	299	e 19 24?	[+ 4]	—	—	—	—	—
Helwan	z.	138·6	295	19 31	[+ 3]	22 55	PKS	22 22	PP	—
Collmberg	z.	141·2	334	e 19 28	[− 5]	—	—	e 22 44	PP	—
Prague		141·5	332	e 22 12	PP	e 23 10	PKS	—	—	—
Rathfarnham C.	z.	144·5	354	i 19 39	[+ 1]	—	—	—	—	—
Stuttgart	z.	144·7	335	e 19 37	[− 2]	—	—	—	—	—
Karlsruhe		144·8	337	i 19 40	[+ 1]	—	—	—	—	—
Triest		145·0	328	e 19 34?	[− 5]	—	—	e 19 52	PKP_2	—
Kew	z.	145·3	347	i 19 40	[0]	—	—	—	—	—
Strasbourg		145·4	335	i 19 40	[0]	—	—	e 23 30	PP	—
Zürich		146·0	335	e 19 26	[−15]	—	—	e 19 40	PKP	—
Chur		146·1	334	e 19 41	[0]	—	—	—	—	—
Taranto		146·1	318	e 21 0	?	—	—	—	—	—
Basle		146·3	335	e 19 40	[− 1]	—	—	—	—	—
Padova		146·7	329	e 19 48	[+ 6]	—	—	—	—	—
Paris		147·0	342	e 19 43s	[0]	i 34 25	PS	i 23 2	PP	—
Besançon		147·2	337	e 19 42	[− 1]	—	—	—	—	—
Florence		147·5	328	i 19 47	[+ 4]	—	—	—	—	—
Pavia	z.	147·5	332	e 19 46	[+ 3]	—	—	—	—	—
Prato		147·5	328	i 19 45	[+ 2]	—	—	—	—	—
Rome		148·2	323	i 19 44	[− 1]	—	—	e 22 28	PP	—
Messina	z.	148·4	316	e 19 53	[+ 8]	—	—	—	—	—
Algiers Univ.	z.	156·9	328	e 20 1	[+ 4]	e 20 39	PKP_2	e 24 21	PP	—
Tamanrasset	z.	162·7	290	e 20 4	[0]	e 21 4	PKP_2	e 24 39	PP	—

Additional readings :—
Brisbane eE =7m.0s.
Riverview i =5m.7s., iE =5m.14s., 5m.27s., and 5m.55s., iZ =6m.1s., iE =7m.9s., iN =9m.2s., iZ =9m.6s., isSEN =9m.12s., iZ =9m.16s.
Wellington PP? =6m.2s., i =7m.17s., P_cP =8m.43s.
Christchurch SS =10m.39s.
Berkeley iZ =13m.3s., eN =27m.51s., eEN =28m.13s., eN =35m.57s.
Fresno eZ =13m.3s., eE =13m.17s., eZ =17m.15s.
College ePP =16m.18s.
Seattle i =13m.12s., 13m.17s., 13m.23s., and 14m.24s.
La Plata PPSE =28m.51s., SSSN =38m.51s.
La Paz iZ =20m.32s., e =26m.32s., iPS =29m.33s., SS =35m.47s.
Collmberg eZ =19m.44s.
Prague e =24m.9s.
Stuttgart iZ =19m.42s., eZ =19m.51s. and 21m.28s.
Strasbourg i =19m.43s. and 19m.52s., e =20m.19s., 20m.56s., 22m.7s., and 23m.34s.
Paris i =19m.50s., 19m.58s., 20m.13s., 21m.23s., and 24m.24s.
Besançon e =19m.57s., i =20m.16s. and 20m.31s.
Rome e =21m.22s.
Algiers Univ. eZ =20m.10s.
Tamanrasset eZ =20m.17s.
Long waves were also recorded at Santa Clara, Seven Falls, Palisades, Chicago, and Granada.

Dec. 3d. 18h. 26m. 3s. Epicentre 36°·5N. 71°·0E. (as on 1950, May 17d.).

$A = +\cdot2623$, $B = +\cdot7619$, $C = +\cdot5922$; $\delta = -1$; $h = 0$;
$D = +\cdot946$, $E = -\cdot326$; $G = +\cdot193$, $H = +\cdot560$, $K = -\cdot806$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		2·4	335	i 0 47	P_g	—	—	—	—	—
Dzhergetal		2·7	4	i 0 50	+ 5	1 20	+ 1	—	—	—
Stalinabad		2·7	319	i 0 50	+ 5	1 22	+ 3	—	—	—
Fergana		3·9	9	i 1 6	+ 4	i 2 52	+62	—	—	—
Andijan		4·4	15	1 12	+ 2	i 2 29	S_g	—	—	—
Samarkand		4·5	317	i 1 13	+ 2	i 2 36	S_g	—	—	—
Lunacharskoe		5·0	347	i 1 20	+ 2	i 2 18	0	—	—	—
Tashkent		5·0	347	i 1 20	+ 2	i 2 19	+ 1	—	—	—
Naryn		6·3	37	i 1 36	0	e 2 45	− 5	—	—	—
Frunse		7·0	23	i 1 46	0	—	—	—	—	—
Mary		7·4	281	e 1 52	0	e 3 13?	− 5	—	—	—
Almata		8·2	33	i 2 2	− 1	—	—	—	—	—
Przhevalsk		8·3	42	i 2 4	0	—	—	—	—	—
New Delhi		9·4	145	e 2 16	− 2	i 3 52	−15	2 35	P*	—
Ashkabad		10·2	282	—	—	4 19	− 8	—	—	—
Bombay		17·6	176	e 4 6	− 2	i 7 25	+ 2	i 8 1	SSS	—
Poona		18·1	171	i 4 11	− 3	i 7 22	−13	4 32	PPP	8·2
Hyderabad		20·1	159	5 3	+25	8 19	0	—	—	—
Calcutta	E.	20·5	129	e 4 51	+ 9	i 8 22	− 5	5 9	PP	9·2
Sverdlovsk		21·5	345	i 4 49	− 3	8 43	− 4	—	—	—
Kodaikanal	E.	26·8	168	—	—	e 10 21	+ 2	—	—	—
Istanbul		32·8	291	e 6 36	− 1	—	—	—	—	—
Athens		37·4	286	e 7 12	− 4	—	—	—	—	—
Prague		42·4	307	e 7 57	− 1	e 14 22	+ 2	e 9 38	PP	—
Collmberg	Z.	43·2	308	e 8 1	− 3	—	—	e 9 50	PP	—
Copenhagen		43·4	317	i 8 4	− 2	—	—	—	—	—
Jena	E.	44·1	308	e 8 10	− 2	—	—	e 9 59	PP	—
Stuttgart	Z.	45·9	306	e 8 24	− 2	—	—	—	—	—
Strasbourg		46·9	306	e 8 31	− 3	—	—	e 10 13	PP	—
Besançon		48·3	305	e 8 35	−10	—	—	e 10 31	PP	—
Paris		50·2	307	e 8 57	− 3	—	—	—	—	—
Tamanrasset	Z.	57·5	276	e 9 50	− 3	—	—	e 11 51	PP	—
College		74·5	16	i 11 35	− 7	—	—	i 12 0	P_cP	—
Grahamstown	Z.	80·9	217	i 12 13	− 4	—	—	—	—	—
Hungry Horse		95·4	4	i 13 22	− 6	—	—	—	—	—
Riverview		102·3	123	—	—	i 37 53	SSS	—	—	e 39·4
Overton	Z.	107·2	4	e 18 53	PP	—	—	—	—	—
Pierce Ferry		107·6	4	e 18 18	[−10]	—	—	—	—	—

Additional readings :—
New Delhi SSEN = 4m.3s.
Poona SSE = 7m.34s., SSSE = 7m.49s.
Calcutta PPPE = 5m.21s., SSE = 8m.36s., SSSE = 8m.58s., P_cPE = 9m.35s., P_cSE = 13m.5s., S_cSE = 16m.47s.
Prague e = 8m.32s., 10m.4s., 10m.32s., and 12m.13s.
Collmberg eZ = 8m.35s.
Jena eN = 8m.13s.?, eEN = 8m.47s., eN = 9m.4s., eE = 11m.59s.
Stuttgart eZ = 8m.47s.
Strasbourg e = 9m.2s., 9m.22s., and 10m.24s.
Besançon ePPP = 11m.35s.
Paris i = 9m.14s., e = 9m.40s.
Tamanrasset eZ = 14m.9s.
Grahamstown iZ = 12m.38s.
Long waves were also recorded at Christchurch.

Dec. 3d. Continuation of the list of aftershocks from the epicentre of 2d. 19h. The times entered continue those of P at China Lake.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	18	22	2	59	42	6	48	39	12	18	26
0	24	34	3	2	24	7	30	33	12	42	32
0	46	47	3	20	40	7	50	1	12	47	15
1	36	34	4	2	49	8	0	28	13	30	40
1	44	47	4	30	3	8	35	5	13	39	52
1	59	51	4	40	11	8	35	28	13	44	41
2	0	29	4	44	55	9	53	7	16	14	24
2	13	14	6	9	43	10	12	39	17	19	32
2	15	24	6	13	37	10	14	9	19	7	58
2	19	18	6	26	17	12	8	11	20	17	31
2	45	51	6	29	15	12	15	10	20	38	15

Dec. 3d. Readings also at 0h. (near Dzhergetal (3)), 1h. (Tucson (2), Logan, Hungry Horse, Shasta Dam (2), near Boulder City (2), Overton (2), and Pierce Ferry (2)), 2h. (Ashkabad), 3h. (near Dzhergetal), 4h. (Tucson, Logan, Hungry Horse, Overton (2), Pierce Ferry (2), near Boulder City and near Shasta Dam), 5h. (Boulder City, Pierce Ferry (2) and Overton (2)), 6h. (Hungry Horse, Shasta Dam, Tucson, Boulder City, Pierce Ferry, and near Overton), 11h. (near Prague), 12h. (near Istanbul and near Ashkabad), 13h. (Leninakan, near Dzhergetal, Gandzha, Stepanavan, Tiflis, and Tsikhlis-Dzhvari), 16h. (near Dzhergetal (2) and near Overton), 18h. (near Shemakla and near Dzhergetal), 19h. (near Prague), 20h. (College and near Dzhergetal), 21h. (College and near Istanbul), 22h. (Boulder City, near Overton, near Dzhergetal, and near Przhevalsk), 23h. (College, Naryn, near Andijan, Dzhergetal, Fergana, Samarkand, and Stalinabad). Many other readings are given on this day associated with the above list of repetitions.

Dec. 4d. 1h. 44m. 3s. Epicentre 18°·0S. 167°·7E. (as on 3d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		21·6	219	i 4 57a	+ 3	e 8 50	+ 1	—	—	e 10·2
Shasta Dzm		87·2	45	i 12 49	0	—	—	i 12 59	pP	—
Pasadena		87·5	53	12 48	− 3	—	—	12 58	pP	—
China Lake		88·6	52	12 54	− 2	—	—	13 4	pP	—
College		89·3	17	e 12 57	− 2	—	—	e 13 7	pP	—
Boulder City		90·7	52	e 13 7	+ 1	—	—	—	—	—
Overton	z.	91·2	52	e 13 8	0	—	—	i 13 17	pP	—
Pierce Ferry		91·4	52	i 13 9	0	—	—	i 13 18	pP	—
Tucson		92·5	56	e 13 13	− 1	—	—	e 13 24	pP	—
Palisades		122·9	52	e 18 23	[−35]	—	—	—	—	—
Stuttgart	z.	144·7	335	e 19 36	[− 3]	—	—	—	—	—
Strasbourg		145·4	335	e 19 40	[0]	—	—	—	—	—
Paris		147·0	342	e 19 46	[+ 3]	—	—	—	—	—
Besançon		147·2	337	e 19 45	[+ 2]	—	—	—	—	—

Additional readings :—
Stuttgart eZ =19m.46s. and 20m.16s.
Strasbourg e =19m.50s.
Long waves were also recorded at Christchurch and Wellington.

Dec. 4d. 3h. 55m. 43s. Epicentre 18°·0S. 167°·7E. (as at 1h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		21·6	219	e 4 54	0	i 8 52	+ 3	i 9 6	sS	e 10·6
Wellington		24·0	167	e 5 48	PP	e 11 52	Q	—	—	e 14·8
Christchurch		25·8	171	—	—	e 10 17?	+15	—	—	—
Shasta Dam		87·2	45	e 12 46	− 3	—	—	—	—	—
Pasadena		87·5	53	12 50	− 1	—	—	13 0	pP	—
China Lake		88·6	52	12 56	0	—	—	13 6	pP	—
College		89·3	17	i 12 57	− 2	—	—	—	—	—
Boulder City		90·7	52	e 13 7	+ 1	—	—	—	—	—
Overton	z.	91·2	52	e 13 9	+ 1	—	—	i 13 18	pP	—
Pierce Ferry		91·4	52	i 13 9	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		92·5	56	e 13 14	0	—	—	e 13 25	pP	—
Stuttgart	z.	144·7	335	e 19 36	[− 3]	—	—	e 22 20	PP	—
Strasbourg		145·4	335	e 19 38	[− 2]	—	—	e 22 22	PP	—
Zürich		146·0	335	e 19 39	[− 2]	—	—	—	—	—
Paris		147·0	342	e 22 28	PP	—	—	—	—	—
Besançon		147·2	337	e 19 43	[0]	—	—	e 22 23	PP	—

Additional readings :—
Riverview eSSE =9m.33s.
Strasbourg e =20m.8s. and 20m.22s.
Besançon e =19m.53s. and 20m.28s.

Dec. 4d. 7h. 38m. 2s. Epicentre 18°·0S. 167°·7E. (as at 3h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·5	232	e 3 52	− 2	e 6 40	−18	i 7 6	SS	i 8·3
Auckland	N.	19·8	162	e 4 0	−35	i 8 23	+10	i 9 19	SS	10·3
Apia		20·2	82	e 4 39	0	e 8 31	+10	—	—	e 11·5
Riverview		21·6	219	i 4 53k	− 1	i 8 50	+ 1	i 5 3	pP	e 10·4
Tuai	N.	22·3	161	e 5 2	+ 1	e 9 7	+ 5	—	—	e 16·0
Wellington		24·0	167	i 5 16	− 1	i 9 18	−14	i 5 54	PP	11·8
Kaimata	N.E.	24·6	174	e 5 42	+19	—	—	—	—	—
Christchurch		25·8	171	5 42	+ 8	e 9 58	− 4	i 10 43	SS	e 12·5
Perth		48·6	242	i 13 8	?	i 16 50	?	—	—	i 21·6
Bandong		59·4	274	—	—	e 15 12	?	—	—	—
Djakarta		60·4	274	e 10 7	− 6	e 18 28	0	—	—	—
Nanking		68·3	317	e 11 3	− 2	—	—	—	—	—
Vladivostok		69·2	332	i 11 11	+ 1	i 20 23	+ 7	—	—	—
Ukiah		85·9	47	—	—	e 23 21	+ 5	—	—	e 39·8
Berkeley		86·0	48	e 12 43	0	e 23 8	[+ 1]	—	—	—
Lick	Z.	86·2	48	i 12 44a	0	—	—	—	—	—
Shasta Dam		87·2	45	i 12 47	− 2	—	—	—	—	—
Pasadena		87·5	53	12 49	− 2	—	—	13 4	pP	—
Mineral	Z.	87·6	47	e 12 52	+ 1	—	—	—	—	—
China Lake		88·6	52	12 55	− 1	—	—	13 10	pP	—
Sitka		88·8	27	—	—	e 23 28	[+ 3]	e 28 0	SS	e 37·2
Irkutsk		88·9	326	e 12 59	+ 1	—	—	—	—	—
College		89·3	17	e 12 57	− 2	e 23 34	[+ 5]	i 13 12	pP	e 36·5
Boulder City		90·7	52	e 13 11	+ 5	—	—	—	—	—
Overton	Z.	91·2	52	i 13 7	− 1	—	—	—	—	—
Pierce Ferry		91·4	52	i 13 8	− 1	—	—	—	—	—
Kodaikanal	E.	93·3	279	e 13 59	+41	i 23 57	[+ 5]	34 45	Q	38·4
Salt Lake City		94·6	48	—	—	e 24 4	[+ 5]	—	—	e 43·5
Hungry Horse		95·7	41	e 13 45	+16	—	—	—	—	—
Bozeman		96·8	44	—	—	e 24 15	[+ 4]	e 26 14	PS	e 45·6
Bombay		100·1	286	e 15 58?	?	i 24 38	[+11]	—	—	—
Rapid City	E.	101·7	47	—	—	e 24 36	[+ 1]	—	—	e 51·2
Frunse		104·3	311	—	—	i 24 55	[+ 8]	—	—	—
Huancayo		111·0	110	e 19 22	PP	e 25 28	[+12]	e 28 34	PS	e 47·0
La Plata	N.	111·8	141	—	—	28 34	PS	44 58	Q	49·0
La Paz		115·2	119	—	—	i 25 40	[+ 7]	26 44	SKKS	60·0
Chinchina		116·9	93	—	—	e 25 48	[+ 9]	e 29 48	PS	e 55·8
Cleveland	E.	117·1	53	—	—	e 25 44	[+ 4]	e 26 28	SKKS	—
Bogota		118·2	95	—	—	e 25 47	[+ 3]	e 30 43	PPS	e 62·0
Pennsylvania	N.	119·9	52	—	—	i 33 33	?	—	—	—
Philadelphia		122·0	53	—	—	e 26 2	[+ 5]	e 37 19	SS	e 47·5
Palisades		122·9	52	—	—	e 25 59	[0]	—	—	—
San Juan		129·0	80	e 22 30	PP	e 26 9	[− 8]	e 32 0	PS	e 60·0
Bermuda		130·8	62	e 22 36	PKS	e 33 37	PPS	—	—	e 73·4
Istanbul		137·8	312	e 22 58?	PKS	e 31 30	?	—	—	—
Helwan	z.	138·6	295	e 19 29	[+ 1]	—	—	23 2	PP	—
Rathfarnham Castle		144·5	354	e 19 48?	[+10]	—	—	—	—	—
Stuttgart		144·7	335	e 19 38a	[− 1]	e 23 39	PKS	e 27 53	SKS	e 41·0
Karlsruhe	z.	144·8	337	i 19 41	[+ 2]	—	—	—	—	—
Kew		145·3	347	e 19 46	[+ 6]	—	—	e 42 9	SS	e 70·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		145·4	335	e 19 40a	[0]	e 30 7	(+15)	—	—	—
Chur		146·1	334	e 19 41	[0]	—	—	—	—	—
Paris		147·0	342	i 19 45	[+ 2]	—	—	i 23 9	PP	—
Besançon		147·2	337	e 19 47	[+ 4]	—	—	—	—	—
Rome		148·2	323	e 19 50	[+ 5]	e 43 45	SSP	e 24 0	PP	e 70·0
Messina	z.	148·4	316	e 19 5	[−40]	—	—	—	—	—
Granada		159·4	340	—	—	29 58	(−71)	44 34	SS	85·5
Tamanrasset	z.	162·7	290	e 20 6	[+ 2]	e 20 55	PKP_2	e 24 38	PP	—

Additional readings :—
Brisbane iE =4m.52s., eSE =6m.44s.
Riverview iPPN =5m.16s., iZ =5m.40s., iE =5m.43s., iP_cPZ =8m.53s., iN =9m.1s., iZ =9m.13s., iN =19m.16s., iSSN =9m.30s., iSSN =9m.43s., iZ =9m.46s.
Wellington i =7m.3s., iSS =10m.13s.
Christchurch iZ =6m.36s., SEN =10m.2s.
Lick iZ =12m.51s.
Mineral eZ =13m.34s.
College eSS =29m.20s.
Bozeman eSS =30m.37s.
Huancayo e =26m.30s., eSS =34m.29s.
La Paz iPS =29m.30s., iSS =35m.46s., i =39m.34s.
Cleveland ePSE =29m.41s., eSSE =36m.46s.
Philadelphia ePS =30m.26s.
San Juan eSS? =41m.32s.
Helwan eZ =20m.8s.
Stuttgart eZ =20m.4s., iZ =20m.16s.
Kew eEN =43m.31s.
Strasbourg i =19m.50s., 20m.6s., and 20m.20s., e =21m.13s. and 24m.8s.
Paris i =19m.51s., 20m.26s., 20m.52s., 24m.18s., and 25m.12s.
Besançon e =19m.53s., 20m.20s., and 20m.46s.
Rome e =20m.27s.
Granada SSS =50m.43s.
Long waves were also recorded at Chicago and Harvard.

Dec. 4d. 10h. 18m. 1s. Epicentre 18°·0S. 167°·7E. (as at 7h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	16·5	232	i 3 52k	− 2	—	—	—	—	—
Apia		20·2	82	e 4 29	−10	—	—	—	—	—
Riverview		21·6	219	e 4 55	+ 1	e 8 52	+ 3	—	—	e 10·6
Wellington		24·0	167	—	—	e 10 29	+57	—	—	—
Christchurch		25·8	171	e 6 19	+45	e 10 39	+37	e 11 21	SS	e 13·3
Berkeley	z.	86·0	48	i 12 44k	+ 1	—	—	—	—	—
Lick	z.	86·2	48	i 12 46k	+ 2	—	—	—	—	—
Shasta Dam		87·2	45	i 12 50	+ 1	—	—	—	—	—
Fresno	z.	87·3	50	e 12 50k	0	—	—	—	—	—
Pasadena		87·5	53	12 51	0	—	—	13 4	pP	—
Mineral	z.	87·6	47	e 12 49	− 2	—	—	—	—	—
China Lake		88·6	52	12 57	+ 1	—	—	13 10	pP	—
College		89·3	17	e 12 56	− 3	—	—	—	—	—
Victoria	z.	90·1	38	e 13 3	0	—	—	—	—	—
Boulder City		90·7	52	i 13 7	+ 1	—	—	i 13 21	pP	—
Overton	z.	91·2	52	i 13 9	+ 1	—	—	—	—	—
Pierce Ferry		91·4	52	i 13 10	+ 1	—	—	—	—	—
Tucson		92·5	56	i 13 15	+ 1	—	—	—	—	—
Hungry Horse		95·7	41	e 13 18	−11	—	—	—	—	—
Weston		124·7	50	e 19 7	[+ 5]	—	—	—	—	—
Stuttgart	z.	144·7	335	e 19 37	[− 2]	—	—	—	—	—
Strasbourg		145·4	335	e 19 51	[+11]	—	—	—	—	—
Besançon		147·2	337	e 20 0	[+17]	—	—	—	—	—

Additional readings :—
Apia e =4m.39s.
Christchurch eQE =11m.39s.
Lick iZ =13m.0s.
Stuttgart eZ =19m.51s. and 19m.59s.
Strasbourg i =19m.55s., e =20m.41s.
Besancon e =20m.10s.

Dec. 4d. 11h. 7m. 42s. Epicentre 18°·0S. 167°·7E. (as at 10h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	16·5	232	i 3 52k	− 2	—	—	—	—	—
Apia		20·2	82	e 4 51	+12	—	—	—	—	—
Riverview		21·6	219	e 4 54	0	i 8 55	+ 6	i 8 51	PcP	e 10·6
Wellington		24·0	167	—	—	e 9 48	+16	—	—	—
Christchurch		25·8	171	—	—	e 10 18	+16	—	—	e 13·8
Lick	z.	86·2	48	e 12 50k	+ 6	—	—	—	—	—
Shasta Dam		87·2	45	i 12 53	+ 4	—	—	—	—	—
Pasadena		87·5	53	12 53	+ 2	—	—	13 9	pP	—
Mineral	z.	87·6	47	e 12 55	+ 4	—	—	—	—	—
China Lake		88·6	52	13 0	+ 4	—	—	13 16	pP	—
College		89·3	17	e 13 0	+ 1	—	—	e 13 14	pP	—
Boulder City		90·7	52	e 13 10	+ 4	—	—	—	—	—
Overton	z.	91·2	52	e 13 12	+ 4	—	—	—	—	—
Pierce Ferry		91·4	52	e 13 13	+ 4	—	—	—	—	—
Stuttgart	z.	144·7	335	i 19 40a	[+ 1]	—	—	—	—	—
Strasbourg		145·4	335	e 19 42	[+ 2]	—	—	—	—	—
Zürich		146·0	335	e 19 44a	[+ 3]	—	—	—	—	—
Chur		146·1	334	e 19 44a	[+ 3]	—	—	—	—	—
Paris		147·0	342	e 19 43	[0]	—	—	—	—	—
Besançon		147·2	337	e 19 46	[+ 3]	—	—	—	—	—

Additional readings :—
Riverview i = 5m.0s., iEN = 9m.5s.
Stuttgart eZ = 19m.47s.
Strasbourg e = 19m.50s.
Paris e = 19m.49s., i = 19m.55s.
Besançon e = 19m.55s.
Long waves were also recorded at Resolute Bay.

Dec. 4d. 16h. 28m. 7s. Epicentre 5°·1S. 153°·5E. Depth of focus 0·010 (as on 1950, Oct. 8d.).

A = −·8914, B = +·4445, C = −·0883 ; δ = −3 ; h = +6 ;
D = +·446, E = +·895 ; G = +·079, H = −·039, K = −·996.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		22·3	181	i 4 51a	+ 1	i 8 56	+12	i 5 15	pP	—
Riverview		28·7	184	i 5 50a	0	i 10 34	+ 3	i 5 58	pP	13·2
Apia		35·3	106	6 45a	− 2	—	—	e 7 4	pP	e 14·7
Auckland	N.	37·2	150	i 7 3	0	13 7	+24	i 8 37	PP	18·5
Manila		37·7	302	i 7 8	0	i 14 24	SS	—	—	—
New Plymouth	E.	38·6	153	i 7 18	+ 3	—	—	—	—	—
Tuai	N.	39·8	151	e 7 25	0	e 13 47	+25	—	—	—
Kaimata	N.E.	40·5	159	7 31	0	e 13 34	+ 2	7 39	pP	—
Wellington		40·7	155	i 7 31	− 1	i 13 35	0	9 10	PP	19·9
Yakusima		41·6	330	e 7 53	+13	14 2	+14	—	—	—
Osima		41·8	343	e 7 30	−11	e 13 38	−14	e 9 25	PP	—
Christchurch		41·8	159	i 7 42	+ 1	13 48	− 4	i 8 5	pP	19·6
Omaesaki		42·0	342	e 7 59	pP	e 17 37	SS	e 10 26	PPP	—
Tokyo		42·6	344	e 7 26	−22	—	—	e 9 33	PP	—
Hunatu		42·7	344	i 7 47	− 2	i 13 48	−17	17 43	SS	19·1
Kameyama		42·8	340	e 8 14	pP	e 13 58	sS	—	—	21·0
Kôti		42·9	336	e 7 50	0	i 13 58	−10	i 8 6	pP	—
Mito		43·0	345	e 8 5	pP	e 14 11	+ 2	—	—	—
Nagoya		43·0	341	8 13	pP	e 14 3	− 6	—	—	—
Osaka		43·0	339	e 8 17	pP	e 13 22	−47	(17 35)	SS	17·6
Sumoto		43·0	339	i 8 12	pP	i 13 54	−15	10 14	PP	17·8
Kobe		43·2	339	e 8 6	pP	—	—	—	—	e 20·2
Gihu		43·3	341	8 13	pP	e 13 52	−21	i 17 48	SS	—
Hikone		43·3	340	e 7 57	+ 3	e 14 3	−10	—	—	—
Maebasi		43·4	344	e 7 57	+ 3	e 13 45	−30	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Matuyama		43·4	342	e 7 55	+ 1	e 14 14	− 1	e 8 17	pP	—
Matusiro		43·8	342	i 7 55	− 3	e 13 44	−37	8 10	pP	17·2
Nagano	N.	43·9	342	e 8 5	+ 6	e 14 37	+15	e 9 57	PP	—
Hirosima		44·0	335	e 7 58	− 1	—	—	e 17 11	SS	—
Hukuoka		44·2	333	e 7 54	− 7	e 14 26	0	e 10 50	PPP	19·3
Perth		44·2	228	i 8 1	0	14 31	+ 5	9 28	PP	i 21·0
Hukusima		44·3	345	8 1	− 1	i 14 25	− 3	—	—	i 18·2
Tomie		44·3	331	8 15	+13	e 14 11	−17	9 59	PP	—
Toyama		44·3	341	e 8 4	+ 2	e 14 28	0	8 38	pP	—
Sendai		44·7	347	8 4	− 1	e 14 31	− 3	10 40	PPP	17·8
Bandong		45·6	266	i 8 23	+11	i 14 54	+ 7	—	—	—
Miyako		45·8	348	e 8 17?	+ 3	e 14 45	− 4	—	—	—
Akita		46·3	346	e 8 14	− 4	14 57	+ 1	e 10 1	PP	e 18·7
Djakarta		46·4	267	i 8 16	− 2	i 14 58	0	—	—	—
Zi-ka-wei	E.	47·3	322	i 8 29	+ 3	i 15 9	− 2	i 8 49	pP	i 18·2
Mori	E.	48·4	349	e 8 35	+ 1	e 15 29	+ 3	—	—	—
Nemuro		48·7	353	e 8 25	−11	e 15 30	0	—	—	—
Sapporo		49·2	348	e 8 39	− 1	15 36	− 1	i 9 4	pP	—
Nanking		49·5	321	i 8 42k	0	i 11 23	PPP	—	—	12·4
Vladivostok		51·8	341	i 8 58	− 2	i 16 14	+ 1	—	—	—
Honolulu		54·5	59	i 9 17	− 3	i 17 14	+24	i 9 34	pP	e 22·7
Klyuchi		61·5	5	10 4	− 5	18 20	− 1	i 10 30	pP	—
Mitchell Field		62·3	20	(i 10 12)	− 2	—	—	(i 10 36)	pP	—
Calcutta	E.	69·3	296	i 10 59	0	i 20 6	+10	i 11 27	pP	28·8
Irkutsk		70·7	330	i 11 7	0	i 20 17	+ 5	—	—	—
Colombo	E.	74·2	278	11 29	+ 1	20 57	+ 5	—	—	37·0
Kodaikanal	E.	77·2	282	i 11 46	+ 1	i 21 27	+ 2	12 8	PcP	35·2
Hyderabad	N.	77·3	289	i 12 7	pP	i 21 31	+ 5	—	—	36·3
New Delhi		80·5	300	i 12 3	0	i 21 59	− 1	12 14	pP	—
Poona		81·8	290	i 12 10	0	i 22 11	− 2	12 32	pP	38·0
College		81·9	22	i 12 6	− 4	i 22 11	− 3	i 12 33	pP	e 34·0
Przhevalsk		82·5	314	i 12 16	+ 3	22 28	+ 8	—	—	—
Bombay		82·9	290	i 12 18	+ 3	i 22 27	+ 3	15 30	PP	37·3
Almata		83·7	315	i 12 22	+ 3	i 22 36	+ 4	—	—	—
Naryn		84·0	312	i 12 21	0	—	—	—	—	—
Sitka		84·3	31	i 12 19	− 3	i 22 39	+ 1	e 12 37	pP	i 35·0
Frunse		85·4	314	i 12 28	0	i 22 45	− 4	i 12 52	pP	—
Andijan		86·6	311	i 12 35	+ 1	i 22 52	[+ 4]	13 0	pP	—
Fergana		87·0	311	i 12 38	+ 2	e 22 53	[+ 2]	e 13 3	pP	—
Dzhergetal		87·2	310	i 12 38	+ 2	—	—	—	—	—
Ukiah		88·0	51	e 12 49	+ 9	e 23 12	− 2	e 13 14	pP	e 36·2
Obi-garm		88·3	308	i 12 43	+ 1	i 23 1	[+ 1]	—	—	—
Berkeley		88·6	52	e 12 42	− 1	e 23 19	0	i 13 4	pP	e 39·9
Santa Clara		88·7	52	i 12 44	0	i 23 54	PS	i 16 27	PP	e 40·0
Shasta Dam		88·8	49	i 12 42	− 2	e 23 55	PS	i 13 11	pP	—
Lunacharskoe		89·0	312	i 12 48	+ 3	i 23 8	[+ 4]	i 13 14	pP	—
Tashkent		89·0	312	i 12 45	0	i 23 7	[+ 3]	i 13 9	pP	—
Stalinabad		89·0	308	i 12 47	+ 2	i 23 9	[+ 5]	—	—	—
Lick	Z.	89·0	52	e 12 44a	− 1	i 16 15	PP	i 13 11	pP	e 41·7
Victoria	Z.	89·2	42	i 12 46	0	i 23 30	+ 5	i 13 11	pP	—
Mineral	Z.	89·4	50	e 12 45	− 2	e 24 37	PS	e 13 9	pP	—
Seattle		89·8	43	e 13 7	PP	e 23 33	+ 3	e 13 37	pP	e 38·9
Fresno	Z.	90·4	53	e 12 50a	− 2	e 25 16	sPS	e 13 12	pP	e 40·4
Samarkand		90·5	310	i 12 53	+ 1	i 23 14	[+ 1]	i 13 18	pP	—
Tinemaha	Z.	91·6	53	e 12 58	+ 1	—	—	i 13 20	pP	—
Pasadena		92·0	56	e 12 53k	− 6	e 23 17	[− 4]	i 13 17	pP	e 36·7
China Lake	Z.	92·1	54	i 12 59a	− 1	e 38 13	P′P′	i 13 22	pP	—
Riverside		92·1	56	i 12 58a	− 2	e 38 24	P′P′	i 13 22	pP	—
Palomar		92·5	57	i 13 0a	− 1	e 38 29	P′P′	i 13 23	pP	—
Boulder City		94·3	54	e 13 9	− 1	e 24 39	+29	i 13 34	pP	—
Mary		94·4	307	i 13 11?	+ 1	e 17 1	PP	e 13 34	pP	—
Overton	Z.	94·7	53	i 17 2	PP	e 24 26	+13	i 30 11	PKKP	—
Pierce Ferry		95·0	54	i 13 12	− 1	e 23 54	[+16]	i 13 29	pP	—
Hungry Horse		95·4	42	e 13 11	− 4	e 23 41	[+ 1]	i 13 39	pP	—
Sverdlovsk		95·8	326	i 13 15	− 1	i 24 24?	+ 2	i 13 37	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Butte	N.	96·4	44	e 13 24	+ 5	e 24 4	[+18]	e 17 27	PP	e 40·1
Salt Lake City		96·8	49	e 13 44	+23	e 24 37	+ 6	e 26 7	PS	e 40·7
Logan		96·9	47	e 13 19	− 2	e 24 26	− 6	e 13 44	pP	e 40·2
Ashkabad		97·2	307	i 13 24	+ 1	23 57	[+ 7]	—	—	—
Bozeman		97·4	45	e 13 27	+ 3	i 24 52	+16	e 17 1	PP	e 41·2
Tucson		97·5	58	i 13 24	0	e 23 46	[− 5]	i 13 48	pP	e 42·6
Saskatoon		100·1	38	17 41	PP	24 5	[+ 1]	27 8	PPS	—
Resolute Bay		100·5	14	13 38	0	24 57	− 5	17 36	PP	—
Rapid City	E.	103·1	46	e 13 47	− 2	i 24 24	[+ 6]	e 17 41	PP	e 46·2
Tananarive		103·3	249	18 29	PP	i 24 29	[+10]	25 3	SKKS	e 48·9
Baku		103·6	310	e 13 53	+ 2	24 30?	[+ 9]	—	—	—
Guadalajara		104·1	69	e 18 1	PKP	—	—	—	—	—
Lenkoran		104·6	308	13 56?	0	—	—	—	—	—
Grozny		106·4	313	e 14 4?	P	i 24 39	[+ 6]	e 18 43	PP	—
Tiflis		107·3	312	e 14 3	P	i 24 42	[+ 5]	i 26 5?	S	—
Gori		107·8	312	—	—	24 48	[+ 8]	—	—	—
Tacubaya		108·0	71	e 18 46	PP	e 28 6	PS	—	—	—
Leninakan		108·2	311	e 14 11	P	—	—	—	—	—
Piatigorsk		108·2	315	e 14 11	P	—	—	—	—	—
Lincoln	E.	108·3	48	e 18 40	PP	e 28 4	PS	e 20 54	PPP	e 49·1
Moscow		108·6	327	e 14 12	P	i 24 46	[+ 3]	e 14 34	pP	—
Abastumanj		108·8	312	e 14 11	P	i 24 51	[+ 7]	e 25 42	SKKS	—
Puebla		108·9	71	e 18 38	?	e 28 9	PS	e 18 59	PP	—
Zugdidi		109·3	313	e 14 15	P	24 52	[+ 6]	e 25 41	SKKS	—
Pulkovo		110·6	333	e 19 5	PP	i 24 54	[+ 3]	26 28	S	—
Sotchi		110·6	315	i 19 28?	PP	i 28 27	PS	—	—	—
Helsinki		112·8	335	i 19 37	PP	e 25 2	[+ 2]	i 19 55	pPP	e 48·9
Theodosia		113·3	317	—	—	25 7	[+ 5]	—	—	—
Florissant		113·4	50	e 17 59	?	i 25 12	[+10]	i 19 15	PP	—
St. Louis		113·6	50	e 17 46	?	i 25 33	[+30]	i 19 16	PP	—
Yalta		114·3	317	e 18 28	[0]	25 8	[+ 2]	e 18 56	pPKP	—
Scoresby Sund		114·6	358	e 18 47	[+18]	25 11	[+ 4]	28 54	PS	55·9
Chicago		114·7	46	i 19 24	PP	e 28 59	PS	e 35 11	SS	e 46·8
Pietermaritzburg z.		115·5	234	i 18 33	[+ 2]	—	—	—	—	—
Ksara		115·7	304	i 14 48	P	18 30	PKP	i 15 12	pP	—
Upsala		115·9	337	e 19 53?	pPP	i 25 10	[− 2]	e 25 53?	SKKS	e 49·9
Grahamstown	Z.	116·9	228	i 18 37	[+ 3]	i 29 26	PS	—	—	e 55·4
Kishinev		116·9	321	e 18 33	[− 1]	—	—	—	—	—
Merida		116·9	69	e 18 11	[−23]	—	—	—	—	e 54·0
Lwow		118·5	325	i 19 57	PP	—	—	e 36 10	SS	—
Istanbul		118·9	315	e 14 59	P	e 29 27	PS	e 18 37	PKP	—
Warsaw		118·9	328	e 18 39	[+ 1]	e 25 40	[+18]	e 20 17	PP	e 53·9
Cleveland		119·2	44	i 18 54k	[+16]	e 24 59	[−25]	e 26 2	sSKS	—
Bucharest		119·7	318	e 20 34	PP	—	—	e 21 0	pPP	—
Bergen	N.	119·8	342	—	—	e 27 45?	?	e 30 21	PS	46·9
Helwan		120·3	301	e 15 30	P	25 32	[+ 5]	18 41	PKP	—
Buffalo		120·5	42	i 20 6	PP	e 29 58	PS	—	—	—
Pittsburgh		120·6	45	i 20 11	PP	—	—	—	—	—
Copenhagen		120·8	336	20 3	PP	i 30 15	PS	20 28	pPP	—
New Kensington	E.	120·8	45	e 20 3	PP	e 26 24	SKKS	e 22 45	PPP	—
Skalnate Pleso		121·0	326	e 18 43	[+ 2]	e 25 36	[+ 6]	e 19 9	pPKP	e 50·4
Ottawa		121·4	38	i 18 41k	[− 1]	30 6	PS	20 13	PP	—
Raciborzu		121·6	328	e 18 44	[+ 2]	—	—	e 19 55	PP	—
Ivigtut		121·7	12	e 20 14	PP	30 7	PS	36 47	SS	57·9
Columbia		122·0	53	e 20 18	PP	e 30 12	PS	e 36 36	SS	e 51·2
Pennsylvania		122·0	43	e 18 58	[+15]	e 30 23	PS	i 20 11	PP	—
Sofia		122·2	318	e 18 45	[+ 1]	—	—	i 21 13	PP	—
Timisoara	N.	122·2	322	e 20 41a	PP	—	—	e 23 14	PPP	—
Budapest	E.	122·5	325	18 55	[+11]	e 27 8	PKKS	20 48	PP	55·9
	N.	122·5	325	18 50	[+ 6]	26 11	[+36]	19 58	PP	55·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Shawinigan Falls	N.	122·6	35	e 18 42	[− 2]	—	—	e 19 9	pPKP		—
Potsdam		122·7	332	e 18 47?	[+ 2]	i 25 43	[+ 8]	i 20 49	PP		e 55·9
Ogyalla		122·8	326	e 20 11	PP	e 25 44	[+ 8]	e 32 16	PPS		—
Belgrade		123·1	321	i 18 45k	[0]	e 26 51	SKKS	e 31 47	PPS		e 62·5
Kalocsa	E.	123·1	324	e 19 4	[+19]	27 18	SKKS	e 21 7	PP		—
	N.	123·1	324	18 51	[+ 6]	e 27 18	SKKS	23 22	PPP		—
Washington		123·3	45	i 20 26	PP	—	—	—	—		—
Collmberg		123·5	331	e 18 46	[0]	e 26 50	SKKS	e 20 30	PP		e 53·4
Prague		123·5	329	e 18 47a	[+ 1]	e 25 48	[+10]	e 19 13	pPKP		e 48·9
Seven Falls	E.	123·6	34	17 48	[−58]	29 13	PS	19 33	PP		—
Athens		123·9	312	i 18 47a	[0]	i 27 26	SKKS	e 19 22	pPKP		—
Philadelphia		124·2	44	e 20 15	PP	e 25 54	[+14]	i 21 18	pPP		e 50·5
Jena		124·4	331	e 18 49	[+ 1]	e 25 41	[0]	e 19 11	pPKP		e 55·9
Aberdeen		124·6	343	i 20 59	PP	i 27 27	SKKS	i 31 16	PS		60·1
Cheb		124·6	331	e 18 52	[+ 4]	e 25 46	[+ 5]	e 19 20	pPKP		—
Palisades		124·6	42	i 18 48	[0]	i 30 29	PS	i 19 14	pPKP		e 57·8
Fordham		124·7	42	e 18 49	[+ 1]	i 30 31	PS	i 20 34	PP		—
Harvard		125·4	39	i 18 51	[+ 1]	e 25 57	[+13]	e 19 14	pPKP		e 58·2
Weston		125·7	39	e 18 50	[0]	e 25 57	[+12]	i 20 38	PP		—
De Bilt		126·3	336	i 18 51	[0]	e 30 17	PS	i 19 19	pPKP		e 55·9
Durham		126·5	342	i 22 16	PKS	—	—	—	—		—
Triest		126·6	326	i 18 54	[+ 2]	i 25 50	[+ 3]	i 19 16	pPKP		—
Stuttgart		127·0	331	e 18 43	[−10]	e 26 29	[+41]	e 19 13	pPKP		e 60·9
Karlsruhe		127·2	332	e 18 46	[− 7]	e 26 29	[+40]	—	—		e 63·9
Balboa Heights		127·2	82	e 18 51	[− 2]	—	—	—	—		—
Taranto		127·3	318	e 19 27	pPKP	e 27 59	SKKS	—	—		e 60·9
Strasbourg		127·8	332	i 18 55	[+ 1]	i 26 8	[+17]	i 19 17	pPKP		e 56·9
Chur		128·1	328	e 18 56a	[+ 1]	—	—	e 21 24	PP		e 60·4
Zürich		128·2	330	e 18 55a	[0]	e 21 14	PP	e 19 18	pPKP		—
Padova		128·3	326	18 58	[+ 3]	25 58	[+ 6]	22 9	PKS		—
Huancayo		128·5	110	e 18 58	[+ 2]	e 26 5	[+13]	e 31 3	PS		—
Basle		128·6	331	e 18 57	[+ 1]	—	—	e 21 29	PP		—
Bologna		128·7	326	e 18 59	[+ 3]	e 22 24	PKS	—	—		—
Kew		128·9	339	i 18 56	[− 1]	e 27 48	SKKS	i 19 22	pPKP		e 41·9
Halifax		129·0	33	e 22 15	PKS	—	—	—	—		—
Florence		129·1	326	e 18 28	[−29]	i 22 21	PKS	e 21 29	PP		—
Prato		129·2	326	i 19 1	[+ 4]	i 29 11	S	—	—		—
Rathfarnham C.	z.	129·2	344	i 19 0	[+ 3]	e 27 52	SKKS	e 22 40	PKS		e 42·9
Neuchatel		129·3	331	e 18 53	[− 4]	—	—	—	—		—
Pavia		129·4	328	e 18 58	[+ 1]	e 38 32	SS	i 22 21	PKS		e 59·1
Rocca di Papa		129·5	323	e 19 3	[+ 5]	—	—	e 22 24	PKS		—
Messina	z.	129·6	317	e 18 58	[0]	—	—	—	—		—
Rome		129·6	323	i 18 57a	[− 1]	e 29 14	S	i 19 21	pPKP		e 59·9
Besançon		129·6	332	i 18 58	[0]	i 22 20	PKS	i 19 22	pPKP		—
Paris		129·9	335	i 19 0	[+ 2]	i 25 55	[− 1]	i 19 24	pPKP		—
La Plata		130·4	146	20 47	?	25 41	[−16]	22 23	PKS		61·2
Chinchina		131·1	86	i 18 55	[− 6]	i 22 25	PKS	i 21 18	PP		—
Jersey	E.	131·4	338	—	—	e 22 30	PKS	e 22 52	pPKS		—
Bogota		132·6	88	i 19 7	[+ 4]	i 22 30	PKS	i 21 30	PP		e 59·9
La Paz		133·6	119	i 19 9	[+ 4]	i 31 53	PS	i 19 26	pPKP		62·9
Tunis		134·0	318	e 19 40	pPKP	e 27 38	SKKS	e 23 38	PPP		—
Bermuda		135·2	48	e 15 59	P	e 25 53	[−15]	e 19 6	PKP		e 55·4
Cuidad Trujillo		135·6	69	i 21 13	?	i 31 46	PS	—	—		—
Barcelona		135·7	329	19 11	[+ 2]	—	—	22 41	PP		—
Tortosa		137·0	330	e 17 50	?	27 44	?	i 23 10	PP		e 48·9
Algiers Univ.	z.	138·4	322	e 19 8	[− 6]	e 22 29	PP	i 19 40	pPKP		—
San Juan		139·1	67	e 19 8	[− 7]	e 31 31	SKKP	e 22 4	PP		e 58·4
Alicante		139·3	328	19 19	[+ 3]	26 57	[+43]	22 56	PP		e 69·4
Toledo		139·9	332	e 19 11	[− 6]	26 10	[− 5]	i 22 39	PP		60·9
Granada		141·8	330	19 16k	[− 4]	27 56	SKKS	20 49	pPKP		i 67·5
Malaga	N.W.	142·6	331	i 19 17	[− 5]	26 3	PPP	i 22 41	PP		73·6
Lisbon	z.	143·1	337	19 18a	[− 5]	22 53	PKS	—	—		—
Tamanrasset	z.	144·4	304	i 19 26k	[+ 1]	e 26 19	[− 3]	e 19 49	pPKP		—
Fort de France		144·6	72	i 19 25	[0]	e 32 35	PS	19 55	pPKP		—

For Notes see next page.

NOTES TO DECEMBER 4d. 16h. 28m. 7s.

Additional readings and notes :—
Riverview iE =5m.56s., iNZ =6m.9s., iZ =6m.15s., iE =6m.58s., i =8m.2s., iE = 8m.15s., 8m.55s., and 9m.1s., iZ =10m.25s., iN =10m.42s. and 10m.55s., iE =11m.5s. and 11m.30s., iSS?EN =11m.58s., iSSS?N =12m.14s., iE$_g$N =12m.39s.
Apia e =8m.3s. and 8m.23s.
Kaimata eNE =13m.16s. and 13m.59s.
Wellington i =8m.35s. and 10m.40s., iSS =16m.35s., iSSS =17m.1s.
Christchurch isP?Z =8m.20s., iPP =9m.23s., eEZ =12m.31s., eSS =16m.23s., S$_c$S?EN = 17m.19s.
Tokyo e =9m.55s.
Kôti ePP =9m.8s., epPP =9m.41s., eSS =17m.25s.
Kobe e =15m.24s. and 15m.34s.
Matuyama e =9m.52s., e =17m.35s.
Matusiro PP =9m.46s., PPP =10m.21s., Q ? =15m.3s.
Nagano eN =8m.35s., 11m.58s., 13m.34s., 17m.34s., and 18m.44s.
Hukuoka e =8m.23s. and 17m.55s.
Perth PPP =10m.5s., SS =17m.13s., i =17m.55s.
Tomie e =16m.33s.
Toyama sP =9m.32s., PP =10m.28s., sPP =11m.43s., sS =16m.6s., SSS =18m.14s.
Sendai i =8m.23s., e =14m.3s.
Sapporo esS =16m.8s., e =16m.40s.
Honolulu eP$_c$P =10m.35s., ePP =11m.15s., eSS =20m.23s.
Mitchell Field readings have been reduced by 1 minute.
Calcutta PPE =13m.28s., PPPE =15m.10s., P$_c$SE =15m.22s., PSE =20m.26s., PPSE = 20m.34s., isSE =20m.56s., SSE =24m.43s., SSSE =27m.34s., PKKPE =30m.28s.
Kodaikanal PPE =14m.36s., PPPE =15m.24s., PSE =22m.3s., PPSE =22m.17s., SSE =26m.17s., QE =31m.37s.
New Delhi PPPEN =16m.30s., iSKSN =22m.11s., PSN =22m.41s., PPSN =22m.58s., SSN =27m.6s., SSSN =30m.26s.
Poona sPE =12m.44s., PPE =15m.21s., PPPE =17m.7s., sSE =22m.54s., PSE = 23m.19s., PPSE =23m.40s., SSE =27m.25s., SSSE =31m.1s., QE =34m.20s.
College ePP =15m.33s., eS =21m.59s., isS =22m.48s., ePS =22m.57s., eSS =27m.54s., ePKKP =30m.25s., eSSS =31m.20s., ePKP,PKP =38m.42s., eSKP,PKP =42m.9s.
Bombay PPPN =17m.18s., PPPE =17m.24s., SSEN =27m.17s.
Sitka iPP =15m.33s., iPS =23m.17s., eSS =28m.3s.
Fergana esS =23m.54s.
Ukiah ePP =16m.18s., eSS =29m.21s., eSSS =33m.8s.
Berkeley ePPZ =16m.8s.
Shasta Dam iPP =16m.20s., eSKS =23m.9s., iPKKP =30m.25s., ePKP,PKP = 38m.37s., eSKP,PKP =41m.48s.
Lunacharskoe iSKKS =23m.31s.?
Tashkent iPP =16m.41s.
Lick isPZ =13m.20s., iZ =13m.25s. and 13m.50s., eZ =16m.27s., eEN =24m.2s., eZ = 25m.59s., iPKP,PKPZ =38m.33s.
Victoria e =16m.18s., i =24m.9s.
Mineral eZ =13m.31s., eE =13m.55s., eZ =14m.12s., ePPEZ =16m.15s., eE =23m.56s.
Seattle esP =13m.55s., iPP =17m.7s., ipPP =17m.43s., eSKKS =23m.52s., eS = 24m.13s., ePS =25m.23s., ePPS =26m.21s., and other unidentified e readings.
Fresno eNZ =13m.38s., eE =14m.0s., eZ =14m.13s., ePPN =16m.25s., eZ =18m.22s., ePKP,PKPZ =38m.31s., eSKP,PKP?E =41m.41s.
Pasadena isPZ =13m.29s., iZ =13m.44s. and 16m.9s., iPPZ =16m.28s., isSNZ = 24m.31s., iSPE =24m.53s., ePKP,PKPZ =38m.30s.
China Lake iPPZ =16m.37s., iZ =38m.26s.
Palomar iZ =13m.29s., iPPZ =16m.43s.
Boulder City ePP =16m.49s., ePKP,PKP =38m.24s.
Overton iPKP,PKPZ =38m.26s.
Pierce Ferry i =13m.34s., iPP =17m.1s., iPKKP =30m.10s., ePKP,PKP =38m.25s.
Hungry Horse eSKS =23m.9s., iPKKP =30m.5s., i =31m.8s., iPKP,PKP =38m.9s.
Sverdlovsk ePP =17m.26s., iSKS =23m.44s., SS =31m.27s.
Butte esSN =25m.3s.
Salt Lake City ePP =16m.56s., eSKS =23m.51s., ePS =26m.7s., eSS =31m.1s.
Logan ePP =17m.45s., iPP =17m.51s., ePPP =20m.4s., isS =24m.45s., iPS =25m.15s., ePPS =26m.38s., iSS =30m.56s., eSSS =35m.31s.
Bozeman iSKS =23m.59s., esS =25m.19s., ePS =26m.19s.
Tucson iPP =17m.18s., ePPP? =19m.24s., iPS =26m.20s., iPKKP =30m.5s., eSS = 31m.41s., eSSS =35m.16s., iPKP,PKP =38m.16s.
Saskatoon SS =31m.59s.
Resolute Bay PPP =19m.47s., SKS =24m.9s., SKKS =24m.35s., PS =26m.43s., PPS = 27m.23s., SSS =35m.41s.
Rapid City iE =25m.5s., ePSE =27m.16s., eSS?E =33m.27s., iPKP,PKPE =40m.45s.
Tananarive PS =27m.20s., SS =32m.42s.
Tiflis iSKKS =25m.31s.
Lincoln eSSE =33m.42s., eSSSE =37m.18s., iE =40m.20s.
Moscow ePP =18m.54s., iSKKS =25m.39s., iS =26m.12s., ePS =28m.3s.
Pulkovo SKKS =25m.52s., PS =28m.32s., SS =34m.5s.
Helsinki iZ =20m.35s., eSKSN =26m.5s., iZ =30m.4s.
Florissant ipPP =19m.42s., i =20m.7s., isSKS? =25m.46s., i =26m.44s., iS? =27m.13s., i =28m.53s., iSS =34m.52s.

Continued on next page.

St. Louis i=19m.19s., ipPP=19m.43s., i=20m.3s., 22m.19s., and 26m.48s., iSP=28m.36s., i=28m.58s., iSS=35m.0s.
Yalta SKKS=26m.14s.
Scoresby Sund 19m.28s., 22m.21s., 24m.48s., and 27m.8s., SS=35m.11s.
Chicago eSSS?=39m.37s.
Upsala iN=23m.20s., iSKSN=25m.13s., i=26m.26s., iSN=27m.8s., eN=29m.53s.? and 33m.2s., eE=34m.53s.?, eSSN=35m.18s., iSSS?=39m.9s., eE=41m.8s., eQN=46·9m.
Warsaw eZ=19m.23s., esPP=20m.54s., eSKPNZ=21m.57s., isPKS=22m.50s., eSKKS=26m.51s., e=27m.42s., eN=28m.13s., SPE=29m.38s., ePSE=29m.56s., eE=30m.49s., eSPPN=31m.7s., ePPSE=31m.21s., eE=31m.54s., eN=33m.7s., SSEN=36m.22s., sSSE=36m.37s., SSSN=40m.4s.
Cleveland eN=19m.53s., iPPE=19m.57s., ipPPZ=20m.13s., iE=20m.37s., ePPPE=22m.28s., esSKKSE=27m.18s., iPSE=29m.42s., iSSN=36m.10s., iN=36m.49s.
Bucharest iE=22m.11s., iN=22m.17s., iE=22m.43s., iN=22m.47s. and 22m.52s., iE=22m.57s.
Helwan PPEN=20m.29s., iEN=26m.59s., PSE=30m.32s., PPSE=31m.55s.
Copenhagen 36m.23s., 39m.5s., and 39m.53s.
New Kensington ePSE=29m.56s., eSSE=37m.14s.
Skalnate Pleso ePP=20m.12s., epPP=20m.38s., ePPP=23m.10s., epPPPE=23m.40s., e=25m.4s., eN=25m.59s., e=27m.4s., ePS=30m.9s., epPSN=30m.34s., eSSN=36m.40s., e=39m.47s., eSSSE=40m.53s., eSSSN=41m.17s., e=42m.17s.
Ottawa eZ=28m.44s., 29m.14s., and 32m.40s., SS=36m.42s.
Ivigtut 30m.40s. and 37m.17s.
Pennsylvania ipPPZ=20m.41s., iE=20m.51s., isPPN=20m.58s., iN=27m.40s. and 28m.50s., eN=29m.33s.
Sofia i=21m.28s.
Timisoara ePP?EN=20m.46s.
Budapest PPPN=23m.18s., SKKSN=27m.11s., PSE=30m.39s., SSE=37m.5s., SSSN=41m.35s., SSSE=41m.45s. and other unidentified eE readings.
Potsdam iPPN=20m.52s., iPPPE=23m.47s., iN=24m.49s., iSKKSN=27m.13s., iSKKSE=27m.16s., iN=28m.10s., iEN=28m.44s., iSPE=30m.33s., ePSN=30m.53s.?, eE=36m.53s., iSSE=37m.46s.
Ogyalla ePPN=20m.43s., e=21m.12s., 23m.44s., 24m.40s., 25m.12s., 27m.20s., and 31m.1s.
Belgrade i=20m.52s. and 22m.23s., e=34m.45s.
Kalossa iE=23m.44s., eE=24m.19s., ePSE=30m.44s., PSN=30m.49s.
Collmberg eZ=19m.16s., eEZ=20m.53s., eZ=22m.1s., eN=22m.23s., eE=22m.51s., eN=26m.33s., eE=28m.6s. and 30m.15s., ePS=30m.41s., eN=30m.51s., eE=32m.40s., eSSEN=37m.15s.
Prague ePP=20m.31s. and 20m.52s., eSKKS=26m.39s., eSP=30m.23s., ePPS=31m.53s., eSS=37m.17s., eSSS=41m.53s. and many other e readings.
Seven Falls PPPE=22m.45s., SSE=36m.8s.
Athens e=25m.10s., i=26m.30s., PKP and pPKP given as for local shock.
Philadelphia iPP=20m.28s., ePPP=23m.14s., eS=28m.15s., iPS=30m.20s., ipPS=30m.56s., iSS=37m.3s., isSS=37m.53s., eSSS=42m.4s.
Jena epPKP?=19m.6s., ePPZ=20m.57s., ePP?E=21m.0s., ePPP?N=23m.57s., eSKS?E=26m.30s., ePSE=30m.43s. and many unidentified e readings.
Aberdeen eE=40m.55s.
Cheb e=15m.59s. and 21m.20s., eSKKS?=26m.34s., e=27m.30s., eSPPE=31m.53s., eSSE=36m.53s., eSSSE=41m.53s.
Palisades iPP=20m.34s., e=27m.35s., iPPS=32m.12s., i=32m.52s., e=37m.50s.
Fordham iSS=38m.2s.
Harvard iPP=20m.41s., isPP=21m.25s., eSKSP=eSP=30m.39s., epPS=31m.7s., iSS=37m.40s. and other unidentified readings.
De Bilt iPP=20m.51s., ePPP=23m.43s.
Triest iPP=21m.16s., iSKP=22m.6s., iPPP=23m.58s., iSKKS=27m.18s., iS=29m.20s.
Stuttgart iPKPZ=18m.53s., eZ=19m.22s., ePP=21m.13s., ePPP=23m.59s., eSKKS=27m.33s., ePS=31m.11s., eSS=37m.47s.
Taranto e=20m.18s. and 48m.49s.
Strasbourg isPKP=19m.39s., iPP=21m.6s. and 21m.13s., esPP?=51m.53s., iPKS=22m.29s., ePKS=22m.35s., iPPP=23m.56s. and 24m.4s., ipPPP=24m.29s., iSKKS=27m.58s., iPS=31m.10s., iSPP?=33m.7s., iSS=38m.6s., eSSS=42m.59s., and other unidentified readings.
Huancayo ePP=19m.3s., e=22m.17s. and 22m.30s., ePPS=33m.4s., eSS=38m.20s., eSSS=42m.43s.
Bologna e=19m.10s., i=24m.13s.
Kew ePPEN=22m.14s., epPPEN=22m.36s., eSSEN=40m.48s.?.
Florence i=23m.39s., 24m.35s., and 34m.1s.
Rathfarnham Castle eZ=21m.1s., ePPPZ=23m.59s., ePSZ=31m.12s.
Pavia e=30m.23s. and 30m.40s.
Rocca di Papa e=22m.45s.
Messina iZ=19m.35s., iE=20m.17s.
Rome iPP?=21m.33s., iSKP=22m.13s., eSS=38m.14s., eSSS=43m.39s.
Besançon esPKP=19m.41s., i=20m.7s., ePP=21m.10s., ipPP=21m.31s., i=22m.7s., isSKP=22m.57s., ePPP=24m.0s., epPPP=24m.23s., i=27m.10s.
Paris isPKP=19m.44s., iPP=21m.12s., i=21m.29s., iSKP=22m.16s., iPKS=22m.25s., iSKP$_2$=22m.30s., ipSKP=22m.40s., ipPKS=22m.49s., isSKP=22m.58s., iPPP=24m.2s., iSKKS=28m.1s., iPKKP=28m.28s., iPKKP$_2$=29m.2s., iSP=31m.2s., iSSP=38m.33s., eSSS=43m.10s.

Continued on next page.

La Plata PKP? =21m.11s., N =22m.11s., E =22m.18s. and 23m.23s., N =31m.5s., E = 31m.11s., 38m.29s., and 38m.35s., N =38m.59s. phases wrongly interpreted.
Chinchina i =31m.21s.
Bogota iZ =19m.35s., iS =26m.58s., iEN =31m.42s.
La Paz iZ =19m.33s., iPPZ =21m.34s., ipPPZ =21m.56s., isPPZ =22m.33s., iPPS = 33m.45s., iSSZ =39m.13s.
Tunis e =23m.9s.
Bermuda iPP =21m.39s., eSS =38m.52s., iSS =39m.21s.
Barcelona e =23m.7s.
Tortosa PSE =33m.25s.
Algiers Univ. iZ =19m.16s., ipPPZ =22m.45s., eZ =23m.21s., 31m.32s., and 35m.20s.
San Juan iPKP =19m.16s., ipPP =22m.47s., ePKP,PKP =41m.37s., eSSS =47m.32s.
Alicante PPP =26m.1s., SKKS =30m.1s., PS =34m.23s., PPS =36m.30s., SS =42m.36s., SSP =43m.16s., SSS =48m.30s., Q =61m.56s.
Toledo SSE =40m.17s.
Granada iPP =22m.53s., pPP =23m.53s., PPP =26m.20s., sSKKS =29m.52s., SKSP = 31m.35s., PPS =34m.44s., iSS =40m.59s., SSS =49m.44s.,
Tamanrasset iPP?Z =23m.0s., eSPZ =32m.46s.
Long waves were also recorded at Vera Cruz.

Dec. 4d. 20h. 12m. 12s. I } Epicentre 18°·0S. 167°·7E.
20h. 38m. 12s. II } (as at 11h.).

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Brisbane		16·5	232	i 3 50	− 4	e 6 58	0	—	—	—
II	Apia		20·2	82	e 4 45	+ 6	e 6 27	?	—	—	—
I	Riverview		21·6	219	i 4 54a	0	i 8 54	+ 5	i 5 21	PP	e 10·4
II			21·6	219	e 4 56	+ 2	e 8 53	+ 4	i 9 38	SS	e 10·9
I	Wellington		24·0	167	—	—	e 9 18?	−14	—	—	—
I	Christchurch		25·8	171	e 6 18	+44	e 10 31	+29	—	—	e 14·0
I	Lick	z.	86·2	48	i 12 47a	+ 3	—	—	i 13 0	pP	—
I	Shasta Dam		87·2	45	i 12 50	+ 1	—	—	—	—	—
I	Fresno	z.	87·3	50	e 12 48a	− 2	—	—	—	—	—
I	Pasadena		87·5	53	12 51	0	—	—	—	—	—
II			87·5	53	12 48	− 3	—	—	—	—	—
I	Mineral	z.	87·6	47	e 12 53	+ 2	—	—	—	—	—
I	China Lake		88·6	52	12 53	− 3	—	—	—	—	—
II			88·6	52	12 54	− 2	—	—	—	—	—
I	College		89·3	17	e 12 55	− 4	—	—	i 12 59	P	—
II			89·3	17	e 12 55	− 4	—	—	—	—	—
I	Boulder City		90·7	52	e 13 4	− 2	—	—	—	—	—
II			90·7	52	e 13 3	− 3	—	—	—	—	—
I	Overton	z.	91·2	52	e 13 10	+ 2	—	—	—	—	—
II		z.	91·2	52	e 13 6	− 2	—	—	—	—	—
I	Pierce Ferry		91·4	52	e 13 7	− 2	—	—	i 13 12	P_cP	—
II			91·4	52	e 13 7	− 2	—	—	—	—	—
I	Tucson		92·5	56	e 13 13	− 1	—	—	i 13 16	P_cP	—
I	Hungry Horse		95·7	41	e 17 29	PP	—	—	—	—	—
I	Weston		124·7	50	i 19 21	[+19]	—	—	—	—	—
II			124·7	50	e 19 12	[+10]	—	—	—	—	—
I	Ksara		134·3	299	e 19 24	[+ 4]	e 38 34	SS	e 21 57	PP	—
II			134·3	299	—	—	e 22 59	PKS	—	—	—
I	Stuttgart	z.	144·7	335	e 19 38	[− 1]	—	—	—	—	—
II		z.	144·7	335	e 19 36	[− 3]	—	—	—	—	—
I	Strasbourg		145·4	335	e 19 40a	[0]	—	—	—	—	—
II			145·4	335	e 19 41	[+ 1]	—	—	—	—	—
I	Zürich		146·0	335	e 19 37	[− 4]	—	—	—	—	—
I	Chur		146·1	334	e 19 43	[+ 2]	—	—	—	—	—
I	Paris		147·0	342	e 19 45	[+ 2]	—	—	—	—	—
I	Besançon		147·2	337	e 19 46	[+ 3]	—	—	—	—	—
I	Algiers Univ.	z.	156·9	328	e 19 56	[− 1]	—	—	e 20 24	PKP_s	—

Additional readings :—
Brisbane I eSE =7m.1s.
Riverview I iZ =5m.1s., iEZ =5m.10s., isSN =9m.9s., II eEN =5m.6s., iS?N =8m.57s.
Fresno I eZ =13m.9s. and 15m.3s.
Stuttgart I eZ =17m.52s.
Strasbourg I i =19m.51s., e =20m.1s. and 20m.17s.
Paris I i =19m.55s. and 20m.9s.
Besançon I e =19m.55s.

Dec. 4d. 21h. 34m. 51s. Epicentre 21°·0S. 67°·5W. Depth of focus 0·005.
(as on 1949, March 13d.).

A = +·3576, B = −·8633, C = −·3563 ; δ = +11 ; h = +4 ;
D = −·924, E = −·383 ; G = −·136, H = +·329, K = −·934.

Uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		4·5	351	i 1 10a	+ 3	i 1 45	−14	—	—	—
Huancayo		11·6	319	e 2 31	−14	e 4 26	−28	—	—	—
San Juan		39·2	3	e 7 21	− 2	—	—	—	—	—
Tucson		67·2	322	i 10 48	− 1	—	—	e 11 34	pP	—
Palomar	z.	71·7	318	e 11 17	0	—	—	e 12 3	sP	—
Pierce Ferry		71·8	322	i 11 18	0	—	—	—	—	—
Boulder City		72·2	321	e 11 21	+ 1	—	—	—	—	—
Overton	z.	72·4	322	i 11 22	+ 1	—	—	—	—	—
Riverside		72·4	318	i 11 21	0	i 12 0	sP	e 11 48	pP	—
Pasadena		73·0	318	i 11 26	+ 1	—	—	i 12 5	sP	—
China Lake	z.	73·8	320	i 11 30k	+ 1	—	—	e 11 58	pP	—
Lick	z.	77·2	319	i 11 51a	+ 2	—	—	i 12 34	sP	—
Mineral	z.	79·1	321	e 11 50	− 9	—	—	e 15 18	PP	—
Shasta Dam		79·8	321	i 12 3	0	—	—	—	—	—
Hungry Horse		80·6	331	i 12 7	0	—	—	—	—	—
Tamanrasset	z.	83·4	62	e 12 39	pP	—	—	—	—	—
Victoria	z.	85·3	327	e 12 31	0	—	—	—	—	—
Stuttgart	z.	97·2	40	e 13 45	+18	—	—	—	—	—

Additional readings :—
La Paz ipP = 1m.14s., i = 1m.53s. and 2m.45s.
Huancayo e = 4m.38s.
San Juan i = 7m.47s.
China Lake isP?Z = 12m.9s.
Stuttgart eZ = 13m.48s.

Dec. 4d. Continuation of the list of aftershocks from the epicentre of Dec. 2d. 19h., recorded from California. The P readings at China Lake is entered.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
4	11	25	5	48	25	10	43	0	15	29	49
4	17	58	7	7	49	14	11	48	18	4	45
4	48	54	7	51	28	14	24	2	20	23	23
5	28	39	9	0	0	14	44	50	21	20	11
5	29	29	10	11	38						

Dec. 4d. Readings also at 0h. (College (2) and near Dzhergetal (2)), 1h. (Guadalajara, Manzanillo, near Puebla, Tacabuya, Pasadena, Palomar, Riverside, China Lake, Tucson, Overton, Pierce Ferry, Lick, Hungry Horse, College (2), Weston, and Stuttgart (2)), 2h. (near Ashkabad (2)), 3h. (College), 4h. (Tucson, Overton, Pierce Ferry (2), College (5), Andijan, Fergana, Samarkand, near Dzhergetal, Stalinabad, and Obi-garm), 5h. (Tucson, Pierce Ferry, College, Strasbourg, and Stuttgart), 6h. (Palomar, Pasadena, Riverside, China Lake, Tucson, Overton, Pierce Ferry, Shasta Dam, Hungry Horse (2), College, Resolute Bay, Ashkabad, Andijan, Fergana, Lunacharskoe, Samarkand, Tashkent, near Dzhergetal, Obi-garm, and Stalinabad), 7h. (Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, College, Stuttgart, and near Dzhergetal), 8h. (Lick, Sotchi, near Yalta, near Dzhergetal, and near Obi-garm), 9h. (Tucson, Overton, Mineral, Shasta Dam, College, Stuttgart, near Dzhergetal (2), and near Obi-garm), 10h. (Tucson (2), Stuttgart (2), and near Naryn), 14h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Tucson (2), Overton, Pierce Ferry, Lick, Shasta Dam, College (2), Weston, Stuttgart, Lenkoran, and near Dzhergetal), 15h. (Calcutta and College (2)), 16h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, Harvard, Weston, Palisades, Scoresby Sund (2), Stuttgart, near San Juan, and near Apia), 18h. (Stuttgart and near Dzhergetal), 19h. (College), 20h. (Ottawa), 21h. (College, Brisbane, Strasbourg, and Stuttgart), 22h. (Calcutta, New Delhi, Poona, and near Yalta), 23h. (Hungry Horse, College (2), Bombay, and Stuttgart).

Dec. 5d. 0h. 3m. 45s. Epicentre 2°·9S. 127°·3E. (as on 1948, March 1d.).

$A = -·6052$, $B = +·7945$, $C = -·0503$; $\delta = +3$; $h = +7$;
$D = +·795$, $E = +·606$; $G = +·030$, $H = -·040$, $K = -·999$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		18·5	340	i 4 26	+ 7	e 7 26	−18	—	—	—
Bandong		20·0	258	e 3 35	−62	i 7 23	−54	—	—	—
Djakarta		20·7	261	e 3 42	−62	e 7 27	−64	—	—	—
Calcutta	E.	45·7	306	—	—	i 15 7	− 1	i 15 39	PPS	—
Vladivostok		46·0	5	e 8 43	+16	i 15 13	+ 1	—	—	—
Kodaikanal	E.	51·3	286	i 9 3	− 5	i 16 19	− 7	—	—	—
Hyderabad	N.	52·2	295	—	—	e 16 33	− 6	—	—	—
Poona		56·7	295	i 9 29	−19	i 17 33	− 7	i 14 35	PcS	—
New Delhi		57·4	307	e 9 51	− 2	i 17 39	−10	21 27	SS	—
Bombay		57·8	295	e 9 53	− 2	i 17 47	− 7	—	—	—
Irkutsk		58·3	344	—	—	18 2	+ 1	—	—	—
Naryn		64·1	319	e 10 38?	0	i 19 15	+ 1	—	—	—
Frunse		65·8	320	e 10 48	− 1	i 19 34	− 1	—	—	—
Andijan		66·2	317	10 51	− 1	i 19 38	− 2	—	—	—
Dzhergetal		66·3	316	e 10 52	0	i 19 39	− 3	—	—	—
Fergana		66·4	317	e 10 53	0	e 19 40	− 3	—	—	—
Obi-garm		67·2	315	i 11 14?	+16	e 20 5?	+13	—	—	—
Stalinabad		67·8	315	i 11 3	+ 1	i 19 58	− 2	—	—	—
Lunacharskoe		68·5	317	e 11 7	+ 1	i 20 5	− 3	—	—	—
Tashkent		68·6	317	i 11 5	− 2	i 20 5	− 4	—	—	—
Mary		72·6	311	i 11 31	0	—	—	—	—	—
Ashkabad		75·4	310	e 11 48	+ 1	—	—	—	—	—
Sverdlovsk		79·9	330	12 11	− 1	22 7	− 9	—	—	—
Baku		82·3	311	—	—	e 22 36	− 4	—	—	—
Lenkoran		82·8	310	12 25	− 2	22 43	− 2	—	—	—
Grozny		85·8	314	e 12 47	+ 5	—	—	—	—	—
Tiflis		86·3	312	e 12 45	0	—	—	—	—	—
Gori		86·9	312	e 12 49	+ 1	—	—	—	—	—
Leninakan		86·9	311	e 12 49	+ 1	—	—	—	—	—
Abastumanj		87·8	312	e 12 52	0	—	—	—	—	—
Piatigorsk		87·8	314	e 12 52	0	—	—	—	—	—
Zugdidi		88·6	312	e 12 54	− 2	—	—	—	—	—
College		90·4	25	e 13 2	− 2	—	—	e 16 48	PP	—
Ksara		92·8	303	i 13 16	0	24 7	−12	—	—	—
Resolute Bay		104·2	11	14 6	− 1	24 39	[− 8]	18 34	PP	e 41·0
Shasta Dam		107·2	48	e 18 41	PP	—	—	—	—	—
Collmberg	Z.	107·3	323	e 18 28	[0]	—	—	e 19 35	PP	—
Stuttgart	Z.	110·4	322	e 18 34	[0]	e 22 4	PKS	—	—	—
Hungry Horse		110·9	39	e 18 33	[− 2]	—	—	—	—	—
China Lake	Z.	112·0	53	e 18 37	[0]	—	—	e 19 53	PP	—
Palomar	Z.	113·1	55	e 18 48	[+ 9]	—	—	—	—	—
Boulder City		114·1	52	e 18 43	[+ 2]	—	—	—	—	—
Overton	Z.	114·3	51	i 18 43	[+ 1]	—	—	—	—	—
Paris		114·5	323	e 18 42	[0]	—	—	—	—	—
Pierce Ferry		114·7	51	e 18 43	[+ 1]	—	—	—	—	—
Tucson		118·3	55	i 18 50	[+ 1]	e 22 3	PKS	e 20 25	PP	—
Tamanrasset	Z.	120·3	295	e 18 53	[− 1]	—	—	—	—	—
Huancayo		153·0	123	i 19 54	[+ 2]	—	—	—	—	—
La Paz	Z.	155·4	143	19 57	[+ 2]	—	—	—	—	—
San Juan		159·8	37	e 19 57	[− 4]	—	—	i 20 41	PKP_2	—

Additional readings and note :—
New Delhi iN = 18m.8s., S_cSN = 20m.4s.
College iP = 13m.9s.
Resolute Bay SKKS = 25m.10s., S = 25m.24s., e = 28m.45s., eE = 31m.57s., SS = 32m.27s., SSS = 36m.21s.
Long waves were also recorded at Wellington and De Bilt.

Dec. 5d. 1h. 34m. 18s. I
8h. 43m. 6s. II
11h. 55m. 48s. III
12h. 6m. 7s. IV
16h. 52m. 16s. V
} Epicentre 18°·0S. 167°·7E. (as on 4d.).

A = −·9299, B = +·2027, C = −·3071; δ = +11; h = +5.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
II	Brisbane	16·5	232	i 3 52k	− 2	e 6 52	− 6	—	—	—
IV		16·5	332	i 3 41k	−13	e 6 34	−24	i 7 0	S	—
V		16·5	232	i 3 50k	− 4	i 6 59	+ 1	e 7 16	SS	—
II	Apia	20·2	82	e 4 46	+ 7	—	—	—	—	—
V		20·2	82	e 4 39	0	—	—	e 4 56	PP	—
II	Riverview	21·6	219	e 4 55	+ 1	e 8 54	+ 5	e 5 22	PP	e 10·9
III		21·6	219	e 4 47	− 7	e 8 42	− 7	i 8 50	S	e 11·0
IV		21·6	219	i 4 47a	− 7	i 8 46	− 3	i 5 11	PP	e 10·3
V		21·6	219	i 4 54k	0	i 8 52	+ 3	i 5 2	pP	e 10·4
V	Wellington	24·0	167	—	—	e 9 14	−18	—	—	—
II	Christchurch	25·8	171	—	—	e 10 54	+52	e 12 34	Q	e 14·4
V		25·8	171	—	—	e 9 44?	−18	—	—	—
V	Berkeley z.	86·0	48	i 12 45a	+ 2	—	—	i 12 58	pP	—
I	Lick z.	86·2	48	i 12 45a	+ 1	—	—	i 12 53	pP	—
II	z.	86·2	48	e 12 44k	0	—	—	—	—	—
III	z.	86·2	48	e 12 47	+ 3	—	—	—	—	—
IV	z.	86·2	48	i 12 46a	+ 2	—	—	i 12 56	pP	—
V	z.	86·2	48	i 12 46a	+ 2	—	—	e 12 59	pP	—
I	Shasta Dam	87·2	45	i 12 48	− 1	—	—	—	—	—
II		87·2	45	e 12 47	− 2	—	—	—	—	—
IV		87·2	45	i 12 49	0	—	—	i 12 59	pP	—
IV	Fresno z.	87·3	50	e 12 51a	+ 1	—	—	e 13 1	pP	—
V		87·3	50	e 12 51a	+ 1	—	—	e 13 8	pP	—
I	Pasadena	87·5	53	12 50	− 1	—	—	12 58	pP	—
II		87·5	53	12 50	− 1	—	—	12 59	pP	—
III		87·5	53	12 12?	−39	—	—	12 21?	pP	—
IV		87·5	53	12 51	0	—	—	13 1	pP	—
V		87·5	53	12 50	− 1	—	—	13 3	pP	—
I	Mineral z.	87·6	47	e 12 51	0	—	—	—	—	—
II	z.	87·6	47	e 12 49	− 2	—	—	—	—	—
IV	z.	87·6	47	e 12 52	+ 1	—	—	e 13 2	pP	—
V	z.	87·6	47	e 12 52	+ 1	—	—	—	—	—
IV	Reno z.	88·5	48	e 12 57k	+ 1	—	—	e 13 7	pP	—
V	z.	88·5	48	e 12 57a	+ 1	—	—	—	—	—
I	China Lake	88·6	52	12 55	− 1	—	—	13 3	pP	—
II		88·6	52	12 55	− 1	—	—	13 4	pP	—
III		88·6	52	12 50	− 6	—	—	12 59	pP	—
IV		88·6	52	12 57	+ 1	—	—	13 7	pP	—
V		88·6	52	12 56	0	—	—	13 9	pP	—
I	College	89·3	17	e 12 56	− 3	—	—	e 13 4	pP	—
II		89·3	17	e 12 55	− 4	—	—	—	—	—
III		89·3	17	e 12 50	− 9	—	—	13 0	pP	—
IV		89·3	17	e 12 58	− 1	—	—	e 13 8	pP	—
V		89·3	17	e 12 57	− 2	—	—	—	—	e 48·0
I	Boulder City	90·7	52	e 13 6	0	—	—	—	—	—
II		90·7	52	e 13 8	+ 2	—	—	—	—	—
IV		90·7	52	e 13 7	+ 1	—	—	i 13 17	pP	—
V		90·7	52	e 13 7	+ 1	—	—	—	—	—
I	Overton z.	91·2	52	e 13 8	0	—	—	—	—	—
II	z.	91·2	52	e 13 7	− 1	—	—	—	—	—
III	z.	91·2	52	e 13 11	+ 3	—	—	—	—	—
IV	z.	91·2	52	e 13 10	+ 2	—	—	i 13 20	pP	—
V	z.	91·2	52	i 13 9	+ 1	—	—	—	—	—
I	Pierce Ferry	91·4	52	e 13 9	0	—	—	—	—	—
II		91·4	52	e 13 8	− 1	—	—	i 13 18	pP	—
III		91·4	52	e 13 12	+ 3	—	—	—	—	—
IV		91·4	52	e 13 10	+ 1	—	—	i 13 20	pP	—
V		91·4	52	i 13 10	+ 1	—	—	—	—	—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Tucson		92·5	56	e 13 14	0	—	—	e 13 22	pP	—
II			92·5	56	e 13 14	0	—	—	i 13 23	pP	—
III			92·5	56	e 13 19	+ 5	—	—	—	—	—
IV			92·5	56	i 13 16	+ 2	—	—	i 13 26	pP	—
V			92·5	56	i 13 16	+ 2	—	—	i 13 29	pP	—
IV	Hungry Horse		95·7	41	e 13 30	+ 1	—	—	—	—	—
V			95·7	41	e 13 32	+ 3	—	—	—	—	—
V	La Paz		115·2	119	e 18 54	[+11]	—	—	—	—	—
V	Ottawa		121·2	46	e 18 53	[− 2]	—	—	—	—	—
V	San Juan		129·0	80	e 19 9	[− 1]	—	—	—	—	—
II	Ksara		134·3	299	e 17 45	?	e 22 59	PKS	e 25 53	PPP	—
IV			134·3	299	e 18 58	[−22]	e 22 36	PKS	—	—	—
V			134·3	299	i 19 23	[+ 3]	e 26 58	[+28]	e 21 59	PP	—
V	Collmberg	z.	141·2	334	e 19 32	[− 1]	—	—	—	—	—
V	Prague		141·5	332	e 22 13	PP	—	—	—	—	—
V	Jena	E.	142·0	334	e 19 29	[− 5]	—	—	e 22 41	PP	—
I	Stuttgart	z.	144·7	335	e 19 35	[− 4]	—	—	—	—	—
II		z.	144·7	335	e 19 37	[− 2]	—	—	e 19 46	PKP_2	—
III		z.	144·7	335	e 19 31	[− 8]	—	—	e 19 42	PKP_2	—
IV		z.	144·7	335	e 19 39k	[0]	—	—	e 19 49	PKP_2	—
V		z.	144·7	335	i 19 39a	[0]	—	—	—	—	—
IV	Triest	z.	145·0	328	e 19 38	[− 1]	—	—	—	—	—
V			145·0	328	i 19 39	[0]	e 28 19	?	i 19 55	PKP_2	—
I	Strasbourg		145·4	335	e 19 38	[− 2]	—	—	—	—	—
II			145·4	335	e 19 40	[0]	—	—	i 19 48	PKP_2	—
III			145·4	335	e 19 34	[− 6]	—	—	—	—	—
IV			145·4	335	e 19 41a	[+ 1]	—	—	e 19 51	PKP_2	—
V			145·4	335	i 19 41	[+ 1]	—	—	i 19 58	pPKP	—
IV	Paris		147·0	342	i 19 45	[+ 2]	—	—	—	—	—
V			147·0	342	e 19 43	[0]	—	—	—	—	—
IV	Besançon		147·2	337	e 19 46	[+ 3]	—	—	—	—	—
V	Rome		148·2	323	e 19 47	[+ 2]	—	—	—	—	—
V	Tamanrasset	z.	162·7	290	e 20 4	[0]	—	—	e 20 53	PKP_2	—

Additional readings :—
Riverview IV iSSEN =9m.31s., V iPPP =5m.28s., iP_cPZ =8m.49s., iN =9m.4s., iE = 9m.10s., iN =9m.13s., iSSNZ =9m.31s.
Lick V eZ =13m.13s.
Shasta Dam IV e =13m.18s.
Reno IV eZ =13m.23s., V eN =13m.15s.
Tucson IV i =14m.9s., ePP =16m.18s.
Stuttgart IV eZ =19m.56s., V eZ =19m.55s.
Strasbourg IV e =19m.59s., V e =21m.14s.
Paris IV i =20m.2s., e =20m.21s., V i =19m.51s., 20m.0s., 20m.10s., and 20m.49s.
Besançon V e =20m.11s.
Tamanrasset V ePPZ =24m.38s.
Long waves were also recorded to shock II at Wellington, and to shock III at Christchurch and Wellington.

Dec. 5d. 21h. 53m. 37s. Epicentre 30°·0N. 130°·5E.

$A = -·5634$, $B = +·6597$, $C = +·4975$; $\delta = +13$; $h = +2$;
$D = +·760$, $E = +·649$; $G = -·323$, $H = +·378$, $K = -·868$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	E.	7·9	281	e 2 7	+ 8	—	—	—	—	—
Nanking		10·3	285	2 36a	+ 4	i 5 13	+43	—	—	6·2
Vladivostok		13·1	4	i 3 29	PPP	i 6 26	L	—	—	(i 6·4)
Irkutsk		29·4	327	6 23	+16	—	—	—	—	—
Przhevalsk		43·2	303	e 8 6	+ 2	—	—	—	—	—
Naryn		45·0	301	e 8 21	+ 2	—	—	—	—	—
Frunse		46·0	302	e 8 27	0	—	—	—	—	—
New Delhi		46·1	282	e 8 29	+ 1	19 48	SSS	18 40	SS	—
Andijan		47·8	299	8 42	+ 1	—	—	—	—	—
Fergana		48·3	299	8 46	+ 1	—	—	—	—	—

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lunacharskoe		50·0	300	e 8 59	+ 1	—	—	—	—	—
Obi-garm		50·1	297	i 9 1	+ 2	—	—	—	—	—
Tashkent		50·1	300	e 9 0	+ 1	—	—	—	—	—
Stalinabad		50·9	297	e 9 6	+ 1	—	—	—	—	—
Samarkand		52·0	299	e 9 9	− 4	—	—	—	—	—
Kodaikanal	E.	53·0	261	—	—	e 17 8	PPS	—	—	—
Sverdlovsk		54·6	321	i 9 30	− 2	17 10	− 1	—	—	—
Ashkabad		59·0	299	e 10 5?	+ 1	—	—	—	—	—
College		59·9	29	e 10 4	− 6	i 18 13	− 8	i 10 11	P	e 25·2
Riverview		66·4	161	e 9 46	?	e 19 44	+ 1	e 20 52	S_cS	e 30·5
Grozny		66·5	308	e 10 55	+ 1	—	—	—	—	—
Moscow		67·3	323	e 10 56	− 3	—	—	—	—	—
Tiflis		67·8	307	e 10 59	− 3	—	—	—	—	—
Zugdidi		69·5	308	e 11 15	+ 3	—	—	—	—	—
Resolute Bay		71·5	12	11 19	− 5	e 20 36	− 7	e 21 24	PS	31·2
Ksara		77·4	302	e 11 56	− 2	e 23 8	PPS	—	—	—
Victoria	Z.	77·8	41	e 13 4	+63	—	—	—	—	—
Scoresby Sund		77·9	351	e 11 59	− 2	—	—	—	—	42·4
Istanbul		78·7	311	e 12 5	− 1	—	—	—	—	—
Collmberg	Z.	82·2	326	e 12 22	− 2	—	—	e 15 41	PP	—
Hungry Horse		83·0	38	e 12 24	− 4	—	—	—	—	—
Jena		83·1	326	e 12 29	0	—	—	—	—	—
Berkeley	Z.	84·2	50	e 12 37	+ 3	—	—	—	—	—
Lick	Z.	84·9	50	e 12 42a	+ 4	—	—	—	—	—
Reno	Z.	84·9	47	e 12 43a	+ 5	—	—	—	—	—
De Bilt		85·3	330	—	—	e 23 23?	+13	—	—	e 41·4
Triest		85·4	322	i 12 36	− 4	—	—	e 16 20	PP	—
Stuttgart		85·7	326	e 12 40	− 2	e 23 23	+ 9	e 12 50	P_cP	42·4
Fresno	Z.	86·5	49	e 12 50a	+ 4	—	—	—	—	—
Tinemaha	Z.	87·3	49	e 12 46	− 4	—	—	i 12 57	P_cP	—
Kew		88·1	332	—	—	e 28 14	?	—	—	e 46·4
Logan		88·4	42	e 12 59	+ 4	—	—	—	—	—
China Lake	Z.	88·5	49	e 12 51	− 5	—	—	i 12 58	P	—
Paris		88·8	329	—	—	—	—	e 40 23?	Q	e 47·4
Mount Wilson	Z.	89·1	50	e 12 47	−11	—	—	i 13 2	P	—
Overton	Z.	90·1	47	e 13 9	+ 6	—	—	—	—	—
Boulder City		90·2	47	e 13 9	+ 5	—	—	—	—	—
Pierce Ferry		90·6	47	e 13 11	+ 6	—	—	e 16 43	PP	—
Tucson		95·1	49	e 13 24	− 2	—	—	—	—	—

Additional readings :—
Riverview eP?Z = 10m.6s., iE = 21m.4s.
Resolute Bay eE = 21m.36s., e = 26m.29s., eE = 28m.35s.
Hungry Horse e = 12m.31s.
Jena eE = 12m.52s., eN = 13m.12s.
Reno eE = 12m.59s., eN = 13m.29s.
Fresno eZ = 13m.49s.
Tucson i = 13m.34s.
Long waves were also recorded at Bombay and at other European stations.

Dec. 5d. Readings also at 0h. (near Dzhergetal), 1h. (Lenkoran, Ksara, La Paz, Hungry Horse, Tucson, Boulder City, Overton, Pierce Ferry, Pasadena, China Lake, near Shasta Dam, near Huancayo, and near Andijan), 2h. (Overton, Tucson, near Gandzha, and Stepanavan), 3h. (Stuttgart, Triest, and near Dzhergetal), 4h. (College, Pasadena, China Lake, Lunacharskoe, Tashkent, Dzhergetal, Naryn, Samarkand, near Andijan, and Fergana), 5h. (Tacubaya, Manila, College, Hungry Horse, Palomar, China Lake, Tinemaha, Overton, Pierce Ferry, Tucson, and near Apia), 6h. (Tacubaya, Hungry Horse, Pasadena, China Lake, near College, and near Dzhergetal (2)), 9h. (Pasadena, China Lake, Ashkabad, Dzhergetal, Frunse, Almata, near Obi-garm, Fergana, Stalinabad, Andijan, Lunacharskoe, and Samarkand), 10h. (College, Dzhergetal, Samarkand, Lunacharskoe, near Fergana, Stalinabad, and Andijan), 11h. (near Apia and near Istanbul), 12h. (Pierce Ferry, Tucson (2), Pasadena (2), China Lake (2), and Stuttgart (2)), 15h. (Hungry Horse, Overton, Pierce Ferry, Mount Wilson, and China Lake), 16h. (College and Hungry Horse), 17h. (near Istanbul), 18h. (near Dzhergetal (2)), 19h. (College, Hungry Horse, Overton, China Lake, Prague, and near Dzhergetal), 20h. (near Dzhergetal (2)), 21h. (Collmberg, Resolute Bay, College (2), Hungry Horse, Reno, China Lake, Tinemaha, Overton, Pierce Ferry, Tucson, near Dzhergetal (2), near Gandzha, Stepanavan, and Tsikhlis-Dzhvari), 22h. (Lenkoran), 23h. (College, China Lake, and Stuttgart).

Dec. 6d. 16h. 54m. 7s. (I) } Epicentre 18°·0S. 167°·7E.
21h. 6m. 3s. (II) } (as on 5d.).

A = −·9299, B = +·2027, C = −·3071; δ = +11; h = +5;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Brisbane		16·5	232	i 3 44k	−10	e 6 34	−24	—	—	—
II		16·5	232	i 3 49k	− 5	—	—	—	—	—
I Riverview		21·6	219	i 4 51k	− 3	i 8 47	− 2	i 8 50	PcP	e 10·3
II		21·6	219	e 4 55	+ 1	e 8 51	+ 2	i 8 56	PcP	e 10·4
I Christchurch		25·8	171	—	—	e 10 13	+11	12 43	Q	e 16·6
I Berkeley	z.	86·0	48	e 12 45	+ 2	—	—	e 12 55	pP	—
I Lick	z.	86·2	48	i 12 46k	+ 2	—	—	i 12 56	pP	—
II	z.	86·2	48	e 12 46a	+ 2	—	—	—	—	—
I Shasta Dam		87·2	45	i 12 50	+ 1	—	—	i 12 59	pP	—
I Fresno	z.	87·3	50	i 12 51k	+ 1	—	—	e 13 3	pP	—
II	z.	87·3	50	e 12 51k	+ 1	—	—	—	—	—
I Pasadena		87·5	53	12 52	+ 1	—	—	13 2	pP	—
II		87·5	53	12 51	0	—	—	13 2	pP	—
I Mineral		87·6	47	e 12 52	+ 1	—	—	e 13 24	?	—
II	z.	87·6	47	e 12 52	+ 1	—	—	—	—	—
II China Lake		88·6	52	12 56	0	—	—	13 7	pP	—
I College		89·3	17	i 12 58	− 1	—	—	—	—	—
II		89·3	17	i 12 58	− 1	—	—	—	—	—
I Victoria	z.	90·1	38	e 14 2	+59	—	—	—	—	—
I Seattle		90·3	40	e 13 7	+ 3	—	—	—	—	—
I Boulder City		90·7	52	e 13 7	+ 1	—	—	—	—	—
II		90·7	52	e 13 2	− 4	—	—	e 13 18	pP	—
II Overton	z.	91·2	52	i 13 10	+ 2	—	—	—	—	—
I Pierce Ferry		91·4	52	i 13 11	+ 2	—	—	—	—	—
II		91·4	52	i 13 10	+ 1	—	—	—	—	—
I Tucson		92·5	56	i 13 17	+ 3	—	—	—	—	—
II		92·5	56	i 13 16	+ 2	—	—	e 13 28	pP	—
I Hungry Horse		95·7	41	e 13 29	0	—	—	—	—	—
I Ksara		134·3	299	e 19 21	[+ 1]	e 22 57	PKS	—	—	—
II		134·3	299	e 21 41	PP	e 29 18	{+31}	—	—	—
I Stuttgart	z.	144·7	335	i 19 37k	[− 2]	—	—	—	—	—
II	z.	144·7	335	e 19 37	[− 2]	—	—	—	—	—
I Karlsruhe	z.	144·8	337	e 19 38	[− 1]	—	—	—	—	—
I Strasbourg		145·4	335	i 19 40	[0]	—	—	—	—	—
II		145·4	335	i 19 41	[+ 1]	—	—	—	—	—
I Zürich		146·0	335	e 19 40	[− 1]	—	—	—	—	—
I Basle		146·3	335	e 19 42	[+ 1]	—	—	—	—	—
I Paris		147·0	342	i 19 43	[0]	—	—	—	—	—
II		147·0	342	e 19 43	[0]	—	—	—	—	—
I Besançon		147·2	337	e 19 44	[+ 1]	—	—	—	—	—
II		147·2	337	e 19 45	[+ 2]	—	—	—	—	—
II Tamanrasset	z.	162·7	290	—	—	e 47 4	SSP	—	—	—

Additional readings :—
Riverview I iZ = 4m.55s. and 5m.12s., ePPZ = 5m.17s., ePPPZ = 5m.27s., iZ = 5m.40s., iN = 8m.56s., eSSZ = 9m.28s.
Shasta Dam I i = 13m.7s.
Fresno I eZ = 15m.6s.
Seattle I e = 13m.10s. and 13m.55s.
Stuttgart I eZ = 19m.47s. and 20m.0s., II eZ = 19m.49s.
Strasbourg I i = 19m.51s., e = 19m.55s. and 20m.1s., II e = 19m.51s.
Paris I i = 19m.52s.
Besançon I e = 19m.56s.
Long waves to shock I were also recorded at Wellington,

Dec. 6d. Readings also at 0h. (College, Hungry Horse, Semipalatinsk, Przhevalsk, Almata, Naryn, Fergana, Samarkand, Stalinabad, Frunse, Sverdlovsk, Ashkabad, and near Vladivostok), 1h. (near Przhevalsk), 2h. (Triest), 3h. (Brisbane, Riverview, Pasadena, Riverside, China Lake (2), Stuttgart, and Strasbourg), 4h. (Brisbane, Riverview, Pasadena, China Lake, College, Lick, Pierce Ferry, Tucson, Ksara, Paris, Besançon, Strasbourg, and Stuttgart), 5h. (Stalinabad, near Fergana, Obi-garm, and Andijan), 7h. (Brisbane, Riverview, Pasadena, China Lake, College, Pierce Ferry, Tucson, Strasbourg, and Stuttgart), 8h. (College, Hungry Horse, and Huancayo), 9h. (College, Hungry Horse, Lick, Mount Wilson, Riverside, Pasadena, China Lake (2), Tinemaha, Pierce Ferry, Stuttgart, and near La Paz), 11h. (La Paz), 13h. (Huancayo, Brisbane, Pietermaritzburg, Collmberg, and Stuttgart), 14h. (Stalinabad, Naryn, near Dzhergetal, Fergana, Andijan, and near Huancayo), 16h. (near Dzhergetal), 17h. (College (2), Victoria, Hungry Horse, Shasta Dam, Mineral, Berkeley, Lick (2), Pasadena (2), Palomar, Riverside, China Lake (2), Tinemaha, Boulder City, Overton (2), Pierce Ferry (2), Tucson, Weston, Strasbourg, Stuttgart, and Collmberg), 18h. (China Lake, Prague, and near Dzhergetal), 20h. (near Ashkabad), 22h. (near Dzhergetal), 23h. (College and near Dzhergetal (2)).

Dec. 7d. 5h. 4m. 53s. Epicentre 32°·4N. 115°·1W.

$A = -\cdot3589$, $B = -\cdot7661$, $C = +\cdot5333$; $\delta = +13$; $h = +1$;
$D = -\cdot906$, $E = +\cdot424$; $G = -\cdot226$, $H = -\cdot483$, $K = -\cdot846$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar		1·8	303	i 0 32	0	i 0 59	+ 3	i 0 36	P_g	—
La Jolla		2·1	284	e 0 34	− 3	i 1 1	− 3	i 0 41	P_g	—
Riverside	z.	2·5	310	i 0 43	0	i 1 21	+ 7	i 0 50	P_g	—
Pasadena		3·1	304	i 0 59	P*	i 1 38	S*	i 1 2	P_g	—
Boulder City		3·6	3	e 2 2	+64	e 2 50	+68	i 2 15	P_g	—
Tucson		3·6	91	i 1 1	+ 3	i 1 43	+ 1	i 1 10	P_g	i 2·1
Overton	z.	4·2	7	i 1 5	− 2	i 2 33	S_g	—	—	—
Fresno		5·8	319	e 1 51	P_g	e 2 45	+ 7	e 3 13	S_g	—
Reno	z.	8·1	333	e 2 45a	P_g	—	—	—	—	—

Additional readings :—
Boulder City iS = 3m.18s. ; all readings appear 1m. late.
Tucson i = 1m.56s.

Dec. 7d. Readings also at 0h. (College (2), China Lake, Pasadena), 1h. (Dzhergetal, Fergana, near Andijan, Frunse, and Naryn), 2h. (Stuttgart, Pasadena, China Lake), 3h. (Hungry Horse, College, Andijan, Fergana, Naryn, near Dzhergetal (2), Obi-garm, and Stalinabad), 4h. (Logan, near Boulder City, and Overton, Fergana, near Andijan, and Dzhergetal (2)), 5h. (College, Pasadena, China Lake, Taranto, and near Messina), 6h. (Boulder City, Pasadena, China Lake, and Overton), 7h. (Logan, Shasta Dam, Pasadena, China Lake, and Hungry Horse), 8h. (Pietermaritzburg and Pretoria), 9h. (near Fergana), 12h. (Overton), 15h., 16h., and 17h. (College), 19h. (Kodaikanal, Ksara, Hungry Horse (2), College, and near Balboa Heights), 20h. (College, near Seattle, and Victoria), 22h. (Brisbane, Pasadena, China Lake, Pierce Ferry, Tacubaya, College, Zugdidi, near Abastumanj, Gori, Grozny, Gandzha, Stepanavan, Tiflis, Tsikhlis-Dzhvari, and near Naryn), 23h. (Christchurch, Overton, Pierce Ferry, Shasta Dam, College, Pasadena, China Lake, Stuttgart, Andijan, Lunacharskoe, Samarkand, near Fergana, Obi-garm, and Stalinabad).

Dec. 8d. 0h. 58m. 37s. Epicentre 18°·0S. 167°·7E. (as on 6d.).

$A = -\cdot9299$, $B = +\cdot2027$, $C = -\cdot3071$; $\delta = +11$; $h = +5$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	16·5	232	i 3 54k	0	—	—	—	—	—
Apia		20·2	82	e 4 43	+ 4	—	—	—	—	—
Riverview		21·6	219	e 5 11	PP	e 9 1	+12	—	—	e 10·3
Shasta Dam		87·2	45	e 12 49	0	—	—	i 13 5	pP	—
Pasadena		87·5	53	12 48	− 3	—	—	13 0	pP	—
Mineral	z.	87·6	47	e 12 35	−16	—	—	e 12 49	pP	—
Mount Wilson	z.	87·6	53	e 12 48	− 3	—	—	—	—	—
Riverside	z.	88·0	53	e 12 51	− 2	—	—	—	—	—
China Lake	z.	88·6	52	e 12 54	− 2	—	—	e 13 6	pP	—
College		89·3	17	e 12 56	− 3	—	—	—	—	e 43·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City		90·7	52	e 13 5	− 1	—	—	—	—	—
Overton	z.	91·2	52	i 13 7	− 1	—	—	—	—	—
Pierce Ferry		91·4	52	e 13 8	− 1	—	—	e 16 53	PP	—
Tucson		92·5	56	e 13 15	+ 1	—	—	—	—	—
Ksara		134·3	299	e 19 25	[+ 5]	23 0	PKS	—	—	—
Stuttgart	z.	144·7	335	e 19 39	[0]	—	—	—	—	—
Strasbourg		145·4	335	i 19 41	[+ 1]	—	—	—	—	—
Paris		147·0	242	i 19 45	[+ 2]	—	—	i 19 55	pPKP	e 78·4
Besançon		147·2	337	e 19 47	[+ 4]	—	—	e 19 57	pPKP	—
Tamanrasset	z.	162·7	290	e 20 7	[+ 3]	—	—	—	—	—

Additional readings :—
Riverview iZ = 5m.17s., iEN = 9m.12s., iP_cPZ = 9m.16s., iEN = 9m.26s., iE = 9m.34s., iN = 9m.37s.
Mineral eZ = 13m.17s.
Stuttgart eZ = 19m.53s. and 20m.33s.
Strasbourg e = 19m.55s.
Besançon e = 20m.11s.
Long waves were also recorded at Christchurch, Wellington, Palisades, and Harvard.

Dec. 8d. 12h. 49m. 55s. Epicentre 15°·5S. 173°·0W. (as on November 27d.).

A = −·9569, B = −·1175, C = −·2656; δ = +1; h = +6;
D = −·122, E = +·993; G = +·264, H = +·032, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	0 44	P_g	1 13	S_g	—	—	—
Brisbane	z.	33·7	244	i 6 42k	− 3	—	—	—	—	—
Berkeley		71·3	41	e 11 19	− 4	—	—	—	—	e 38·7
Pasadena	z.	71·8	46	i 11 28	+ 2	—	—	—	—	—
Fresno	z.	72·2	43	e 11 29s	0	—	—	e 12 15	?	—
Palomar	z.	72·3	47	e 11 29	0	—	—	—	—	—
Riverside	z.	72·3	46	e 11 30	+ 1	—	—	—	—	—
Shasta Dam		73·0	38	i 11 34	+ 1	—	—	—	—	—
China Lake	z.	73·1	45	i 11 34	0	—	—	—	—	—
Mineral	z.	73·2	39	e 11 36	+ 1	—	—	e 11 55	P_cP	—
Tinemaha	z.	73·4	43	e 11 38	+ 2	—	—	—	—	—
Reno	z.	73·8	40	e 11 40k	+ 2	—	—	—	—	—
Boulder City		75·1	45	e 11 46	0	—	—	—	—	—
Overton	z.	75·7	45	e 11 50	+ 1	—	—	—	—	—
Tucson		76·1	51	i 11 52	+ 1	—	—	—	—	—
Logan		80·1	42	e 12 12	− 1	—	—	—	—	—
Hungry Horse		82·3	35	e 12 25	0	—	—	—	—	—
College		82·4	11	i 12 26	+ 1	—	—	—	—	—
La Paz		99·3	110	e 13 45	0	e 24 24	[0]	32 21	SSP	—
Collmberg	z.	144·0	354	e 19 36	[− 1]	—	—	e 20 37	?	—
Jena		144·5	354	e 19 44?	[+ 6]	—	—	—	—	—
Prague		145·0	352	e 19 42	[+ 3]	—	—	—	—	—
Paris		146·6	6	e 19 50	[+ 8]	—	—	—	—	e 84·1
Stuttgart	z.	146·8	358	e 19 47	[+ 5]	—	—	—	—	—
Strasbourg		147·0	359	e 20 2?	[+19]	—	—	—	—	—
Istanbul		148·1	328	e 19 33	[−11]	—	—	—	—	—
Ksara		148·2	310	e 19 53?	[+ 8]	—	—	23 37	PP	—
Besançon		148·3	2	e 19 58	[+13]	—	—	—	—	—
Tamanrasset	z.	172·6	7	e 20 13	[+ 2]	—	—	—	—	—

Additional readings :—
Jena eE = 19m.52s., eN = 19m.55s., eEN = 20m.23s.
Prague e = 19m.50s. and 19m.59s., i = 20m.4s., e = 20m.25s., ePP? = 22m.7s.
Paris i = 20m.6s.
Stuttgart eZ = 20m.19s.
Besançon e = 20m.8s. and 20m.34s.
Long waves were also recorded at Christchurch and Wellington.

Dec. 8d. 15h. 31m. 36s. Epicentre 18°·0S. 167°·7E. (as at 0h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	16·5	232	i 3 54 a	0	—	—	—	—	—
Riverview		21·6	219	—	—	i 9 0	+11	—	—	e 10·8
Shasta Dam		87·2	45	e 12 46	− 3	—	—	—	—	—
Pasadena	z.	87·5	53	e 12 51	0	—	—	—	—	—
Mineral	z.	87·6	47	e 12 52	+ 1	—	—	e 13 2	pP	—
Palomar	z.	88·1	54	e 12 54	0	—	—	—	—	—
Reno	z.	88·5	48	e 12 58 a	+ 2	—	—	—	—	—
China Lake	z.	88·6	52	i 12 56	0	—	—	e 13 5	pP	—
Tinemaha	z.	88·6	50	e 12 56	0	—	—	—	—	—
College		89·3	17	e 12 56	− 3	—	—	—	—	—
Boulder City		90·7	52	e 13 8	+ 2	—	—	—	—	—
Overton	z.	91·2	52	e 13 10	+ 2	—	—	—	—	—
Tucson		92·5	56	e 13 15	+ 1	—	—	—	—	—
Stuttgart	z.	144·7	335	e 19 36	[− 3]	—	—	—	—	—
Strasbourg		145·4	335	e 19 41	[+ 1]	—	—	e 19 50	pPKP	—
Besançon		147·2	337	e 19 45	[+ 2]	—	—	—	—	—

Long waves were also recorded at Christchurch and Wellington.

Dec. 8d. Readings also at 1h. (Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Hungry Horse, Overton, Pierce Ferry, and Tucson), 3h. (China Lake, near Djakarta, and Bandong), 4h. (College, Hungry Horse (2), Shasta Dam, Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Boulder City, Overton (2), Tucson, Algiers Univ., and Tamanrasset), 7h. (Pretoria, Brisbane, Christchurch, Wellington, College, Shasta Dam, Mineral, Riverside, Pasadena, Palomar, China Lake, Tinemaha, Boulder City, Overton, Tucson, Weston, Puebla, near Tacubaya, Stalinabad, Fergana, Andijan, near Obi-garm, and Dzhergetal), 8h. (Alicante, Palisades, Frunse, near Andijan, Fergana, Naryn, and Dzhergetal (2)), 9h. (Brisbane, College (2), Shasta Dam, Pasadena, Riverside, China Lake (3), Tinemaha, Boulder City, Overton, Tucson, Strasbourg, Stuttgart, and near Dzhergetal), 10h. (near Prague), 11h. and 12h. (China Lake), 13h. (College, Overton, and near Apia), 14h. (College (2), Hungry Horse, Shasta Dam, Mount Wilson, Palomar, China Lake, Overton (2), Tucson, Collmberg, Stuttgart, and near Apia), 15h. (near Ottawa), 16h. (Lick), 17h. (near Frunse), 18h. (near Dzhergetal), 19h. (near Andijan), 20h. (College and near Dzhergetal), 21h. (near Dzhergetal), 23h. (Tucson, Pierce Ferry, College, Vera Cruz, near Oaxaca, Puebla, Tacubaya, and near Dzhergetal).

Dec. 9d. 21h. 38m. 50s. Epicentre 24°·3S. 67°·4W. Depth of focus 0·015.

Intensity VII in Chile between 23° and 24° South latitudes; IV at Moquegua, Arequipa, etc. One dead, several injured at Calama. Felt also at Arica and on the coast of Santa Margarita 22°42′S. 71°10′W. Epicentre 23°·5S. 67°·5W. with depth 100km. (Gutenberg).

F. Greve, S.J.
Boletín del año 1950, Instituto Sismológico, Santiago, 1951, p. 13.

E. Silgado.
Datos Sismológicos del Perú, 1949-1950, Bol. No. 4, Lima, Peru, 1952, p. 25.
Epicentre given by J.S.A. with depth 100km.

$$A = +\cdot3506,\ B = -\cdot8421,\ C = -\cdot4097;\quad \delta = -9;\quad h = +4;$$
$$D = -\cdot923,\ E = -\cdot384;\quad G = -\cdot157,\ H = +\cdot378,\ K = -\cdot912.$$

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		7·8	355	i 1 50 a	− 2	—	—	i 3 2	?	—
Santiago		9·5	197	e 2 18	+ 3	i 3 59	− 1	2 41	?	—
Buenos Aires		12·8	145	i 3 0	+ 2	5 51	SSS	3 11	?	—
La Plata		13·4	144	i 3 6	0	6 10	SS	6 22	SSS	7·2
Huancayo		14·4	327	i 3 17	− 2	—	—	—	—	—
Bogota		29·5	346	i 5 53	− 1	i 10 34	− 4	i 6 13	pP	—
Chinchina	N.	30·2	345	i 5 48?	−12	i 10 10?	−39	i 19 40?	?	—
Balboa Heights		35·2	340	i 6 46	+ 2	i 12 20	+13	—	—	—
Fort de France		39·2	11	i 7 17	0	i 16 7	SS	i 13 6	Sc	—
Port au Prince		42·5	354	i 7 59	+15	i 13 41	−15	16 39	SS	e 19·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		42·5	3	i 7 40	− 4	i 13 42	−14	i 8 42	?	i 17·0
Ciudad Trujillo		42·6	358	i 10 4	PPP	i 16 14	?	—	—	—
Guantanamo Bay		44·6	4	i 8 2	+ 1	—	—	—	—	—
Merida		49·9	333	e 8 43	+ 1	i 15 40	− 1	—	—	—
Oaxaca		50·1	324	i 8 42	− 2	i 15 40	− 4	—	—	—
Miami		51·5	345	i 8 58	+ 4	—	—	—	—	—
Vera Cruz		51·5	325	i 8 58k	+ 4	i 16 10	+ 7	—	—	—
Puebla		52·5	323	i 8 59	− 3	i 16 11	− 6	i 17 32	sS	—
Tacubaya		53·4	322	i 9 9k	0	e 16 29	0	—	—	—
Manzanillo		56·2	317	e 9 25	− 4	e 16 57	− 9	i 10 21	PcP	—
Bermuda		56·5	3	i 9 28	− 3	i 17 1	− 9	i 10 5	pP	i 23·0
Guadalajara		56·8	319	i 9 28k	− 5	i 17 10	− 4	i 18 30	sS	—
Columbia		59·4	348	i 9 50	− 1	i 17 45	− 3	e 10 51	pP	e 23·9
Washington		63·6	353	i 10 16	− 3	i 18 22	−19	i 14 39	PPP	e 25·3
Philadelphia		64·4	354	e 10 15	−10	i 18 42	− 9	i 10 42	pP	i 26·2
Chihuahua		64·5	323	i 10 39k	+14	i 19 7	+15	i 39 27	PKP,PKP	—
Cincinnati		65·1	346	i 10 29	0	i 19 35	PS	—	—	—
Fordham		65·1	356	i 10 27	− 2	i 18 59	− 1	i 10 58	PcP	—
Palisades		65·3	356	i 10 28k	− 2	i 19 2	0	i 14 23	PPP	e 30·8
Pennsylvania		65·5	352	i 10 31	− 1	i 18 58	− 6	i 11 4	PcP	—
Pittsburgh		65·5	350	i 10 29	− 3	i 19 4	0	i 11 21	pP	—
St. Louis		66·2	341	i 10 33	− 3	i 19 9	− 4	—	—	—
Lubbock		66·3	329	10 34	− 3	—	—	i 19 36	SP	—
Florissant		66·4	341	i 10 34	− 3	i 19 8	− 7	i 19 38	SP	—
Weston		66·5	358	i 10 37	− 1	i 19 19	+ 2	—	—	—
Harvard		66·6	358	i 10 38	− 1	i 19 11	− 7	—	—	—
Cleveland		66·8	349	i 10 38k	− 2	i 19 16	− 4	—	—	—
Buffalo		67·7	352	i 10 43	− 3	e 19 31	0	—	—	—
Chicago		68·4	344	i 10 45	− 5	i 19 33	− 6	e 11 45	pP	e 27·3
Halifax		68·7	4	10 51	− 1	19 43	0	27 23	SSS	—
Ottawa		69·8	354	i 10 56k	− 2	i 19 56	0	i 20 54	ScS	—
Tucson		69·9	322	i 10 57	− 2	i 19 53	− 4	i 39 6	P′P′	i 28·3
Lincoln	E.	70·3	337	i 11 9	+ 8	i 19 59	− 3	e 13 45	PP	i 28·2
Shawinigan Falls	N.	70·7	357	i 11 3	− 1	i 20 7	+ 1	—	—	—
Seven Falls	E.	71·2	358	10 8	−59	i 19 13	−59	24 16	SS	—
Lome		73·3	75	i 11 17	− 2	i 20 31	− 5	i 11 40	pP	e 30·9
La Jolla		74·1	318	e 11 22	− 2	i 20 47	+ 2	—	—	—
Palomar		74·2	319	i 11 24k	0	i 20 47	+ 1	i 11 47	pP	—
Pierce Ferry		74·5	323	i 11 25	− 1	i 20 52	+ 3	e 39 3	PKP,PKP	—
Boulder City		74·9	322	e 11 27	− 1	i 20 56	+ 2	i 12 34	pP	i 23·0
Riverside		75·0	319	i 11 27	− 2	i 20 56	+ 1	i 38 43	PKP,PKP	—
Overton	Z.	75·1	323	i 11 28	− 2	i 20 56	0	i 29 2	SSS	—
Pasadena		75·6	319	i 11 31k	− 1	i 21 2	+ 1	e 14 22	PP	i 30·2
Rapid City	E.	75·6	335	i 11 33	+ 1	i 20 56	− 5	i 14 35	PP	—
China Lake	Z.	76·4	321	i 11 34k	− 3	—	—	i 38 53	PKP,PKP	—
Santa Barbara		76·7	318	e 11 37	− 2	i 21 7	− 6	—	—	—
Haiwee		76·8	321	i 11 38k	− 1	e 21 15	+ 1	e 38 40	PKP,PKP	—
Salt Lake City		76·8	327	i 11 38	− 1	i 21 15	+ 1	i 12 7	pP	i 31·4
Logan		77·5	328	i 11 36	− 7	i 21 17	− 5	i 22 13	PS	i 31·0
Tinemaha		77·6	321	i 11 43k	0	i 21 23	0	i 12 7	pP	—
Fresno		78·3	320	e 11 45k	− 2	e 21 26	− 4	e 38 51	PKP,PKP	—
Lick		79·8	319	i 11 55k	0	e 21 41	− 5	i 30 45	PKKP	—
Santa Clara		80·0	319	i 12 2	+ 5	i 21 16	−32	i 12 26	pP	e 33·8
Grahamstown	Z.	80·1	122	i 12 1	+ 4	i 22 28	sS	—	—	—
Bozeman		80·2	331	e 11 56	− 2	i 21 32	−18	i 12 46	pP	e 32·4
Reno		80·2	322	e 11 57k	− 1	e 21 52	+ 2	e 38 54	PKP,PKP	—
Berkeley		80·5	319	i 11 57k	− 2	e 21 52	− 2	e 38 44	P′P′	e 32·5
Butte	N.	81·1	331	i 12 2	0	i 22 0	0	i 14 58	PP	e 33·8
Mineral		81·7	321	i 12 4k	− 2	e 22 1	− 5	e 15 24	PP	—
Ukiah		81·9	320	e 12 2	− 5	i 22 9	+ 1	i 23 18	PS	e 34·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Shasta Dam		82·4	321	i 12 7	− 2	e 21 52	−21	i 38	39	PKP,PKP	—
Lisbon		83·1	42	12 16k	+ 3	22 28	+ 8	i 13	19	pP	38·7
Saskatoon		83·5	337	i 12 14	− 1	i 22 25	+ 1		23 22	PS	—
Johannesburg		84·2	116	i 12 24	+ 6	e 22 37	+ 6		—	—	—
Pretoria		84·4	115	i 12 23	+ 4	i 22 35	+ 2	i 38	38	P'P'	e 45·7
Pietermaritzburg	z.	84·6	120	i 12 25	+ 5	e 22 16	−19	e 30	31	PKKP	—
Malaga	z.	84·9	46	i 12 22k	0	i 22 36	− 2	i 15	38	PP	38·9
Tamanrasset	z.	84·9	62	12 26a	+ 4	e 22 52	+14		—	—	—
Granada		85·7	46	i 12 29a	+ 3	i 22 43	− 2		13 2	pP	i 48·3
Ivigtut		86·6	9	i 12 31	+ 1	i 22 45	[+ 3]	i 13	0	pP	43·5
Seattle		87·0	327	i 12 32k	0	e 23 2	+ 4	i 13	30	pP	—
Toledo		87·0	44	i 12 36	+ 4	i 22 49	− 9		17 48	PPP	41·0
Victoria		88·1	327	i 12 36k	− 1	i 23 12	+ 4	e 23	2	SKS	—
Alicante		88·4	46	12 34	− 5	23 1	−10		18 9	PPP	—
Algiers Univ.	z.	89·9	50	e 12 48	+ 2	23 9	[+ 7]	e 13	24	pP	—
Tortosa		90·4	45	i 12 56	+ 8	i 23 12	[+ 7]		16 28	PP	e 39·2
Bagneres		91·3	43	e 13 5	+13	i 23 18	[+ 7]		—	—	—
Barcelona		91·7	45	e 13 4	+ 8	i 23 20	[+ 7]	i 24	52	SP	e 31·5
Christchurch		92·9	219	i 13 0	0	i 23 25	[+ 5]	i 25	22	PS	e 43·7
Tuai	N.	92·9	225	e 13 5	+ 5	—	—	—		—	—
Wellington		93·0	222	i 13 2	+ 2	e 24 0	+ 8	i 23	3	SKS	—
Jersey	E.	93·4	37	e 13 13	+11	e 24 25	+30	e 16	52	PP	81·2
Rathfarnham Castle		93·6	32	i 13 6	+ 3	i 23 27	[+ 3]	i 13	56	pP	e 39·0
Kaimata	N.E.	94·2	220	e 13 11	+ 6	e 23 33	[+ 6]	e 13	16	?	—
Cobb River	E.	94·3	222	e 13 9?	+ 3	e 23 12?	[−15]	i 13	12?	P	—
Clermont-Ferrand		94·6	41	i 13 7	0	e 23 20	[− 9]	i 17	20	pPP	e 44·2
New Plymouth	E.	94·7	224	e 13 11	+ 3	e 23 59	− 8		—	—	—
Tunis		94·9	52	e 13 17	+ 8	i 24 15	+ 7	i 13	42	pP	42·2
Reykjavik		95·0	18	i 13 26	+17	i 24 10	+ 1	i 23	42	SKS	e 38·6
Kew		95·6	36	i 13 15	+ 3	e 24 20	+ 6	e 13	45	pP	e 31·2
Paris		95·7	39	e 13 12	0	i 24 11	− 4	i 13	45	pP	e 46·2
Edinburgh	E.	96·6	31	13 23	PcP	24 24	+ 1		14 14	pP	—
Durham	E.	96·7	32	i 13 31	PcP	i 23 47	[+ 7]	i 17	40	PP	—
Besançon		97·0	42	e 13 19	+ 1	e 23 33	[− 9]	e 13	57	pP	—
Apia		97·1	252	i 13 23k	+ 4	e 23 50	[+ 8]	e 17	48	PP	e 55·2
Neuchatel		97·5	42	e 13 23	+ 3	e 23 52	[+ 8]		—	—	—
Pavia		98·0	44	e 13 26a	+ 3	i 23 53	[+ 6]	e 31	32	SS	—
Basle		98·1	42	e 13 30	+ 7	e 23 55	[+ 7]	e 17	25	PP	—
Zürich		98·6	42	e 13 26	+ 1	e 23 52	[+ 2]	e 17	32	PP	—
Prato		98·7	46	e 13 33	+ 7	i 24 46	+ 6		—	—	—
Strasbourg		98·7	41	e 13 28a	+ 2	i 24 39	− 1	i 13	59	pP	i 44·7
Florence		98·8	46	e 13 25	− 1	i 23 58	[+ 7]	i 14	13	pP	—
Rome		98·8	48	i 13 27k	+ 1	i 23 57	[+ 6]	i 24	30	SKKS	e 47·2
De Bilt		98·9	36	i 13 34	+ 7	i 23 59	[+ 7]	i 17	20	PP	e 47·2
Honolulu		98·9	289	e 13 32	+ 5	e 23 44	[− 8]	i 14	3	pP	e 45·6
Rocca di Papa		98·9	48	e 13 53	pP	i 23 55	[+ 3]	e 17	30	PP	—
Chur		99·0	43	e 13 29k	+ 2	i 23 57	[+ 5]	i 17	32	PP	—
Sitka		99·0	329	e 13 26	− 1	i 24 43	0	i 17	52	pPP	—
Bologna		99·1	45	e 13 35?	+ 7	i 24 0	[+ 7]	e 31	51	SS	—
Karlsruhe		99·3	40	e 13 33	+ 4	24 25	−20		—	—	e 40·2
Messina		99·4	52	e 13 10?	−19	24 5	[+11]	e 17	49	pPP	—
Padova		99·5	46	13 40	+10	i 24 7	[+12]	i 25	3	S	—
Stuttgart		99·6	41	e 13 31	+ 1	i 24 2	[+ 7]	i 14	2	pP	49·2
Scoresby Sund		99·8	13	i 13 34	+ 3	23 57	[+ 1]		—	—	—
Resolute Bay		100·4	352	13 34	0	23 49	[−10]		17 44	PP	—
Triest		101·2	44	i 13 40	+ 3	i 24 8	[+ 5]	i 26	41	PS	—
Taranto		101·5	51	e 12 58	−41	23 58	[− 6]		17 38	PP	e 41·0
Jena		101·9	39	e 13 44	+ 4	i 24 14	[+ 8]	i 17	53	PP	e 40·3
Cheb		102·1	40	e 13 50	+ 9	i 24 10	[+ 3]	e 14	36	pP	—
Bergen		102·8	28	14 44	pP	i 24 15	[+ 5]	e 27	21	PS	e 40·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Collmberg		102·9	39	e 13 46	+ 1	i 24 19	[+ 8]	e 18 0	PP	e 41·2
Prague		103·3	40	e 13 51	+ 5	i 24 21	[+ 8]	e 14 40	pP	e 41·2
Tananarive		103·4	118	14 28	pP	i 24 25	[+12]	17 59	PP	50·7
Potsdam		103·4	38	e 13 52	+ 5	i 24 20	[+ 7]	e 14 20	pP	e 40·2
Copenhagen		104·3	35	13 57	+ 6	i 24 25	[+ 8]	32 31	SS	—
Lund		104·7	35	18 14	PP	i 24 27	[+ 8]	—	—	—
Ogyalla		104·8	44	15 1	sP	i 24 27	[+ 7]	i 24 52	SKKS	38·7
Kalossa		104·9	45	e 14 11	P_cP	i 24 25	[+ 5]	e 18 19	PP	e 50·2
Budapest		105·2	45	14 6	P_cP	i 24 26	[+ 5]	18 19	PP	50·2
Belgrade		105·3	48	e 14 10a	P_cP	i 27 31	PS	i 18 20	PP	e 53·6
Athens		105·4	56	e 13 55	0	25 33	− 3	e 14 30	pP	—
Raciborzu		105·6	42	e 14 1	+ 5	e 24 22	[− 1]	e 14 46	pP	—
Timisoara	E.	106·1	47	e 14 58	pP	i 24 33	[+ 8]	i 18 47	PP	—
Skalnate Pleso		106·5	43	e 14 4	+ 3	24 25	[− 2]	e 14 54	pP	e 39·2
Sofia		106·6	50	e 15 19	sP	i 24 32	[+ 4]	i 18 19	PP	—
College		107·8	334	e 14 7	P	e 24 37	[+ 4]	i 18 32	PP	e 43·7
Warsaw		107·9	40	e 14 16	P	25 33	SKKS	14 45	pP	e 34·2?
Upsala		108·3	32	e 14 29	P	i 24 37	[+ 2]	i 18 23	PKP	e 43·2
Helwan		108·8	65	14 16	P	i 24 43	[+ 6]	15 13	pP	—
Bucharest		109·0	49	e 17 38	?	i 24 46	[+ 8]	i 18 51	PP	—
Lwow		109·1	43	i 18 47	PP	i 24 43	[+ 5]	e 27 59	SP	—
Istanbul		110·2	53	(e 18 25)	[+ 9]	(e 23 56)	[−47]	—	—	—
Kishinev		111·5	46	14 12	P	—	—	e 18 57	PP	—
Riverview		111·5	214	i 14 25k	P	i 24 54	[+ 6]	i 18 13	PKP	e 45·4
Helsinki	E.	111·9	32	e 19 6	PP	i 24 52	[+ 2]	i 28 41	PS	e 54·2
Ksara		113·7	62	i 14 40	P	25 9	[+12]	15 8	pP	—
Pulkovo		114·5	33	e 18 27	[+ 2]	i 25 2	[+ 2]	i 28 48	PS	—
Yalta		114·6	50	14 46	P	25 6	[+ 6]	15 14	pP	—
Brisbane		115·4	220	e 14 46	P	i 25 0	[− 3]	e 19 23	PP	—
Theodosia		115·6	49	e 18 30	[+ 3]	25 10	[+ 6]	—	—	—
Moscow		118·1	38	18 36	[+ 4]	i 25 18	[+ 5]	19 10	pPKP	—
Sotchi		118·5	52	e 18 38	[+ 5]	25 24	[+10]	—	—	—
Zugdidi		119·9	52	e 18 44?	[+10]	25 20?	[+ 1[	—	—	—
Abastumanj		120·5	53	e 18 50	[+14]	e 25 32	[+11]	i 20 7	PP	—
Piatigorsk		120·9	52	e 18 44	[+ 7]	25 34	[+11]	—	—	—
Leninakan		121·2	56	e 18 54	[+16]	—	—	—	—	—
Erevan		121·6	56	e 18 48	[+ 9]	—	—	—	—	—
Tiflis		122·0	54	i 18 46	[+ 7]	i 25 34	[+ 8]	i 20 8	PP	—
Grozny		122·8	53	e 18 46	[+ 5]	—	—	i 20 10	PP	—
Perth		123·9	184	e 15 24	P	28 12	S	20 35	PP	—
Lenkoran		124·8	58	18 51?	[+ 6]	—	—	—	—	—
Sverdlovsk		130·6	34	e 18 57?	[+ 1]	27 57	SKKS	22 20	PKS	—
Ashkabad		132·2	60	21 19	PP	—	—	—	—	—
Klyuchi		132·8	325	e 19 3	[+ 3]	i 22 31	PKS	i 19 40	pPKP	—
Mary		135·0	60	i 19 8	[+ 4]	—	—	21 37	PP	—
Lunacharskoe		140·3	54	19 22	[+ 8]	26 29	[+20]	22 4?	PP	—
Tashkent		140·3	54	i 19 52	[+38]	e 26 54	[+45]	22 53	PP	—
Stalinabad		140·4	58	i 19 12?	[− 2]	e 28 59	SKKS	—	—	—
Obi-garm		141·1	58	i 19 16	[+ 1]	—	—	—	—	—
Kulyab		141·2	59	i 19 27	[+11]	—	—	—	—	—
Fergana		142·3	54	e 19 20	[+ 2]	29 11	SKKS	e 22 27	PP	—
Bombay		142·7	91	i 19 24	[+ 6]	i 41 4	SS	22 35	PP	66·6
Andijan		142·7	54	e 19 19	[+ 1]	—	—	—	—	—
Poona		143·6	92	i 19 21	[+ 1]	26 33	[+19]	20 38	pPKP	66·1
Frunse		143·7	50	i 19 21	[+ 1]	—	—	—	—	—
Kodaikanal	E.	143·8	106	i 19 25	[+ 5]	29 25	SKKS	41 16	SS	67·4
Semipalatinsk		143·9	35	e 19 25	[+ 5]	i 22 58	PKS	—	—	—
Colombo	E.	144·2	114	19 25	[+ 4]	—	—	—	—	67·2
Almata		145·2	47	i 19 27	[+ 5]	—	—	—	—	—
Naryn		145·2	50	i 19 26	[+ 4]	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Przhevalsk		146·5	47	i 19 33	[+ 9]	—	—	i 22 48	PP	—
Nemuro		147·0	314	i 19 33	[+ 7]	—	—	i 20 3	pPKP	—
Hyderabad	N.	147·4	96	i 19 31	[+ 5]	41 42	SS	24 30	PP	61·7
New Delhi		148·1	74	19 35	[+ 8]	30 4	SKKS	23 31	PP	70·2
Bandong		148·6	171	e 20 13	pPKP	—	—	—	—	—
Dehra Dun	N.	148·8	71	e 19 40	[+12]	30 25	SKKS	—	—	44·1
Djakarta		149·1	169	i 19 32	[+ 3]	—	—	i 21 18	?	—
Sapporo		149·9	317	19 42	[+12]	—	—	e 20 11	pPKP	—
Hatinohe		150·9	311	e 19 34	[+ 3]	—	—	e 43 21	SSP	—
Miyako	Z.	150·9	310	19 33	[+ 2]	—	—	20 8	PKP_2	—
Aomori		151·3	312	e 19 39	[+ 7]	—	—	—	—	—
Irkutsk		151·4	11	19 35	[+ 3]	29 38	SKKS	23 1	PP	—
Morioka		151·5	310	e 19 36	[+ 4]	—	—	—	—	—
Akita		152·2	310	e 19 39	[+ 6]	—	—	e 20 9	pPKP	—
Sendai		152·2	307	e 19 38	[+ 5]	i 49 4	SSS	e 32 57	PKKS	—
Mito		153·2	303	e 19 50	[+15]	—	—	—	—	—
Tokyo		154·0	302	e 19 43	[+ 7]	—	—	—	—	—
Kumagaya		154·1	303	e 19 37	[+ 1]	—	—	—	—	—
Yokohama		154·1	302	e 19 30	[− 6]	—	—	20 26	pPKP	—
Maebasi		154·3	306	e 19 52	[+16]	—	—	i 20 27	pPKP	—
Osima		154·6	301	e 19 46	[+ 9]	—	—	e 20 25	pPKP	—
Hunatu		154·8	302	19 44	[+ 7]	—	—	—	—	—
Nagano		154·8	306	19 59	[+22]	26 57	[+28]	20 11	PKP_2	—
Matusiro		154·9	306	19 41	[+ 4]	48 57	SSS	20 7	PKP_2	70·1
Shizuoka		155·3	303	e 19 47	[+ 9]	—	—	20 12	pPKP	—
Vladivostok		155·4	324	i 19 40	[+ 2]	i 27 5	[+35]	20 7	pPKP	—
Nagoya		156·3	303	e 19 42	[+ 3]	—	—	e 20 15	pPKP	—
Gihu		156·4	303	19 46	[+ 7]	43 28	SS	27 4	PPP	—
Hikone		156·8	303	e 19 41	[+ 1]	e 26 28	[− 3]	e 20 19	pPKP	—
Kameyama		156·8	302	e 19 57	pPKP	e 46 23	?	e 23 53	PP	—
Calcutta	E.	157·7	90	i 19 48	[+ 7]	—	—	i 30 31	?	—
Kobe		157·8	303	19 48	[+ 7]	45 26	SPS	20 20	PKP_2	—
Toyooka		157·8	305	e 19 40	[− 1]	—	—	e 23 49	PP	—
Sumoto		158·2	303	e 19 48	[+ 7]	—	—	20 24	pPKP	e 95·9
Koti		159·5	301	e 19 49	[+ 6]	e 44 23	SS	e 20 57	pPKP	—
Hirosima		160·0	304	e 19 52	[+ 8]	e 37 18	PPS	43 59	SS	—
Matuyama		160·0	303	e 19 53	[+ 9]	e 44 33	SS	e 20 26	pPKP	—
Hukuoka		161·9	304	e 19 48	[+ 3]	e 44 55	SS	i 20 24	pPKP	—
Kumamoto		162·0	303	e 19 56	[+10]	e 43 12	?	e 25 27	?	—
Tomie		163·6	305	e 20 2	[+15]	—	—	—	—	—
Manila		167·5	221	i 20 0	[+10]	—	—	—	—	—
Zi-ka-wei		169·6	313	e 20 4	[+12]	22 2	PKS	—	—	—

Additional readings :—
La Plata iPZ = 3m.13s., S?N = 5m.56s., SE = 6m.4s., Z = 6m.58s.
Bogota iSSZ = 11m.6s., iS_cS = 19m.6s.
Fort de France i = 7m.23s.
Port au Prince PP? = 8m.59s., PPP? = 9m.27s.
Manzanillo i = 9m.48s., esS = 18m.15s.
Bermuda iP_cP = 10m.33s., iPPP = 12m.43s., iS_cS = 18m.33s.
Guadalajara i = 19m.32s.
Columbia ePP = 12m.34s., isS = 18m.55s., iS_cS = 19m.29s., eSS = 21m.53s.
Washington isS = 19m.36s.
Philadelphia iP_cP = 11m.8s., isS = 19m.18s., iS_cS = 19m.47s.
Chinchina isSS = 26m.44s., e = 31m.55s., 44m.1s., and 47m.0s.
Fordham i = 11m.47s.
Palisades i = 11m.7s., iPP = 13m.20s.
Pennsylvania iZ = 10m.46s., iEZ = 11m.42s., iPPEZ = 13m.19s., isPPEZ = 14m.20s., iN = 14m.24s. and 18m.36s., iEZ = 19m.10s.
St. Louis iP_cP = 11m.2s., iS = 19m.21s.
Chicago ePP = 13m.7s., epPP = 13m.46s., ePPP? = 15m.53s., isS = 20m.31s., eSS? = 24m.31s.
Ottawa SS = 24m.40s.
Tucson ipP? = 11m.53s., iPP = 13m.50s., ipPP = 14m.33s., iPPP = 15m.2s., ipPPP = 15m.43s., isS = 20m.50s., isSS = 25m.1s.
Lincoln epPP?E = 14m.35s.
Shawinigan Falls eN = 12m.32s., 14m.32s., and 24m.24s.

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Palomar i =11m.28s.
Boulder City iPKP,PKP =39m.1s.
Riverside ePKP,PKP,PKPZ =58m.36s.
Overton ePKP,PKPZ =39m.5s.
Pasadena i =11m.55s., iEN =12m.0s. and 21m.26s., eSSEN =26m.22s., ePKP,PKPZ = 38m.49s., iZ =39m.2s., and 29m.35s., ePKP,PKP,PKPZ =58m.33s., iQNZ ($\triangle > 180^{\circ}$) =120m.10s.
Rapid City eSSE =25m.30s., eSSSE =29m.52s.
China Lake ePKP,PKP,PKPZ =58m.33s.
Haiwee ePKP,PKP,PKPZ =58m.39s.
Salt Lake City ePP =15m.7s., iPS =22m.18s., iSS =25m.58s.
Logan i =13m.2s., iPP =15m.8s., iPPP =16m.12s., iSS =25m.16s., iSSS =30m.0s.
Tinemaha ePKP,PKPZ =38m.40s., ePKP,PKP,PKPZ =58m.40s.
Fresno iE =12m.28s., eE =13m.0s. and 13m.32s., ePKP,PKP,PKPZ =58m.38s.
Lick iE =12m.31s., eN =21m.46s., iZ =22m.2s., eN =23m.12s., eE =27m.43s., eN = 33m.53s., iPKP,PKPZ =38m.46s., eSKP,PKPZ =41m.59s., ePKP,PKP,PKPZ = 58m.40s.
Grahamstown eZ =19m.25s., iZ =36m.6s., eZ =38m.41s. and 39m.53s.
Bozeman ePP? =16m.6s., isPS =23m.11s., eSS =27m.24s.
Reno iZ =12m.2s. and 12m.26s., eN =22m.12s., eZ =22m.22s., eSSEN =26m.40s., ePKP,PKP,PKPZ =58m.46s.
Berkeley esS?EN =22m.22s., eEN =22m.59s., eSKP,PKPZ =41m.58s., ePKP,PKP, PKPZ =58m.52s.
Butte esPSN =23m.19s., eSSN =26m.43s., eSSS?N =29m.58s.
Mineral eN =12m.55s., eE =14m.9s., i =16m.4s., iNZ =16m.24s., eEN =22m.6s., iNZ = 22m.16s., eZ =22m.57s., ePKKPZ =30m.38s., ePKP,PKPEZ =38m.37s., ePKP, PKP,PKPZ =58m.56s.
Ukiah iP =12m.9s., ePP =15m.19s., eSS? =27m.41s.
Shasta Dam eSKP,PKP =41m.59s., e =42m.12s.
Lisbon e =27m.16s., Q?EN =34m.28s.
Saskatoon SS =28m.31s.
Pretoria eSZ =21m.6s., eZ =30m.0s.
Pietermaritzburg eZ =31m.3s.
Malaga iPPPZ =17m.36s., PSZ =23m.38s., SSZ =28m.10s.
Tamanrasset eZ =26m.5s. and 33m.26s.
Granada iPP =16m.1s., pPP =16m.31s., sSKS =23m.1s., S =23m.22s., PPS =24m.18s., iSS =28m.19s., SSS =31m.17s., Q =40·5m.
Ivigtut i =13m.39s., PP =16m.5s., pPP =16m.33s., i =23m.57s.
Seattle i =12m.34s., 12m.53s., and 13m.15s., isP =13m.48s., eS =23m.34s., eSP = 23m.56s., e =24m.21s., 24m.33s., 25m.1s., 25m.39s., 25m.58s., 26m.43s., and 27m.9s.
Toledo PPN =15m.49s., SS =28m.21s., SSS =31m.55s.
Victoria i =14m.0s., e =17m.37s., i =24m.12s., e =30m.14s., iZ =30m.26s.
Alicante PP =16m.25s.
Algiers Univ. ePPZ =16m.21s., eSKKSZ =23m.37s., ePSZ =24m.51s., eSSZ =29m.52s.
Tortosa S_cSEN =23m.38s., PSN =24m.56s., PPSN =25m.34s., SS?EN =29m.12s., SSS?E =32m.40s.
Barcelona PS =24m.0s., SS =28m.31s.
Christchurch ePP =16m.45s., ePPP =19m.25s., SSNZ =30m.45s., eQEN =38m.20s.
Wellington pP? =13m.46s., iPP =15m.52s., e =17m.6s.
Jersey eE =21m.10s. and 25m.14s.
Rathfarnham Castle i =14m.10s., ePP =16m.18s., ePPP =18m.29s., iEN =25m.22s., eSSEN =29m.35s., eSSSEN =32m.29s., eEN =36m.2s.
Clermont-Ferrand i =13m.21s., isP =13m.40s., i =15m.10s. and 15m.50s., iPPP = 18m.42s., e =22m.0s., and 22m.41s.
Tunis e =13m.21s , i =13m 33s., iPP =17m.30s., i =18m.28s. and 22m.48s., iSKS = 23m.37s., iS =24m.23s., iSP =25m.38s., iSPP =26m.17s., i =27m.11s. and 28m.56s., iSS =30m.54s., i =33m.23s., eSSS? =35m.49s., e =36m.27s.
Reykjavik iEN =24m.50s. and 25m.58s., iN =29m.40s.
Kew i =14m.17s., iPP =16m.53s., ePPP =20m.45s., eSKS =23m.41s., eSS?Z =30m.3s.
Paris i =13m.40s., isP =13m.58s., i =14m.7s. and 14m.16s., iPP =17m.2s. and 17m.9s., i =17m.25s., ipPP =17m.33s., i =17m.38s. and 23m.29s., iSKS =23m.39s., iSKKS = 24m.3s., ipS? =24m.54s., iSP? =25m.1s., isS? =25m.15s., iPS =25m.27s. iSS =30m.39s., isSS =31m.27s., iPKP,PKP? =38m.19s., i =38m.52s. and 39m.12s., iPKS,PKS =42m.49s.
Edinburgh PP =16m.25s., PPP =19m.34s., SKS =23m.42s., sS =25m.55s., SS =31m.13s., SSP =31m.24s., SSS =35m.2s.
Durham iE =13m.44s., iEN =13m.54s., iE =14m.20s., iEN =14m.29s., iE =17m.12s.
Besançon i =13m.26s., isP =14m.8s., i =14m.27s., e =14m.46s., iPP =17m.19s.
Apia eEN =17m.16s., iZ =18m.26s., e =18m.58s., eE =23m.33s.
Pavia ePP =17m.23s., e =18m.57s., i =24m.19s., eS? =24m.43s., e =27m.51s. and 42m.32s.
Zürich e =17m.31s.
Strasbourg i =13m.40s., isP =14m.17s., i =14m.22s., 14m.35s., 14m.55s., and 15m.2s., iPP =17m.19s., ipPP? =17m.56s., i =18m.21s., iPPP =19m.26s., iSKS =23m.56s., iSKKS =24m.15s., i =25m.12s., isS =25m.37s., iPS? =25m.55s., iSPP =26m.52s., i =29m 17s and 29m 45s

Continued on next page.

Florence iPP =17m 31s , iS =24m 52s., i =25m.17s., e =26m.57s. and 37m.28s.
Rome iPP =17m.32s., iS =24m.53s., PS =26m.2s., SS =32m.14s., SSS =35m 10s ?
Honolulu ePP =17m.42s., ePPP =19m.37s., eSKKS =24m.7s., eS? =24m.25s., ePS = 25m.58s., ePPS =27m.23s., eSS? =32m.58s.
Sitka ePP =17m.28s., iSKS =23m.24s., iPS =26m.2s., iSSS? =36m.30s.
Bologna e =17m.46s., eS =25m.11s., e =25m.25s.
Messina e =18m.16s. and 25m.32s.
Padova PP? =17m.18s.
Stuttgart iP =13m.36s., eZ =13m.44s., i =15m 34s , iPP =17m.34s., ipPP? =18m.3s., i =19m.5s., iS =24m.26s., iPS =26m.24s., iPPS =27m 16s , i =31m.4s., iSS = 31m.50s., eQ =41·2m.
Resolute Bay PPPE =19m.58s.
Triest iPKP =17m.39s , iPP =18m 13s ?, iSKKS =24m 38s , iS =25m 12s , i =25m 40s , iPPS =27m 32s , iSS =32m 29s , eSSS =36m 43s
Taranto e =25m 28s
Jena ePEN =13m 49s , eE =13m 55s , eN =14m 38s., eZ =14m.46s., eN =15m.44s., iN =18m.17s., eNZ =18m.30s., eE =18m.37s., iE =19m.13s. and 20m.18s., iN = 20m.24s., iE =20m.35s. and 22m.10s , iSE =24m 30s , iSZ =24m 34s , iPSE = 26m 46s , iNZ =27m 52s , iSSN =32m 8s , iSSZ =32m 14s., iSSN =32m.17s., iSSE = 32m.22s., eE =35m.0s., eN =35m.20s. and 39m.26s.
Cheb e =14m.10s., esP =15m.1s., ePPE =17m.54s., iN =18m.39s., epPPN =18m.58s., epPPP =20m.54s., iN =24m.43s., epSKSN =25m.20s., esSKSN =25m.39s., esSN = 26m.25s., eSSN =30m.40s., e =31m.50s., eN =35m.13s. and 36m.3s., eSSS =36m.14s., e =37m.25s.
Bergen PPEN =18m.1s., eN =18m.29s., SKSE =24m.41s., iNZ =25m.19s., SSN = 32m.0s.
Collmberg eE =13m.51s., eZ =24m.14s., iSE =25m.26s., iPSN =26m.55s., eZ =26m.59s., iE =27m.56s., iSSN =32m.12s., iE =34m.35s.
Prague eN =13m.55s., iN =14m.1s., e =14m.18s., esPZ =15m.2s., e =15m.24s., 15m.41s., 16m.3s., and 17m 3s , iN =17m.16s. and 17m.52s., iPPZ =18m.0s , epPP? = 18m.33s., esPP? =19m.11s., e =19m.30s., ePPP =20m.18s., eNZ =20m.50s., epPPPE =21m.8s., eZ =22m.20s., e =24m.46s., eS =25m.37s , esS =26m 51s., e =30m.40s., eSS =32m.30s., esSS =33m.58s., eSSS =36m.34s
Tananarive PPP =20m 7s., iS =25m.34s., i =25m.49s., isS =26m.24s., i =27m.1s., iPS = 27m.17s., i =27m.43s., iPPS =28m.31s., SS? =33m.27s., SSS =36m 52s., Q = 44m.40s.
Potsdam ePN =13m.55s., epP?N =14m.24s., iPKPE =18m.5s., iPKPN =18m.9s., iPPE =18m.27s., iPPN =18m.30s., iSKSN =24m.25s., iSKSE =24m.47s., iSKSN = 24m.51s., iSEN =25m.30s., iSPE =27m.3s., iSPN =27m.10s., iPSE =27m.42s., iPSN =27m.45s., and other unidentified readings
Copenhagen 14m 22s , 18m.10s., 18m.31s., 24m.51s., and 27m.10s.
Ogyalla e =15m.41s. and 17m.39s., ePKP =18m.1s., ePP =18m 14s , e =18m 44s., epPP =18m.56s., e =19m.14s., esPP =19m.23s , ePPPE =19m.37s., ePPPN = 19m.49s., epPPPE =20m.12s., e =21m.28s. and 21m.48s., eSKKSN =24m 40s , epSKS =25m 32s., isSKS =26m.2s., e =26m.33s., ePS =27m.34s., e =27m.45s., eSPP =28m.14s., eSS =33m.4s., esSS =34m.28s., eSSS =37m.28s.
Kalossa PPE =18m.27s., PPPEN =21m.4s., SKSN =24m.29s., iSKSE =24m.55s., PSN =27m.20s., eSSE =33m.2s., eLN =46·2m., and other unidentified readings.
Budapest ePcPE =14m.25s., PPE =18m.12s., PPPE =21m.4s., PPPN =21m.12s., iSKSN =24m.31s., SKSE =24m.55s., PSN =27m.18s., PSE =27m.25s., PPSE = 28m 12s , SSE =33m 7s., SSN =33m.12s., eSSSE =37m.40s., SSSN =38m.10s.
Belgrade i =17m.34s. and 31m.47s., eQ =39m.9s.
Athens i =18m.24s., e =25m.57s.
Racíborzu eSPZ =15m.22s., ePPNZ =18m.16s., eSEN =25m.34s.
Timisoara eE =17m.7s., eN =18m.40s.
Skalnate Pleso e =14m.19s. and 14m.34s., esP =15m.14s., iPP =18m.22s., iE =18m.52s., esPP? =19m.34s., e =20m.10s., i =24m.54s., ipSKS =25m.20s., eS =25m.47s., e =26m.22s., esS =27m.34s., e =30m.10s. and 32m.21s., eSSE =33m.22s., eN = 33m.48s., esSS? =34m.24s., eSSS =37m.52s.
Sofia i =21m.53s. and 25m.2s.
Warsaw sP =15m.13s., PPZ =18m.31s., PPEN =18m.45s., epPPZ =19m 7s., e =19m.45s. and 20m.21s., esPPP =21m.37s., iEN =23m.29s., e =23m.42s., i =24m.23s., iSKS = 24m.55s., SZ =26m.1s., iSEN =26m.8s., isS =26m 53s , iPSN =27m.59s., iPPS = 29m.5s., i =30m.23s. and 31m.35s., iSS =33m.8s., sSS =33m.55s., SSS =37m.8s.
College iPKP =17m.59s., iPPP =20m.50s., iS =25m 51s , isS =26m 24s., ePS =27m.54s., iSS =33m.2s., eSSS =37m.38s., ePKP,PKP,PKP =59m.27s.
Upsala iE =18m.39s., iPP?N =19m 14s., eN =21m.42s., iE =24m.58s. and 25m.34s., iSN =26m.6s., epSN =27m 10s , eSPE =27m.43s., eE =28m.52s., iSS =33m.35s., iSSS =37m.50s.
Helwan eZ =17m.32s., PPZ =18m.43s., SKKSN =25m.12s.
Bucharest iE =19m.9s., eN =19m.15s., iN =20m.18s. and 20m.44s., iEN =21m.21s., iN =22m.4s., iE =25m.9s., iN =26m.4s. and 26m.21s.
Lwow PKS =21m 53s
Istanbul readings have been increased by 5m.
Riverview ipPZ =14m.59s., iPPN =19m.1s., iPPEZ =19m.4s., isPPN =19m.39s., iPPPZ =21m.28s., ipPPPZ =21m.46s., iS?N =26m.32s., iSSN =34m.24s., and many other unidentified readings.

Continued on next page.

Helsinki eSKKSE =25m.19s., ipSKS?E =25m.54s., eN =27m.43s. and 28m.9s., eSP?E = 28m.23s., eSSN =34m.31s., iSSS?E =39m.2s., eQ?N =48·2m.
Pulkovo eP =14m.57s.?, iPP =19m.23s., iSKKS =26m.9s.
Yalta PKP =18m.30s., PP =19m.29s., pPP =19m.55s., SKKS =26m.13s., PS = 28m.51s.
Brisbane eZ =19m.3s., iE =19m.58s., iEN =20m.1s., iSKSN =25m.7s., iEN =25m.37s., iSPEN =29m.25s.
Moscow iPP =19m.50s., pPP =20m.17s., iSKKS =26m.24s., ePS =28m.38s., SS = 34m.58s.
Abastumanj ipPP =20m.37s., iPS =30m.1s.
Perth i =22m.10s., PPP =23m.18s., i =30m.35s., PPS =31m.28s., SS =36m 37s
Lunacharskoe PKS =23m 4s , PPP =25m 8s ?, SKKS =29m 0s
Tashkent iPKS =23m 26s , SKKS =29m 26s
Fergana ePKS =22m 58s
Bombay PPPEN =25m 30s , PSEN =32m 56s , SSPEN =41m 40s , SSSEN =46m.40s., QN =60m.2s.
Poona sPKPN =20m.49s., PPN =22m.31s., pPPN =22m.59s., PKSN =23m.21s., PKSN =23m.48s., PPPN =25m.59s., pPPPN =26m.55s., PKKPN =28m.27s., iN =29m.19s., SKKKSN =30m.28s., PKKSN =32m.11s., SKSPN =32m.56s., PSN =33m.34s., PPP_2N =34m.12s., SKKSEN =34m.57s., PPSN =35m.23s., $SKKS_2N$ =35m.55s., SSN =41m.21s., SSPN =41m.51s., sSSN =42m.44s., SSSN = 46m.14s., SSPN =53m.44s., QN =59m.48s., SSS_2N =61m.21s.
Kodaikanal PKSE =22m.25s., SKKKSE =30m.0s., $SKKS_2E$ =34m.24s., SSPE = 41m.47s., SSSE =45m.47s., SSP_2E =52m.2s., SSS_2E =58m.16s., QE =61m.17s.
Hyderabad PKSN =25m.39s., SKSN =29m.37s., SKSPN =34m.33s.
New Delhi $iPKP_2EN$ =19m.51s., i =22m.39s., PKS =23m.5s., SKS_2 =26m.46s., PP_2 = 27m.56s., PKKP =28m.23s., SKKKS =30m.38s., PKKS =31m.57s., PPP_2 = 33m.28s., $SKKS_2$ =34m.33s. and 35m.7s., PPS =36m.1s., $SKKKS_2$ =36m.57s., SS =41m.37s., SSP =41m.57s., SSS =48m.1s.?, SS_2 =52m.47s., SSP_2 =54m.36s., SSS_2 =60m.20s., Q =62m.50s.
Sapporo e =20m.36s. and 21m.0s., ePPP =25m.48s., eL? =44m.36s.
Akita e =28m.9s. and 31m.23s.
Sendai i =22m.50s., iPP? =25m.19s., iPPS? =38m.23s., iSS? =43m.56s., iPSPS? = 45m.5s.
Mito e =22m.7s., 25m.12s., and 28m.37s.
Tokyo e =22m.1s., PP =26m.13s., SKS =29m.8s., eSKKS? =31m.59s., SS =44m.30s.
Kumagaya eN =28m.26s., eE =35m.55s., iE =38m.34s.
Yokohama e =25m.42s.
Maebasi e =24m.3s.
Hunatu e =23m.44s. and 44m.34s.
Nagano SKP?E =24m.10s., PPE =24m.30s., SKKSE =30m.58s., PSKSE =34m.33s.
Matusiro PP =23m.24s., PPP =26m.44s., SKKS =30m.0s., SKKKS =31m.22s., SS = 42m.8s., Q =60m.39s.
Shizuoka e =26m.1s., 35m.15s., 40m.0s., and 44m.47s.
Vladivostok iPP =23m.46s., iSKKS =30m.23s., iPS =33m.57s., iSS =43m.10s.
Nagoya e =24m.15s.
Gihu PKP_2 =22m.27s., PP =25m.1s., PKS =26m.46s., SKS =30m.9s., SKKS =31m.33s., PPS =37m.33s., SSS =48m.43s.
Hikone e =35m.5s.
Kobe e =20m.55s., ePP =23m.58s., e =24m.26s. and 25m.20s., SKKS? =31m.38s.
Koti e =24m.36s., 25m.57s., 32m.8s., 35m.13s., and 40m.48s.
Matuyama e =22m.24s., 24m.22s., 26m.25s., 31m.53s., and 38m.58s.
Hukuoka $iPKP_2$ =20m.40s., esPKP =20m.58s., $epPKP_2$ =21m.42s., ePP =24m.17s., esPP =25m.20s., eSKS? =25m.42s., eSSS =51m.50s.
Tomie e =21m.15s., 25m.2s., 35m.42s., and 47m.20s.
Zi-ka-wei i =25m.26s., S? =27m.2s.

Dec. 9d. Readings also at 0h. (College (2), Tinemaha, China Lake, Pasadena, Overton, Riverside, Palomar, Tucson, Pierce Ferry, and Ksara), 2h. (near Ashkabad), 3h. (Brisbane, Overton, Boulder City, College, China Lake, Pasadena, Riverside, Palomar, Pierce Ferry, and Ksara), 4h. (College), 5h. (Shasta Dam, College, Tinemaha, Overton, Tucson, China Lake, Pierce Ferry, and near Apia), 6h. (near Dzhergetal), 7h. (Baku and College), 9h. (Djakarta and Bandong), 10h. (Ksara, near Sofia, Athens, Bucharest, Timisoara, and near Istanbul (2)), 11h. (Tacubaya, Overton, and Pierce Ferry), 12h. (Prague), 13h. (Andijan, Stuttgart, and Strasbourg), 14h. (near Dzhergetal (2)), 15h. (Hungry Horse and Pierce Ferry), 16h. (Brisbane, Riverview, Christchurch, Wellington, Palomar, Pasadena (2), China Lake (2), Overton, Pierce Ferry, College (2), Besançon, Zürich, Stuttgart (2), Strasbourg (2), Ksara, and near Alicante (5)), 17h. (Paris, Strasbourg, Stuttgart, Boulder City, Riverside, Shasta Dam, Lick, Tinemaha, Tucson, Pasadena (2), Palomar, China Lake (2), Overton, Pierce Ferry (2), College (2), Riverview, and Brisbane), 18h. (Stuttgart, Strasbourg, and Zürich), 19h. (Granada), 20h. (Pierce Ferry, China Lake, Tucson, Tinemaha, Riverside, Hungry Horse, Overton, and La Paz), 21h. (College), 22h. (Pierce Ferry, China Lake, Tinemaha, Riverside, Hungry Horse, Pasadena, Cleveland, Resolute Bay, Palisades, Haiwee, Tamanrasset, Strasbourg (2), Collmberg, and Stuttgart (2)), 23h. (Riverside, China Lake, and Mount Wilson).

Dec. 10d. 2h. 50m. 39s. Epicentre 14°·6S. 76°·3W. Focus at Base of Superficial Layers.
(as on 1945, May 10d.).

Intensity VI at Ica ; V-VI at Hualtara; V at Pisco and Nasca ; IV-V at Chincha ; IV at Cañete, Caraveli, and Ayacucho; III-IV at Lima, Tarma, and Jauja. Macroseismic area 490,000 sq. km.
Epicentre 14·25°S., 75·75°W., depth 80km. (Gutenberg).

E. Silgado.
El sismo del 9 de decembre de 1950, Datos Sismológicos del Perú, 1949-1950, Bol. No. 4, Lima, Peru, 1952, pp. 25, 47-51, with 4 photos and separate isoseismic map.

$A = +·2293$, $B = -·9406$, $C = -·2505$; $\delta = +6$; $h = +6$;
$D = -·972$, $E = -·237$; $G = -·059$, $H = +·243$, $K = -·968$.

		△	Az.	P	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		2·7	20	i 0 43	+ 1	—	—	—	—	—
La Paz		8·1	105	i 1 53k	− 5	i 3 23	− 7	—	—	4·6
Bogota		19·2	5	i 4 24	0	i 8 15	SS	i 4 41	PP	—
Santiago		19·4	167	i 4 32	+ 6	e 8 7	+10	—	—	—
Chinchina	N.	19·5	2	i 5 14?	+47	i 7 51?	− 9	i 10 31?	?	—
Balboa Heights		23·6	353	i 5 15	+ 6	e 9 29	+12	—	—	—
Buenos Aires		25·6	144	i 5 29	+ 1	9 45	− 6	i 10 9	S	—
La Plata		26·1	144	i 5 29	− 4	10 11?	+12	10 57	SS	12·8
Fort de France		32·8	28	i 6 25	− 7	e 13 43	SS	—	—	—
Guantanamo Bay		34·3	2	i 6 52	+ 7	—	—	—	—	—
San Juan		34·3	17	e 6 40	− 5	i 11 57	−12	i 7 26	sP	e 13·6
Merida		37·7	339	e 7 17	+ 3	e 13 5	+ 3	—	—	—
Vera Cruz		38·9	329	e 7 29	+ 5	e 13 39	sS	i 7 43	pP	—
Puebla		39·8	327	e 7 39	+ 7	e 13 39	+ 6	—	—	—
Miami		40·5	355	e 7 47	pP	—	—	—	—	—
Tacubaya		40·6	326	e 7 47	pP	i 13 54	+ 9	i 17 44	S_cS	—
Guadalajara		44·0	322	e 13 49	P_cS	—	—	e 17 55	S_cS	—
Bermuda		48·0	13	i 8 34	− 4	i 15 24	− 8	i 10 28	PP	e 20·6
Columbia		48·5	355	e 8 42	0	e 15 36	− 3	e 10 32	PP	e 19·9
Washington		53·2	359	i 9 16	− 1	e 16 43	− 1	e 11 48	pPP	e 21·6
Lubbock		53·8	334	9 21	− 1	16 53	+ 1	—	—	—
Cincinnati		54·0	352	i 9 20	− 3	i 16 49	− 6	—	—	—
Philadelphia		54·3	2	i 9 16	− 9	i 16 48	−11	e 17 12	sS	e 25·6
St. Louis		54·5	346	i 9 27	0	i 17 1	− 1	e 11 39	PP	—
Pittsburgh		54·9	357	i 9 29	− 1	i 17 4	− 3	i 19 3	S_cS	—
Pennsylvania		55·1	358	i 9 52	+21	i 17 6	− 4	i 10 32	P_cP	—
City College, N.Y.		55·2	2	i 9 36?	+ 4	—	—	—	—	—
Fordham		55·2	2	i 9 31	− 1	i 17 5	− 6	—	—	—
Palisades		55·4	2	i 9 32k	− 1	i 17 10	− 4	i 11 21	PP	e 26·8
Cleveland		56·0	355	i 9 35k	− 3	e 17 14	− 8	e 9 54	pP	—
Weston		56·9	5	i 9 41	− 3	e 17 26	− 8	—	—	—
Harvard		57·0	5	i 9 44	− 1	i 17 30	− 5	i 19 22	S_cS	—
Chicago		57·1	350	e 9 40	− 6	i 17 28	− 8	e 10 8	pP	e 24·1
Tucson		57·1	325	i 9 47	+ 1	e 17 39	+ 3	i 10 3	pP	e 24·0
Buffalo		57·3	358	i 9 42	− 5	e 17 33	− 6	i 10 31	P_cP	—
Lincoln	E.	58·3	342	e 9 56	+ 2	i 17 48	− 4	i 18 14	sS	e 24·2
Ottawa		59·7	1	e 10 2	− 2	i 18 3	− 7	10 50	P_cP	—
Halifax		60·1	11	10 7	+ 1	18 12	− 4	13 56	PPP	—
Shawinigan Falls	N.	60·9	3	e 10 10	− 2	e 18 21	− 5	—	—	—
Palomar		61·4	321	i 10 17a	+ 2	i 18 40	+ 8	e 39 38	P′P′	—
Seven Falls	E.	61·6	4	e 10 15	− 1	i 17 31	−64	—	—	—
Pierce Ferry		61·8	326	i 10 19	+ 1	i 18 43	+ 6	e 39 16	P′P′	—
Boulder City		62·1	325	i 10 21	+ 1	e 18 48	+ 7	e 39 18	P′P′	—
Riverside		62·2	321	i 10 22a	+ 2	e 18 48	+ 6	e 39 34	P′P′	—
Overton	Z.	62·3	326	i 10 23	+ 2	i 18 53	+ 9	e 39 19	P′P′	—
Pasadena		62·7	321	i 10 25a	+ 1	i 18 55	+ 6	i 10 43	pP	—
Rapid City	E.	63·3	339	e 10 30	+ 2	i 18 57	+ 1	i 11 1	pP	e 31·3
China Lake	Z.	63·6	323	i 10 30a	0	e 25 31	SSS	i 10 47	pP	—
Haiwee		64·0	323	e 10 34	+ 2	—	—	e 39 34	P′P′	—
Salt Lake City		64·2	331	e 10 42	+ 8	e 19 10	+ 3	e 19 30	sS	e 28·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		64·8	323	i 10 39a	+ 1	i 11 0	sP	e 39 26	P′P′	—
Logan		64·9	332	e 10 36	− 2	i 19 12	− 4	e 14 32	PPP	e 26·1
Fresno	z.	65·5	323	e 39 27k	P′P′	—	—	e 39 45	pP′P′	—
Lick	z.	67·0	322	i 10 53a	+ 1	e 20 52	S_cS	e 39 24	P′P′	—
Berkeley		67·7	322	i 10 58a	+ 2	i 19 58	+ 8	e 24 29	SS	—
Bozeman		67·7	335	e 11 0	+ 4	i 19 49	− 1	e 20 48	S_cS	e 32·2
Butte	N.	68·6	334	e 11 3	+ 1	e 20 3	+ 2	e 20 56	S_cS	e 27·8
Mineral		69·0	324	e 11 5	+ 1	e 20 7	+ 2	e 39 15	P′P′	—
Ukiah		69·1	323	—	—	e 20 14	+ 8	e 24 40	SS	e 30·7
Shasta Dam		69·6	324	i 11 8	0	—	—	e 39 13	P′P′	—
Hungry Horse		71·1	335	i 11 16	− 1	e 20 28	− 2	e 39 9	P′P′	—
Saskatoon		71·5	341	—	—	i 20 30	− 4	—	—	—
Seattle		74·3	330	e 11 37	+ 1	e 21 11	+ 5	i 12 25	pP	—
Victoria		75·5	330	e 11 47	+ 4	i 21 27	+ 7	—	—	—
Ivigtut		78·8	14	—	—	i 21 51	− 4	—	—	41·4
Lisbon		82·1	47	i 13 19k	+60	i 22 29	− 1	23 7	SP	38·2
Malaga	z.	84·7	50	i 12 32a	0	i 22 54	− 2	15 54	PP	42·2
Granada		85·5	50	i 12 35a	− 1	22 56	[+ 1]	12 53	pP	i 44·4
Toledo	z.	86·2	48	i 12 39	0	i 23 12	+ 2	—	—	41·2
Sitka		86·7	332	e 13 21	?	e 23 6	[+ 3]	i 23 17	S	—
Alicante		88·2	49	e 12 50	+ 1	i 23 8	[+ 4]	16 2	PP	e 39·5
Tamanrasset	z.	88·2	66	e 12 50	+ 1	—	—	e 13 7	pP	—
Tortosa		89·7	48	13 0	+ 4	23 22	[0]	24 55	PS	e 44·4
Resolute Bay		89·9	355	e 12 55	− 2	23 36	− 9	24 54	PS	—
Rathfarnham Castle		90·1	34	i 13 25	+27	e 24 1	+14	i 13 35	pP	e 34·4
Grahamstown	z.	92·5	125	i 13 10	+ 1	—	—	e 13 26	pP	—
Kew		92·8	38	e 13 33	+23	e 23 39	[0]	e 24 5	S	e 34·4
Paris		93·6	41	i 13 12	− 2	i 23 38	[− 6]	i 13 28	pP	e 44·4
Wellington		94·1	226	i 19 41?	PPP	—	—	—	—	43·4
Christchurch		94·7	223	—	—	—	—	e 42 1	Q	e 43·8
Besançon		95·4	43	e 13 21	− 1	e 13 58	sP	e 13 44	pP	—
College		95·5	336	i 13 23	0	i 23 54	[− 1]	e 17 23	PP	—
De Bilt		96·2	37	e 17 30	PP	e 23 59	[0]	e 26 2	PS	e 40·4
Pretoria	z.	96·3	118	e 13 26	0	—	—	e 13 42	pP	—
Strasbourg		96·9	41	e 13 50	+21	e 24 1	[− 1]	e 17 36	PP	45·4
Pavia		97·1	45	e 17 53	pPP	e 24 6	[+ 3]	e 26 13	PS	e 46·7
Zürich		97·2	43	e 13 29k	− 1	e 24 4	[0]	e 13 46	pP	—
Karlsruhe		97·5	40	i 13 31	− 1	—	—	—	—	—
Stuttgart		97·9	41	e 13 32	− 2	e 24 7	[0]	e 13 54	pP	e 46·4
Florence		98·2	47	e 13 55	+20	24 27	[+18]	i 18 1	PP	—
Rome		98·7	49	e 13 34	− 3	e 24 15	[+ 4]	e 17 32	PP	—
Jena		99·9	40	e 13 42?	− 1	e 24 19	[+ 2]	e 17 43	PP	—
Cheb	E.	100·2	40	e 14 3	+19	i 24 20	[+ 1]	e 26 38	PS	—
Triest		100·3	45	e 14 10	+26	i 24 47	[+28]	i 18 12	PP	—
Collmberg	z.	100·8	40	e 13 46	− 1	—	—	e 17 51	PP	—
Potsdam	E.	101·0	38	—	—	i 24 26	[+ 3]	—	—	e 48·4
Copenhagen		101·2	35	e 14 6	pP	i 24 24	[0]	32 9	SS	48·0
Prague		101·5	40	e 14 20	+30	i 24 17	[− 8]	e 17 54	PP	e 36·4
Skalnate Pleso		105·2	42	e 18 32	PP	e 24 36	[− 6]	e 19 1	pPP	—
Warsaw		105·9	39	e 18 18	PP	24 41	[− 4]	27 29	PS	e 50·4
Lwow		107·6	42	e 18 36	PP	e 24 46	[− 7]	e 28 2	PS	—
Helsinki		108·1	30	—	—	e 24 52	[− 3]	e 28 3	PS	e 51·4
Pulkovo		110·9	31	19 3	PP	25 7	[− 1]	28 37	PS	—
Istanbul		111·0	51	e 18 17	[−13]	e 28 36	PS	—	—	—
Helwan		112·3	63	e 14 55	P	28 48	PS	19 14	PP	—
Riverview		114·0	222	i 19 38	PP	i 25 27	[+ 8]	i 29 15	PS	e 53·0
Yalta		114·6	47	19 31	PP	25 23	[+ 2]	26 29	SKKS	—
Moscow		115·4	34	19 38	PP	25 23	[− 1]	—	—	—
Ksara		116·3	59	18 46	[+ 6]	28 24	?	e 15 2	P	—
Brisbane		116·5	229	i 19 54k	PP	e 25 34	[+ 6]	e 29 13	SP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tiflis		122·7	49	e 20 35	PP	—	—	—	—	—
Lenkoran		126·3	52	20 49	PP	—	—	—	—	—
Sverdlovsk		126·7	27	e 20 49	PP	e 26 6	[+ 4]	e 38 10	SS	—
Baku		126·8	50	e 19 17	pPKP	—	—	e 20 59	PP	—
Ashkabad		133·7	51	e 19 2	[−11]	i 22 32	PKS	21 27	PP	—
Mary		136·5	50	19 22	[+ 3]	i 22 51	PKS	—	—	—
Tashkent		140·0	41	e 19 29	[+ 4]	i 23 0	PKS	i 25 20	PPP	—
Stalinabad		141·1	44	i 19 32	[+ 5]	i 29 17	SKKS	—	—	—
Obi-garm		141·6	44	e 19 30	[+ 2]	—	—	—	—	—
Fergana		142·1	40	e 19 26	[− 3]	e 29 24	SKKS	e 22 49	PP	—
Andijan		142·3	40	e 19 28	[− 1]	—	—	—	—	—
Frunse		142·3	35	e 19 34	[+ 5]	i 29 27?	SKKS	e 22 35	PP	—
Irkutsk		142·4	0	e 19 24	[− 5]	—	—	e 22 24	PP	—
Vladivostok		142·7	325	i 19 39	[+ 9]	e 23 25	PKS	e 22 33	PP	—
Naryn		144·1	36	e 19 34	[+ 2]	—	—	e 22 47	PP	—
Przhevalsk		144·7	31	e 19 31	[− 2]	—	—	—	—	—
Bombay		150·1	77	e 19 54	pPKP	—	—	—	—	—
Poona		151·1	78	19 48	[+ 4]	26 48	[+ 2]	23 27	PKS	—
New Delhi		151·8	56	e 19 52	[+ 7]	30 16	SKKS	23 32	PKS	—
Kodaikanal	E.	154·0	95	e 20 27	$pPKP_2$	30 32	SKKS	23 32	PP	—
Colombo	E.	155·4	105	20 11	PKP_2	—	—	—	—	75·8
Hyderabad	N.	155·6	79	e 19 50	[0]	—	—	—	—	—
Bandong		158·3	191	20 24	PKP_2	—	—	—	—	—
Djakarta		159·1	189	18 16	?	—	—	—	—	—

La Paz iZ = 1m.57s., iPPZ = 2m.23s., iS = 3m.13s., SS = 4m.17s.
Bogota iP_cPZ = 8m.37s., eSS = 8m.53s.
La Plata iPN = 5m.34s.?, SSN = 10m.33s.
San Juan iPP = 8m.1s., iS_cP = 13m.1s.
Bermuda iSS = 18m.44s.
Columbia eS_cS = 18m.26s.
Philadelphia i = 17m.43s., iS_cS = 19m.0s., eSS = 20m.36s.
St. Louis e = 10m.4s., epPPP = 12m.45s., eS = 16m.52s., iSP = 17m.24s.
Pennsylvania iN = 11m.31s. and 12m.47s., eN = 16m.45s.
Palisades iPPP = 12m.52s., i = 19m.14s.
Cleveland ipPZ = 9m.57s., esSE = 17m.38s., eN = 18m.16s., eE = 19m.19s. and 19m.42s.
Chicago isS = 17m.52s., eS_cS = 19m.25s., eSS? = 22m.24s.
Tucson isP = 10m.14s., iPP = 11m.55s., epPP = 12m.26s., ePPP = 13m.30s., iS = 17m.42s., esS = 18m.8s., eS_cS? = 19m.30s., eSS = 21m.37s., ePKP,PKP = 39m.26s.
Buffalo e = 13m.24s. and 18m.35s.
Lincoln iS_cSE = 19m.34s.
Ottawa PPP = 13m.41s., PS = 18m.31s., S_cS = 19m.45s.
Halifax PS = 18m.38s., S_cS = 19m.50s., SSS = 24m.46s.
Palomar iN = 19m.7s., iS_cSN = 20m.5s., iE = 20m.34s.
Pasadena eZ = 10m.56s., iPPZ = 12m.54s., iSS?EN = 19m.17s., iS_cSZ = 20m.12s., eSSEN = 22m.57s., eEN = 26m.9s., ePKP,PKPZ = 39m.23s.
Rapid City iPE = 10m.33s., isSE = 19m.21s., eSSE = 23m.1s.
China Lake iZ = 11m.43s., ePKP,PKPZ = 39m.22s.
Salt Lake City ePP = 13m.17s., eS_cS = 20m.9s., eSS = 23m.9s.
Logan iS_cS? = 20m.49s.
Lick iZ = 11m.15s.
Berkeley eZ = 11m.29s., esS?EN = 20m.23s.
Bozeman eS = 19m.45s., eSS = 24m.11s.
Mineral eZ = 12m.30s., 20m.15s., and 40m.8s.
Seattle i = 11m.40s., iP_cP = 11m.43s., i = 11m.57s., 12m.0s., and 12m.14s., ipP_cP = 12m.33s., isP = 12m.48s., isP_cP = 12m.55s., i = 13m.9s. and 13m.34s.
Malaga PPPZ = 18m.1s.
Granada PP = 16m.11s., SKKS = 23m.11s., S = 24m.8s., i = 26m.29s., eSS = 29m.37s.
Sitka eS = 23m.41s., eSSS? = 36m.1s.
Alicante PPP = 17m.56s., S_cS = 23m.22s., PS = 23m.50s., PPS = 24m.20s., SS = 28m.30s., SSS = 32m.3s., Q = 34m.50s.
Tamanrasset ePPZ = 16m.28s., epPPZ = 16m.49s.
Resolute Bay PPE = 13m.22s., eE = 18m.5s., SSN = 29m.49s., e = 33m.12s.
Rathfarnham Castle ePS = 25m.8s., eEN = 27m.58s.
Kew ePSEN = 26m.2s.
Paris iPP = 16m.54s., ePPP = 18m.59s., iS? = 24m.11s., iSP = 25m.23s. and many unidentified readings.
Besançon e = 14m.37s.
College epPP = 17m.49s., iS = 24m.26s., eSS = 31m.3s., eSSS = 34m.56s.
De Bilt eSSS = 35m.9s.
Strasbourg e = 15m.40s., 17m.13s., and 22m.2s., ePS = 25m.59s., eSSS? = 35m.49s., eQ = 41·4m.

Continued on next page.

Zürich ePP =17m.29s.
Stuttgart ePP =17m.26s., ePS =26m.15s., eSS =31m.39s.
Florence S =25m.44s.
Jena eEN =14m.4s., eE =14m.23s., eN =14m.27s., eE =25m.9s.
Cheb eE =17m.50s., iSKKSE =24m.50s., eE =25m.12s.
Triest i =24m.18s., iPS =27m.2s., iPPS =27m.38s.
Prague e =14m.31s., iSKKS =24m.46s., ePS =26m.46s.
Skalnate Pleso eSKKSE =25m.6s., e =25m.53s., ePSN =27m.45s., eE =27m.59s., e =28m.26s.
Warsaw e =24m.47s., eSKKS =25m.15s., PPS =28m.37s.
Lwow eSS =33m.37s.
Helsinki eE =29m.8s.
Pulkovo SKKS =26m.0s.
Helwan PPS?Z =29m.41s., eZ =33m.9s.
Riverview iEN =25m.55s., iE =26m.37s. and 27m.6s., eNZ =29m.25s., eSSE =35m.42s
Brisbane eEN =29m.43s., eN =36m.26s.
Sverdlovsk SKKS =27m.47s., eSSS =43m.15s.
Tashkent iPS =32m.37s.
Vladivostok iSS =41m.23s.
Poona PKP_2E =20m.15s., PPE =23m.44s., PPPE =27m.13s., PPE =27m.56s., SKKSE =30m.16s., SKKKSE =30m.42s., SKSPE =34m.1s.
New Delhi PPN =22m.55s., PPPN =26m.6s., PSN =33m.47s., SSN =41m.32s., iN =42m.44s., SSSN =46m.43s.
Kodaikanal PSE =31m.17s., SSE =35m.42s., SSSE =39m.2s., QE =41m.57s., RE =45m.47s.
Long waves were also recorded at Upsala and Budapest.

Dec. 10d. 8h. Kamchatka region.

College iP =47m.22s.
Hungry Horse iP =50m.36s.
Shasta Dam iP =50m.42s.
Mineral ePZ =50m.46s., eZ =51m.13s.
Lick iPZ =51m.1s.a, ipPZ =51m.12s.
Tinemaha iPZ =51m.17s., ipPZ =51m.27s.
China Lake iPZ =51m.26s.a, ipPZ =51m.36s.
Pasadena iPZ =51m.31s., ePZ =51m.42s.
Overton iPZ =51m.36s.
Riverside iPZ =51m.36s., epPZ =51m.46s.
Boulder City iP =51m.37s.
Pierce Ferry iP =51m.39s.
Palomar ePZ =51m.42s., epPZ =51m.52s.
Tucson iP =52m.10s., i =52m.20s.
Weston iP =53m.13s.
Stuttgart ePZ =53m.19s.
Strasbourg eP =53m.23s.
Paris iP =53m.26s.
Besançon iP =53m.32s.

Dec. 10d. 11h. 16m. 42s. Epicentre 17°·4S. 167°·9E. (as on 1948, Dec. 12d.).

$A = -·9336$, $B = +·2002$, $C = -·2972$; $\delta = +2$; $h = +5$;
$D = +·210$, $E = +·978$; $G = +·291$, $H = -·062$, $K = -·955$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		17·0	230	i 4 1	0	e 7 22	+12	—	—	—
Apia		19·9	83	e 4 37	+ 1	—	—	e 4 44	P	—
Riverview		22·2	218	i 5 1k	+ 1	e 8 58	− 2	—	—	e 10·5
Wellington		24·5	167	e 8 48	P_cP	—	—	—	—	—
Christchurch		26·4	172	—	—	e 10 38	+26	e 12 8	Q	e 15·5
Shasta Dam		86·6	46	e 12 43	− 3	—	—	—	—	—
Fresno	z.	86·8	50	e 12 47	0	—	—	e 12 58	pP	—
Mineral	z.	87·0	47	e 12 48	0	—	—	—	—	—
Pasadena	z.	87·0	53	e 12 46	− 2	—	—	e 12 57	pP	—
Riverside	z.	87·5	53	e 12 48	− 3	—	—	—	—	—
China Lake	z.	88·0	51	i 12 53	0	—	—	i 13 4	pP	—
Tinemaha	z.	88·1	50	e 12 53	− 1	—	—	e 13 3	pP	—
College		88·7	17	e 12 56	− 1	—	—	i 13 5	pP	e 44·9
Boulder City		90·2	52	e 13 5	+ 1	—	—	—	—	—
Overton	z.	90·6	52	e 13 5	0	—	—	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Pierce Ferry		90·9	52	e 13 6	− 1	—	—	— —	—
Tucson		92·0	57	e 13 15	+ 3	—	—	e 13 22 pP	—
Stuttgart	z.	144·2	336	e 19 37	[− 1]	—	—	e 19 48 pPKP	—
Strasbourg		144·9	337	e 19 40	[+ 1]	—	—	— —	—
Chur		145·6	334	e 19 41 a	[+ 1]	—	—	— —	—
Zürich		145·6	335	e 19 40 a	[0]	—	—	— —	—
Basle		145·9	336	e 19 42 a	[+ 1]	—	—	— —	—
Paris		146·5	342	i 19 44	[+ 2]	—	—	i 19 56 pPKP	—
Besançon		146·7	337	e 19 42	[0]	—	—	e 19 58 pPKP	—

Riverview gives also iE = 9m.7s., iEN = 9m.12s.
Long waves were also recorded at Palisades and Ksara.

Dec. 10d. 12h. 1m. 35s. Epicentre 44°·2N., 10°·2E. (as on 1949, December 23d.).
Intensity III-IV in the province of Massa-Carrara. Epicentre 44°·N 10°E.
Monthly Bulletin, National Institute of Geophysics, Rome, December, 1950, p. 10.

A = +·7079, B = +·1274, C = +·6947 ; δ = −4 ; h = −3 ;
D = +·177, E = −·984 ; G = +·684, H = +·123, K = −·719.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Prato		0·7	116	i 0 15	P_g	i 0 25	S_g	— —	—
Bologna		0·8	70	—	—	e 0 24	S_g	e 0 33 S*	—
Florence		0·9	120	i 0 16	P_g	i 0 33	− 1	— —	—
Padova		1·2	77	—	—	e 0 59	?	e 1 19 ?	—
Pavia		1·2	323	e 0 25k	P_g	—	—	i 1 47 ?	—
Chur		2·7	350	e 0 47	+ 2	e 1 18	− 1	— —	—
Zürich		3·4	340	e 0 53	− 2	e 1 37	0	— —	e 1·9
Basle		3·8	332	e 1 2	+ 1	e 1 51	+ 4	— —	—
Besançon		4·2	317	—	—	e 2 8	S*	e 2 28 S_g	e 2·8
Stuttgart	z.	4·6	352	e 1 8?	− 4	e 2 5	− 2	e 1 31 P_g	—
Strasbourg		4·7	340	—	—	e 2 17	+ 7	e 2 45 S_g	—
Prague		6·5	25	—	—	e 3 7	+12	e 3 33 S_g	—
Paris		7·0	314	e 2 1	P*	—	—	— —	—

Additional readings :—
Stuttgart eZ = 1m.14s. and 1m.43s., eSZ = 1m.59s., eZ = 2m.12s., eS_gZ = 2m.37s., eZ = 2m.46s.
Prague eS* = 3m.22s.

Dec. 10d. 13h. 23m. 3s. Epicentre 28°·5S. 179°·0W. Depth of focus 0·025.

Intensity IV in the Bay of Plenty as far as Cook Strait and Banks Peninsula.
Epicentre 28°·5S. 179°W. Depth 300km.
Seismological Report for Oct.-Dec., 1950, Seismological Observatory, Wellington, New Zealand, p. 16.

A = −·8800, B = −·0154, C = −·4747 ; δ = −2 ; h = +2 ;
D = −·017, E = +1·000 ; G = +·475, H = +·008, K = −·880.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tuai	N.	10·8	196	2 33	+ 2	4 24	− 5	14 47 S_eS	—
New Plymouth	E.	12·0	207	2 55	+ 9	5 4	+ 8	— —	—
Wellington		13·7	200	3 6	− 1	5 27	− 8	14 52 S_eS	—
Cobb River	E.	14·3	206	e 3 15	0	e 5 39	−10	— —	—
Kaimata	N.E.	16·0	206	3 33	− 3	6 15	−12	14 57 S_eS	—
Apia		16·1	26	i 3 41k	+ 4	e 6 29	0	e 15 5 S_eS	—
Christchurch		16·4	202	e 3 40	− 1	6 26	−10	— —	—
Brisbane		24·7	266	i 5 8k	+ 3	i 9 7	− 3	i 6 2 pP	—
Riverview		26·0	250	i 5 19k	+ 2	i 9 29	− 2	i 6 15 pP	—
Honolulu		53·5	25	i 9 4	+ 1	e 16 15	− 4	i 10 0 pP	e 21·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		55·7	250	i 9 27	+ 8	i 16 45	− 3	i 10 25	pP	—
Bandong		72·1	272	e 11 0	− 5	i 19 59	−11	—	—	—
Manila		72·1	298	i 11 5	0	—	—	i 11 34	pP	—
Djakarta		73·2	272	i 11 9	− 3	i 20 16	− 6	—	—	—
Osima		74·2	326	e 11 15	− 2	i 20 25	− 9	—	—	—
Tokyo		74·7	327	11 21	+ 1	20 42	+ 3	12 19	pP	—
Shizuoka		74·9	325	11 21k	0	20 34	− 7	14 13	PP	31·6
Mito		75·0	327	i 11 21	− 1	i 20 35	− 7	—	—	—
Tukubasan		75·0	327	11 13	− 9	20 31	−11	—	—	—
Hunatu		75·1	326	i 11 23k	0	i 20 37	− 6	—	—	—
Kumagaya		75·3	327	i 11 26k	+ 2	i 20 42	− 4	11 47	PcP	—
Maebasi		75·7	327	i 11 25	− 1	e 20 43	− 7	e 14 18	PP	—
Nagoya		75·7	324	i 11 29	+3	i 20 47	− 3	e 14 24	PP	—
Kameyama		75·8	324	11 27	+ 1	20 46	− 5	i 14 9	PP	—
Yakusima		75·9	317	i 11 29	+ 2	i 20 46	− 6	—	—	—
Gihu		76·0	324	i 11 15	−13	20 47	− 6	i 14 9	PP	—
Hukusima		76·1	329	11 36	+ 8	i 20 51	− 3	—	—	e 32·3
Osaka		76·1	323	11 29	+ 1	i 20 53	− 1	e 12 8	pP	—
Simidu		76·1	320	i 11 39	+11	i 21 1	+ 7	—	—	—
Hikone		76·2	324	11 31	+ 2	e 20 48	− 7	e 12 48	?	—
Matusiro		76·2	326	i 11 29	0	20 50	− 5	13 31	pP	32·2
Sumoto		76·2	323	i 11 30k	+ 1	i 20 51	− 4	i 12 21	pP	—
Kobe		76·3	323	i 11 31k	+ 2	i 20 51	− 5	i 22 12	PS	—
Kyoto		76·3	324	e 11 30	+ 1	e 20 52	− 4	—	—	—
Nagano		76·3	326	e 11 29	0	i 20 51	− 5	13 7	pP	32·2
Sendai		76·3	329	i 11 28k	− 1	20 47	− 9	14 26	PP	32·2
Kôti		76·4	321	i 11 30k	0	i 20 52	− 6	e 12 43	pP	—
Toyama		76·8	326	11 39	+ 7	e 21 2	0	25 23	SS	—
Miyako		76·9	331	11 33k	0	20 59	− 4	—	—	32·2
Ooita		77·2	320	e 11 39	+ 5	e 21 0	− 6	—	—	—
Morioka		77·3	330	i 11 35k	0	i 21 4	− 3	—	—	—
Kumamoto		77·4	319	e 11 29	− 6	20 58	−10	—	—	—
Akita		77·9	330	11 38	0	i 21 7	− 7	—	—	—
Hukuoka		78·2	319	i 11 39k	− 1	i 21 11	− 6	—	—	—
Nemuro		78·5	335	i 11 44	+ 3	i 21 52	SP	—	—	e 33·2
Tomie		78·5	318	i 11 39k	− 2	i 21 28	+ 8	—	—	—
Hatinohe		79·2	331	11 36	− 9	21 5	−22	—	—	—
Sapporo		80·0	333	i 11 50	+ 1	i 21 33	− 3	i 13 8	pP	e 33·3
Mitchell Field		80·1	2	i 11 49	− 1	i 21 36	− 1	i 13 7	?	—
Zi-ka-wei		82·1	312	e 12 1	+ 1	21 51	− 6	15 13	PP	—
Vladivostok		84·3	326	i 12 12	0	i 22 20	+ 1	i 13 24	pP	—
Nanking		84·4	311	i 12 12k	0	i 22 7	−13	—	—	—
Santa Clara		84·6	42	i 12 13	0	i 22 11	−11	i 12 25	pP	e 34·4
Berkeley		84·7	42	i 12 14k	0	e 22 10	−13	e 13 24	pP	—
Lick	z.	84·7	42	i 12 13k	− 1	e 22 20	− 3	i 13 25	pP	—
Pasadena		84·8	47	i 12 13k	− 1	i 22 22	− 2	e 15 27	PP	i 34·6
Ukiah		85·0	40	e 12 14	− 1	i 22 22	− 4	e 22 11	SKS	e 34·2
Palomar		85·1	48	i 12 15	0	e 22 7	[−11]	i 22 14	S	—
Riverside		85·2	47	i 12 15k	− 1	e 22 14	[− 5]	e 30 19	PKKP	—
Fresno		85·5	44	i 12 17k	0	e 22 27	− 4	e 13 27	pP	—
China Lake	z.	86·2	46	i 12 20k	− 1	e 22 29	[+ 3]	i 15 54	PP	—
Haiwee		86·2	45	i 12 21k	0	e 22 21	[− 5]	—	—	—
Klyuchi		86·2	349	i 12 20	− 1	i 22 14	[−12]	—	—	—
Manzanillo		86·2	66	e 12 17	− 4	e 22 22	[− 4]	e 27 59	SS	—
Shasta Dam		86·6	40	i 12 22	− 1	e 22 38	− 3	e 17 46	PPP	—
Tinemaha		86·6	45	i 12 22	− 1	i 22 41	0	e 22 18	SKS	—
Mineral	z.	86·8	41	i 12 23	− 1	e 22 24	[− 6]	i 13 15	pP	—
Guadalajara		87·8	65	e 12 25	− 3	i 22 43	−10	i 22 21	SKS	—
Boulder City		88·1	47	e 12 30	0	i 22 39	[+ 1]	e 16 1	PP	—
Tucson		88·5	52	i 12 32	0	i 22 59	0	i 13 42	pP	i 36·0

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Overton	Z.	88·7	47	i 12 33	0	e 23 2	+ 1	i 14 10	sP	—
Pierce Ferry		88·7	48	i 12 33	0	i 23 1	0	e 22 36	SKS	—
Tacubaya		90·6	68	e 12 45	+ 3	i 23 16	− 2	e 22 40	SKS	—
Puebla		91·2	69	e 12 43	− 1	i 23 17	− 6	e 22 47	SKS	—
Seattle		91·3	34	i 12 46k	+ 1	i 22 51	[− 6]	i 14 2	pP	—
Victoria		91·4	33	i 12 45k	0	i 23 28	+ 3	i 22 53	SKS	—
Salt Lake City		92·8	44	e 12 50	− 2	i 23 36	− 1	e 16 26	PP	e 36·3
Sitka		92·8	22	i 12 51	− 1	i 23 35	− 2	i 14 42	sP	e 37·4
Vera Cruz		93·0	70	e 12 49	− 4	i 23 25	−14	i 22 49	SKS	—
Logan		93·4	43	i 12 49	− 6	i 23 34	− 8	i 22 59	SKS	e 39·4
Butte	N.	95·5	39	e 13 8	+ 4	i 24 0	0	e 23 12	SKS	e 37·6
La Plata	E.	95·9	135	13 3	− 3	i 23 15	[− 7]	23 51	S	—
Huancayo		96·0	107	i 13 7	+ 1	i 23 10	[−13]	i 14 20	pP	i 39·6
Hungry Horse		96·0	37	i 13 4	− 2	e 23 11	[−12]	i 17 52	pPP	—
Bozeman		96·1	41	e 13 5	− 2	i 24 4	− 1	e 17 5	PP	e 39·8
College		96·2	12	e 13 4	− 3	i 24 0	− 6	i 16 55	PP	e 40·5
La Paz		99·6	115	e 13 21	− 2	i 23 31	[−10]	i 14 34	pP	45·2
Rapid City	E.	100·0	45	i 13 26	+ 1	i 23 37	[− 6]	e 14 45	pP	e 41·1
Saskatoon		102·1	36	17 49	PP	i 24 54	− 2	i 23 41	SKS	—
Balboa Heights		102·5	87	—	—	e 23 43	[−12]	e 26 38	SP	—
Calcutta	E.	102·6	288	e 13 38	+ 2	23 54	[− 2]	17 57	PP	—
Lincoln	E.	102·7	50	e 17 52	PP	i 25 2	+ 1	e 23 45	SKS	e 44·2
Colombo	E.	103·0	270	13 39	+ 1	23 47	[−11]	—	—	40·0
Chinchina	N.	104·1	91	i 17 39?	PP	e 24 53?	−19	i 32 19?	SS	42·0
Irkutsk		104·5	322	i 13 44	0	25 11	− 5	e 15 28	sP	—
Bogota	Z.	105·3	93	e 13 48	+ 1	e 21 57	?	e 19 0	pPP	—
Florissant		106·2	54	e 13 53	+ 2	i 25 28	− 1	e 18 18	PP	—
St. Louis		106·3	54	e 13 53	+ 2	i 24 2	[−10]	i 18 18	PP	—
Hyderabad	N.	108·9	280	e 15 7	?	25 43	S	18 33	PP	45·8
Chicago		109·3	51	e 18 38	PP	i 25 56	S	e 27 42	SP	e 44·2
Cincinnati		110·4	56	i 14 1	P	24 20	[−10]	i 18 48	PP	—
Columbia		111·4	62	—	—	e 24 21	[−13]	e 28 7	PS	e 47·6
Poona		113·3	279	e 14 28	P	i 24 28	[−13]	i 19 2	PP	—
Cleveland		113·5	54	i 18 13	[− 2]	i 24 32	[−10]	e 19 10	pPKP	—
Grahamstown	Z.	113·9	203	e 13 54	P	—	—	i 18 14	PKP	—
Dehra Dun	N.	114·1	293	e 26 51	?	e 35 33	SS	—	—	e 54·4
New Delhi	N.	114·2	290	19 1	PP	i 24 33	[−12]	i 28 8	SP	51·9
Bombay		114·4	279	e 14 28	P	24 40	[− 6]	—	—	46·7
Pittsburgh		114·4	55	i 18 18	[+ 1]	i 24 39	[− 7]	i 25 47	SKKS	—
New Kensington	E.	114·6	55	e 19 13	PP	e 24 37	[− 9]	e 29 57	SPP	—
Tananarive		114·8	229	—	—	24 36	[−11]	25 46	SKKS	47·6
Pietermaritzburg	Z.	115·7	208	e 18 18	[− 1]	—	—	e 19 13	pPKP	—
Resolute Bay		115·7	16	i 18 26	[+ 7]	e 25 56	SKKS	19 27	PP	—
Pennsylvania		116·0	55	i 19 25	PP	i 24 41	[−11]	i 25 54	SKKS	—
Washington		116·0	58	e 18 25	[+ 5]	e 29 3	PS	i 19 29	PP	—
Philadelphia		117·7	57	e 19 32	PP	i 24 41	[−17]	i 25 59	SKKS	e 48·7
Semipalatinsk		118·0	315	e 19 33	PP	—	—	—	—	—
San Juan		118·3	83	i 18 22	[− 3]	i 24 47	[−13]	e 19 37	PP	e 48·0
Ottawa		118·6	51	i 18 22	[− 3]	i 29 23	PS	19 44	PP	—
Almata		118·7	306	18 23	[− 2]	24 52	[− 9]	e 14 46	P	—
Fordham		118·9	56	e 18 23	[− 3]	i 26 17	SKKS	i 27 19	S	54·0
Palisades		118·9	56	i 18 24	[− 2]	i 24 54	[− 8]	e 19 50	PP	—
Naryn		119·0	303	i 18 24	[− 2]	i 24 50	[−12]	14 46	P	—
Pretoria	Z.	120·1	208	18 25	[− 3]	—	—	—	—	—
Frunse		120·3	305	i 18 27	[− 1]	i 24 57	[−10]	e 19 59	PP	—
Shawinigan Falls	N.	120·9	50	e 18 29	[0]	e 27 30	?	—	—	—
Harvard		121·0	55	i 18 28	[− 2]	i 26 31	SKKS	i 20 3	PP	—
Weston		121·1	55	i 18 28	[− 2]	—	—	i 28 32	PKKP	—
Fort de France		121·2	90	i 18 32	[+ 2]	e 29 48	PS	19 58	PP	—
Andijan		121·5	302	18 30	[− 1]	e 25 2	[− 9]	i 20 3	PP	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fergana		121·8	302	i 18 29	[− 2]	25 2	[− 9]	15 0	P	—
Seven Falls	E.	122·3	50	e 17 29	[−63]	—	—	i 20 35	pPP	—
Kulyab		122·8	299	i 18 35	[+ 2]	—	—	—	—	—
Obi-garm		123·1	300	i 18 33	[− 1]	—	—	—	—	—
Stalinabad		123·8	300	i 18 34	[− 1]	—	—	19 47	pPKP	—
Lunacharskoe		123·8	302	i 18 33	[− 2]	i 25 1?	[−17]	—	—	—
Tashkent		123·9	302	i 18 34	[− 1]	i 25 9	[− 9]	i 20 18	PP	—
Bermuda		124·0	68	i 39 43	P′P′	i 36 40	SS	e 43 21	?	e 51·2
Halifax		127·0	54	21 58	pPP	25 8	[−20]	23 14	PPP	—
Mary		129·0	296	i 18 43	[− 2]	—	—	e 20 2	pPKP	—
Sverdlovsk		129·9	322	i 18 35	[−12]	25 25	[−10]	i 20 52	PP	—
Ashkabad		131·8	297	20 54	PP	—	—	—	—	—
Ivigtut		133·9	31	i 18 52	[− 2]	i 38 52	SS	41 2	sSS	64·0
Baku		138·4	300	e 18 50	[−13]	—	—	—	—	—
Lenkoran		139·3	298	18 56	[− 8]	—	—	20 22	pPKP	—
Grozny		141·3	305	e 19 4	[− 4]	i 22 47?	PKS	i 28 36	SKKS	—
Tiflis		142·2	302	e 19 5	[− 4]	—	—	—	—	—
Moscow		142·3	327	19 3	[− 7]	28 36	SKKS	20 30	pPKP	—
Erevan		142·6	300	e 19 11	[+ 1]	—	—	—	—	—
Pulkovo		142·9	336	i 19 3	[− 8]	i 28 38	SKKS	i 22 10	PP	—
Leninakan		143·0	301	e 19 11	[0]	—	—	—	—	—
Piatigorsk		143·1	307	19 8	[− 3]	i 28 45?	SKKS	i 20 24	pPKP	—
Abastumanj		143·7	302	i 19 10	[− 2]	—	—	—	—	—
Helsinki		144·4	340	i 19 11	[− 2]	e 28 49	SKKS	i 20 23	pPKP	—
Sotchi		145·6	307	i 19 14	[− 1]	—	—	—	—	—
Upsala		146·7	345	i 19 17	[0]	e 25 59?	[− 6]	i 20 33	pPKP	e 53·2
Bergen	N.	148·0	356	19 19	[0]	26 13	[+ 6]	22 42	PKS	52·8
Theodosia		148·2	311	19 22	[+ 2]	—	—	19 50	PKP_2	—
Yalta		149·2	309	i 19 19	[− 2]	e 22 54	PKS	—	—	—
Ksara		149·8	289	i 19 20	[− 2]	29 28	SKKS	19 36	pPKP	—
Aberdeen		151·3	3	i 19 39	[+15]	i 42 8	SS	i 23 56	pPP	—
Kishinev		151·5	318	i 19 22	[− 2]	i 29 32	SKKS	e 19 32	PKP_2	—
Copenhagen		151·6	347	i 19 23k	[− 2]	i 29 22	SKKS	i 23 12	PP	—
Warsaw		152·0	334	e 19 1	[−24]	25 40	[−32]	i 29 33	SKKS	e 61·0
Lwow		152·4	327	e 19 23	[− 3]	e 29 33	SKKS	e 22 54	PKS	—
Edinburgh	E.	152·7	5	—	—	e 42 12	SS	—	—	—
Helwan		153·5	280	i 19 25k	[− 2]	e 29 42	SKKS	20 42	pPKP	—
Durham		153·7	3	i 19 47	PKP_2	i 29 46	SKKS	i 42 38	SS	—
Istanbul		153·9	307	e 19 23	[− 5]	e 26 58	[+44]	—	—	—
Bucharest		154·5	315	i 19 56	PKP_2	i 26 4	[−11]	i 22 23	SKP	42·0
Potsdam		154·5	344	e 19 30	[+ 1]	i 29 48	SKKS	i 19 54	PKP_2	e 52·0
Rathfarnham Castle		154·6	10	i 19 30	[+ 1]	e 29 54	SKKS	i 23 39	PP	e 55·0
Skalnate Pleso		154·6	330	e 19 20	[− 9]	e 29 36	SKKS	e 20 42	pPKP	e 60·4
Raciborzu	Z.	154·8	334	e 19 27	[− 2]	—	—	e 19 54	PKP_2	—
Collmberg		155·5	340	i 19 28	[− 2]	e 29 49	SKKS	e 23 31	PP	e 61·0
De Bilt		156·2	354	i 19 31k	[0]	i 30 2	SKKS	i 20 47	pPKP	e 52·3
Jena		156·2	343	i 19 29	[− 2]	e 29 57	SKKS	e 20 53	pPKP	—
Prague		156·2	339	e 19 29	[− 2]	e 29 53	SKKS	i 20 40	pPKP	e 63·0
Budapest		156·4	328	19 35	[+ 4]	26 20	[+ 3]	i 29 59	SKKS	71·0
Ogyalla		156·5	330	e 19 32	[0]	e 26 24	[+ 7]	e 20 47	pPKP	—
Timisoara		156·5	322	e 19 37?	[+ 5]	—	—	i 20 5	PKP_2	—
Cheb		156·8	343	e 19 32	[0]	e 30 3	SKKS	e 20 41	pPKP	e 63·4
Kew		157·0	2	i 19 30k	[− 2]	e 29 57	SKKS	i 20 3	PKP_2	e 55·0
Kalossa		157·1	327	e 19 37	[+ 5]	26 21	[+ 4]	20 12	PKP_2	—
Sofia		157·1	314	e 19 33	[+ 1]	30 4	SKKS	i 20 8	PKP_2	—
Belgrade		157·5	322	e 19 30k	[− 2]	—	—	i 20 7	PKP_2	e 58·8
Karlsruhe		158·7	346	i 19 32	[− 2]	—	—	i 23 51	PP	—
Athens		158·8	300	e 19 17	[−17]	—	—	e 20 33	pPKP	—
Stuttgart		158·8	345	i 19 33k	[− 1]	i 30 7	SKKS	i 20 13	PKP_2	—
Jersey	E.	159·2	5	20 18	PKP_2	e 43 36	SS	e 24 23	pPP	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		159·3	347	i 19 33k	[− 2]	e 26 20	[0]	i 20 32	pPKP	—
Paris		159·7	358	i 19 33	[− 2]	i 30 17	SKKS	i 20 51	pPKP	e 69·0
Triest		160·1	334	e 19 42	[+ 6]	—	—	i 20 18	PKP_2	—
Zürich		160·2	346	e 19 33k	[− 3]	—	—	i 20 18	PKP_2	—
Basle		160·3	347	e 19 33	[− 3]	e 30 21	SKKS	i 20 19	PKP_2	—
Chur		160·5	342	e 19 34k	[− 2]	—	—	i 20 20	PKP_2	—
Besançon		160·9	349	e 19 34	[− 3]	e 26 3	[−18]	e 20 52	pPKP	—
Neuchatel		161·0	347	e 19 35	[− 2]	e 30 25	SKKS	i 20 22	PKP_2	—
Padova		161·8	335	e 20 21	PKP_2	35 5	PSKS	i 20 29	pPKP	—
Bologna		162·0	336	e 19 41?	[+ 3]	e 44 18?	SS	e 20 33	pPKP	—
Pavia		162·1	342	e 19 36k	[− 2]	e 34 35	SKSP	e 20 27	pPKP	—
Taranto		162·1	316	e 20 8	?	e 23 18	PKS	e 33 48	?	—
Prato		162·6	335	i 19 35	[− 3]	i 30 32	SKKS	—	—	—
Clermont-Ferrand		162·7	355	i 19 31	[− 7]	i 26 10	[−12]	i 20 30	PKP_2	e 52·3
Florence		162·7	335	e 19 40	[+ 2]	—	—	i 20 25	pPKP	—
Rome		163·7	328	i 19 35k	[− 4]	e 26 0	[−23]	e 20 32	pPKP	—
Messina		164·4	313	e 19 49k	[+ 9]	—	—	i 20 51	pPKP	—
Lisbon		166·7	37	19 42k	[0]	44 55	SS	20 45	PKP_2	79·2
Barcelona		167·0	356	e 24 42	PP	(e 45 44)	SSP	—	—	e 45·7
Tortosa	N.	167·7	2	i 19 47	[+ 4]	31 44	SKKS	i 24 40	PP	—
Toledo		167·9	19	i 19 40	[− 3]	i 31 0	SKKS	i 20 52	PKP_2	68·8
Tunis		168·7	319	e 19 55	[+12]	e 23 1	SKP	e 20 51	pPKP	—
Alicante		170·1	7	19 41	[− 3]	—	—	21 2	PKP_2	—
Granada		170·5	23	i 19 41a	[− 3]	26 7	[−20]	20 5	pPKP	i 79·0
Malaga	z.	170·6	28	i 20 43k	pPKP	26 41	[+14]	i 21 3	PKP_2	80·7
Algiers Univ.	z.	171·6	350	i 19 43k	[− 2]	e 31 27	SKKS	i 21 1	pPKP	—
Tamanrasset	z.	173·0	217	i 19 45a	[− 1]	i 31 30	SKKS	e 21 3	pPKP	—

Additional readings and notes :—
Brisbane iP_cPN =8m.29s., iZ =11m.37s.
Riverview iPPEZ =6m.27s., isPE =6m.49s., iP_cPE =8m.39s., iSE =9m.25s., isSE =10m.58s., iS_cPN =11m.45s., iS_cSN =15m.38s., and other unidentified readings.
Honolulu esP =10m.37s., esS =18m.16s.
Perth i =10m.37s., 12m.49s., 14m.12s., 18m.10s., and 31m.52s.
Tokyo pPP =14m.45s., PPP =15m.53s., e =19m.57s., and 20m.53s., SS =25m.19s.
Shizuoka sS =22m.34s.
Kumagaya iZ =11m.52s., eZ =12m.32s., pP?N =13m.10s., sP? =14m.18s.
Nagoya iE =21m.20s.
Gihu i =11m.51s., 12m.28s., and 14m.21s., PPP =16m.9s., i =21m.13s., S_cS =22m.1s., SS =24m.47s.
Osaka e =23m.20s.
Matusiro P_cP =11m.38s., PPP =16m.52s., pPPP =17m.50s.
Kobe eEN =13m.15s. and 21m.22s.
Nagano eSP =21m.58s.
Sendai eE =15m.56s., PPP? =16m.43s., S_cS =20m.51s., SSS =29m.22s.
Kôti ePP =14m.38s., epPP =15m.42s., ePPP =16m.47s., iS =20m.43s., esS =22m.51s., esPS =23m.40s., eSS =25m.40s., eSSS =29m.32s.
Toyama PP =14m.44s., PPP? =16m.40s., PPS =22m.49s.
Sapporo i =13m.28s. and 22m.52s., esS =23m.55s.
Vladivostok SKS =22m.3s., iS_cS =22m.27s., iPS =23m.57s., sS =24m.24s., SS =27m.57s., SSS =31m.4s.
Nanking ipP?Z =13m.32s., iZ =13m.56s., iPP?Z =15m.56s., SN =23m.8s.
Santa Clara isSEZ =22m.26s.
Berkeley esPZ =14m.0s., iSP?Z =22m.25s., eSSEN =27m.54s., ePKP,PKPZ =38m.29s., eSKP,PKPZ =41m.21s.
Lick iZ =13m.35s., iPKKPZ =30m.21s., eN =34m.45s., ePKP,PKPZ =38m.22s., iZ =39m.13s., iSKP,PKPZ =41m.22s., iZ =41m.39s.
Pasadena iE =12m.41s., iNZ =13m.6s., iEZ =13m.33s., iS? =22m.7s., iSP =23m.12s., eSSEN =27m.27s., iPKKP =30m.19s., iZ =31m.17s., ePKP,PKPZ =38m.28s., eSKP,PKPZ =41m.20s., iZ =41m.38s., ePKP,PKP,PKPZ =58m.34s.
Ukiah eSP =23m.15s., eSS =27m.56s., eSSS =31m.34s.
Riverside iZ =14m.2s., ePKP,PKPZ =38m.15s., iSKP,PKPZ =41m.35s., eZ =58m.50s.
Fresno eZ =13m.33s., eSE =22m.12s., eN =22m.18s., eSPEN =23m.17s., esSN =24m.39s., ePKP,PKPZ =38m.23s., eSKP,PKPZ =41m.17s., eZ =41m.37s.
China Lake iPKKP =30m.18s., iZ =32m.22s., ePKP,PKPZ =38m.7s., iZ =38m.28s., iSKP,PKPZ =41m.36s., ePKP,PKP,PKPZ =58m.50s.
Manzanillo eSKS =22m.7s., e =34m.54s.
Shasta Dam eSKS =22m.16s., ePKP,PKP =38m.23s., eSKP,PKP =41m.9s.
Tinemaha ePKP,PKPZ =38m.22s., eSKP,PKPZ =41m.33s.

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Mineral iZ =13m.55s., eZ =14m.22s. and 21m.57s., eSP?EN =22m.41s., eZ =22m.46s., ePS =23m.45s., iPKKPZ =30m.15s., ePKP,PKPZ =38m.21s., eSKP,PKPZ = 41m.11s.
Guadalajara ePS =23m.37s.
Boulder City eSKS =22m.24s., ePKKP =30m.14s., ePKP,PKP =38m.14s.
Tucson isP =14m.27s., ePP =16m.15s., i =16m.40s., iPPP =18m.16s., iSKS =22m.33s., ipS =23m.59s., isS =24m.52s., eSS =28m.17s., iSSS =32m.25s., ePKP,PKP, PKP =58m.30s.
Overton iPPZ =16m.7s., ePKP,PKPZ =38m.17s., ePKP,PKP,PKPZ =58m.28s.
Pierce Ferry iPKP,PKP =38m.9s., ePKP,PKP,PKP =58m.11s.
Puebla e =24m.31s.
Seattle i =13m.8s. and 13m.21s., isP =14m.29s., ePP =16m.27s., ePPP =18m.29s., iS =23m.2s., i =23m.27s., iSP =24m.2s., iPS =24m.15s., epS =24m.28s., esS = 25m.7s., iSS =29m.13s., e =35m.57s. and 37m.15s.
Victoria i =14m.3s., e =29m.39s.
Salt Lake City eSKS =22m.59s., ePS =24m.37s., esSS? =32m.9s.
Sitka iPP =16m.38s., isPP =18m.17s., iSKS =22m.57s., iPS =24m.49s., iSS =29m.49s.
Logan ePP =17m.6s., iPS =24m.50s., eSS =30m.10s., eSSS =33m.44s.
Butte ePPN =16m.46s., iPSN =25m.19s., iSSN =30m.27s.
La Plata PPE =16m.3s., iSN =23m.10s., LN =29m.3s.
Huancayo ePP =16m.51s., e =22m.24s.
Hungry Horse iPKP,PKP? =40m.31s.
Bozeman iSKS =23m.15s., iSS =30m.39s., eSSS =34m.23s.
College epPPP =20m.4s., eSKKS =23m.21s., ePKKP =29m.48s., iSS =30m.30s., eSSS? =34m.10s., ePKP,PKP =37m.59s., iSKP,PKP =41m.4s., ePKP,PKP, PKP =58m.27s.
La Paz iPZ =13m.25s., isP =14m.41s., iPPZ =17m.25s., iZ =20m.33s., iS =24m.21s., iPS =26m.0s., iPPS =27m.14s., iSS =31m.37s., SSS =35m.17s., Q =41·6m.
Rapid City iPPE =17m.35s., eSE =24m.5s., ePSE =25m.49s., eSSE=31m.21s., eSSSE= 35m.27s.
Saskatoon PPS =27m.9s., SS =32m.0s.
Calcutta PPPE =19m.52s., SKKSE =24m.31s., SKSE =24m.37s., iSE =25m.11s., PSE =26m.53s., PPSE =27m.39s., PKKPE =28m.52s., SSE =31m.50s., P_cP PKP_2E =33m.7s., SSSE =35m.45s., SKKSE =36m.9s., SKKKSE =39m.42s.
Lincoln ePSE =26m.36s., eSSE =32m.14s., eSSSE =36m.12s.
Chinchina ePP =23m.28s.?, iSKKSN =26m.29s.?
Irkutsk iPP =18m.3s., ePPP =19m.39s., iSKS =23m.54s., esS =27m.21s., sPS =28m.57s.
Florissant e =17m.9s., iSKS =24m.0s., iSKKS =24m.52s., i =27m.12s. and 28m.15s.
St. Louis e =14m.58s., i =19m.50s., iSKKS =24m.54s., iS =25m.30s.
Hyderabad SKSN =25m.8s., SSN =32m.14s.
Chicago eSKKS =25m.2s., eSS =33m.22s., eSSS =37m.46s.
Cincinnati iSKKS =25m.20s.
Columbia eS =26m.11s., eSS =34m.13s., eSSS =38m.9s.
Poona PKPE =17m.52s., PPE =18m.51s., PPPE =21m.19s., PKSE =21m.35s., SKKSE =25m.40s., iSE =26m.19s., PSE =28m.11s., sSE =28m.26s., PPSE =29m.23s., SSE =34m.1s., SSPE =34m.17s., SSSE =38m.9s.
Cleveland iSKKSE =25m.39s., isSKSN =26m.30s., iE =28m.38s., iZ =30m.0s., iE = 30m.43s., iSSN =34m.34s., eSSS?E =39m.11s., eE =40m.36s.
Grahamstown iPKPZ =17m.44s., epPKPZ =18m.37s., iZ =20m.51s., eSZ =27m.42s., isSZ =28m.30s.
New Delhi iN =20m.58s., SKKSN =25m.43s., iN =26m.30s., PPSN =29m.6s., iN = 30m.9s. and 31m.22s., iSSN =34m.7s., SSSN =38m.26s., QN =45m.53s.
Bombay SKSEN =20m.55s., PPSEN =25m.51s., iSSEN =30m.42s., SSSEN =33m.36s., QN =41m.42s.
New Kensington eSE =26m.41s., iSSSE =39m.9s.
Tananarive SP =28m.21s., PPS =30m.27s., SS =34m.42s.
Resolute Bay eE =20m.36s., PPPZ =21m.56s., SKS =24m.15s., eN =30m.38s., SSN = 34m.45s., e =37m.33s. and 47m.18s.
Pennsylvania iNZ =19m.42s., isPPN =21m.9s., iSN =26m.51s., eN =28m.51s. and 32m.38s., iN =34m.7s.
Philadelphia iS =26m.57s., ePS =28m.32s., eSP =28m.54s., iPPS =30m.15s., iSS = 35m.21s., iPKP,PKP =38m.43s., eSSS =39m.52s.
San Juan epPP =21m.13s., esPP =21m.30s., iSKKS =26m.9s., iS =27m.17s., iPKKP? = 28m.42s., iPS =29m.7s., eSS =35m.37s., eSSS =40m.27s.
Ottawa eEN =27m.16s. and 28m.17s., iZ =28m.41s., SSN =35m.38s.
Almata pPKP =19m.37s., PP =19m.49s., SKKS =26m.16s., SKSP =29m.7s., SS = 35m.39s.
Palisades iSKKS =26m.17s., i =27m.17s., iPS =29m.14s., i =30m.26s.
Naryn pPKP =19m.28s., iPP =19m.48s.
Pretoria iZ =21m.35s., isSZ =28m.37s.
Harvard i =20m.24s., ipPP =21m.13s., eSKKS =25m.42s., iS =27m.32s., isS =29m.39s., eSPP =30m.37s., eSS =35m.59s.
Fergana pPKP =19m.54s., eSKKS =26m.34s.
Seven Falls iE =19m.11s.
Stalinabad eP =15m.11s.?, ePP =20m.16s., pPP =21m.28s.
Tashkent iPPP =22m.0s., iPPS =31m.43s., iSS =36m.36s.
Halifax e =27m.9s., 28m.26s., 37m.23s., and 40m.8s.

Continued on next page.

Mary PP =20m.52s.
Sverdlovsk eP =15m.37s., iPKS =22m.9s., SKKS =27m.25s., SKSP =30m.32s., SS = 37m.45s.
Ivigtut i =21m.52s., 22m.19s., and 24m.12s., SSS =43m.33s.
Moscow PP =22m.10s., PKS =22m.36s., SS =40m.21s.
Pulkovo iSP =30m.28s.
Helsinki iN =19m.17s., eSKPZ =22m.24s., eZ =23m.14s., eN =29m.23s., eSKKPZ = 30m.27s., eN =32m.41s., 34m.21s., and 42m.55s.
Upsala iSKPN =22m.41s., iPPN =23m.11s., epPPN =24m.27s., ePPPN =26m.41s., iSKKSN =28m.53s., iSKSPE =32m.42s., iPSKS?N =32m.54s., eSPPN =35m.35s., eSS?N =41m.25s., and other unidentified readings.
Bergen SKKSN =29m.4s., SKSPN =32m.30s., eN =36m.18s.
Aberdeen iEN =21m.14s., iE =25m.39s., iN =29m.28s., iPSKSN =33m.28s., iN = 37m.49s., iEN =52m.23s., iE =53m.4s.
Kishinev iPP =23m.15s.
Copenhagen i =20m.42s., 24m.33s., 33m.29s., 35m.53s., 37m.39s., 38m.27s.
Warsaw PKP_2 =19m.18s., esPKP_2 =20m.20s., eSKP =22m.31s., PP =23m.1s., iPSKS = 33m.32s., PPS =35m.55s., SS =42m.22s., sSS =43m.26s., and numerous unidentified readings.
Helwan PKP_2Z =19m.52s., PPEZ =23m.21s., eE =24m.15s., SKSPZ =32m.50s.
Durham iEN =19m.56s., 33m.18s., 33m.42s., 42m.46s., 51m.56s., and 52m.31s.
Bucharest eN =20m.1s., 21m.39s., and 28m.5s., iE =29m.2s., eN =29m.23s., iE = 30m.35s., iN =32m.34s., iE =33m.47s., iN =33m.51s.
Potsdam iPPEN =23m.28s., iPPPN =27m.15s., eSKKS?E =29m.57s., iN =35m.42s., iPPSN =36m.32s., iN =38m.32s.
Rathfarnham Castle iZ =19m.49s., eSKSPEN =33m.56s., ePPSEN =38m.5s., eSSEN = 42m.47s., eEN =46m.57s., eSSSEN =52m.17s.
Skalnate Pleso iPKP_2 =19m.50s., esPKP_2 =21m.13s., ePP =23m.23s., ePPPN =26m.57s., ePSKSN =33m.16s., epPS =35m.36s., esPS =36m.14s., eSS =42m.9s., eSSS = 48m.9s., and other unidentified readings.
Raciborzu ePKPN =19m.31s.
Collmberg eE =19m.37s., eZ =19m.41s., iPKP_2?NZ =19m.58s., eN =29m.54s., eZ = 33m.15s., eSKSPN =33m.47s.
De Bilt iPKP_2 =20m.2s., ipPKP_2 =21m.16s., iPP =23m.35s., iPPP =27m.18s., iSKKKS =30m.57s., eSS =43m.4s.
Jena ePKPE =19m.32s.?, iPKP_2NZ =19m.59s., iPKP_2E =20m.5s., iPPN =23m.35s., iPPE =23m.38s., eN =26m.37s., eE =32m.29s., eN =33m.59s. and 35m.29s., eE =36m.45s.
Prague iPKPN =19m.33s., iPKP_2 =20m.1s., epPKP_2 =21m.14s., esPKP_2 =21m.41s., iPPZ =23m.35s., ePPP =26m.23s., epPPP =27m.35s., ePSKS =33m.18s., epPS = 35m.32s., ePPS =36m.39s., eSS =42m.27s., eSSS =48m.57s., and many unidentified readings.
Budapest PKP_2E =19m.59s., PKP_2N =20m.5s., PPE =23m.31s., PPN =23m.39s., PPPEN =27m.18s., iE =35m.32s., eE =38m.22s. and 40m.12s., SSN =43m.9s., SSE =43m.12s., SSSN =53m.29s., SSSE =53m.34s.
Ogyalla ePKP_2 =20m.1s., epPKP_2 =21m.15s., esPKP_2 =21m.43s., epPP =24m.49s., ePPPE =27m.16s., eSKKS? =29m.37s., eSKSP =33m.3s., ePSKS =33m.35s., eSPPE =36m.22s., eSS =42m.33s., and other unidentified readings.
Cheb iPKP_2N =20m.2s., eE =20m.57s., epPKP_2 =21m.21s., esPKP_2 =21m.59s., ePP = 23m.41s., epPP? =24m.40s., ePPP =27m.17s., e =30m.50s., ePSKS =34m.5s., e = 35m.31s. and 36m.37s., eSPP =38m.9s., eSS =42m.57s., e =47m.27s.?
Kew iPP =23m.41s., eSKSP =33m.56s., ePPSEN =38m.11s., eEN =38m.57s., eSS = 43m.4s., e =46m.56s., eSSS =51m.51s.
Kalossa eE =19m.47s., 20m.17s., and 20m.58s., PPE =23m.31s., PPPE =27m.20s., eN =27m.59s., eEN =30m.6s., eN =35m.23s., eE =35m.30s.
Sofia PP =23m.45s., SKSP? =35m.29s.
Belgrade i =23m.47s., e =25m.36s. and 33m.35s., i =51m.49s.
Athens e =19m.29s. and 20m.43s.
Stuttgart iPP =23m.51s., i =25m.33s., iSKKS =30m.57s., iS? =32m.29s., i =33m.17s., iPSKS =34m.15s., iPPS =37m.19s., eSSS =49m.57s.?
Strasbourg iPKP_2 =20m.15s., ipPKP =20m.38s., esPKP =20m.48s., iPP =23m.54s., ipPP =25m.0s., isPP =25m.37s., iPPP =27m.37s., isSKS =28m.3s., iSKKS? = 29m.57s., iSKKS =30m.16s., ePS =33m.13s., iPSKS =34m.19s., iSPP =36m.55s., ePPS =37m.22s., iSS =43m.32s., iSSP =44m.35s., and other unidentified i readings.
Paris iPKP_2 =20m.16s., epPKP =21m.27s., ipPKP_2 =21m.36s., iPP =23m.54s., isPP = 25m.38s., iPPP =27m.37s., iSPP =36m.56s., iPPS =37m.23s., iSS? =44m.2s., and other unidentified i readings.
Zürich ePP =23m.59s.
Basle e =24m.0s.
Chur ePP =24m.2s.
Besançon iPKP_2 =20m.22s., esPKP =21m.2s., e =21m.41s., ePP =23m.54s., epPP = 24m.43s., esPP =25m.12s., ePPP =27m.39s., e =27m.55s., epPPP =28m.38s., eSKKS =29m.55s.
Neuchatel ePP =24m.2s.
Padova iSKP? =23m.53s.
Bologna ePP =24m.9s., eSSS =50m.48s.
Pavia eE =21m.17s., e =22m.47s., ePPP?Z =27m.55s., e =33m.8s. and 37m.10s.

Continued on next page.

Clermont-Ferrand iSKP =22m.43s., iPP =24m.11s., ipPP =25m.1s., isSKS =27m.19s., iPPP? =28m.26s., iSKKS =30m 22s., iPSKS =34m.42s., eSS? =43m.1s., eSSP = 45m.0s., eSSS? =49m.27s., and numerous unidentified readings.
Florence iPP =24m.16s., e =30m.14s., SKKS? =31m.34s., SSS =51m.22s.?
Rome e =22m.18s., ePP =24m.16s., e =37m.10s.
Messina iPP =24m.36s., e =27m.15s.
Lisbon E =21m.45s., iPPZ =24m.35s., $SKKS_2$?EN =32m.44s. and 32m.53s., $SKKKS_2$?N =34m.21s., SKKKS?EN =34m.31s., SSE =44m.26s. and 44m.44s., SSSEN = 51m.33s.
Tortosa PKP_2N =20m.53s., SKSP?N =34m.27s., iN =36m.47s., PPS?N =38m.10s., SSN =45m.0s., SSPN =46m.50s., iN =50m.7s., SS?N =52m.2s.
Toledo iN =22m.55s., iPPZ =24m.41s., iN =25m.20s., i =26m.3s., iPPP =28m.42s., iZ =32m.39s., iN =32m.51s., i =34m.23s. and 35m.0s., SSE =45m.3s., e =46m.51s. and 50m.13s.
Tunis epPKP$_2$ =21m.27s., ePKS =23m.30s., e =24m.22s., iPP =24m.51s., esPP = 26m.10s., eSKKS =31m.39s., e =50m.57s.?
Alicante PP =24m.51s., PPP =28m.59s., SKKS =32m.39s., SS =46m.51s., SSP =48m.7s.
Granada PKP_2 =21m.16s., $pPKP_2$ =21m.43s., iPP =24m.55s., pPP =25m.31s., iSKKS = 32m.7s., SKSP =36m.3s., iSS =46m.40s., sSS =47m.19s., SSS =56m.58s., Q =71·4m.
Malaga iPPZ =24m.55s., PPPZ =29m.3s.
Algiers Univ. $ePKP_2Z$ =20m.37s., $epPKP_2Z$ =22m.16s., ePPZ =25m.4s., ePPPZ = 29m.14s., eZ =32m.22s. and 34m.56s.
Tamanrasset $iPKP_2Z$ =21m.13s., eZ =21m.46s. and 22m.12s., ePPZ =25m.1s., epPPZ = 26m.13s., eZ =28m.12s., ePPPZ =29m.1s., epPPPZ =30m.15s., eZ =32m.17s., eSKSP?Z =35m.1s.

Dec. 10d. Readings also at 0h. (Stuttgart, Mount Wilson (2), Riverside (2), China Lake (2), Tinemaha (2), Berkeley, Lick, Hungry Horse, Overton (2), Pierce Ferry (2), and Tucson), 1h. (Naryn, Frunse, near Fergana, Andijan, Obi-garm, Tashkent, Lunacharskoe, Kulyab, and Stalinabad), 3h. (Huancayo (4) and Stuttgart), 4h. (La Paz, College (2), Hungry Horse, Shasta Dam, Lick, Pasadena, Riverside, China Lake, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and near Istanbul), 5h. (Brisbane, Huancayo, College, Lick, Pasadena, Riverside, Palomar, China Lake, Tinemaha, Boulder City, Overton, Pierce Ferry, and near Tiflis), 6h. (College, Hungry Horse (2), Shasta Dam, Mineral, Lick, Fresno, Pasadena, Riverside, Palomar, China Lake (2), Tinemaha, Boulder City, Overton (2), Pierce Ferry, Tucson, near Huancayo, and near Honolulu), 7h. (Sitka, near Obi-garm, Kulyab, Stalinabad, Fergana, and Andijan), 8h. (near Klyuchi), 9h. (Brisbane, Riverview (3), Christchurch (2), Wellington (2), College (3), Hungry Horse, Shasta Dam (2), Mineral, Lick (2), Fresno, Pasadena (3), Mount Wilson, Riverside (4), Palomar (2), China Lake (4), Tinemaha (2), Boulder City (2), Overton (3), Pierce Ferry (3), Tucson (3), Strasbourg, Stuttgart, Zürich, Basle, Ksara, Bogota, La Paz, and near Huancayo), 10h. (Honolulu, Riverview, Brisbane, College (2), Hungry Horse, Shasta Dam, Mineral, Lick, Riverside, China Lake, Tinemaha, Boulder City, Overton (2), Pierce Ferry (2), Tucson, Besançon, Strasbourg (3), Stuttgart (3), Zürich (2), Basle, Kulyab, Stalinabad, near Obi-garm, and near Alicante (3)), 11h. (Ksara, Palisades, College, Hungry Horse, Overton, and Pierce Ferry), 12h. (near Alicante (2) and near Vladivostok), 13h. (Lick), 14h. (Brisbane), 15h. (Honolulu, New Plymouth, Kaimata, Cobb River, near Tuai, Christchurch, Wellington, and near Leninakan), 16h. (College, Hungry Horse, Overton, and Pierce Ferry), 17h. (La Paz, Ottawa, near Dzhergetal, and near Tananarive), 18h. (La Paz, College, Hungry Horse, Lick, China Lake, Boulder City, Overton, Pierce Ferry, Tucson, and near Honolulu), 19h. (Overton, Pierce Ferry, Tucson, La Paz, Huancayo, near Puebla, and Tacubaya), 20h. (near Dzhergetal), 21h. (Bogota, Chinchina, La Paz, San Juan, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, Shasta Dam, Pasadena, Riverside, Palomar, China Lake (2), Tinemaha, College (3), Weston, Harvard, Huancayo (3), Ashkabad, and near New Delhi), 22h. (College (2), Palomar, China Lake, and Pretoria), 23h. (Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Hungry Horse, Boulder City, Overton, Tucson, and La Paz).

Dec. 11d. 3h. 32m. 45s. Epicentre 23°·3S. 66°·4W. Depth of focus 0·010.
(as on 1949, May 7d.).

$A = +·3681$, $B = -·8425$, $C = -·3933$; $\delta = -1$; $h = +4$;
$D = -·916$, $E = -·400$; $G = -·157$, $H = +·360$, $K = -·919$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	6·9	346	i 1 49k	+ 9	i 3 37	SS	2 22	PP	5·0
Buenos Aires	13·2	150	e 3 18	pP	—	—	—	—	—
La Plata	13·7	150	2 57	−14	6 27	SSS	3 33	PP	7·4
Huancayo	14·1	321	i 3 12	− 4	e 5 34	−17	e 3 45	pP	—
Bogota	28·7	343	i 5 52	+ 2	e 10 34	+ 3	e 6 52	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chinchina		29·5	341	e 5 38	−19	e 10 18	−25	—	—	—
San Juan		41·4	0	i 7 41	+ 3	e 13 41	− 5	i 9 28	PP	e 16·9
Tacubaya		53·2	320	e 9 11	+ 1	—	—	—	—	—
Weston		65·5	357	i 10 38	+ 3	—	—	—	—	—
Harvard		65·6	357	i 10 39	+ 3	—	—	—	—	—
Florissant		65·7	339	—	—	e 19 6	− 7	—	—	—
Cleveland		66·0	348	e 10 39	+ 1	i 19 15	− 2	i 20 8	sS	—
Ottawa		68·9	353	i 10 58a	+ 2	e 19 52	0	e 20 47	sS	—
Tucson		69·7	320	i 10 59	− 2	—	—	—	—	—
Shawinigan Falls	N.	69·8	356	e 11 2	0	—	—	—	—	—
Seven Falls	E.	70·2	357	—	—	i 19 10	sP	—	—	—
Palomar		74·1	318	i 11 26k	− 1	—	—	—	—	—
Pierce Ferry		74·3	322	i 11 29	+ 1	—	—	—	—	—
Boulder City		74·6	321	e 11 30	0	—	—	—	—	—
Overton	Z.	74·8	321	i 11 31	0	—	—	i 12 25	pP	—
Riverside		74·8	318	i 11 30k	− 1	—	—	—	—	—
Pasadena		75·4	318	i 11 33k	− 2	—	—	—	—	—
China Lake	Z.	76·2	320	i 11 38k	− 1	—	—	—	—	—
Tinemaha		77·4	320	i 11 46k	0	—	—	—	—	—
Fresno	Z.	78·1	319	e 11 48k	− 2	—	—	—	—	—
Lick	Z.	79·6	318	i 11 57k	− 1	—	—	i 12 45	pP	—
Reno	Z.	79·9	321	e 12 0k	0	—	—	—	—	—
Grahamstown	Z.	79·9	121	i 12 10	+10	—	—	—	—	—
Berkeley	Z.	80·3	318	i 12 1k	− 1	—	—	—	—	—
Mineral		81·5	321	i 12 6	− 2	—	—	—	—	—
Shasta Dam		82·2	320	i 12 9	− 3	—	—	—	—	—
Hungry Horse		83·1	331	i 12 16	0	—	—	—	—	—
Tamanrasset	Z.	83·6	61	i 12 30k	+11	—	—	—	—	—
Pretoria	Z.	84·0	115	i 12 31	+10	—	—	—	—	—
Seattle		86·6	326	i 12 35a	+ 1	—	—	i 13 27	pP	—
Victoria		87·8	326	i 12 40	+ 1	—	—	—	—	—
Algiers Univ.	Z.	88·6	49	i 12 53k	+10	—	—	e 13 36	pP	—
College		107·3	334	e 14 8	P	—	—	—	—	—

Additional readings :—
La Paz iZ = 2m.1s., i = 3m.8s., SS = 3m.49s.
La Plata E = 3m.51s., PEN = 4m.3s., E = 4m.33s.
Bogota eP_cPNZ = 9m.1s.
Florissant e = 18m.15s. and 20m.3s.
Mineral eZ = 12m.16s.
Seattle i = 12m.41s., 12m.59s., and 13m.33s.
Long waves were also recorded at Ksara.

Dec. 11d. 4h. 21m. 0s. Epicentre 44°·2N. 10°·2E. (as on 10d.).

Intensity III-IV in Province of Massa-Carrara.
Monthly Bulletin National Institute of Geophysics, Rome, p. 11.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prato		0·7	116	0 20	+ 3	0 30	+ 2	—	—	—
Florence		0·9	120	0 22	+ 2	0 40	+ 6	—	—	—
Zürich		3·4	340	e 0 58	+ 3	e 1 40	+ 3	e 1 7	P_g	—
Basle		3·8	332	e 0 57	− 4	e 1 52	+ 5	—	—	—
Besançon		4·2	317	—	—	2 0?	+ 3	—	—	—
Stuttgart	Z.	4·6	352	e 1 26	P*	e 2 4	− 3	e 2 39	S_g	—
Strasbourg		4·7	340	e 1 45	P_g	e 2 15	+ 5	e 2 42	S_g	e 2·9
Prague		6·5	25	—	—	e 3 1	+ 6	e 3 30	S_g	—
Paris		7·0	314	e 1 41	− 5	—	—	—	—	—

Additional readings :—
Zürich eS_g? = 1m.56s.
Stuttgart eZ = 1m.49s. and 2m.9s.
Paris eP? = 1m.48s.

Dec. 11d. 14h. 46m. 44s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·100.
(as on December 2d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		5·7	228	i 1 42	0	i 3 4	0	—	—	—
La Paz		8·7	162	i 2 11k	+ 3	i 3 56	+ 6	i 2 20	PP	4·3
Chinchina		13·9	340	i 2 35	−22	i 4 57	−21	i 13 19	S_cS	—
Balboa Heights		19·0	335	i 3 43	− 1	i 6 44	+ 1	e 13 55	S_cS	—
Fort de France		24·8	24	i 4 34	− 1	i 8 8	− 7	—	—	—
San Juan		26·9	10	i 4 51	− 3	i 8 38	−10	i 6 25	pP	e 15·6
La Plata	E.	29·1	157	5 16	+ 4	9 18	− 4	6 40	pP	14·1
	N.	29·1	157	i 5 4	− 8	9 16	− 6	6 46	pP	14·9
Merida		34·3	328	e 5 54	− 2	i 10 34	− 7	i 15 1	S_cS	—
Puebla		38·1	316	e 6 27	0	—	—	—	—	—
Tacubaya		39·0	316	i 6 36	+ 2	i 15 33	S_cS	i 11 23	S_cP	—
Bermuda		40·8	9	—	—	i 12 10	− 5	—	—	e 15·6
Palisades		49·0	359	i 7 49	− 2	i 14 7	− 2	i 16 37	S_cS	—
Cleveland		50·4	351	i 8 0	− 1	i 14 24	− 4	i 10 6	pP	—
Harvard		50·5	1	i 8 0	− 2	—	—	—	—	—
Lubbock		50·8	328	7 58	− 6	14 34	+ 1	—	—	—
Buffalo		51·4	353	e 8 7	− 1	—	—	—	—	—
Chicago		52·0	345	—	—	e 14 38	−11	i 16 52	S_cS	—
Ottawa		53·5	357	e 8 22a	− 1	—	—	—	—	—
Shawinigan Falls	N.	54·5	359	e 8 25	− 5	—	—	—	—	—
Seven Falls	E.	55·1	1	i 7 34	−60	14 26	−63	—	—	—
Tucson		55·3	320	i 8 35	− 1	e 15 25	− 7	i 10 21	pP	—
Rapid City	E.	59·6	334	i 9 6	+ 2	i 16 27	+ 1	—	—	—
Pierce Ferry		59·8	321	i 9 6	0	—	—	—	—	—
Palomar		60·0	317	i 9 8k	+ 1	e 16 33	+ 2	i 17 54	S_cS	—
Boulder City		60·2	320	e 9 8	0	—	—	—	—	—
Overton	Z.	60·3	321	i 9 10	+ 1	—	—	—	—	—
Riverside		60·8	317	i 9 11k	− 1	—	—	i 11 14	pP	—
Pasadena		61·4	317	i 9 16k	0	e 16 41	− 7	i 11 21	pP	—
China Lake	Z.	61·9	318	i 9 17k	− 2	i 37 43	P′P′	i 11 27	pP	—
Logan		62·2	327	e 9 8	−13	e 16 50	− 8	e 12 19	sP	e 26·0
Tinemaha		63·1	319	i 9 27k	0	e 17 13	+ 4	e 18 17	S_cS	—
Fresno		63·9	318	e 9 31k	− 1	e 17 22	+ 4	e 12 8	PP	—
Lick	Z.	65·5	318	i 9 42k	0	i 10 22	P_cP	i 11 48	pP	—
Reno	Z.	65·5	321	e 9 44k	+ 2	e 17 51	+14	—	—	—
Berkeley	Z.	66·2	318	i 9 47k	+ 1	—	—	e 12 27	PP	—
Mineral		67·1	320	i 9 52	0	—	—	—	—	—
Hungry Horse		67·8	331	i 9 56	0	i 18 6	+ 2	—	—	—
Shasta Dam		67·8	320	i 9 55	− 1	e 18 47	SP	—	—	—
Seattle		71·7	327	i 10 19k	0	—	—	—	—	—
Victoria	Z.	72·8	327	i 11 25k	+60	19 2	+ 2	—	—	—
Toledo	Z.	78·0	47	e 10 57	+ 4	—	—	e 13 7	pP	—
Tamanrasset	Z.	80·9	65	i 11 11k	+ 3	e 20 21	− 3	i 13 23?	pP	—
Algiers Univ.	Z.	82·3	51	e 11 17	+ 2	—	—	—	—	—
Resolute Bay	Z.	84·0	353	i 10 55	−29	—	—	—	—	—
Paris		85·4	39	i 11 31	0	i 15 0	PP	i 13 50	pP	—
Besançon		87·2	42	e 11 42	+ 3	—	—	e 13 56	pP	—
Strasbourg		88·7	41	e 11 51	+ 5	—	—	e 15 32	PP	—
Stuttgart	Z.	89·7	41	e 11 52	+ 1	e 21 24	[+ 6]	e 14 1	pP	—
Rome		90·6	48	e 15 45	PP	e 22 28	+34	—	—	—
Jena		91·7	39	e 12 2	+ 2	—	—	e 14 19	pP	—
College		91·8	335	i 11 59	− 1	i 21 59	− 5	i 29 16	PKKP	—
Pretoria	Z.	94·7	117	i 12 15	+ 1	i 16 15	PKP	e 14 35	pP	—
Istanbul		102·9	49	e 17 11	PP	e 25 26	SP	—	—	—
Ksara		108·5	57	e 17 56	PP	e 28 54	PPS	—	—	—
Nanking		154·6	341	i 19 5	[+27]	—	—	e 22 44	PP	—

Additional readings :—
La Paz SS = 4m.11s.
San Juan iP_cP = 7m.45s., iS_cP = 10m.30s., eP_cS = 11m.39s., iS_cS = 14m.24s.
Cleveland iE = 16m.40s., esSE = 18m.19s.
Tucson i = 8m.55s., iP_cP = 9m.28s., ePP = 10m.39s., esP = 11m.33s.

Continued on next page.

Riverside eZ =11m.35s.
Pasadena iP_cPZ =10m.3s., iS_cSEN =18m.1s.
China Lake iZ =10m.10s., 11m.50s., and 12m.11s., eZ =40m.44s.
Logan iS =16m.53s., eS_cS =17m.25s., eSS =21m.14s.
Fresno eZ =17m.31s.
Mineral iZ =10m.13s.
Seattle i =10m.44s. and 11m.33s.
Tamanrasset ePPZ =14m.25s., eSPZ =21m.18s., ePKP,PKPZ =37m.46s.
Algiers Univ. eZ =11m.21s.
Paris i =11m.35s., esP =14m.56s.
Besançon e =11m.45s.
Stuttgart eZ =11m.56s., epPZ =14m.8s., ePPZ =15m.34s., ePPPZ =17m.6s., eSZ = 22m.0s.
Jena eE =14m.48s.
College iSS =30m.51s., eSSS =36m.30s.

Dec. 11d. Readings also at 0h. (Palomar (2), China Lake (2), Tucson, Overton, Boulder City, Pierce Ferry, Hungry Horse, and near Algiers Univ.), 1h. (near Lenkoran and Yalta), 2h. (near Obi-garm, near Gandzha and Stepanavan), 3h. (Ashkabad and La Paz), 4h. (Palomar (2), Pasadena, Riverside, (2), China Lake (2), Tinemaha (2), Tucson (2), Boulder City, Overton (2), Pierce Ferry (2), Lick, Shasta Dam, Hungry Horse (2), College, near Huancayo, La Paz, and near Dzhergetal), 5h. (near New Delhi), 6h. (near Bogota), 7h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Fresno, Mineral, Shasta Dam, Hungry Horse (2), Seattle, Sitka, College (2), Tacubaya, and near Honolulu), 8h. (Palomar, China Lake, and Dzhergetal), 10h. (Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Mineral, Shasta Dam, Hungry Horse, College, Leninakan, near Erevan, near Dzhergetal, Stepanavan, Tiflis, and Tsikhlis-Dzhvari), 11h. (Palomar, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Hungry Horse, College, Chicago, Ottawa, Huancayo (2), Merida, Tacubaya, near Oaxaca, Puebla, and near Dzhergetal), 12h. (near Overton), 13h. (Tacubaya), 15h. (Overton, Pierce Ferry, Berkeley, Hungry Horse, College, near Andijan, Dzhergetal (2), Fergana, Kulyab, Obi-garm, and near Santa Clara), 16h. (Overton, Pierce Ferry, Hungry Horse, College, Granada, Pretoria, La Paz, near Huancayc, near Bandong, and Djakarta), 17h. (Frunse, Naryn, Samarkand, near Andijan, Fergana, Kulyab, Lunacharskoe, Obi-garm, Tashkent, and Tchimkent), 18h. (Frunse, Przhevalsk, Samarkand (2), near Andijan (2), Fergana (2), Kulyab (2), Lunacharskoe (2), Obi-garm, Naryn (2), Tashkent (2), Tchimkent (2), China Lake (2), Tucson, Overton (2), Pierce Ferry (2), Hungry Horse, College (2), near Santa Clara and near Apia), 19h. (Hungry Horse, Samarkand, Kulyab, Lunacharskoe, near Andijan, Fergana, and Obi-garm), 21h. (Hungry Horse), 22h. (Honolulu, Overton, Pierce Ferry, Pasadena, near China Lake, and Tinemaha), 23h. (Pretoria, Pierce Ferry, Hungry Horse, and near Victoria).

Dec. 12d. Readings at 1h. (Bandong, Djakarta, Perth, Tananarive, Bombay, Poona, Colombo, Kodaikanal, Pretoria, Fergana, Tashkent, Istanbul, Ksara, Stuttgart, Tamanrasset, Palomar, Pasadena (2), Riverside, China Lake (2), Tucson, Boulder City, Overton (2), Pierce Ferry (2), Shasta Dam, Hungry Horse (2), College, Sitka, and San Juan), 2h. (Resolute Bay, Berkeley, Reno, Christchurch, and Kew), 3h. (Huancayo, Palomar, China Lake, Tinemaha, Overton, Pierce Ferry, and Ksara), 4h. (near Grozny (2), and near Dzhergetal), 5h. (Overton, Shasta Dam, and near Dzhergetal), 6h. (La Paz), 7h. (near Stepanavan, Tsikhlis-Dzhvari, and Yalta), 8h. (Kodaikanal Ksara and Tamanrasset), 9h. (Obi-garm, near Andijan, Almata, Frunse, Naryn, and Przhevalsk), 10h. (China Lake, Tucson, Overton, Pierce Ferry, near Huancayo, near Victoria, and near Tsikhlis-Dzhvari), 11h. (near Huancayo), 12h. (College), 13h. (near Dzhergetal), 15h. (College), 16h. (La Paz and near Ashkabad), 22h. (China Lake, Tinemaha, and Pierce Ferry), 23h. (Prague).

Dec. 13d. Readings at 0h. (near Dzhergetal), 1h. (Calcutta, Stuttgart, and College), 2h. (Pasadena, Palomar, Riverside, China Lake, Pierce Ferry, College, Stuttgart, and near Andijan), 3h. (Pierce Ferry, Rathfarnham Castle, and near Dzhergetal), 4h. (College, Andijan, Lunacharskoe, Tchimkent, near Fergana, Kulyab, Obi-garm, Stalinabad, near Ashkabad, and near Dzhergetal), 5h. (near Huancayo), 6h. (Samarkand, near Andijan, Dzhergetal, Fergana, Kulyab, Obi-garm, and Stalinabad), 8h. (Fergana, Kulyab, Stalinabad, near Dzhergetal, and Obi-garm), 9h. (near Dzhergetal), 10h. (near Gandzha, Stepanavan, and Tsikhlis-Dzhvari), 11h. (Obi-garm and near Dzhergetal), 12h. (Overton, Pierce Ferry, and College), 13h. (Stuttgart, near Belgrade, Timisoara, near Huancayo, and near Zugdidi), 14h. (near Tananarive), 17h. (La Paz), 18h. (Mount Wilson, Riverside, China Lake, Overton, Pierce Ferry, Hungry Horse, College, La Paz, Samarkand, Stalinabad, Tchimkent, near Dzhergetal, Fergana, and Obi-garm), 19h. (near Dzhergetal, and near Stepanavan), 22h. (Overton, Hungry Horse, College, near Bandong, and Djakarta), 23h. (near Dzhergetal).

Dec. 14d. 0h. 31m. 54s. Epicentre 19°·9S. 169°·9E. (as on 1943, Nov. 13d.).

$A = -·9264$, $B = +·1651$, $C = -·3384$; $\delta = -1$; $h = +5$;
$D = +·175$, $E = +·984$; $G = +·333$, $H = -·059$, $K = -·941$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	17·2	241	i 4 9	+ 6	—	—	—	—	—
Apia		18·6	74	e 4 12	− 9	e 7 55	+ 9	—	—	—
Tuai	N.	19·9	164	4 34	− 2	—	—	—	—	—
Wellington		21·7	171	i 4 56	+ 1	e 8 53	+ 2	e 9 27	SS	11·1
Riverview		21·7	226	i 4 58a	+ 3	i 9 5	+14	e 5 29	PP	e 10·8
Kaimata	N.E.	22·6	177	e 5 6	+ 3	—	—	—	—	—
Christchurch		23·7	176	i 5 14	0	e 9 36	+ 9	5 42	PP	e 12·1
Vladivostok		71·8	332	i 11 27	+ 1	i 20 51	+ 5	—	—	—
Berkeley		85·8	48	e 12 42a	0	e 24 14	PS	—	—	e 39·6
Fresno	Z.	87·0	52	e 12 46a	− 2	—	—	e 13 9	pP	—
Pasadena	Z.	87·0	52	e 12 44	− 4	—	—	—	—	—
Shasta Dam		87·0	45	e 12 43	− 5	—	—	—	—	—
Mineral	Z.	87·4	46	e 12 48	− 2	—	—	e 13 11	pP	—
Riverside	Z.	87·5	52	e 12 47	− 4	—	—	e 13 10	pP	—
China Lake	Z.	88·1	51	e 12 50	− 4	—	—	i 13 13	pP	—
Reno	Z.	88·2	47	e 12 52	− 2	—	—	—	—	—
Tinemaha	Z.	88·2	50	e 12 53	− 1	—	—	—	—	—
Boulder City		90·2	52	e 13 1	− 3	—	—	—	—	—
College		90·5	16	e 13 0	− 5	—	—	—	—	—
Overton	Z.	90·7	51	e 13 5	− 1	—	—	e 16 34	PP	—
Pierce Ferry		90·9	52	i 13 5	− 2	—	—	—	—	—
Tucson		91·8	56	e 13 9	− 2	—	—	—	—	—
Ksara		137·0	298	i 19 27	[+ 2]	—	—	e 22 48	PKS	—
Istanbul		140·6	311	e 19 27	[− 5]	—	—	e 21 29	PP	—
Helwan	Z.	141·3	292	e 19 30	[− 3]	—	—	e 22 45	PP	—
Collmberg	Z.	143·8	334	e 19 34	[− 3]	—	—	—	—	—
Jena	N.	144·6	335	e 19 36	[− 2]	—	—	—	—	—
Athens		145·6	308	i 19 40k	[0]	—	—	i 19 46	PKP_2	—
Stuttgart	Z.	147·3	336	e 19 41	[− 2]	—	—	—	—	—
Triest	Z.	147·7	328	e 19 45	[+ 1]	—	—	i 19 50	PKP_2	—
Strasbourg		148·0	337	e 19 48	[+ 4]	—	—	e 23 18	PP	—
Besançon		149·7	338	e 19 50	[+ 3]	—	—	—	—	—
Florence		150·2	327	e 19 47	[− 1]	—	—	—	—	—
Tamanrasset	Z.	165·2	284	e 20 7	[+ 1]	e 24 37	PP	e 21 7	PKP_2	—

Additional readings :—
Riverview i =5m.1s., iZ =5m.12s., iPPPN =5m.41s., iZ =9m.12s., iE =9m.18s., iN = 9m.26s.
Christchurch iSEN =9m.41s.
Berkeley eZ =12m.54s. and 13m.50s.
Fresno eZ =13m.56s.
Mineral eZ =14m.2s.
China Lake iZ =14m.3s.
Tinemaha eZ =14m.3s.
Overton iZ =14m.15s.
Jena eE =19m.41s. and 19m.46s., eN =20m.43s.
Stuttgart eZ =19m.45s., 19m.49s., and 20m.39s.
Strasbourg e =20m.51s.
Besançon e =20m.2s. and 21m.1s.
Florence iZ =20m.33s.
Tamanrasset eZ =22m.16s. and 25m.12s., ePPPZ =28m.16s.

Dec. 14d. 1h. 52m. 53s. Epicentre 19°·7S. 175°·9W. Depth of focus 0·030.
(as on 1949, June 25d.).

Intensity VI at Nukualofa and III at Apia. Prel. Seismo. Bull., Apia Observatory, Western Samoa, Oct.-Dec., 1950, p.8.

Seismo. Report for Oct., Nov., Dec., 1950, Wellington, New Zealand, p.14. Epicentre 19°·25S. 175°·75W. Depth 200km. (Gutenberg).

$A = -·9397$, $B = -·0674$, $C = -·3351$; $\delta = -13$; $h = +5$;
$D = -·071$, $E = +·997$; $G = +·334$, $H = +·024$, $K = -·942$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·1	35	i 1 34k	− 8	2 49	−13	—	—	—
Tuai	N.	19·9	196	e 4 17	+ 1	—	—	—	—	e 9·8
New Plymouth	E.	21·0	201	e 4 31	+ 4	e 8 12	+10	—	—	—
Wellington		22·8	197	i 4 42	− 2	i 8 35	+ 2	15 34	S_cS	—
Kaimata	N.E.	25·2	203	e 5 6	− 1	e 9 10	− 3	—	—	—
Christchurch		25·5	200	i 5 11	+ 2	i 9 22	+ 4	—	—	—
Brisbane		29·5	249	i 5 46k	0	—	—	—	—	—
Riverview		32·4	238	i 6 13	+ 2	i 11 11	+ 3	i 6 51	pP	—
Honolulu		44·4	25	e 7 48	− 2	i 14 7	0	i 8 39	pP	i 17·6
Guam		50·9	308	i 8 38	− 2	—	—	—	—	—
Perth		61·8	244	10 2	+ 5	18 2	+ 1	11 12	PP	—
Osima		68·8	322	i 10 42	0	e 19 27	+ 1	e 38 54	P′P′	—
Yokohama		69·2	322	e 10 36	− 8	e 19 23	− 8	e 11 28	pP	—
Tokyo		69·3	323	i 10 45	0	e 19 35	+ 3	e 11 56	pP	—
Mito		69·4	323	i 10 48	+ 3	19 38	+ 5	i 14 1	PP	—
Omaesaki		69·4	321	e 10 39	− 6	i 20 36	S_cS	—	—	—
Tukubasan		69·5	323	10 47	+ 1	19 36	+ 2	20 37	S_cS	21·5
Shizuoka		69·6	321	10 47	0	19 37	+ 2	—	—	28·8
Hunatu		69·7	322	i 10 48	+ 1	i 19 38	+ 2	—	—	28·9
Kumagaya		69·8	323	i 10 49	+ 1	19 41	+ 3	i 38 51	P′P′	—
Maebasi		70·2	323	i 10 50	0	i 19 45	+ 3	e 13 38	PP	e 30·8
Owase		70·3	320	10 52	+ 1	19 47	+ 3	—	—	—
Hukusima		70·4	326	10 51	− 1	19 45	0	i 20 38	pS	e 30·4
Nagoya		70·6	321	10 54	+ 1	e 19 50	+ 3	i 20 42	pS	29·4
Gihu		70·8	321	10 56	+ 2	19 53	+ 4	13 21	PP	—
Manila		70·8	294	i 10 53	− 1	i 19 44	− 5	—	—	—
Matusiro		70·8	323	10 52	− 2	19 50	+ 1	11 23	P_cP	—
Miyako		70·9	327	i 10 53	− 1	e 19 51	+ 1	—	—	—
Nagano	N.	70·9	322	e 10 56	+ 2	e 19 45	− 5	e 12 6	pP	—
Sendai		70·9	326	10 51	− 3	19 48	− 2	11 58	pP	—
Hikone		71·1	321	10 58	+ 2	19 49	− 3	c 11 49	pP	e 31·8
Kyoto		71·2	321	e 10 57	+ 1	c 19 52	− 2	—	—	—
Osaka		71·2	320	10 56	0	19 53	− 1	e 11 15	P_cP	e 29·5
Kobe		71·3	320	e 10 58	+ 1	e 19 58	+ 3	e 14 35	PPP	e 29·8
Sumoto		71·3	320	i 10 58	+ 1	i 19 55	0	11 57	pP	28·2
Morioka		71·4	327	i 10 59	+ 1	i 19 58	+ 2	—	—	—
Kôti		71·5	317	i 11 0	+ 2	i 20 1	+ 4	i 11 44	pP	—
Simidu		71·5	317	i 10 59	+ 1	i 20 0	+ 3	—	—	30·6
Toyama		71·5	323	11 0	+ 2	20 7	+10	e 12 1	pP	—
Mitchell Field		71·6	0	i 10 56	− 3	i 19 50	− 8	—	—	—
Yakusima		71·7	313	11 3	+ 4	20 5	+ 5	—	—	—
Hatinohe		71·8	328	10 56	− 4	19 58	− 3	13 41	PP	32·4
Akita		72·0	327	11 3	+ 2	20 54	S_cS	—	—	e 27·0
Nemuro		72·0	332	i 11 1	0	i 20 5	+ 2	29 54	Q	e 33·8
Wazima	N.	72·1	323	e 11 6	+ 4	e 20 6	+ 2	—	—	—
Matuyama		72·3	318	i 11 5	+ 2	i 20 10	+ 4	11 58	pP	e 29·8
Aomori		72·4	327	11 5	+ 2	i 20 11	+ 4	i 20 59	S_cS	—
Ooita		72·7	316	i 11 7	+ 2	i 20 15	+ 4	—	—	e 34·0
Hirosima		72·8	317	i 11 7	+ 1	i 20 17	+ 5	—	—	e 28·0
Kumamoto		73·0	316	e 12 3	pP	e 20 14	0	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nagazaki		73·5	315	i 11 13	+ 3	20 21	+ 1	—	—	e 33·6
Hukuoka		73·7	316	11 11	0	e 20 23	+ 1	e 23 48	PS	—
Sapporo		73·9	330	i 11 12	0	i 20 27	+ 3	e 12 23	pP	—
Tomie		74·2	315	i 11 16	+ 2	i 20 22	− 5	12 9	pP	—
Bandong		75·0	268	i 11 21	+ 3	i 20 42	+ 6	—	—	—
Santa Barbara		75·8	46	e 11 23	0	i 20 50	+ 5	—	—	—
Djakarta		76·0	269	i 11 24	0	i 20 42	− 5	—	—	—
Santa Clara		76·1	42	i 11 26	+ 1	i 20 53	+ 5	i 11 35	pP	e 38·3
Berkeley		76·3	42	i 11 25a	− 1	e 20 54	+ 4	i 12 18	pP	—
Ukiah		76·5	40	e 11 29	+ 2	i 21 0	+ 7	e 12 21	pP	e 31·0
La Jolla		76·7	48	e 11 27	− 1	i 20 59	+ 4	e 12 24	pP	—
Pasadena		76·8	47	i 11 27a	− 1	i 20 55	− 1	i 12 17	pP	i 31·8
Fresno		77·2	44	i 11 30a	− 1	e 20 59	− 1	e 12 21	pP	e 38·8
Palomar		77·2	48	i 11 30a	− 1	i 21 4	+ 4	e 38 42	P′P′	—
Riverside		77·2	47	i 11 29a	− 2	i 21 5	+ 5	i 12 22	pP	—
China Lake	Z.	78·0	45	i 11 34a	− 1	i 21 12	+ 3	i 38 39	P′P′	—
Haiwee		78·0	45	i 11 35a	0	i 21 14	+ 5	i 12 31	pP	—
Shasta Dam		78·0	39	i 11 34	− 1	—	—	—	—	—
Klyuchi		78·2	348	i 11 39	+ 3	i 21 15	+ 4	i 12 55	pP	—
Mineral		78·2	40	i 11 36	0	e 21 14	+ 3	i 38 35	P′P′	—
Tinemaha		78·4	44	i 11 37a	0	i 21 19	+ 6	e 38 19	P′P′	—
Zi-ka-wei	N.	78·6	309	e 11 41	+ 3	i 21 39	+24	14 23	PP	—
Reno		78·8	42	e 11 40a	+ 1	i 21 25	+ 8	e 12 35	pP	—
Vladivostok		78·9	324	i 11 40	0	i 21 22	+ 4	—	—	—
Boulder City		80·0	47	i 11 45	− 1	i 21 42	+12	i 11 52	PcP	—
Overton	Z.	80·6	46	i 11 49	0	i 21 50	+14	i 30 14	PKKP	—
Pierce Ferry		80·6	47	i 11 49	0	i 21 40	+ 4	i 30 14	PKKP	—
Nanking		80·9	308	i 11 53k	+ 3	i 21 50	+11	—	—	—
Tucson		80·9	51	i 11 51	+ 1	i 21 44	+ 5	i 12 44	pP	e 33·3
Guadalajara		81·6	65	i 11 57a	+ 3	i 21 51	+ 5	i 12 51	pP	—
Seattle		82·5	34	i 11 59a	0	i 22 1	+ 6	i 12 30	pP	—
Victoria		82·5	33	i 11 58a	− 1	i 22 2	+ 7	i 12 49	pP	—
Chihuahua		82·8	56	e 12 1	+ 1	i 21 53	− 5	i 12 52	pP	—
Sitka		84·2	22	i 12 7	0	i 22 9	− 3	i 12 57	pP	e 34·5
Salt Lake City		84·5	44	i 12 10	+ 1	i 22 18	+ 3	i 13 2	pP	e 34·5
Tacubaya		84·6	68	i 12 13a	+ 4	i 22 15	− 1	i 13 10	pP	i 39·6
Logan		85·1	42	i 12 4	− 8	i 22 12	[0]	i 13 3	pP	i 34·6
Spokane		85·1	36	i 12 13	+ 1	i 22 17	− 3	i 13 5	pP	—
Puebla		85·3	68	c 12 17	+ 4	i 22 21	− 1	—	—	—
Butte	N.	86·9	38	e 12 23	+ 2	i 22 31	− 7	e 13 15	pP	e 35·0
College		87·2	12	i 12 19	− 3	i 22 40	0	i 13 9	pP	e 35·4
Vera Cruz		87·2	69	i 12 24a	+ 2	i 22 35	− 5	—	—	—
Hungry Horse		87·3	36	i 12 21	− 2	i 22 20	[− 6]	e 12 58	pP	—
Bozeman		87·6	40	i 12 26	+ 2	i 22 35	− 9	i 13 19	pP	e 35·2
Santiago		91·3	127	e 12 43	+ 2	i 19 42	?	14 57	?	—
Rapid City	E.	91·7	44	i 12 46	+ 3	i 23 39	+18	e 13 39	pP	e 36·1
Saskatoon		93·3	36	12 53	+ 2	23 4	[+ 2]	13 44	pP	—
Merida		93·6	70	e 12 55	+ 3	i 23 10	[+ 6]	—	—	—
Lincoln	E.	94·9	49	i 13 1	+ 3	i 24 0	+11	i 13 56	pP	—
Huancayo		95·7	106	i 13 4	+ 3	i 23 25	[+11]	i 14 0	pP	i 38·6
Little Rock		95·9	56	e 13 3	+ 1	i 24 7	+10	e 13 56	pP	—
Florissant		98·7	52	i 13 16	+ 1	i 24 30	+ 9	i 14 9	pP	—
St. Louis		98·8	52	i 13 16	+ 1	e 24 33	+11	i 14 10	pP	—
Balboa Heights		98·9	84	e 13 21	+ 5	e 23 35	[+ 5]	—	—	—
Irkutsk		99·3	322	13 19	+ 1	i 24 34	+ 8	i 14 19	pP	—
La Plata		99·9	133	e 13 13	− 7	23 32	[− 3]	14 7	pP	42·3
La Paz		100·4	112	i 13 25a	+ 2	i 23 41	[+ 3]	i 14 15	pP	48·4
Chinchina		101·3	88	i 13 36?	+ 9	i 23 53?	[+11]	i 17 45?	PP	e 48·2
Chicago		101·6	49	e 13 27	− 1	i 23 44	[0]	i 14 21	pP	—
Calcutta	E.	102·4	290	i 13 38	+ 6	23 57	[+10]	17 51	PP	47·3

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota	z.	102·7	90	i 13 36	+ 3	e 23 51	[+ 2]	i 17 45	PP	—
Cincinnatti		103·2	53	i 13 36	+ 1	i 23 52	[0]	i 14 29	pP	—
Columbia		104·6	59	e 14 35	pP	i 24 3	[+ 5]	e 18 3	PP	—
Colombo	E.	105·6	272	13 48	+ 1	18 13	PP	—	—	22·5
Cleveland		106·0	52	i 13 49k	+ 1	i 24 4	[0]	i 14 42	pP	—
Resolute Bay		106·5	16	e 13 52	0	24 8	[+ 2]	25 30	S	—
Pittsburgh		106·9	53	i 14 50	pP	i 24 12	[+ 4]	i 18 19	PP	—
New Kensington	E.	107·1	53	e 14 43	pP	i 24 10	[+ 1]	e 17 45	PKP	—
Buffalo		108·2	51	i 14 1	P	e 25 53	S	i 14 54	pP	—
Pennsylvania		108·5	53	i 14 55	pP	i 24 18	[+ 3]	i 18 27	PP	—
Washington		108·8	54	i 14 3	P	e 27 36	sS	e 14 54	pP	e 50·4
Kodaikanal	E.	108·9	275	i 14 3k	P	i 24 15	[− 2]	20 15	PPP	40·4
Hyderabad	E.	110·0	283	i 14 6	P	24 22	[0]	18 21	PKP	48·1
Philadelphia		110·4	53	e 14 1	P	i 24 17	[− 6]	e 14 52	pP	e 47·3
Ottawa		110·8	48	e 14 11	P	26 12	S	14 59	pP	—
Fordham		111·5	53	i 14 11	P	i 24 30	[+ 3]	i 18 50	PP	—
Palisades		111·5	53	e 14 13	P	i 24 31	[+ 4]	i 15 5	pP	—
Shawinigan Falls	N.	113·0	47	e 18 17	PP	e 26 22	S	e 29 12	PPS	—
Dehra Dun	N.	113·2	296	e 19 55	?	e 31 25	?	—	—	e 48·2
Harvard		113·5	52	i 14 20	P	i 24 39	[+ 4]	i 15 13	pP	i 50·2
Weston		113·6	52	e 14 23	P	i 34 33	SS	i 15 17	pP	—
New Delhi	N.	113·6	294	e 14 25	P	i 24 32	[− 4]	18 59	PP	53·0
San Juan		114·1	78	e 15 19	pP	i 24 36	[− 2]	e 18 12	PKP	e 47·5
Seven Falls	E.	114·3	47	i 14 21	P	24 51	[+13]	e 17 17	PKP	—
Poona		114·5	282	e 14 28	P	24 45	[+ 6]	18 15	PKP	52·4
Almata		115·6	310	e 14 33	P	i 24 47	[+ 4]	i 19 19	PP	—
Bombay	N.	115·6	282	e 14 36	P	24 52	[+ 9]	19 4	PP	—
Naryn		116·2	308	e 14 35	P	—	—	e 18 21	PKP	—
Frunse		117·3	309	e 14 41	P	i 19 39	PP	i 18 24	PKP	—
Bermuda		117·8	63	e 15 35	pP	i 24 53	[+ 2]	i 19 34	PP	e 49·0
Fort de France		117·8	84	e 18 23	[+ 3]	e 24 57	[+ 6]	e 19 37	PP	—
Andijan		118·9	306	e 14 48	P	i 25 1	[+ 6]	i 18 25	PKP	—
Fergana		119·3	306	e 14 49	P	e 25 1	[+ 5]	e 18 21	PKP	—
Halifax		119·3	50	19 45	PP	24 40	[−16]	26 25	SKKS	—
Dzhergetal		119·7	306	e 18 26	[+ 3]	—	—	—	—	—
Obi-garm		120·9	305	e 18 27	[+ 1]	—	—	—	—	—
Tchimkent		121·0	309	i 14 56	P	i 25 8	[+ 6]	i 18 28	PKP	—
Lunacharskoe		121·2	307	e 14 56	P	i 25 9	[+ 6]	i 18 32	PKP	—
Tashkent		121·2	307	14 56	P	i 25 6	[+ 3]	e 18 30	PKP	—
Stalinabad		121·6	304	i 14 59	P	25 0	[− 4]	16 3	pP	—
Tananarive		122·6	231	e 20 4	PP	25 17	[+10]	21 22	sPP	49·6
Samarkand		123·0	305	e 15 17?	P	i 25 15	[+ 6]	e 18 35	PKP	—
Grahamstown	z.	123·1	203	e 15 49	P	e 23 25	?	i 18 32	PKP	—
Sverdlovsk		124·4	327	i 15 10	P	i 25 18	[+ 5]	i 18 34	PKP	—
Pietermaritzburg	z.	124·8	209	18 34	[+ 1]	—	—	e 20 27	PP	—
Ivigtut		124·9	29	e 20 27	PP	i 27 59	SKKS	i 36 56	SS	i 65·2
Scoresby Sund		126·9	11	i 18 37	[0]	37 19	SS	20 37	PP	—
Mary		127·1	303	i 18 42	[+ 4]	—	—	e 20 40	PP	—
Pretoria		129·1	210	i 16 13	P	e 21 0	PP	i 18 44	PKP	—
Ashkabad		129·8	304	i 18 47	[+ 4]	—	—	—	—	—
Reykjavik		132·3	16	i 18 56	[+ 8]	i 22 26	PKP	e 32 43	PPS	e 63·3
Pulkovo		135·8	342	e 16 5	P	i 25 55	[+14]	18 57	PKP	—
Baku		135·9	309	i 19 1	[+ 7]	—	—	e 21 40	PP	—
Moscow		136·1	333	e 16 9	P	e 25 51	[+10]	i 18 59	PKP	—
Helsinki		136·9	347	i 18 52	[− 4]	i 22 30	PKS	i 19 53	pPKP	e 66·1
Lenkoran		137·1	307	e 18 48	[− 8]	—	—	e 21 27	PP	—
Grozny		138·0	315	e 19 3	[+ 5]	—	—	—	—	—
Upsala		138·7	351	e 18 52	[− 7]	i 23 34	sPKS	i 20 5	sPKP	e 53·1
Tiflis		139·2	312	i 19 5	[+ 5]	i 22 27	PKS	e 21 57	PP	—
Bergen	N.	139·3	359	18 53	[− 7]	i 23 33	PKS	i 21 53	PP	52·6
Piatigorsk		139·5	317	e 19 5	[+ 4]	i 22 36	PKS	i 22 5	PP	—
Erevan		139·9	310	e 19 5	[+ 3]	—	—	—	—	—
Leninakan		140·2	312	e 19 3	[+ 1]	—	—	—	—	—
Zugdidi		140·9	315	e 19 3	[0]	—	—	e 22 27	PKS	—
Sotchi		141·9	318	i 19 4	[− 1]	—	—	i 22 15	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Aberdeen	N.	142·3	6	i 19 3	[− 3]	i 26 12	[+21]	i 22 13	PP		i 64·0
Edinburgh	E.	143·4	7	19 6	[− 2]	25 51	[− 2]	22 33	PP		—
Copenhagen		143·5	353	e 19 3	[− 5]	22 43	PKS	22 19	PP		—
Theodosia		143·8	323	e 19 10	[+ 1]	—	—	—	—		—
Durham		144·7	6	e 19 14	[+ 4]	i 40 51	SS	i 42 4	SSP		i 60·6
Warsaw		144·9	343	19 11	[0]	i 29 4	SKKS	19 25	PKP_2		e 59·1
Yalta		145·0	322	i 19 12	[+ 1]	i 29 6	SKKS	i 22 38	PP		—
Rathfarnham C.	Z.	145·5	11	i 19 15	[+ 3]	i 28 18	SKKS	i 22 38	PP		e 40·1
Lwow		146·0	337	i 19 13	[+ 1]	—	—	i 20 15	pPKP		—
Kishinev		146·1	332	e 19 13	[+ 1]	e 29 4	SKKS	—	—		—
Potsdam		146·6	351	e 19 18	[+ 5]	i 25 54	[− 4]	i 20 17	pPKP		e 65·1
De Bilt		147·6	358	i 19 18k	[+ 3]	e 32 55	SKSP	20 16	pPKP		—
Collmberg		147·7	351	i 19 17	[+ 2]	e 29 45	SKKS	i 21 15	sPKP		e 60·7
Raciborzu		147·7	343	e 19 21	[+ 6]	—	—	—	—		e 58·1
Skalnate Pleso		147·9	342	i 19 20	[+ 5]	e 26 7	[+ 7]	e 19 58	pPKP		e 58·6
Kew		148·1	6	i 19 17a	[+ 1]	e 30 37	PSKS	i 19 25	PKP_2		e 39·1
Jena		148·3	351	e 19 17	[+ 1]	e 41 27	SS	i 20 20	PKP_2		e 60·7
Ksara		148·5	304	i 19 18	[+ 2]	23 5	PP	20 9	pPKP		—
Prague		148·6	348	e 19 19	[+ 3]	e 22 34	SKP	i 20 5	pPKP		e 58·1
Cheb		149·0	351	e 19 20	[+ 3]	e 22 36	SKP	e 20 8	pPKP		—
Bucharest		149·3	330	e 19 23	[+ 6]	i 29 31	SKKS	i 22 18	PP		47·1
Budapest	E.	149·7	341	19 23	[+ 5]	29 35	SKKS	22 55	PP		67·1
Ogyalla		149·7	342	e 19 21	[+ 3]	e 28 56	SKKS	e 20 15	pPKP		e 54·1
Istanbul		149·9	321	19 18	[0]	—	—	e 23 1	PP		—
Jersey	E.	150·2	8	i 19 26	[+ 7]	e 42 0	SS	e 33 11	PS		—
Timisoara		150·4	336	e 19 26	[+ 7]	i 29 38	SKKS	i 35 37	SS		e 47·1
Paris		150·5	4	i 19 21	[+ 2]	i 41 58	SS	i 20 18	pPKP		e 70·1
Kalocsa		150·6	340	i 19 29	[+10]	29 37	SKKS	22 49	PP		e 47·6
Karlsruhe		150·6	355	i 19 24	[+ 5]	—	—	i 20 36	pPKP		e 47·1
Stuttgart		150·7	353	e 19 21k	[+ 1]	e 29 37	SKKS	i 20 39	pPKP		—
Strasbourg		151·0	356	19 22	[+ 2]	i 29 16	SKKS	i 20 21	pPKP		i 55·8
Belgrade		151·5	336	e 19 23a	[+ 2]	i 33 10	SKSP	i 23 16	PP		e 52·9
Sofia		151·9	331	i 19 27	[+ 6]	i 29 46	SKKS	i 35 49	PPS		i 57·0
Basle		152·1	356	e 19 23	[+ 1]	e 30 32	SKKS	e 23 17	PP		—
Zürich		152·2	354	e 19 22k	[0]	e 29 37	SKKS	e 20 39	pPKP		—
Besançon		152·5	358	e 19 26	[+ 4]	—	—	—	—		—
Chur		152·6	353	e 19 23k	[+ 1]	e 29 48	SKKS	—	—		e 41·6
Neuchatel		152·7	357	e 19 25	[+ 3]	—	—	—	—		—
Triest		152·9	347	i 19 13	[−10]	i 26 23	[+17]	i 20 1	PKP_2		—
Helwan		153·3	298	i 19 25k	[+ 2]	i 30 57	SKKS	20 22	pPKP		—
Clermont-Ferrand		154·0	3	i 19 11	[−13]	i 24 14	pPP	i 19 51	pPKP		—
Pavia		154·2	353	i 19 29k	[+ 4]	e 33 38	PSKS	i 20 33	pPKP		e 67·6
Padova		154·4	349	19 30	[+ 5]	i 29 50	SKKS	—	—		e 72·8
Bologna		154·5	349	e 19 29	[+ 4]	e 33 47	PSKS	e 23 27	PP		—
Athens		155·1	322	i 19 27a	[+ 1]	—	—	i 20 22	pPKP		—
Prato		155·2	349	i 19 29	[+ 3]	i 29 36	SKKS	—	—		—
Florence		155·3	349	i 19 28	[+ 2]	i 30 2	SKKS	20 9	pPKP		—
Taranto		156·4	337	e 19 22?	[− 5]	e 31 2	SKKS	23 32	PP		e 70·0
Rome		156·7	345	i 19 29k	[+ 1]	e 30 15	SKKS	i 20 3	pPKP		e 74·1
Rocca di Papa		156·8	345	e 19 32	[+ 4]	e 30 13	SKKS	—	—		—
Lisbon		157·8	29	19 33a	[+ 4]	i 43 22	SS	20 6	PKP_2		59·0
Barcelona		158·3	5	e 19 41	[+11]	44 2	SS	23 56	PP		e 48·1
Toledo		158·7	20	i 19 34	[+ 4]	43 31	SS	20 19	pPKP		62·1
Tortosa		158·7	8	i 19 33	[+ 3]	26 35	sSKS	i 23 49	PP		e 68·1
Messina		159·0	335	e 19 27k	[− 4]	e 30 3	SKKS	e 37 25	PPS		—
Alicante		161·0	13	19 39	[+ 6]	26 33	[+19]	20 31	PKP_2		e 73·0
Granada		161·3	20	19 40k	[+ 7]	i 26 52	[+38]	20 25	PKP_2		i 76·3
Malaga		161·5	22	i 19 41k	[+ 8]	26 31	[+16]	i 20 27	pPKP		72·5
Tunis		162·2	343	e 19 48	[+14]	i 30 43	SKKS	i 20 36	pPKP		—
Algiers Univ.	Z.	162·9	3	i 19 38a	[+ 3]	e 31 46	SKKS	e 20 29	pPKP		—
Tamanrasset	Z.	176·6	—	e 19 45	[+ 2]	e 26 49	[+27]	i 20 47	pPKP		—

For Notes see next page.

NOTES TO DECEMBER 14d. 1h. 52m. 53s.

Additional readings :—
Apia iN =2m.39s.
Wellington i =5m.55s.
Riverview iE =7m.25s., iPPN =7m.30s., iPPPN =7m.50s., iP_cPE =8m.46s., isSE = 12m.18s., iE =12m.33s., iN =12m.42s., iSS?N =13m.38s., iS_cSE =16m.19s.
Honolulu isP =8m.55s., ePPP =10m.28s., isS =15m.30s.
Perth i =13m.50s., 18m.17s., and 19m.29s., SS =21m.17s., SSS =23m.57s.
Osima e =20m.30s.
Yokohama e =15m.41s.
Tokyo eP_cP?E =11m.23s., epPP?N =14m.15s., eS_cS? =20m.35s.
Mito i =11m.8s. and 20m.36s.
Kumagaya i =11m.16s., 11m.48s., 15m.3s., and 20m.35s.
Maebasi iZ =14m.57s.
Gihu S_cS =21m.21s.
Matusiro SS =25m.13s., SSS =28m.3s.
Nagano P_cPN =11m.15s., PP =13m.49s., pPPN =14m.53s., ePPPN =16m.11s., S_cSN = 20m.31s., SSN =24m.47s., sSSN =26m.37s., SSS =29m.21s.
Sendai P_cP =11m.8s., sP? =12m.28s., S_cS =20m.39s., PKP,PKP =38m.49s.
Hikone ePP =13m.23s., eSS =24m.16s.
Osaka e =12m.11s., ePP =13m.54s., e =15m.45s., epPPP =16m.34s., eS_cS =20m.45s., e =21m.8s. and 21m.54s., eSS =25m.15s.
Kobe eEN =11m.12s., iEZ =12m.21s., e =20m.20s., iEN =20m.46s., iSS? =22m.20s., eQEN =26m.32s.
Sumoto iE =13m.20s.
Kôti ePP =14m.0s., epPP =15m.55s., eS_cS =20m.45s., esS =21m.48s., eSS =25m.30s.
Toyama sP =13m.4s., PP =16m.33s., sS =20m.57s., SSS? =28m.40s.
Hatinohe PPP =15m.19s., PS =20m.48s., S_cS =21m.35s.
Matuyama sS =20m.55s., sPS =22m.25s.
Aomori i =12m.11s. and 13m.7s.
Huknoka e =12m.33s., eS =19m.19s., e =29m.46s.
Sapporo eS_cS =21m.8s., isS =22m.11s.
Berkeley ePPN =14m.20s., eEN =21m.27s., 24m.7s., and 31m.19s., ePKP,PKPZ = 38m.27s., iZ =38m.50s., eSKP,PKPZ =42m.1s., ePKP,PKP,PKPZ =58m.31s.
Ukiah ePP =14m.45s., isS =21m.35s., eSS =25m.47s., eSSS =29m.12s.
Pasadena i? =11m.30s., iE =11m.44s., iZ =12m.25s., isPZ =12m.45s., ipPPZ =15m.23s., iS =20m.59s., isSNZ =22m.15s., iSSN =25m.37s., eZ =37m.55s. and 38m.32s., iPKP,PKPZ =38m.45s., iZ =39m.46s., iSKP,PKPZ =41m.56s., ePKP,PKP, PKPZ =58m.26s.
Fresno iZ =11m.40s., eZ =12m.0s., iZ =12m.24s., ePPN =14m.36s., ePKP,PKPZ = 38m.35s. and other e readings.
Palomar iZ =11m.54s. and 12m.29s., iE =20m.35s., iN =21m.38s., eSKP,PKPZ = 41m.58s.
Riverside ePKP,PKPZ =38m.22s., iZ =38m.41s., 38m.48s., and 39m.46s., iSKP, PKPZ =41m.55s., ePKP,PKP,PKPZ =58m.29s.
China Lake iZ =38m.46s. and 39m.46s., iSKP,PKPZ =41m.55s., ePKP,PKP,PKPZ = 58m.18s.
Mineral eN =12m.36s., eZ =20m.34s. and 21m.44s., eNZ =30m.31s., eSKP,PKPN = 41m.43s., ePKP,PKP,PKPZ =58m.36s.
Tinemaha iZ =11m.41s. and 11m.51s., eZ =38m.44s.
Reno ePKP,PKPZ =38m.43s.
Boulder City ePKKP =30m.39s., ePKP,PKP =38m.29s.
Overton iPKP,PKPZ =39m.40s., ePKP,PKP,PKPZ =58m.25s.
Pierce Ferry iPKP,PKP =38m.40s., ePKP,PKP,PKP =58m.24s.
Tucson iPP =14m.58s., esPP =16m.12s., epPPP =17m.17s., eS =21m.37s., iSS = 27m.5s., eSSS =30m.30s., ePKP,PKP =38m.32s., eSKP,PKP =41m.47s., ePKP,PKP,PKP =58m.33s.
Guadalajara i =23m.3s.
Seattle iPP =15m.23s., i =15m.45s., 16m.22s., 22m.7s., 22m.19s., 23m.30s., and 24m.13s.
Victoria e =15m.57s., i =22m.9s., e =23m.21s. and 29m.16s., i =38m.34s.
Chihuahua iPP =15m.21s.
Sitka ePP =15m.10s., ePPP =17m.3s., isS =23m.22s., eSSS =31m.29s.
Salt Lake City ePP? =15m.49s., iPS =23m.19s., iSS =27m.43s., isSS =28m.31s.
Tacubaya iPP =15m.34s., iSS =28m.1s., iQ =34m.46s., i =35m.43s., iPKP,PKP = 38m.19s.
Logan iPP =15m.20s., ipPP =16m.9s., isPP =16m.39s., isS =23m.16s., iSS =27m.44s., isSS =29m.5s., eSSS? =31m.57s.
Spokane PS =22m.55s., S_cS =23m.13s., P_cSS_cP =27m.22s., SS =27m.59s., iSSS = 35m.17s. and other unidentified readings.
Butte epPPN =16m.33s., ePSN =23m.49s., iSSN =28m.27s., eSSSN =32m.17s.
College iPP? =16m.11s., i =17m.13s., iSKS =22m.25s., iPS =23m.34s., eSS =28m.17s., iPKKP =30m.15s., ePKP,PKP =38m.20s., ePKP,PKP,PKP =58m.30s.
Hungry Horse iPP =15m.52s., iPKKP =30m.16s., iPKP,PKP =38m.19s., ePKP, PKP,PKP =58m.36s.
Bozeman ePP? =16m.25s., epPPP =18m.39s., iPS =23m.37s., iSS =28m.35s.
Rapid City epPPE =17m.33s., iSKS?E =22m.59s., eSSE =29m.35s., ePKKP?E = 30m.9s., ePKP,PKP?E =38m.20s.

Continued on next page.

Saskatoon PP =16m.36s., sS =23m.40s., PS =24m.44s., PPS =25m.24s., SS =29m.49s.
Lincoln iPPE =16m.50s., ipPPE =17m.36s., iSKSE =23m.8s., eSSS?E =35m.48s.
Huancayo ePP =16m.59s., eSS =30m.55s., isSS? =35m.37s.
Little Rock iSKS =23m.18s.
Florissant iPP =17m.17s., i =21m.58s., iSKS =23m.33s., iSP =isS =25m.46s.
St. Louis iPP =17m.17s., iSKS =23m.34s., iSKKS =24m.6s.
Irkutsk PP =17m.5s.?, iPS =26m.19s.
La Plata N =13m.19s., PZ =14m.12s., PPZ =17m.18s., PPE =17m.23s., iSKSN = 23m.36s., SN =24m.37s., PSZ =25m.59s., PPSN =26m.7s., PPSE =26m.12s., PKKPN =29m.55s., SS?E =31m.1s., SSN =31m.31s.
La Paz iZ =13m.53s., iPPZ =17m.35s., i =18m.29s., PPP =19m.58s., iS =24m.55s., iPS =26m.57s., iPPS =27m.37s., iSS =31m.57s.
Chinchina i =26m.31s.
Chicago ePP? =17m.7s., ipPP =18m.25s., ePPP? =20m.13s., iS =24m.25s., iSP = 26m.11s., iSS =31m.49s., eSSS? =35m.20s.
Calcutta PPPE =19m.58s., SE =24m.58s., PSE =26m.45s., PPSE =27m.35s., PKKPE = 29m.32s., SSE =32m.33s., P_cP,PKP_2 =34m.12s., SSSE =36m.15s., QE =42m.8s.
Bogota esSZ =26m.36s., iPPS?Z =29m.35s.
Cincinnati i =17m.17s., iPP =17m.47s.
Columbia iS? =25m.27s., ePS =27m.1s., iSS? =32m.43s., eSSS =36m.29s.
Cleveland ePPN =18m.9s., iPPE =8m.13s., iN =22m.25s., isSKSEN =25m.32s.
Resolute Bay e =17m.53s., 20m.1s., 22m.55s. and 23m.43s., PS =27m.8s.
New Kensington iSE =25m.3s., ePSE =27m.13s., eSS?E =33m.17s.
Buffalo i =15m.13s. and 27m.41s., eSS =33m.23s.
Pennsylvania iN =19m.35s., iE =21m.27s.
Washington iPP =18m.25s., ipPP =19m.18s., iPKKP =29m.17s., ePKP,PKP =37m.19s.
Kodaikanal PPPE =22m.7s., PSE =25m.0s., PPSE =25m.30s., SSE =29m.45s., SSSE = 33m.15s., QE =36m.33s.
Hyderabad eE =17m.40s., PPE =18m.41s., SKKSE =25m.18s., PSE =28m.8s.
Philadelphia ePKP =18m.19s., iPP? =19m.23s., iSKKS =25m.17s. iS =26m.1s., esS = 27m.39s., ipPS =29m.19s., iSS =33m.52s., esSS =35m.25s., iSSS =39m.7s.
Ottawa PKPZ =18m.9s., PP =18m.47s., e =21m.57s., PS =28m.3s., PKKPZ =29m.9s., SS =33m.45s.
Fordham iS =26m.18s., iSP =28m.0s.
Palisades iPP =18m.53s., i =19m.39s., iSKKS =25m.33s., iS =26m.20s., iPS =28m.9s., eSS =34m.9s.
Shawinigan Falls eN =38m.28s.
Harvard iPP =19m.5s., iSKKS? =25m.44s., iS =26m.36s., iSP =28m.17s., iSS =34m.42s., iSSS =38m.37s.
Weston iPP =19m.6s., i =26m.39s., iPKKP =29m.1s.
New Delhi iSKSN =22m.32s., PKKPN =25m.43s., iPSN =27m.29s., iN =28m.42s., iPPSN =29m.6s., iSSN =34m.25s., QN =47m.28s.
San Juan iPP =19m.7s., iPPP =21m.34s., iS =26m.45s., iSP =28m.22s., iPS =28m.59s., iSS =34m.47s.
Seven Falls pPKPE =17m.53s., PPE =18m.57s., SKSE =23m.38s., SE =26m.3s., sSE =27m.37s.
Poona PPEN =19m.6s., iN =19m.24s., PPPEN =21m.38s., SKS_2EN =25m.8s., sSKSN = 25m.36s., SKKSN =25m.55s., iSN =26m.29s., pSN =27m.2s., sSN =27m.35s., PSN =28m.21s., PKKPN =28m.51s. and 29m.17s., PPSN =29m.37s., sPSN = 30m.2s., iN =31m.28s., PKKSN =32m.51s., iN =33m.50s., SSN =35m.6s., SSPN = 35m.23s., $SKKS_2$N =36m.55s., P_cP,PKP_2N =37m.41s., SSSN =39m.24s., SKKKSN =39m.59s., QN =47m.21s.
Almata iPS =28m.51s.
Bombay SKKSN =26m.8s.
Bermuda ipPP =20m.24s., iPPP =22m.23s., ipPPP =22m.56s., i =26m.15s., iS = 27m.12s., iSP =28m.55s., iPS =29m.20s., isPS =30m.15s., iSS =35m.15s., eSSS = 40m.23s.
Fergana epPKP =19m.20s., PP =19m.47s.
Halifax i =27m.26s., PS =29m.21s., SS =35m.51s.
Lunacharskoe iPP =20m.2s., ipPP =21m.6s., iSKKS =26m.36s.
Tashkent pPKP =19m.36s.?, ePP =19m.59s., ipPP =21m.4s., iSKKS =26m.37s., ePS =30m.6s.
Stalinabad PKP =18m.29s., pPKP =19m.31s., PP =19m.49s., pPP =20m.51s., eSKKS = 26m.51s.
Tananarive SKKS =26m.51s., PKKP? =27m.58s., SP =29m.37s., PS =29m.56s., PKKS? =31m.31s., SS =36m.34s., SSS =41m.14s.
Samarkand ePP =20m.19s.
Grahamstown ipPKPZ =19m.2s., ePPZ =20m.16s., eZ =23m.2s., isSZ =28m.55s.
Sverdlovsk ipPKP =19m.33s., iPP =20m.2s., iSKKS =26m.56s.
Ivigtut 21m.14s., 27m.1s., 29m.54s., 30m.47s., and 29m.57s.
Scoresby Sund 22m.2s.
Pretoria eZ =21m.54s.
Reykjavik iN =22m.9s., iEN =23m.23s., eEN =38m.31s.
Pulkovo ipPKP =19m.55s., iPP =21m.33s., iPKS =22m.29s., PPP =24m.33s., SKKS = 28m.7s., SS =39m.13s.
Moscow iPP =21m.36s., iPKS =22m.29s., pPKS =23m.29s., iSKKS =28m.9s.

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Helsinki esPKPZ =20m.13s., ePP =21m.45s., eSPZ =31m.53s., epSPZ =32m.53s., esSPZ =33m.18s., eSPPZ =33m.40s., ePSPZ =34m.5s., eSSEN =39m.31s., esSSEN =41m.5s., eSSSE =44m.33s. and other unidentified readings.
Upsala iPP =21m.50s., ipPP =22m.37s., isPP =22m.51s., iSPN =31m.54s., iSSE =39m.44s., eSS?N =39m.54s., esSS =41m.9s.?, and other unidentified readings.
Bergen PPPN =22m.39s., iSSE =39m.51s., SSSN =41m.13s., iN =42m.9s.?.
Piatigorsk ipPKS =23m.41s., PPP =25m.4s.
Aberdeen iPKSN =22m.43s., iN =23m.47s., iSKKSN =28m.54s., iN =30m.5s., iPSKSN =32m.17s., iN =38m.51s., iSSN =41m.34s.
Edinburgh PSE =33m.18s., PPSE =35m.25s., SSE =41m.5s., SSPE =41m.46s., SSSE =46m.36s.
Copenhagen i =19m.7s. 20m.2s., pPP =23m.9s., i=30m.40s., SS=40m.47s., SSS=46m.10s.
Warsaw PKP?EN =19m.14s., pPKP?N =19m.48s., sPKP?EZ =20m.16s., ePPZ =22m.23s., PPEN =22m.31s., PPP =25m.28s., SKSP =32m.38s., PSKS =32m.53s., PS =33m.17s., esPS =34m.53s., SPP =35m.7s., SSEN =40m.58s., eSSEN =42m.26s., SSS =46m.56s., and other unidentified e readings.
Yalta iSKSP =32m.18s., iSS =40m.54s.
Rathfarnham Castle iZ =23m.22s. and 30m.21s.
Lwow ePP =22m.30s.
Potsdam iPKPEN =19m.21s., iPKP$_2$N =19m.28s., ipPKPE =20m.23s., iPPEN =23m.1s., esPPEN =24m.7s., ipPPPN =28m.6s., iSKKSE =28m.55s., iSKSPN =32m.30s., iSSEN =41m.24s., isSSN =42m.59s. and many other unidentified readings.
De Bilt iPP =22m.47s., ipPP =23m.45s., iPS =34m.17s., iSS =41m.23s., esSS =43m.5s., eSSS =47m.2s., esSSS =48m.34s.
Collmberg ipPKP?Z =20m.24s., iPPN =22m.49s., eSKS?N =28m.0s., iSKSPN =32m.58s., iSSN =43m.15s., eSSSN =47m.19s. and other unidentified readings.
Skalnate Pleso iPKPE =19m.23s., eE =19m.37s., esPKP =20m.21s., ePP =22m.47s., esPP? =23m.50s., eN =27m.56s., iSKKS?E =29m.25s., e =31m.7s. and 32m.58s., eN =34m.47s., eSS =41m.37s., eSSS =46m.55s.
Kew i =20m.28s., iPP =22m.51s., i =23m.3s., e =33m.5s.
Jena ipPKPNZ =19m.23s., iPKP$_2$N =20m.23s., iPKP$_2$E =20m.29s., ipPKP?Z =20m.35s., ipPKP?N =20m.39s., ePPN =22m.47s., ePPZ =22m.50s., eSS?N =41m.37s., eSSS?EN =47m.25s. and other unidentified readings.
Prague iPKP$_2$ =19m.27s., epPKP$_2$ =20m.18s., esPKP =20m.25s., esPKP$_2$ =20m.36s., ePP =22m.47s., epPP =23m.31s., ePPP =26m.21s., iSKKS? =29m.29s., ePSKS =33m.3s., epPS =34m.39s., esPS =35m.10s., eSPP =35m.25s., eSS =41m.39s., esSS =43m.7s., eSSS =47m.37s. and many unidentified readings.
Cheb iPKP$_2$N =19m.28s., esPKP =20m.34s., ePP =22m.53s., ePPPN =26m.18s., iPSKS =33m.5s., epPS =34m.30s., ePPS =35m.37s., eSS =41m.36s., esSS =42m.57s., eSSS =46m.53s. and other unidentified e readings.
Bucharest iN =19m.27s. and 21m.15s., iEN =21m.24s., iN =22m.45s.
Budapest PPN =26m.21s., eE =27m.30s., P$_c$S,PKPE =31m.7s., PSN =33m.27s., S$_c$S,PKPE =34m.23s., SSN =41m.50s., iSSE =42m.1s., iE =43m.32s., SSSE =47m.33s., SSSN =47m.37s.
Ogyalla ePKP$_2$ =19m.37s., epPKP$_2$ =20m.27s., sPKP =20m.35s., ePP =23m.3s., epPPN =23m.54s., esPP =24m.23s., e =25m.35s., ePPP =26m.37s., e =29m.34s., ePSKS =32m.59s., e =34m.38s., eSPPN =35m.34s., e =36m.24s., eSSE =41m.50s., esSS =43m.25s., eSSS =47m.37s.
Jersey eE =21m.7s.?.
Timisoara eEN =19m.32s.
Paris iPKP$_2$ =19m.42s., isPKP =20m.34s., iPP =23m.4s., ipPP =24m.5s., iPPP =26m.34s., ipPPP =27m.10s., iSP? =32m.55s., iSPP =35m.40s., iSSP =43m.23s., isSS =43m.40s., iSSS =47m.59s., iSSS($\triangle$ >180°) =60m.13s. and other unidentified i readings.
Kalocsa iE =20m.6s. and 20m.51s., iN =21m.7s. and 21m.45s., PPPE =26m.24s., eN =26m.42s., eE =27m.21s., 34m.22s., 41m.51s., and 46m.7s.?
Stuttgart iPKPZ =19m.24s., iPP =22m.51s., iPPP =26m.30s., ePSKS =33m.22s., eSS =41m.51s., eSSS =47m.31s. and many other unidentified readings.
Strasbourg ePKP$_2$ =19m.50s., isPKP =20m.35s., ipPKP$_2$ =21m.18s., isPKP$_2$ =21m.43s., iSKP =22m.27s., iPKS =22m.45s., iPP =23m.7s., ipPP =24m.11s., esPP =24m.44s., iPPP =26m.43s., isSKS =27m.27s., iSKKS? =29m.40s., ePSKS =32m.50s., iPSKS =32m.54s., iPS =33m.17s., iSPP =35m.57s., iPPS =36m.29s., iSS =41m.58s., iPSS =43m.21s., isSS =43m.43s., iSSS =48m.2s., isSSS =48m.39s. and many other unidentified readings.
Belgrade i =28m.43s.
Sofia i =19m.44s., 30m.29s., 33m.13s., and 38m.7s.
Basle ePPP =26m.46s.
Zürich ePP =23m.11s.
Triest iSKP =23m.0s., iPP =23m.58s., iSKKS =29m.50s., iPSKS =33m.32s., iSS =43m.23s., iPSS =44m.27s.
Helwan PKP$_2$N =19m.49s., PPN =23m.19s., iN =27m.1s. and 28m.13s.
Clermont-Ferrand i =19m.23s., iPKP$_2$ =19m.36s., isPKP =20m.24s., i =20m.39s.
Pavia ePP =23m.24s., e =24m.20s., 27m.43s., 31m.8s., and 38m.38s., eSS =42m.47s.
Padova i =19m.51s.
Bologna eSS =42m.33s.
Athens i =19m.39s., 19m.55s., and 20m.18s.
Florence PP =23m.31s., e =62m.26s.

Continued on next page.

Taranto e =38m.42s., PSKS =42m.2s., eSSS =48m.32s., e =57m.42s.
Rome ePP =23m.34s., ePPS =37m.56s., eSS =43m.16s., eSSS =50m.7s.?.
Rocca di Papa i =20m.4s.
Lisbon PKPNZ =19m.38s., Z =20m.33s., EN =20m.50s., Z =21m.2s., PPZ = 23m.48s., Z =24m.36s., N =33m.57s., 36m.29s., and 49m.25s.
Barcelona i =43m.30s.
Toledo PKP_2 =20m.10s., i =21m.11s., PP =23m.49s., iN =27m.31s., i =32m.22s., SSS =49m.16s., i =52m.3s.
Tortosa PKP_2N =20m.9s., PPPN =27m.39s., SKKS?N =30m.33s., SKSP?E =34m.7s., SSE =43m.35s., SSS?E =49m.8s.
Messina iZ =20m.6s., e =27m.25s.
Alicante PP =24m.3s., PPP =28m.12s., SKKS =30m.47s., PPS =37m.43s., SS = 43m.51s., SSP =45m.4s., SSS =49m.51s., Q =65m.17s.
Granada PKP_2 =19m.55s., $pPKP_2$ =21m.25s., iPP =24m.6s., pPP =24m.41s., sPP = 25m.7s., SKKS =30m.49s., sSKKS =31m.49s., PPP($\Delta > 180°$) =32m.30s., SKSP = 34m.10s., iSS =44m.1s., SSS =49m.7s., Q =65·6m.
Malaga iPPZ =24m.7s., PPPZ =28m.13s., SKKSZ =31m.17s.
Tunis i =19m.55s., $iPKP_2$ =20m.14s., i =21m.54s., e =23m.3s., iPP =24m.24s. and 26m.35s., ePSKS =34m.31s., ePS =36m.27s., e =39m.30s., eSS =44m.22s., e = 45m.44s., eSSS? =51m.25s., e =57m.7s.
Algiers Univ. $ePKP_2Z$ =20m.34s., $epPKP_2Z$ =21m.23s., iPPZ =24m.10s., ipPPZ = 25m.5s., ePPPZ =27m.56s., epPPPZ =28m.43s.
Tamanrasset $ePKP_2Z$ =21m.30s., ePPZ =25m.23s., epPPZ =26m.6s., eZ =28m.31s., iPPPZ =29m.39s., iSKKSZ =31m.58s., iSKSPZ =35m.20s., iPPSZ =39m.45s.

Dec. 14d. 3h. 0m. 32s. Epicentre 19°·7S. 175°·9W. (as at 1h.). Depth of focus 0·030.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		7·1	35	e 1 36	− 6	2 45	−17	—	—
Pasadena		76·8	47	i 11 28a	0	—	—	i 12 22	pP
Palomar	z.	77·2	48	i 11 31	0	—	—	i 12 27	pP
Riverside	z.	77·2	47	i 11 30a	− 1	—	—	—	—
China Lake	z.	78·0	45	i 11 36a	+ 1	—	—	i 12 33	pP
Shasta Dam		78·0	39	i 11 34	− 1	—	—	—	—
Mineral	z.	78·2	40	i 11 37	+ 1	—	—	i 12 32	pP
Tinemaha	z.	78·4	44	i 11 38	+ 1	—	—	—	—
Boulder City		80·0	47	i 11 47	+ 1	—	—	—	—
Overton	z.	80·6	46	i 11 50	+ 1	—	—	i 12 48	pP
Pierce Ferry		80·6	47	i 11 50	+ 1	—	—	i 12 47	pP
Tucson		80·9	51	i 11 52	+ 2	—	—	—	—
Victoria	z.	82·5	33	e 11 58	− 1	—	—	—	—
College		87·2	12	i 12 20	− 2	—	—	i 13 16	pP
Hungry Horse		87·3	36	i 12 23	0	—	—	—	—
Collmberg	z.	147·7	351	e 19 20	[+ 5]	—	—	e 20 18	pPKP
Prague		148·6	348	e 32 52	PS	—	—	—	—
Stuttgart	z.	150·7	353	e 19 22	[+ 2]	—	—	e 20 30	pPKP
Strasbourg		151·0	356	e 19 37	[+17]	—	—	—	—
Tamanrasset	z.	176·6	—	i 19 47a	[+ 4]	e 25 21	PP	e 20 50	pPKP

Additional readings :—
Pasadena iZ =11m.50s.
Palomar iZ =11m.54s.
China Lake iZ =11m.56s.
Mineral iZ =11m.58s.
Tucson i =12m.15s.
Prague e =32m.57s.
Stuttgart eZ =19m.34s.
Tamanrasset $ePKP_2Z$ =21m.29s., $ipPKP_2Z$ =22m.2s., eZ =22m.31s., eZ =28m.47s., ePPPZ =29m.37s.

Dec. 14d. 8h. 59m. 32s. (I)
9h. 29m. 51s. (II)
Epicentre 40°·1N. 120°·1W.
(as on 1950, November 22d.).

A = −·3847, B = −·6636, C = +·6416; δ = +1; h = −2;
D = −·865, E = +·502; G = −·322, H = −·555, K = −·767.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Reno	0·6	158	i 0 12k	− 3	i 0 19	− 7	—	—	—
I	Ukiah	2·6	248	e 1 1	P_g	e 1 19	+ 2	i 1 33	S_g	i 1·9
II		2·6	248	—	—	e 1 19	+ 2	—	—	e 1·6
I	Berkeley	2·8	217	i 0 48a	+ 1	i 1 23	+ 1	—	—	—
I	San Francisco	3·0	218	e 0 51	+ 1	—	—	—	—	—
I	Branner	3·1	211	i 0 52k	+ 1	i 1 33	+ 4	—	—	—
I	Santa Clara	3·1	208	e 0 28?	?	i 1 33	+ 4	—	—	—
II		3·1	208	e 0 9	?	i 0 36	?	—	—	—
I	Fresno z.	3·4	175	e 0 54k	− 1	—	—	—	—	—
I	Tinemaha	3·4	153	i 0 54	− 1	i 1 54	S*	i 1 6	P*	—
II		3·4	153	e 0 55	0	i 1 49	S*	—	—	—
I	Haiwee	4·3	156	e 1 19	P*	i 2 20	S_g	—	—	—
I	China Lake z.	4·7	154	i 1 16	+ 2	i 2 36	S_g	i 1 31	P*	—
I	Overton z.	5·7	127	i 1 27	− 1	i 2 51	S*	—	—	—
II	z.	5·7	127	i 1 28	0	—	—	—	—	i 3·0
I	Boulder City	5·9	133	i 1 29	− 2	—	—	—	—	—
II		5·9	133	e 1 30	− 1	—	—	—	—	e 3·1
I	Pasadena	6·1	165	i 1 33	− 1	i 3 1	S*	—	—	—
II		6·1	165	i 1 34	0	e 3 9	S*	—	—	—
I	Pierce Ferry	6·2	128	i 1 35	0	—	—	i 2 2	P_g	i 3·2
II		6·2	128	i 1 36	+ 1	e 2 56	+ 8	—	—	i 3·3
I	Logan	6·5	73	e 1 59	P*	e 3 17	S*	—	—	e 3·9
I	Seattle	7·7	349	e 2 3	+ 7	i 2 59	−26	—	—	e 4·3
II		7·7	349	e 2 4	+ 8	—	—	—	—	e 4·3
I	Hungry Horse	9·3	26	i 2 20	+ 3	i 4 24	+19	—	—	e 5·0
I	Tucson	10·8	133	e 2 40	+ 1	e 4 40	− 2	e 3 20	P_g	e 5·9
II		10·8	133	e 2 40	+ 1	—	—	e 3 20	P_g	e 5·7
II	Florissant	23·0	83	—	—	e 9 32	+18	—	—	—
I	St. Louis	23·1	83	e 5 8	0	e 9 28	+12	—	—	—
II		23·1	83	e 5 8	0	e 9 29	+13	—	—	—

Long waves to shock I were also recorded at Bozeman.

Dec. 14d. 13h. 24m. 19s. Epicentre 40°·1N. 120°·1W. (as at 9h.).

Intensity VII at Herlong; VI at Beckworth, Doyle, Litchfield, Portola, and Flanigan.
Epicentre 40°·1N. 120°·2W. Macroseismic area 20,000 sq.m.

L. M. Murphy and F. P. Ulrich.
United States Earthquakes, 1950, Serial No. 755, Washington, 1950, pp. 14, 15, with macroseismic chart.

A = −·3847, B = −·6636, C = +·6416; δ = +1; h = −2;
D = −·865, E = +·502; G = −·322, H = −·555, K = −·767.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno		0·6	158	i 0 11	− 4	i 0 20	− 6	—	—	—
Mineral		1·2	282	i 0 22	− 2	—	—	—	—	—
Ukiah		2·6	248	e 0 44	0	i 1 18	+ 1	i 1 5	P_g	i 1·7
Berkeley		2·8	217	i 0 46a	− 1	i 1 23	+ 1	—	—	—
San Francisco		3·0	218	i 0 48	− 2	—	—	—	—	—
Branner		3·1	211	e 0 51a	0	i 1 29	0	—	—	—
Santa Clara		3·1	208	i 0 53	+ 2	i 1 31	+ 2	—	—	—
Ferndale	E.	3·2	278	e 0 57	+ 5	—	—	—	—	—
Fresno	z.	3·4	175	e 0 55a	0	—	—	—	—	—
Tinemaha		3·4	153	i 0 55	0	i 1 54	S_g	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		4·3	156	i 1 11	+ 3	i 2 18	S_g	i 1 19	P*	—
China Lake	z.	4·7	154	i 1 15	+ 1	—	—	i 1 31	P_g	—
Santa Barbara	z.	5·6	177	i 1 29	+ 2	—	—	—	—	—
Overton	z.	5·7	127	i 1 27	− 1	—	—	—	—	—
Boulder City		5·9	133	i 1 29	− 2	—	—	—	—	i 3·1
Pasadena		6·1	165	i 1 33	− 1	i 2 42	− 3	i 1 53	P*	—
Pierce Ferry		6·2	128	i 1 35	0	—	—	—	—	i 3·3
Salt Lake City		6·3	81	e 1 36	0	i 2 49	− 1	—	—	i 3·1
Riverside	z.	6·5	159	i 1 38	− 1	—	—	—	—	—
Logan		6·5	73	e 1 32	− 7	e 2 57	+ 2	i 1 56	P*	i 3·8
Seattle		7·7	349	i 2 0k	+ 4	i 3 13	−12	i 4 3	S_g	—
Spokane		7·9	14	i 2 1	+ 2	i 4 19	S_g	—	—	—
Butte	N.	8·1	41	e 2 4	+ 2	—	—	—	—	e 4·1
Bozeman		8·7	47	e 2 9	− 1	e 3 37	−13	e 2 55	P_g	e 4·0
Victoria		8·7	345	2 10	0	e 3 50	0	e 4 35	S_g	—
Tucson		10·8	133	i 2 42	+ 3	e 4 49	+ 7	i 3 23	P_g	e 5·4
Rapid City	E.	13·2	67	i 3 11	0	e 5 39	− 1	—	—	e 6·6
Saskatoon		15·2	33	3 36	− 2	—	—	—	—	—
Lubbock		16·0	107	3 43	− 5	—	—	—	—	8·4
Lincoln	E.	17·9	79	e 4 11	− 1	e 7 32	+ 2	—	—	e 10·5
Sitka		19·6	335	e 4 31	− 1	e 8 19	+11	—	—	e 9·5
Florissant		23·0	83	i 5 7	0	e 9 18	+ 4	—	—	—
St. Louis		23·1	83	e 5 7	− 1	e 9 21	+ 5	—	—	—
Chicago		24·5	74	e 5 20	− 2	i 9 47	+ 7	—	—	i 13·0
Cincinnati		27·3	80	—	—	i 10 50	+23	—	—	—
Cleveland	E.	29·1	74	—	—	i 11 0	+ 4	—	—	e 14·8
College		29·5	337	e 6 6	− 2	e 11 33	+31	e 9 9	P_cP	e 14·7
New Kensington	E.	30·6	75	e 6 16	− 2	e 11 34	+14	—	—	e 16·6
Ottawa	Z.	32·7	66	e 6 35	− 1	—	—	—	—	—
Palisades		34·8	72	e 6 53	− 1	e 12 18	− 7	e 8 8	PP	e 21·2
Fordham		34·9	72	—	—	e 12 32	+ 5	e 15 16	SSS	—
Resolute Bay		36·6	10	e 8 8	+58	e 12 54	+ 1	e 8 35	PP	e 18·7
Apia		71·9	233	e 27 58	?	—	—	—	—	—
Stuttgart		80·8	31	i 21 45	SKP	—	—	—	—	—
Alicante		84·3	43	12 32	− 3	24 10	PS	—	—	e 41·9
Tamanrasset	z.	99·5	48	e 13 35	−11	—	—	e 17 33	PP	—
Pretoria	z.	150·0	71	i 19 52?	[+ 5]	—	—	—	—	—

Additional readings :—
Berkeley eE =1m.19s.
Tinemaha iZ =1m.4s.
Logan iS =3m.11s.
Seattle i =2m.16s., 4m.12s., 4m.18s., 4m.43s., and 4m.52s.
Spokane i =4m.9s., 4m.17s., 5m.9s., and 6m.25s.
Sitka iS =8m.27s.
Florissant iS =9m.24s.
St. Louis iS =9m.27s.
Palisades e =15m.14s., eQ =18m.15s.
Resolute Bay e =16m.46s.
Apia 29m.7s.
Long waves were also recorded at Scoresby Sund, Florence, Istanbul, Chihuahua, Tacubaya, and other American stations.

Dec. 14d. 14h. 15m. 43s. Epicentre 16°·3N. 98°·6W. (as on 1950, Oct. 5d.).

Strongly felt in Central and South-East Mexico. Intensity V throughout the Federal District, with much damage.
Suggested epicentres : 16° 29′N. 98° 13′W. Depth 50km. (Tacubaya).
17°N. 97°·5W. (Gutenberg).
Tacubaya Monthly Seismo. Bulletin, 1950, December, p. 5.

$A = -\cdot1436$, $B = -\cdot9495$, $C = +\cdot2789$; $\delta = -4$; $h = +5$;
$D = -\cdot989$, $E = +\cdot150$; $G = -\cdot042$, $H = -\cdot276$, $K = -\cdot960$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		1·9	68	i 0 30 a	− 4	—	—	—	—	i 0·8
Puebla		2·8	8	i 0 48	+ 1	—	—	—	—	i 1·4
Tacubaya		3·1	350	i 0 54 a	+ 3	—	—	—	—	i 1·6
Vera Cruz		3·7	39	i 0 57 a	− 3	—	—	—	—	i 1·7
Guadalajara		6·3	315	e 1 41	+ 5	—	—	—	—	3·2
Mazatlan		10·0	314	e 2 34	+ 7	—	—	—	—	5·2
Chihuahua		14·1	332	i 3 27	+ 4	i 6 11	+ 9	—	—	—
Little Rock		19·2	16	i 4 24	− 4	i 8 14	+15	i 4 40	pP	—
Tucson		19·4	328	i 4 31	+ 1	i 7 47	−17	i 8 12	SS	i 8·7
Balboa Heights		19·9	108	i 4 45	+ 9	i 8 39	+24	—	—	—
St. Louis		23·4	16	e 5 9	− 2	e 9 39	+18	i 5 25	pP	—
La Jolla		23·6	318	e 5 16	+ 3	—	—	—	—	—
Columbia		23·7	37	i 5 13	− 1	i 9 31	+ 4	i 5 37	PP	e 10·6
Palomar		23·7	321	i 5 16 a	+ 2	—	—	—	—	—
Pierce Ferry		24·0	328	i 5 19	+ 2	—	—	—	—	—
Boulder City		24·3	328	i 5 22	+ 2	—	—	—	—	—
Riverside		24·4	321	i 5 22 a	+ 1	—	—	—	—	—
Lincoln	E.	24·5	3	e 5 20	− 2	i 9 48	+ 8	e 6 2	PP	e 11·9
Overton	Z.	24·6	328	i 5 24	+ 1	—	—	—	—	—
Pasadena		25·0	321	i 5 29 a	+ 2	i 9 53	+ 4	i 6 6	PP	i 11·5
Port au Prince		25·1	80	e 5 38	+10	e 10 18	+27	6 18	PP	e 12·7
China Lake	Z.	25·8	323	i 5 36 a	+ 2	—	—	—	—	—
Cincinnati		25·9	25	i 5 31	− 4	i 10 15	+11	—	—	—
Bogota		26·7	113	i 5 58	+15	e 10 46	SS	e 6 47	PP	—
Salt Lake City		27·0	338	i 5 40	− 5	e 9 41	−41	i 6 47	PP	i 10·8
Tinemaha		27·1	324	i 5 47 a	+ 1	—	—	—	—	—
Chicago		27·2	17	i 5 45	− 2	i 10 33	+ 8	—	—	e 13·3
Fresno	Z.	27·7	322	e 5 52 a	0	e 10 50	+17	—	—	e 14·8
Logan		27·8	339	i 5 45	− 8	i 10 45	+10	i 6 44	PP	i 11·2
Rapid City	E.	28·0	353	i 5 57	+ 2	i 10 57	+19	i 6 57	PP	e 13·2
Cleveland		29·1	26	i 5 42 a	−22	i 10 52	− 4	i 7 14	PPP	—
New Kensington	E.	29·2	29	i 6 5	0	i 11 4	+ 6	—	—	i 12·8
Washington		29·4	36	i 6 5	− 2	—	—	i 7 42	PPP	i 12·3
Santa Clara		29·4	321	i 6 11	+ 4	i 11 10	+ 9	—	—	e 13·5
Branner	Z.	29·6	320	e 6 11 a	+ 2	—	—	—	—	—
Reno		29·6	326	e 6 11 a	+ 2	—	—	—	—	e 15·1
Berkeley		29·9	321	i 6 15 a	+ 3	e 11 23	+14	e 7 25	PPP	e 14·2
Pennsylvania		30·3	32	i 6 12	− 3	i 11 24	+ 9	i 9 3	P_cP	—
San Juan		31·0	80	i 6 23	+ 2	i 11 36	+10	e 7 23	PP	e 13·4
Bozeman		31·1	344	i 6 23	+ 1	e 11 12	−16	i 7 55	PPP	e 13·6
Philadelphia		31·2	36	i 6 12	−11	i 11 25	− 4	—	—	i 13·1
Mineral		31·2	325	e 6 19	− 4	e 11 52	+23	e 7 53	PPP	e 16·5
Ukiah		31·3	323	e 6 29	+ 5	e 11 42	+11	—	—	e 14·5
Buffalo		31·4	28	e 6 23	− 2	e 11 52	+20	e 6 35	pP	—
Butte		31·8	344	i 6 28	0	e 12 3	+25	—	—	e 14·4
Shasta Dam		31·9	325	i 6 27	− 2	—	—	—	—	—
Fordham		32·5	36	e 6 32	− 2	i 11 45	− 4	—	—	—
Palisades		32·6	36	i 6 33 a	− 2	i 11 27	−24	i 6 43	pP	—
Hungry Horse		34·4	341	i 6 50	− 1	e 12 18	− 1	e 8 24	PP	e 14·4
Bermuda		34·6	56	e 6 43	−10	i 12 14	− 8	i 8 4	PP	e 14·4
Ottawa		34·8	28	e 6 51 a	− 3	—	—	—	—	—
Harvard		34·9	36	i 6 53	− 2	i 12 32	+ 5	—	—	—
Weston		34·9	36	i 6 53	− 2	e 12 18	− 9	—	—	—
Spokane		35·0	337	i 6 55	− 1	e 12 30	+ 2	8 21	PP	16·6
Fort de France		36·1	87	i 7 6	− 1	—	—	e 13 36	P_eS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Saskatoon		36·3	352	7 7	0	i 12 53	+ 5	e 8 40	PP	—
Huancayo		36·4	139	e 7 18	+10	i 12 48	− 2	—	—	e 15·4
Seattle		36·9	334	i 7 13a	+ 1	—	—	—	—	—
Shawinigan Falls	N.	37·0	30	e 7 11	− 2	13 7	+ 8	e 8 27	PP	—
Victoria		37·9	334	i 7 22a	+ 2	13 13	0	—	—	—
Seven Falls	E.	38·4	31	6 23	−62	i 12 26	−54	8 3	PP	—
Halifax		40·8	38	7 44	− 1	14 8	+12	9 27	PcP	—
La Paz		44·3	135	i 8 20a	+ 7	i 14 51	+ 3	i 10 17	PP	22·3
Sitka		49·3	335	i 8 52	− 1	i 16 6	+ 7	i 10 13	PcP	e 20·3
Honolulu		56·0	286	e 9 45	+ 2	e 17 39	+ 9	e 10 45	PcP	e 22·4
Santiago		56·2	152	e 9 58	+14	e 18 6	+33	—	—	—
Ivigtut		57·3	27	i 9 50	− 2	e 17 42	− 5	13 38	PPP	30·3
Resolute Bay		58·4	1	9 57	− 3	18 2	0	13 41	PPP	—
College		58·7	338	e 10 0	− 2	i 17 53	−13	i 10 44	PcP	e 23·3
Buenos Aires		63·4	143	10 44	+10	19 9	+ 3	—	—	—
La Plata		63·9	143	10 35	− 2	19 11	− 1	23 41	SSP	29·3
Reykjavik		69·7	26	e 11 25	+11	—	—	—	—	e 35·2
Scoresby Sund		70·3	20	i 11 16	− 1	i 20 35	+ 6	—	—	38·3
Apia		78·2	251	12 23	+20	e 22 25	+28	—	—	e 35·3
Rathfarnham Castle		78·5	38	i 12 6	+ 2	e 22 1	0	e 15 12	PP	e 33·3
Lisbon		79·6	52	12 1k	− 9	22 12	0	27 35	SS	36·9
Edinburgh	E.	79·7	35	12 10	− 1	22 7	− 6	12 24	PcP	—
Aberdeen		79·9	34	i 12 15	+ 3	i 22 27	+11	i 15 37	PP	42·0
Durham		80·8	36	i 12 44	+27	i 22 42	+17	i 15 31	PP	—
Jersey	E.	82·0	41	e 12 35	+12	e 23 20	PS	—	—	—
Klyuchi		82·4	326	12 31	+ 6	e 22 45?	+ 4	—	—	—
Kew		82·5	39	i 12 26	0	e 22 51	+ 9	e 15 31	PP	e 34·3
Bergen		82·7	29	e 12 21	− 6	22 53	+ 9	28 39	SS	36·3
Toledo		83·1	51	e 12 30	+ 1	e 22 48	0	15 44	PP	40·4
Malaga	N.	83·7	54	i 12 38	+ 6	i 23 8	+14	i 15 54	PP	43·4
Granada		84·2	53	i 12 40k	+ 6	23 2	+ 3	12 49	PcP	i 41·8
Paris		85·0	42	i 12 40	+ 2	i 22 59	[− 2]	i 15 49	PP	e 39·7
De Bilt		85·5	37	e 12 43a	+ 2	e 23 28	+16	e 16 11	PP	e 39·3
Alicante		86·2	51	12 50	+ 6	23 33	+14	12 58	PcP	e 39·8
Tortosa		86·2	49	12 54	+10	i 23 23	+ 4	12 59	PcP	e 39·3
Clermont-Ferrand		86·4	43	i 12 48	+ 3	e 23 27	+ 6	i 16 32	PP	e 46·3
Barcelona		87·2	48	e 13 2	+13	i 23 54	+26	—	—	e 46·0
Besançon		87·7	42	e 12 50	− 2	—	—	e 16 29	PP	—
Copenhagen		88·0	32	i 12 56	+ 3	i 23 47	+11	16 29	PP	42·3
Strasbourg		88·3	40	e 12 53	− 2	i 23 49	+10	i 16 23	PP	e 41·3
Neuchatel		88·5	42	e 12 55	− 1	e 23 48	+ 7	—	—	—
Upsala		88·5	27	e 12 56	0	e 23 20?	[− 4]	i 13 16	pP	e 38·3
Basle		88·6	42	e 12 59	+ 3	e 23 54	+12	e 16 15	PP	—
Karlsruhe		88·6	39	i 12 58	+ 2	i 23 53	+11	—	—	e 40·3
Stuttgart		89·1	39	i 13 0a	+ 2	e 23 53	+ 7	e 16 27	PP	e 41·3
Zürich		89·3	41	e 13 1	+ 2	e 23 47	− 1	e 16 31	PP	—
Algiers Univ.	Z.	89·4	52	e 13 0	0	—	—	e 16 21	PP	—
Jena		89·6	37	e 13 1	0	e 23 53	+ 2	e 16 22	PP	e 45·3
Potsdam		89·8	34	e 13 17	+15	i 23 59	+ 6	i 16 43	PP	e 38·3
Chur		90·1	41	e 13 7	+ 4	e 23 39	[+ 6]	e 16 31	PP	e 47·8
Collmberg		90·3	36	e 13 4	0	e 24 2	+ 5	e 16 38	PP	e 38·8
Cheb		90·5	37	e 13 9	+ 4	e 23 57	− 2	e 16 39	PP	—
Pavia		90·6	42	e 13 8	+ 3	e 24 24	+24	e 16 52	PP	—
Helsinki		91·4	24	e 13 20	+11	e 24 4	− 3	i 16 56	PP	e 43·3
Prague		91·7	37	e 13 10	0	e 24 13?	+ 3	e 16 39	PP	e 43·3
Padova		92·2	42	13 23	+10	23 56	[+10]	17 0	PP	—
Bologna		92·3	42	e 13 46?	+33	e 24 18	+ 3	e 17 17	PP	—
Prato		92·4	43	e 13 20	+ 6	i 25 6	PS	—	—	—
Florence		92·5	43	14 8?	+54	24 44?	+27	—	—	—
Triest		93·3	41	i 13 22	+ 4	i 24 26	+ 2	i 17 4	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Pulkovo		93·7	24	e 13 20	0	23 58	[+ 4]	i 17 3	PP		—
Raciborzu		93·8	36	e 13 23	+ 3	—	—	—	—		e 51·3
Warsaw		94·1	33	e 13 25	+ 3	e 24 45	+14	17 13	PP		e 46·3
Rome		94·2	45	e 13 21	− 1	e 24 27	− 4	e 17 7	PP		—
Tunis		94·7	50	e 17 41	PP	e 24 24	−12	e 30 9	SS		—
Ogyalla		94·9	38	e 13 35	+10	e 24 12	{− 5}	17 25	PP		—
Skalnate Pleso		95·4	35	e 16 56	?	e 24 17	{− 4}	e 17 38	PP		e 43·8
Budapest		95·6	38	e 13 38	+10	24 33	−10	17 17	PP		44·3
Kalossa	E.	96·0	38	e 13 46	+16	e 24 18	{− 7}	e 18 3	PP		e 54·3
	N.	96·0	38	e 13 49	+19	e 24 39	− 8	e 26 59	PPS		e 53·8
Tamanrasset	Z.	96·2	65	e 13 33	+ 2	e 26 25	PS	i 17 28	PP		—
Lwow		97·0	34	e 13 36	+ 1	e 25 0	+ 5	i 17 33	PP		—
Belgrade		97·8	39	e 13 46a	+ 8	i 24 31	{− 8}	i 17 57	PP		e 51·2
Timisoara		97·8	38	e 14 17?	+39	e 24 23	[+ 7]	e 17 58?	PP		e 52·3
Taranto		98·0	44	13 37	− 2	24 12	[− 5]	e 17 57	PP		—
Wellington		98·1	230	i 13 54	+14	i 24 22	[− 4]	i 17 50	PP		40·8
Moscow		99·3	24	e 13 44	− 1	e 25 14	0	17 59	PP		—
Christchurch		99·9	228	i 14 5	+17	24 37	[+10]	e 17 47	PP		e 45·3
Sofia		100·7	40	e 13 53	+ 1	e 24 45	[+15]	e 18 23	PP		—
Kishinev		101·3	34	13 57	+ 3	27 0	PS	18 7	PP		—
Bucharest		101·4	37	e 17 47	PP	i 24 46	[+12]	i 27 14	PS		45·3
Vladivostok		104·9	324	e 14 12?	+ 2	i 25 5	[+15]	e 18 17	PP		—
Istanbul		105·1	38	e 14 12	+ 1	e 24 44	[− 7]	—	—		—
Sverdlovsk		105·1	12	i 14 12	+ 1	i 24 38	[−13]	i 18 28	PP		—
Yalta		105·8	33	e 14 18	+ 3	—	—	e 18 46	PP		—
Irkutsk		108·9	345	e 14 31	P	e 34 17	SS	19 1	PP		—
Sotchi		109·2	31	e 18 41	[+10]	—	—	—	—		—
Grozny		112·3	27	e 18 53	[+15]	—	—	—	—		—
Helwan		113·3	47	e 14 47	P	e 25 37	[+12]	19 23	PP		—
Brisbane		113·4	247	e 19 41	PP	e 25 28	[+ 2]	i 29 38	PS		e 52·5
Leninakan		113·4	30	e 19 27	PP	—	—	—	—		—
Ksara		113·9	42	e 14 51	P	29 21	PS	19 31	PP		—
Erevan		114·2	31	e 19 39	PP	—	—	—	—		—
Riverview		115·5	240	e 20 12	PP	e 25 36	[+ 2]	e 22 31	PPP		e 53·5
Baku		116·5	27	e 20 0	PP	—	—	—	—		—
Nanking		120·0	324	e 20 22	PP	e 24 43	?	i 28 35	S		—
Almata		120·6	4	e 18 58?	[+ 4]	—	—	i 20 21	PP		—
Luncharskoe		121·6	11	e 20 19?	PP	i 30 26	PS	—	—		—
Tashkent		121·6	11	e 18 56	[0]	i 30 25	PS	i 20 26	PP		—
Ashkabad		121·9	22	e 19 3	[+ 7]	—	—	—	—		—
Naryn		122·3	5	i 18 59	[+ 2]	e 30 20	PS	—	—		—
Andijan		122·6	11	e 19 3	[+ 5]	—	—	e 20 49	PP		—
Samarkand		122·7	14	e 19 7	[+ 9]	—	—	—	—		—
Fergana		122·9	11	e 19 3	[+ 5]	e 30 42	PS	e 23 21	PPP		—
Mary		123·3	19	i 20 41	PP	—	—	—	—		—
Dzhergetal		124·0	9	e 19 8	[+ 7]	e 20 46	PP	e 23 29	PPP		—
Obi-garm		124·2	11	i 19 4	[+ 3]	—	—	—	—		—
Stalinabad		124·2	12	19 6	[+ 5]	i 30 56	PS	—	—		—
Grahamstown	Z.	128·0	120	e 19 16	[+ 8]	—	—	i 21 14	PP		e 57·9
Pretoria	Z.	129·7	111	e 19 18	[+ 7]	—	—	—	—		—
Manila		130·3	306	e 13 17?	?	—	—	—	—		—
Dehra Dun	N.	133·5	4	e 22 11?	?	e 37 11?	?	—	—		—
New Delhi	N.	135·2	6	e 19 32	[+10]	i 23 4	PKS	i 22 10	PP		57·8
Calcutta	E.	140·8	349	e 19 29	[− 3]	23 27	PKS	22 34	PP		65·6
Bombay		144·0	14	e 19 40	[+ 3]	32 58	PS	22 53	PP		—
Poona		144·6	12	19 38	[0]	26 45	[− 1]	19 55	PKP_2		68·7
Perth		145·1	238	i 19 55	[+16]	i 35 33	PPS	i 42 32	SS		i 61·0
Hyderabad	N.	146·4	5	19 47	[+ 5]	30 20	{+22}	23 12	PKS		—
Tananarive		147·7	100	e 20 5	[+21]	30 26	{+21}	23 45	PP		—
Bandong		152·7	288	e 19 24	[−27]	—	—	—	—		83·2
Djakarta		153·2	289	e 20 19	[+27]	—	—	—	—		e 84·2
Kodaikanal	E.	153·4	9	e 18 58	[−54]	—	—	—	—		—
Colombo	E.	156·9	5	e 20 5	[+ 8]	—	—	—	—		83·6

For Notes see next page.

NOTES TO DECEMBER 14d. 14h. 15m. 43s.

Additional readings :—
Tucson i =4m.38s.
Lincoln iPE =5m.28s.
Pasadena iN =7m.6s., iZ =8m.9s.
Port au Prince i =5m.55s., PPP? =6m.38s., SS =11m.28s.
Chicago i =6m.5s.
Fresno eZ =6m.40s.
Cleveland iSE =11m.9s., iSN =11m.12s.
Reno eE =6m.33s., eN =7m.31s.
Berkeley eEN =6m.38s.
Pennsylvania iZ =6m.17s., iN =9m.56s.
San Juan i =7m.9s.
Bozeman eP_cP =9m.13s., i =11m.51s.
Philadelphia i =6m.38s., eS =11m.2s.
Mineral eN =13m.44s.
Buffalo e =12m.47s. and 13m.39s.
Palisades iPP =7m.24s., iPPP =7m.44s.
Bermuda iP =6m.50s.
Spokane P_cP =9m.28s., P_cS =13m.27s., SS =14m.20s.
Saskatoon iSEN =13m.3s.
Huancayo i =13m.15s.
Shawinigan Falls eN =8m.4s.
Seven Falls iE =11m.51s., SSE =15m.12s.
Halifax PP =10m.6s., PPS =14m.33s.
La Paz iZ =8m.29s., iS =15m.2s., iZ =15m.29s., iSS =18m.41s. and 19m.17s.
Resolute Bay PS =18m.19s., PPS =18m.30s., e =22m.41s.
College iPP =12m.21s., iPPP? =13m.52s., eS_cS =20m.26s.
La Plata iPE =10m.43s., N =19m.29s.
Apia e =12m.44s.
Rathfarnham Castle iZ =12m.22s., ePPPN =16m.43s., iPSEN =22m.31s., iEN =23m.3s., eSSEN =27m.41s.
Lisbon iSN =22m.22s., Q?N =34m.41s.
Edinburgh PPE =15m.17s., SKSE =22m.27s., S_cSE =22m.36s., PSE =22m.59s.
Aberdeen E =15m.11s., iPPPE =17m.12s., iEN =24m.19s., SSE =28m.7s., iSSSEN =31m.27s.
Kew i =12m.41s., e =13m.57s., 23m.27s., and 28m.21s., iSSZ =30m.49s., iN =31m.33s.
Bergen eE =12m.47s., 15m.1s., and 15m.59s., EN =23m.19s.?, eE =24m.19s.?.
Toledo i =12m.42s. and 23m.4s., eE =24m.5s., SS =28m.9s., eN =29m.9s., e =32m.54s.
Malaga PPPN =17m.54s.
Granada PP =15m.58s., iS =23m.28s., PS =24m.22s., SS =28m.22s.
Paris ePPP =17m.48s., iS_cS =23m.24s., iPPS =24m.32s., iSS =28m.37s., iPKKP =31m.4s., iSSS =32m.18s. and other unidentified i readings.
De Bilt iZ =18m.12s., iPS =24m.37s., eSS =29m.11s.
Alicante PP =16m.54s., PPP =18m.9s., S_cS =23m.46s., PPS =24m.42s., SS =29m.19s., SSS =33m.3s., Q =35m.42s.
Tortosa S_cSE =23m.43s., PSE =24m.30s., SSEN =29m.50s.
Clermont-Ferrand i =14m.8s., 15m.17s., and 17m.17s., ePPP =18m.32s., e =21m.47s., i =22m.28s., ePPS =24m.33s., e =25m.21s.
Besançon e =13m.27s., 13m.45s., 14m.7s., 14m.27s., 14m.48s., and 16m.8s.
Copenhagen 24m.35s., 25m.5s., and 29m.17s.
Strasbourg ePP =18m.28s. and 18m.41s., iSKS =23m.31s., iPS =24m.1s., iPPS =25m.24s., iSS =29m.48s., eSSS =33m.44s., and many other unidentified readings.
Upsala esPE =13m.31s., eN =15m.36s., iPP =16m.20s.?, ipPPN =16m.41s., ipPPE =16m.47s., eE =19m.55s., ipS =23m.48s., eN =24m.53s., eE =25m.24s., esSS =29m.54s.
Stuttgart iZ =13m.12s., eZ =14m.7s., iPP =16m.38s., e =19m.40s., ePS =25m.17s.
Zürich eSKS =23m.21s.
Jena ePE =13m.4s., eZ =13m.13s., eE =16m.7s., iPPN =16m.41s., eSZ =23m.57s., eE =25m.21s., eSS?E =29m.55s.
Potsdam iE =20m.11s., eSSEN =30m.5s., eEN =34m.59s.
Collmberg eE =14m.17s.?, eEN =16m.48s., eN =24m.12s., ePPSE =25m.31s., eN =25m.35s., eSSEN =30m.17s.
Cheb ePPP =19m.12s., eSKSE =23m.49s., ePSN =25m.9s., ePPS =25m.28s., eSS =30m.28s., eSSS =34m.17s.
Pavia eSKS =23m.39s., e =35m.18s.
Helsinki iSN =24m.40s., iPSN =25m.4s.
Prague iP =13m.13s., iN =13m.19s., e =18m.2s. and 18m.42s., eSKS? =23m.51s., ePS =25m.2s., ePPS =25m.47s., e =26m.59s., eSS =30m.44s., eSSS =33m.47s.
Bologna e? =23m.47s., eS =25m.5s.,
Triest iSKS =23m.52s., iSKKS =24m.5s., iPS =25m.50s., iSS =30m.58s.
Pulkovo iPPP =18m.55s., ePS =25m.54s.
Warsaw ePE =13m.37s., eN =17m.36s., eE =19m.9s. and 21m.29s., SKS =24m.12s., eSE =24m.48s., PSEN =25m.58s., PPSEN =26m.39s., SS =31m.21s., eN =33m.39s., SSS =34m.57s.
Rome e =14m.57s., eSS =31m.57s.
Tunis e =18m.17s., eS =25m.2s., eSSS =34m.11s., e =40m.41s.

Continued on next page.

Ogyalla eN =19m.10s., ePPP =19m.53s., eE =23m.50s., e =25m.39s., ePSE =25m.59s., ePPSN =26m.20s.
Skalnate Pleso e =24m.3s., ePS =26m.3s., eSS? =30m.53s., eSSS? =34m.53s.
Budapest eE =17m.11s., PPN =17m.23s., iN =17m.45s., PPPE =18m.58s., SKKSEN = 24m.17s., PSEN =26m.17s., PPSE =26m.49s., PPSE =26m.57s., SSE =30m.32s., SSN =30m.59s., SSSN =34m.4s., SSSE =35m.11s.
Kalocsa eE =26m.31s., SSN =30m.37s.
Tamanrasset iZ =13m.45s., eZ =21m.35s. and 22m.13s., iPPSZ =26m.33s., ePKP,PKPZ =38m.39s.
Lwow ePPP =19m.50s., eSKS =24m.6s., ePS =26m.37s., eSS =31m.54s., eSSS = 35m.59s.
Belgrade e =31m.11s. and 39m.40s.
Wellington i =15m.17s., eSKKS =24m.42s., iS? =25m.35s., eZ =26m.33s., iPS = 27m.7s.
Moscow PPP =20m.11s., SKS =24m.25s., SKKS =24m.51s.
Christchurch ePPPEZ =19m.41s., eEZ =23m.57s., SNZ =24m.59s., ePS? =26m.3s., ePPS =27m.7s., eSSEN =31m.27s., eQE =40m.17s.
Bucharest eE =18m.21s., eN =18m.26m., eE =19m.58s.
Vladivostok ePPP =20m.28s.
Sverdlovsk iPPP =21m.8s., PS =27m.50s., SS =33m.45s.
Irkutsk SSS =38m.53s.?.
Helwan eZ =18m.29s. and 21m.23s., PPPZ =21m.52s., eZ =24m.3s., eN =26m.41s., iEN =29m.17s.
Brisbane eE =25m.39s., eSSE =35m.47s.
Riverview eSKKSE =26m.46s., iPSE =29m.43s., iPPSE =29m.58s., iE =35m.40s. and 36m.34s., eQN =47·8m.
New Delhi iN =27m.14s., SKKKSN =29m.12s., PSN =32m.25s., PPSN =34m.21s., SKKSN(Δ >180°) =35m.50s., iN =40m.51s. and 45m.55s.
Calcutta SKSE =23m.4s., PPPE =25m.33s., PKKPE =28m.50s., SKKSE =29m.28s., PKKSE =32m.34s., SKSPE =32m.53s., PPSE =35m.9s., SKKSE(Δ >180°) = 35m.38s. and 36m.19s., SKKKSE =38m.11s., SSE =41m.8s., SSPE =41m.45s., SSSE =46m.17s., QE =59m.15s.
Bombay PPPN =26m.16s., PSE =33m.37s., iSSEN =41m.57s.
Poona PKSN =23m.3s. and 23m.30s., PPPN =26m.15s., PKKPN =27m.53s., SKKSN = 29m.44s., SKKKSN =30m.8s., PKKSN =31m.56s., PPPN =33m.35s., PPSN = 36m.4s., iN =36m.59s., SSN =42m.2s., SSPN =42m.49s., SSSN =47m.30s., SSP_2N= 53m.50s., SSS_2N =60m.54s., QN =62m.4s.
Perth i =21m.32s. and 31m.30s.
Hyderabad SKSPN =33m.39s.
Tananarive PS =33m.44s., PPS =36m.0s., SS =42m.47s., SSS =48m.20s.
Long waves were also recorded at Auckland and Kaimata.

Dec. 14d. Readings also at 0h. (China Lake, Overton, and Pierce Ferry), 1h. (Mount Wilson, China Lake, Overton, Pierce Ferry, Hungry Horse, and College), 2h. (Palisades (2) and Tamanrasset), 3h. (Overton (2) and Pierce Ferry (2)), 4h. (near Istanbul), 5h. (Mount Wilson, Palomar, China Lake, Pierce Ferry, and near Dzhergetal), 6h. (Palomar, China Lake (2), Tinemaha, Overton (2), Pierce Ferry (2), and Apia (2)), 7h. (Palomar, China Lake, Tinemaha, Pierce Ferry (2), College (2), Hungry Horse (2), Overton (2), and Tucson (2)), 9h. (Overton, Pierce Ferry, and Hungry Horse), 10h. (Hungry Horse and Brisbane), 11h. (Brisbane (3), La Paz, Grahamstown, Pretoria, Riverside, China Lake, Overton (2), Pierce Ferry, Tinemaha, Hungry Horse, Victoria, College, Ksara, and Tamanrasset (2)), 12h. (Overton and near Ashkabad), 13h. (Tucson, Berkeley, Ukiah, China Lake, Hungry Horse, near Pasadena, Boulder City (2), Overton (4), Pierce Ferry (2), Fresno, Santa Barbara, and near Santa Clara), 14h. (Mount Wilson, Palomar, Pasadena, Riverside, China Lake (2), Tinemaha (2), Tucson, Boulder City (2), Overton (2), Pierce Ferry (2), Santa Clara, College, Merida, Samarkand, Stalinabad, Tchimkent, near Dzhergetal, Fergana, Obi-garm, and near Athens), 15h. (Hungry Horse, Overton, and near Huancayo), 16h. (Guadalajara (3), near Tacubaya (2), Vera Cruz (3), Mount Wilson, Riverside, China Lake, Overton (3), Pierce Ferry, Hungry Horse (2), College (3), near Santa Clara, and Shasta Dam), 17h. (Pierce Ferry (2), College, Vera Cruz (3), near Puebla (4), and Tacubaya (3)), 18h. (College, Vera Cruz, near Puebla, Tacubaya, and near Huancayo), 19h. (Puebla), 20h. (Guadalajara, Puebla, near Tacubaya (2), near Obi-garm, near Mary, and near Dzhergetal), 21h. (Vera Cruz (2), near Puebla (2), Tacubaya (2), and near Shasta Dam), 22h. (Pietermaritzburg, Tacubaya, Overton, and near Shasta Dam), 23h. (College).

Dec. 15d. 1h. 38m. 9s. Epicentre 22°·3N. 142°·5E. Depth of focus 0·020.
(as on 1945, Oct. 5d.).

A = −·7347, B = +·5638, C = +·3773; δ = +1; h = +4;
D = +·609, E = +·793; G = −·299, H = +·230, K = −·926.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		22·6	340	i 4 36	−11	i 8 29?	−10	—	—	—
Irkutsk		41·9	326	e 7 29	− 7	e 13 25?	−17	—	—	—
Przhevalsk		56·4	308	i 9 26	− 1	—	—	—	—	—
Almata		57·5	309	9 32	− 3	17 19	+ 2	—	—	—
Frunse		59·2	308	i 9 45	− 2	i 17 41	+ 1	—	—	—
Andijan		61·0	306	e 9 57	− 2	18 4	+ 2	—	—	—
College		61·4	27	e 9 58	− 3	e 18 7	− 1	i 10 27	pP	e 24·8
Fergana		61·5	305	i 10 0	− 2	e 18 10	+ 1	—	—	—
Dzhergetal		62·1	304	i 10 4	− 2	i 18 15	− 1	—	—	—
Tchimkent		62·9	307	i 10 12	+ 1	i 18 29	+ 3	—	—	—
Luncharskoe		63·2	307	—	—	i 18 31	+ 1	—	—	—
Obi-garm		63·3	304	e 10 11	− 3	e 18 31	0	—	—	—
Tashkent		63·3	307	—	—	i 18 30	− 1	—	—	—
Stalinabad		64·0	304	i 10 18	− 1	i 18 41	+ 1	—	—	—
Bombay		64·8	281	—	—	e 18 51?	+ 1	—	—	—
Samarkand		65·2	305	e 10 25	− 1	—	—	—	—	—
Sverdlovsk		67·2	325	i 10 35	− 4	i 19 13	− 6	—	—	—
Victoria	z.	76·2	43	e 11 32	0	—	—	—	—	—
Resolute Bay		76·6	13	i 11 31	− 3	e 21 4	− 2	e 12 0	pP	—
Seattle		77·2	43	i 11 40a	+ 2	—	—	12 23	pP	—
Baku		77·8	309	—	—	e 21 26	+ 7	—	—	—
Lenkoran		79·1	308	i 20 48	?	i 21 34	+ 3	—	—	—
Shasta Dam		79·5	51	i 11 51	+ 1	—	—	i 12 20	pP	—
Moscow		79·8	326	—	—	i 21 31	− 9	—	—	—
Grozny		79·8	313	e 11 52	0	i 21 39	− 1	—	—	—
Mineral	z.	80·2	50	i 11 55	+ 1	—	—	e 12 25	pP	—
Berkeley	z.	80·6	53	i 11 58a	+ 2	—	—	i 12 27	pP	—
Lick	z.	81·2	53	i 12 1a	+ 2	—	—	i 12 31	pP	—
Reno		81·8	50	e 12 3	+ 1	—	—	i 12 32	pP	—
Hungry Horse		82·1	40	i 12 5	+ 1	e 23 7	PS	i 12 33	pP	—
Fresno	z.	82·8	53	e 12 9a	+ 2	—	—	e 12 38	pP	—
Tinemaha	z.	83·8	52	i 12 15a	+ 3	—	—	i 12 46	pP	—
China Lake	z.	84·8	53	i 12 19a	+ 2	—	—	i 12 46	pP	—
Pasadena		85·1	55	i 12 21a	+ 2	i 22 36	+ 3	i 12 50	pP	—
Riverside	z.	85·7	55	i 12 23	+ 1	—	—	i 12 50	pP	—
Palomar		86·4	55	i 12 26a	+ 1	i 22 51	+ 5	e 12 53	pP	—
Overton	z.	86·8	51	i 12 31	+ 4	—	—	i 13 0	pP	—
Boulder City		86·8	53	i 12 30	+ 3	—	—	i 12 59	pP	—
Yalta		86·9	317	—	—	i 22 41	[+ 5]	—	—	—
Pierce Ferry		87·3	52	i 12 33	+ 3	e 23 3	+ 9	i 13 2	pP	—
Ksara		90·7	307	e 12 45	− 1	e 23 6	[+ 6]	i 24 39	SP	—
Tucson		91·4	54	i 12 53	+ 4	—	—	i 13 22	pP	—
Prague		94·6	330	e 12 51?	−13	—	—	e 13 51	pP	—
Stuttgart	z.	97·9	332	e 13 17	− 2	—	—	—	—	—
Tamanrasset	z.	118·7	315	18 33k	[+ 4]	e 28 54	SP	i 19 5	pPKP	—
Pretoria	z.	120·5	253	i 18 38	[+ 5]	—	—	—	—	—
Grahamstown	z.	123·0	245	i 18 44	[+ 7]	—	—	—	—	—
La Paz	z.	150·6	84	i 19 35	[+ 8]	—	—	e 23 15	PP	—

Additional readings :—
Resolute Bay PPPE = 15m.55s., PS = 21m.21s., e = 21m.30s., SS = 25m.27s.
Seattle i = 12m.9s., e = 12m.51s. and 13m.54s.
Berkeley eZ = 13m.44s. and 14m.46s.
Lick iZ = 12m.17s.
Reno ePP?Z = 15m.0s.
Tucson ePP? = 17m.21s.
Tamanrasset eZ = 19m.1s., ePPZ = 19m.43s., eZ = 19m.47s. and 31m.43s.

Dec. 15d. Readings also at 1h. (near Shasta Dam), 2h. (Hungry Horse, near Samarkand, Andijan, Tchimkent, Stalinabad, Obi-garm (2), Lunacharskoe, Dzhergetal (2), and Fergana), 3h. (Hungry Horse, Overton (3), Pierce Ferry (3), China Lake, near College, Vera Cruz, Puebla, Tacubaya, Frunse, Andijan, near Almata, Naryn, and Przhevalsk), 4h. (Riverside, Palomar, Hungry Horse, Overton (2), Pierce Ferry (2), China Lake, College, near Vera Cruz, Puebla, Tacubaya, Almata, Frunse, Przhevalsk, Lunacharskoe, Obi-garm, near Andijan (2), Fergana (2), and Dzhergetal (2)), 5h. (Tucson, Hungry Horse, Overton, Pierce Ferry, and China Lake), 6h. (La Paz, Tacubaya, Overton, and Pierce Ferry), 7h. (near Naryn, Andijan, Dzhergetal (2), and near Ashkabad), 8h. (Tacubaya), 9h. (near Tacubaya (2), Puebla (2), Vera Cruz (2), Guadalajara, Tucson, Hungry Horse, Overton, Pierce Ferry, China Lake, Mount Wilson, Riverside, Palomar, near Shasta Dam (4), Boulder City (2), College, Pretoria, near Istanbul (2), near Gandzha, Stepanavan, and Tsikhlis-Dzhvari), 10h. (Salt Lake City, Seattle, near Huancayo, and near Dzhergetal (2)), 11h. (Tacubaya), 12h. (near Yalta), 13h. (near Shasta Dam and near Dzhergetal), 14h. (near Dzhergetal), 15h. (Port au Prince, Weston, Harvard, Hungry Horse, Pierce Ferry, Overton, College, and near San Juan), 17h. (Balboa Heights and Overton), 18h. (Pretoria Pasadena, Tucson, Boulder City, Overton (2), Pierce Ferry, Branner, Fresno, Lick, Mineral, Hungry Horse, near Berkeley, Santa Clara, Reno, and Tinemaha), 20h. (Palisades, Pierce Ferry, College (3), and near Balboa Heights), 21h. (near Istanbul and Pierce Ferry), 22h. (Prague), 23h. (San Juan, Puebla, Tacubaya, near La Paz, Semipalatinsk, Fergana (2), Przhevalsk, Andijan, Stalinabad (2), Lunacharskoe, Tashkent, Tchimkent (2), near Naryn (2), Almata, Frunse (2), and Obi-garm).

Dec. 16d. 10h. 49m. 4s. Epicentre 43°·7N. 126°·7W. (as on 1950 June 19d.).

$A = -\cdot4335$, $B = -\cdot5815$, $C = +\cdot6884$; $\delta = -4$; $h = -3$;
$D = -\cdot802$, $E = +\cdot598$; $G = -\cdot411$, $H = -\cdot552$, $K = -\cdot725$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seattle		5·0	36	i 1 22a	+ 4	i 2 25	+ 7	—	—	e 3·0
Mineral		5·1	130	e 1 19	− 1	e 2 30	+10	—	—	e 3·0
Victoria		5·3	24	1 23	+ 1	2 28	+ 3	1 36	P*	—
Reno		6·6	126	e 1 42k	+ 1	—	—	e 2 3	P*	e 3·8
Berkeley		6·7	148	e 1 39k	− 3	e 3 8	+ 8	e 1 54	P*	e 5·7
Santa Clara		7·3	149	i 1 59	+ 9	e 4 15	S_g	—	—	e 5·2
Lick	z.	7·4	147	i 1 48k	− 4	—	—	—	—	i 4·5
Fresno		8·7	140	e 2 9k	− 1	—	—	—	—	—
Tinemaha	z.	9·2	133	e 2 19	+ 3	—	—	—	—	—
Hungry Horse		10·0	58	i 2 29	+ 2	—	—	—	—	—
China Lake	z.	10·6	135	i 2 34k	− 2	—	—	—	—	—
Logan		11·1	95	e 2 37	− 6	—	—	—	—	e 5·8
Bozeman		11·3	75	e 2 48	+ 2	—	—	—	—	e 5·7
Pasadena		11·6	142	i 2 47a	− 3	—	—	—	—	e 5·2
Overton	z.	11·8	123	i 2 54	+ 1	—	—	—	—	—
Riverside	z.	12·1	140	i 2 54k	− 3	—	—	—	—	—
Pierce Ferry		12·3	124	i 3 1	+ 2	—	—	—	—	—
Palomar	z.	12·8	140	e 3 5	− 1	—	—	—	—	—
Tucson		16·9	127	e 4 1	+ 2	e 7 32	+25	—	—	e 9·2
College		24·3	338	e 5 16	− 4	e 9 3	−34	—	—	e 12·3
Ottawa		35·9	69	i 7 4	0	—	—	e 8 28	PP	—
San Juan		56·3	96	i 9 43	− 2	—	—	—	—	—

Additional readings.
Seattle i = 1m.26s., 1m.31s., 2m.37s., 2m.42s.., and 2m.45s.
Victoria i = 2m.39s.
Berkeley eQEN = 4m.44s.
Long waves were also recorded at Butte, Salt Lake City, Ukiah, Sitka, Chicago and Palisades.

Dec. 16d. Readings also at 0h. (Mount Wilson, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry (2), Lick, Reno, Mineral, Hungry Horse, Tamanrasset, Andijan, Fergana, Lunacharskoe, Samarkand, Tashkent, Tchimkent, near Almata (2), Frunse, Naryn (2) and Przhevalsk (2), several shocks.), 1h. (Apia, Boulder City, Overton, Pierce Ferry, College, near Tucson, near Oaxaca, Puebla (2) Tacubaya (2), Vera Cruz, Naryn (2), near Almata (2), Frunse (2) and Przhevalsk (2), several shocks), 3h. (Apia, China Lake, Tucson, Overton, Pierce Ferry, and Huancayo), 4h. (Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Hungry Horse, College, Salt Lake City, Guadalajara, near Oaxaca, Puebla, Tacubaya, and Vera Cruz), 7h. (College), 8h. (Overton, Pierce Ferry, and La Paz), 10h. (Almata, Naryn, near Przhevalsk, near Prague, near Puebla, and Tacubaya), 11h. (Weston, near Puebla (2), and Tacubaya (2)), 12h. (Andijan, Samarkand, near Obi-garm, Stalinabad, Theodosia, and near Prague), 14h. (College, and near Tortosa), 15h. (Brisbane, Riverview, Christchurch, Wellington, Mount Wilson, Palomar, China Lake, Tinemaha, Tucson, Overton, Pierce Ferry, Lick, College, and Stuttgart), 16h. (Mount Wilson (2), China Lake (3), Tinemaha (3), Tucson, Boulder City (2), Pierce Ferry (3), Berkeley, Lick (2), Reno, Mineral, College, Stuttgart, near Ashkabad, and Mary), 17h. (Strasbourg, Stuttgart, and near Przhevalsk), 18h. (Pierce Ferry, Hungry Horse, College, Besançon, Collmberg, Strasbourg, and Stuttgart), 20h. (near Ottawa, and near Tchimkent), 21h. (Collmberg), 22h. (Seattle, and near Messina).

Dec. 17d. 1h. 7m. 58s. Epicentre 16°·3N. 98°·6W. (as on 14d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		1·9	68	0 36	+ 2	1 6	+ 7	—	—	—
Puebla		2·8	8	0 49	+ 2	1 31	+ 9	—	—	—
Tacubaya		3·1	350	0 52	+ 1	—	—	—	—	1·7
Vera Cruz		3·7	39	1 1	+ 1	—	—	—	—	2·0
Tucson		19·4	328	i 4 29	− 1	—	—	—	—	e 10·2
Palomar		23·7	321	i 5 14 a	0	—	—	—	—	—
Pierce Ferry		24·0	328	i 5 18	+ 1	—	—	—	—	e 13·0
Boulder City		24·3	327	i 5 21	+ 1	—	—	—	—	e 12·8
Riverside		24·4	321	i 5 21	0	—	—	—	—	—
Lincoln	E.	24·5	3	—	—	e 9 24	−16	—	—	e 13·9
Overton	Z.	24·6	328	i 5 23	0	—	—	—	—	e 13·2
Pasadena		25·0	321	i 5 26	− 1	i 10 8	+19	—	—	e 11·2
Chinchina		25·2	113	e 5 32?	+ 3	e 11 17?	SS	—	—	—
China Lake	Z.	25·8	323	i 5 33 a	− 1	—	—	—	—	—
Bogota		26·7	113	e 5 49	+ 6	e 10 25	+ 8	—	—	—
Tinemaha		27·1	324	i 5 45 a	− 1	—	—	—	—	—
Chicago		27·2	17	—	—	e 10 30	+ 5	—	—	e 16·5
Fresno	Z.	27·7	322	e 5 50 a	− 2	—	—	—	—	—
Logan		27·8	339	—	—	e 10 50	+15	—	—	e 14·2
Rapid City	E.	28·0	353	e 7 0	+65	—	—	—	—	e 15·1
Lick	Z.	29·2	321	i 6 5 a	0	—	—	—	—	—
Reno		29·6	326	e 6 9	0	—	—	—	—	—
San Juan		31·0	80	e 6 19	− 2	e 11 9	−17	—	—	—
Bozeman		31·1	344	—	—	e 11 39	+11	—	—	e 16·8
Mineral	Z.	31·2	325	e 6 22	− 1	—	—	—	—	—
Hungry Horse		34·4	341	i 6 49	− 2	—	—	—	—	—
Bermuda		34·6	56	—	—	e 13 10	+48	—	—	e 14·3
Ottawa		34·8	28	6 52	− 2	—	—	—	—	—
Seattle		36·9	334	i 7 12	0	—	—	—	—	e 20·0
Victoria		37·9	334	7 20	0	—	—	—	—	—
La Paz		44·3	135	i 8 19	+ 6	14 42	− 6	—	—	21·8
Resolute Bay		58·4	1	e 9 56	− 4	—	—	—	—	e 30·1
College		58·7	338	i 9 58	− 4	—	—	—	—	e 29·3
Paris		85·0	42	e 12 36	− 2	—	—	—	—	e 44·0
Tamanrasset	Z.	96·2	65	e 13 32	+ 1	—	—	—	—	—

Additional readings :—
Lick iZ =6m.33s.
Long waves were also recorded at Guadalajara, Manzanillo, Merida, Butte, Salt Lake City, Sitka, Stuttgart, and Rome.

Dec. 17d. Readings also at 0h. (Hungry Horse), 1h. (Puebla, Pasadena, China Lake, Tinemaha, Tucson, Overton, Pierce Ferry, and near Santa Clara), 2h. (Vera Cruz, near Puebla, Tacubaya, near Tananarive, and near Andijan), 3h. (Mount Wilson, Riverside, China Lake, Tucson, Overton, Pierce Ferry, Lick, Hungry Horse, College, Guadalajara, Oaxaca, near Puebla, Tacubaya, and Vera Cruz), 5h. (Riverside, China Lake, Boulder City, Overton, Pierce Ferry, Lick, Mineral, and College), 6h. (Mount Wilson, Riverside, China Lake, Overton, and Pierce Ferry), 8h. (near Obi-garm), 9h. (Pierce Ferry, near Puebla (2), and Vera Cruz), 10h. (China Lake, Overton, Pierce Ferry, College, and Tamanrasset), 11h. (La Paz, Kaimata, near Christchurch, New Plymouth, and Tuai), 13h. (near Stuttgart, and near Dzhergetal), 18h. (Calcutta, New Delhi, Poona, and near Dzhergetal), 19h. (College, Tamanrasset, Bombay, Fergana, Przhevalsk, near Andijan, Dzhergetal, and Naryn), 20h. (College, Tamanrasset, New Delhi, Ashkabad, Almata, Frunse, Przhevalsk, Samarkand, near Andijan (3), Dzhergetal (3), Fergana (2), Lunacharskoe (2), Naryn (3), Obi-garm (2), Stalinabad (2), Tashkent (2), and Tchimkent (2)), 21h. (Oaxaca, near Puebla, Tacubaya, Vera Cruz, and near Dzhergetal), 22h. (La Paz), 23h. (China Lake, La Paz, Puebla, near Tacubaya, and near Dzhergetal).

Dec. 18d. 2h. Kermadec Islands.
New Plymouth eE =31m.
Wellington eP? =32m.15s., iPZ =32m.34s., e =32m.47s., i =33m.48s., and 34m.25s., e =34m.35s., 34m.40s., and 36m.6s., eS? =36m.30s.
Kaimata ePNE =32m.45s., eS?NE =35m.38s.
Christchurch eZ =33m.20s., eS? =35m.0s., LZ =36m.25s.
Brisbane iPE =35m.8s., iSE =39m.38s.
Riverview iPZ =35m.25s.k, iEZ =35m.49s., iSN =39m.37s., iEN =40m.12s., eLZ =41·9m.
Pasadena ePZ =42m.42s., epP?Z =42m.52s., eLE =76m.36s.
Riverside ePZ =42m.44s.
Palomar iP =42m.45s.
China Lake iPZ =42m.49s., ipPZ =43m.1s.
Tinemaha ePZ =42m.53s.
Mineral ePZ =42m.53s., eZ =44m.18s., ePPZ =46m.20s.
Pierce Ferry eP =43m.1s., e =45m.25s.
Tucson iP =43m.1s., e =45m.26s., eL =79m.28s.
Overton ePZ =43m.2s., eZ =45m.27s.
College eP? =43m.46s., eSS =65m.44s., eL =76m.44s.
Ksara ePKP? =50m.49s.?, e =54m.9s., and 64m.28s.
Rome ePKPZ =51m.1s., eSKP?Z =54m.9s., ePPZ =55m.13s., eSKKS?Z =62m.1s.
Long waves were also recorded at La Plata, Resolute Bay, De Bilt, Paris, and Stuttgart.

Dec. 18d. 8h. 4m. 45s. Epicentre 14°·5N. 90°·5W. Depth of focus 0·020.
A = −·0085, B = −·9685, C = +·2488 ; δ = −3 ; h = +6 ;
D = −1·000, E = +·009 ; G = −·002, H = −·249, K = −·969.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida		6·4	7	e 1 27	− 6	i 2 38	− 7	—	—	—
Vera Cruz		7·1	312	—	—	e 3 6	+ 4	—	—	—
Puebla		8·6	303	e 2 5	+ 3	i 3 41	+ 3	—	—	—
Tacubaya		9·6	302	e 2 20	+ 5	i 4 8	+ 7	—	—	—
Balboa Heights		12·0	116	e 2 53	+ 6	—	—	—	—	—
Bogota		18·9	118	i 4 13	+ 2	i 7 43	+11	e 15 30	S_cS	—
San Juan		23·7	77	i 4 57	− 1	i 6 11	sP	i 5 35	pP	e 10·1
St. Louis		24·0	1	i 5 3	+ 2	e 9 5	+ 2	i 5 43	pP	—
Florissant		24·2	1	e 5 4	+ 1	e 9 9	+ 2	i 5 43	pP	—
Cincinnati		25·1	11	i 5 13	+ 2	i 9 26	+ 4	i 5 50	pP	—
Tucson		25·6	318	i 5 18	+ 2	e 9 13	−17	i 5 56	pP	e 10·7
Lincoln	E.	26·8	351	e 6 31	PP	—	—	—	—	e 10·9
Washington		27·0	24	i 5 31	+ 2	—	—	i 6 37	PP	e 11·3
Chicago		27·3	5	i 5 31	− 1	e 9 57	− 1	e 6 8	pP	e 11·6
Pittsburgh		27·4	18	i 5 33	+ 1	i 10 2	+ 3	—	—	—
Cleveland		28·0	14	i 5 39	+ 1	e 10 2	− 7	i 6 16	pP	—
Pennsylvania		28·4	21	i 5 42	0	i 10 16	+ 1	i 6 53	PP	—
Philadelphia		28·7	26	i 5 34	−10	e 10 8	−12	e 6 41	PP	e 12·6
Bermuda		29·5	49	i 5 46	− 5	e 10 48	+15	i 6 48	PP	e 12·4
City College, N.Y.		29·9	27	i 5 56	+ 1	—	—	—	—	—
Fordham		30·0	27	i 5 56	0	—	—	—	—	—
Palisades		30·1	27	i 5 57	0	e 10 40	− 2	i 6 54	PP	i 16·8
Pierce Ferry		30·1	321	i 5 59	+ 2	—	—	—	—	—
Huancayo		30·4	149	i 6 1	+ 2	i 10 51	+ 4	e 6 39	pP	—
Palomar		30·4	314	i 6 2a	+ 3	i 12 28	S_cP	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Overton	Z.	30·6	321	i 6 4	+ 3	—	—	—	—	—
Riverside	Z.	31·1	314	i 6 7a	+ 2	i 12 22	S_cP	i 8 56	P_cP	—
Rapid City	E.	31·4	343	i 6 11	+ 3	e 10 55	− 7	e 7 7	PP	—
Pasadena		31·7	314	i 6 12a	+ 2	i 12 24	S_cP	i 8 58	P_cP	—
China Lake	Z.	32·2	318	i 6 17a	+ 2	i 12 26	S_cP	e 8 57	P_cP	—
Harvard		32·3	28	i 6 16	0	—	—	—	—	e 17·8
Weston		32·3	28	i 6 16	0	—	—	i 6 54	pP	i 13·4
Logan		32·8	331	e 6 4	−16	e 11 22	− 2	e 6 46	pP	e 14·2
Ottawa		33·2	19	i 6 24	0	11 31	+ 1	e 7 42	PP	—
Tinemaha		33·4	318	e 6 27a	+ 2	—	—	i 12 28	S_cP	—
Fresno		34·2	317	e 6 33a	+ 1	—	—	e 8 41	P_cP	—
Shawinigan Falls	N.	35·2	22	e 6 38	− 2	—	—	—	—	—
Bozeman		35·6	336	e 6 43	− 1	e 12 7	0	e 13 27	sS	e 15·6
Reno		35·8	321	e 6 49a	+ 3	e 12 40	+30	e 7 30	pP	—
Seven Falls	E.	36·4	23	5 51	−59	—	—	—	—	—
Mineral		37·4	320	e 7 1	+ 2	e 12 44	+ 9	e 7 57	pP	—
La Paz		37·9	143	i 7 5a	+ 2	i 12 42	0	i 7 44	pP	19·0
Hungry Horse		38·9	336	i 7 13	+ 1	e 13 59	sS	e 7 54	pP	—
Seattle		42·3	329	e 7 41	+ 2	—	—	e 8 21	pP	—
Victoria		43·4	329	i 7 49	+ 1	14 7	+ 3	—	—	—
Resolute Bay		60·2	359	i 9 51	− 2	17 47	− 5	18 11	PS	—
College		63·4	337	i 10 13	− 2	—	—	i 10 47	pP	e 20·7
Rathfarnham Castle		75·1	39	e 11 36	+10	e 21 12	+23	e 13 7	sP	e 28·2
Malaga	Z.	78·4	55	i 11 43a	− 1	i 15 44	PP	12 30	pP	—
Kew		78·9	40	e 11 45	− 2	e 21 25	− 5	e 12 33	pP	e 30·2
Granada		79·0	55	i 11 48k	0	21 38	+ 7	12 48	pP	33·8
Bergen	N.	80·4	30	—	—	e 23 13	pS_cS	—	—	—
Paris		81·2	42	e 11 58	− 1	i 21 48	− 6	i 12 42	pP	e 38·2
De Bilt		82·1	38	i 12 6	+ 1	e 22 3	0	i 12 48	pP	—
Besançon		83·8	44	e 12 25	+13	e 13 14	sP	e 12 58	pP	—
Strasbourg		84·6	42	e 12 16	0	e 22 15	−13	e 13 3	pP	e 31·2
Stuttgart		85·5	41	e 12 19	− 2	e 22 30	[+ 3]	e 13 7	pP	e 41·6
Jena		86·3	39	e 12 23	− 2	e 27 25?	SS	e 13 12	pP	—
Upsala		86·4	29	—	—	i 22 39	[+ 6]	e 23 39	pS	—
Triest		89·4	43	—	—	e 22 38	[−15]	i 24 34	PS	—
Helsinki	N.	89·6	27	—	—	e 24 35	PS	—	—	—
Rome		89·8	47	e 12 37	− 5	e 23 1	[+ 6]	e 16 11	PP	—
Tamanrasset	Z.	89·9	67	e 12 40	− 2	—	—	e 13 28	pP	—
Warsaw		91·3	35	e 16 31	PP	e 23 30	− 1	e 17 21	pPP	—
Istanbul		101·5	41	e 17 45	PKP	—	—	—	—	—
Ksara		109·9	45	e 18 45	[+33]	e 28 24?	PS	—	—	—

Additional readings :—
St. Louis isP =6m.2s., i =9m.39s., isS =10m.3s., i =10m.16s.
Florissant iP =5m.7s., isP =6m.3s., i =9m.44s., isS =10m.6s., i =10m.17s.
Cincinnati isP? =6m.9s., isS =10m.36s.
Chicago isS =11m.6s.
Cleveland eEN =6m.41s., iE =10m.10s., eN =10m.43s., esSN =11m.10s., eSSN =11m.30s., isSSN =12m.28s.
Pennsylvania iN =8m.17s., iP_cPZ =8m.36s., iS_cPN =11m.40s., iE =11m.46s.
Philadelphia esS =11m.27s.
Palisades i =7m.33s., eSS =12m.35s.
Rapid City ePPP?E =7m.57s., esSE =12m.15s.
Ottawa SSS =13m.56s.
Fresno eZ =9m.5s.
Reno eZ =7m.6s.
Mineral eZ =8m.27s., eZ =10m.23s.
La Paz i =14m.15s.?, iSS =15m.40s.
Hungry Horse iP_cP =9m.18s.
Seattle e =7m.51s., 8m.7s., 8m.42s., 10m.0s., and 10m.20s.
Resolute Bay eZ =10m.33s., eE =19m.0s. and 20m.42s., SSE =21m.36s., SSSE =23m.54s.
Rathfarnham Castle eEN =25m.14s.
Malaga PPSZ =22m.54s.
Kew ePPZ =15m.48s., eSKSEN =22m.52s.
Granada PP =15m.9s.
Paris isP =13m.1s., iPP =15m.4s., i =16m.16s. and 18m.36s., iPS =23m.11s., e =35m.12s.
De Bilt esS =23m.21s.

Continued on next page.

Besançon ePP = 15m.34s.
Strasbourg esP = 13m.21s., ePP = 15m.27s., e = 18m.57s., esS = 23m.47s.
Stuttgart esPZ = 13m.25s., ePPZ = 15m.44s., ePPS? = 23m.53s., eSS = 27m.39s.
Jena eE = 13m.34s., ePP?N = 15m.35s., ePP?E = 15m.43s.
Upsala iS?N = 22m.44s., esS?N = 24m.5s.
Rome e = 17m.9s., ePS = 24m.33s.
Tamanrasset eZ = 14m.52s.
Warsaw eSKS = 22m.58s., e = 24m.16s., ePS = 24m.25s., ePPS = 24m.55s.
Long waves were also recorded at Oaxaca, Vermont, and Alicante.

Dec. 18d. 15h. 44m. 42s. Epicentre 3°·9S. 128°·2E.

A = −·6170, B = +·7840, C = −·0676; δ = −9; h = +7;
D = +·786, E = +·618; G = +·042, H = −·053, K = −·998.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Korror		12·8	29	4 4	+58	6 53	L	—	—	(6·9)
Manila		19·7	338	i 4 25	− 9	—	—	i 4 41	pP	—
Bandong		20·7	262	i 4 50	+ 6	i 9 8	SS	—	—	—
Djakarta		21·4	264	e 4 52	+ 1	i 8 13	−32	—	—	—
Guam		23·8	42	5 47	PPP	—	—	—	—	—
Perth		30·2	201	i 6 28	+14	11 20	+ 7	i 7 38	PPP	15·5
Brisbane		33·3	136	e 6 39	− 2	e 12 0	− 2	e 12 3	S	—
Riverview		36·7	146	i 7 11a	+ 1	i 12 56	+ 2	i 8 41	PP	15·6
Nanking		36·9	346	7 0	−12	e 12 39	−19	i 7 21	pP	—
Vladivostok		46·9	4	e 8 33	− 1	i 15 21?	− 4	—	—	—
Calcutta	E.	47·0	306	i 8 42k	+ 7	i 15 27	+ 1	10 18	PcP	21·9
Colombo	E.	49·4	282	8 55	+ 2	17 37	?	10 55	PP	23·3
Kodaikanal	E.	52·4	286	i 9 19	+ 3	e 16 42	0	12 20	PPP	24·1
Hyderabad	N.	53·5	295	9 22	− 2	16 56	− 1	—	—	27·2
Christchurch		55·6	142	e 9 43	+ 3	17 23	− 2	e 21 33	SS	e 23·0
Wellington		55·8	138	e 10 58	PcP	e 17 23	− 5	e 23 54	SSS	28·0
Poona		58·0	295	i 9 54	− 3	17 56	− 1	10 46	PcP	24·0
New Delhi		58·7	307	e 10 1	− 1	e 18 0	− 6	12 16	PP	24·8
Bombay		59·0	295	e 10 3	− 1	i 17 58	−12	—	—	—
Irkutsk		59·5	343	e 10 9	+ 2	18 21?	+ 5	—	—	—
Przhevalsk		64·5	322	i 10 46	+ 5	—	—	—	—	—
Naryn		65·5	319	e 10 46	− 1	—	—	—	—	—
Almata		65·8	322	e 10 48	− 1	19 35	0	—	—	—
Frunse		67·1	320	e 11 1	+ 4	19 55	+ 4	—	—	—
Andijan		67·6	317	e 11 0	− 1	e 19 55	− 2	—	—	—
Dzhergetal		67·7	316	i 11 1	0	—	—	—	—	—
Fergana		67·8	317	10 59	− 3	—	—	—	—	—
Stalinabad		69·2	314	i 11 9	− 1	e 20 13	− 3	—	—	—
Lunacharskoe		69·9	316	—	—	i 20 23	− 1	—	—	—
Tashkent		69·9	316	i 11 12	− 3	i 20 19	− 5	—	—	—
Tchimkent		70·1	318	e 11 14	− 2	—	—	—	—	—
Mary		73·9	310	i 11 39	0	—	—	—	—	—
Sverdlovsk		81·2	329	12 17	− 2	—	—	—	—	—
Lenkoran		84·2	309	12 37	+ 3	22 59	0	—	—	—
College		90·9	25	e 13 5	− 2	e 24 2	− 1	e 30 0	SS	e 37·6
Sotchi		91·6	313	—	—	e 23 42?	[0]	—	—	—
Moscow		93·5	325	e 13 24	+ 5	e 23 52	[− 1]	e 17 5	PP	—
Ksara		94·1	303	e 13 24	+ 2	e 24 40	+ 9	—	—	—
Sitka		96·8	33	—	—	e 24 32	−22	e 31 36	SS	e 49·6
Pulkovo		97·3	329	—	—	e 25 9?	+11	—	—	—
Helwan		97·9	299	e 13 33	− 6	25 0	− 3	17 40	PP	—
Istanbul		99·4	311	e 13 44	− 2	—	—	—	—	e 56·3
Lwow		102·1	320	—	—	e 25 18	−20	—	—	—
Upsala	N.	103·6	331	—	—	e 33 18?	SSP	—	—	e 52·3
Warsaw		103·6	322	(e 18 11)	PKP	(e 24 31)	[−13]	(e 28 30)	PPS	(e 50·3)
Resolute Bay		105·0	11	e 14 12	+ 1	e 25 12	[+22]	19 48	?	—
Copenhagen		107·5	328	—	—	e 25 58	−26	—	—	50·3
Reno		109·4	49	e 19 4k	PP	—	—	e 19 54	?	—
Hungry Horse		111·1	38	e 18 1	[−34]	—	—	e 29 44	PKKP	—
Rome		111·6	314	e 19 30	PP	e 26 13	{− 3}	e 21 36	PPP	e 58·3

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena	z.	111·7	55	e 18 38	[+ 1]	—	—	e 19 23	PP	e 60·3
China Lake	z.	111·8	53	i 18 43	[+ 6]	—	—	—	—	—
Stuttgart		111·8	322	e 18 42	[+ 5]	e 39 18	SSS	e 29 56	PPS	e 60·3
Riverside	z.	112·4	55	e 19 26	PP	—	—	—	—	—
Strasbourg		112·7	322	e 19 18	PP	e 34 58	SS	e 29 54	PPS	e 53·3
De Bilt		112·9	326	e 19 48	PP	e 35 18	SSP	—	—	e 53·3
Pavia		113·0	318	—	—	e 27 4	{+38}	—	—	e 57·9
Overton	z.	114·2	51	e 18 46	[+ 5]	—	—	e 29 34	PKKP	—
Pierce Ferry		114·6	51	e 18 46	[+ 4]	—	—	—	—	—
Paris		115·8	323	e 18 51	[+ 6]	e 27 34	{+48}	i 29 26	PS	e 57·3
Kew		116·2	327	e 28 55	PKKP	e 36 39	SSP	e 42 25	Q	e 55·3
Tucson		118·1	55	e 18 53	[+ 4]	—	—	e 20 28	PP	e 56·2
Rathfarnham Castle		118·3	331	—	—	e 27 13	{+11}	e 37 12	SSP	—
Tamanrasset	z.	121·6	295	e 18 55	[− 1]	e 25 43	[−12]	e 23 6	PPP	—
Granada		124·9	313	i 20 57 a	PP	—	—	23 36	PPP	74·5
Malaga	z.	125·7	313	i 21 2k	PP	28 46	{+54}	31 58	PS	70·7
Cleveland	E.	134·1	31	—	—	e 39 35	SS	—	—	—
Bermuda		149·2	21	e 23 26	PP	e 42 38	SS	—	—	63·8
Huancayo		151·7	124	e 19 57	[+ 7]	e 43 58	SS	—	—	e 72·8
La Paz	z.	154·1	143	e 19 49	[− 4]	26 33	[−26]	23 38	PP	77·3
San Juan		159·9	42	e 21 6	PKP_2	—	—	—	—	—

Additional readings :—
Perth i =7m.1s., SS =14m.13s.
Riverview iZ =7m.17s. and 8m.37s., iEN =8m.44s., iZ =9m.5s., iN =9m.53s., isSE = 13m.10s., eE =14m.42s., iSSN =15m.27s.
Nanking iZ =7m.38s., iE =12m.51s.
Calcutta PPE =10m.28s., PPPE =11m.11s., P_cSE =14m.11s., PSE =15m.39s., PPSE = 15m.46s., S_cSE =18m.41s., QE =19m.31s., SSSE =19m.50s.
Kodaikanal QE =21m.42s.
Hyderabad SE =16m.47s., SSN =21m.34s.
Christchurch PPEZ =11m.43s., PPP =12m.58s., eS_cS?EN =18m.48s.
Wellington eSS? =20m.43s., e =24m.48s.
Poona PPE =12m.9s., PPPE =13m.21s., S_cPE =14m.37s., eSE =17m.39s., PSE = 17m.49s., S_cSE =19m.21s., SSE =21m.17s., SSSE =23m.45s.
New Delhi P_cPN =10m.52s., PPPN =13m.43s., iN =18m.35s.
College ePP =16m.45s.
Warsaw eS? =(25m.11s.), ePPS? =(27m.7s.), and other unidentified e readings, times have been reduced by 5 minutes.
Rome eS =29m.47s., e =37m.26s.
Stuttgart ePPZ =19m.11s., e =19m.54s., 20m.37s., 22m.38s., and 23m.31s., ePKKP = 30m.48s., e =31m.36s.
Strasbourg eSKP =22m.24s., e =28m.5s., and 29m.46s., eSSS =39m.36s., e =41m.54s.
De Bilt eE =31m.18s.
Pavia e =51m.44s.
Paris iPP =20m.4s., i =21m.49s., e =22m.48s., i =28m.52s., 30m.13s. and 32m.22s., eSS? =38m.54s.
Rathfarnham Castle eEN =46m.20s. and 48m.17s.
Tamanrasset ePPZ =20m.23s., ePKKPZ =29m.4s.
Granada pP =21m.42s.
Malaga PPPZ =24m.50s.
La Paz SKKS =29m.52s., SS =41m.42s.
Long waves were also recorded at Helsinki, Potsdam, and other American stations.

Dec. 18d. Readings also at 0h. (Tacubaya and College), 1h. (College), 2h. (Dzhergetal (2), Mount Wilson, Palomar, Pasadena, Riverside (2), China Lake (2), Tinemaha, Tucson, Overton, Pierce Ferry, Hungry Horse, Vera Cruz, near Oaxaca, Puebla (2), and Tacubaya (2)), 3h. (Puebla, Tacubaya, Mount Wilson, Pasadena, Riverside (2), China Lake (2), Tucson, Overton (2), Pierce Ferry (2), Hungry Horse, and College), 4h. (Tacubaya and Tucson), 5h. (Mineral), 6h. (Timisoara, near Bucharest, Istanbul, Sofia, near Dzhergetal, and Obi-garm), 7h. (near Ili), 8h. (near Tortosa), 9h. (Balboa Heights), 10h. (near Leninakan, Stepanavan, Tiflis, Tsikhlis-Dzhvari, and near Dzhergetal), 11h. (Stuttgart), 12h. (Christchurch, Kaimata, Tuai, Wellington, Palomar, Pasadena, Riverside, China Lake, Tucson, Overton, Pierce Ferry, Hungry Horse, Huancayo, La Paz, and Stuttgart), 14h. (near Istanbul), 15h. (Tacubaya, Puebla, San Juan, Huancayo, La Paz, La Plata, Palomar, Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Fresno, Mineral, Reno, Hungry Horse, and Stuttgart), 18h. (Dzhergetal, China Lake, Overton, Pierce Ferry, Puebla, and near Tacubaya), 19h. (Mount Wilson, Riverside, China Lake, Tinemaha, Boulder City, Overton, Pierce Ferry, Hungry Horse, and near La Paz), 20h. (near Dzhergetal and near Huancayo), 22h. (Mount Wilson, Riverside, China Lake, Tucson, Overton, Pierce Ferry, Tamanrasset, Vera Cruz, near Oaxaca, Puebla, and Tacubaya), 23h. (Prague).

Dec. 19d. 21h. 27m. 17s. Epicentre 53°·1N. 35°·1W. (as on 1948, June 19d.).

$A = +·4933$, $B = -·3467$, $C = +·7977$; $\delta = -13$; $h = -7$;
$D = -·575$, $E = -·818$; $G = +·653$, $H = -·459$, $K = -·603$.

		△	Az.	P.	O−C.	S.	+OC.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rathfarnham Castle		17·0	77	e 4 7	+ 6	—	—	—	—	e 13·7
Aberdeen	N.	19·2	64	—	—	i 7 54	− 5	—	—	—
Kew		21·2	80	e 4 50	+ 1	e 8 52	+11	—	—	e 9·7
Paris		23·9	85	e 5 17	+ 1	e 9 23	− 7	i 5 47	PP	e 9·7
De Bilt		24·3	75	e 5 37	+17	e 10 13	+36	—	—	e 11·7
Besançon		26·7	85	i 5 50	+ 7	e 10 31	+14	—	—	—
Granada		27·0	113	i 6 35k	PP	11 1	SS	—	—	13·9
Strasbourg		27·1	82	e 5 48	+ 2	e 10 29	+ 5	—	—	e 12·7
Ottawa	Z.	27·3	271	e 5 51	+ 3	—	—	—	—	—
Stuttgart		27·9	80	e 5 54	0	e 10 43	+ 6	—	—	e 13·7
Jena		28·4	76	e 5 59	+ 1	e 10 46	+ 1	e 6 55	PP	—
Collmberg	Z.	29·1	74	e 6 3	− 1	—	—	—	—	—
Resolute Bay		31·8	336	e 6 19	− 9	e 13 49	SSS	—	—	e 15·5
Tamanrasset	Z.	43·1	119	i 8 11k	+ 7	e 9 53	PP	e 10 3	P_cP	—
Hungry Horse		47·8	299	e 8 37	− 4	—	—	e 10 7	PP	—
Sverdlovsk		50·7	45	8 58	− 5	16 13	− 5	—	—	—
College		51·5	331	e 9 4	− 5	—	—	—	—	—
Ksara		52·7	82	e 9 19	+ 1	e 16 57	+11	—	—	—
Overton	Z.	55·8	288	e 9 41	0	—	—	—	—	—
Pierce Ferry		55·8	287	e 9 40	− 1	—	—	—	—	—
Boulder City		56·4	287	e 9 45	0	—	—	—	—	—
Tucson		56·7	281	e 9 49	+ 1	—	—	—	—	e 32·7
Tinemaha	Z.	57·6	290	e 9 55	+ 1	—	—	—	—	—
China Lake	Z.	58·1	289	e 9 55	− 3	—	—	—	—	—
Riverside	Z.	59·2	288	e 10 4	− 1	—	—	—	—	—
Pasadena	Z.	59·6	288	e 10 6	− 2	—	—	—	—	—
Tchimkent		65·1	52	i 10 40	− 5	—	—	—	—	—

Additional readings :—
Kew eEZ = 2m.48s.
Paris i = 5m.21s., iPPP = 5m.56s., e = 6m.31s.
Besançon e = 6m.18s.
Strasbourg e = 10m.41s.
Long waves were also recorded at Copenhagen, Palisades, and Chicago.

Dec. 19d. Readings also at 0h. (Overton, Pierce Ferry, Hungry Horse, Chinchina, Sofia, near Istanbul (3), and near Yalta), 1h. (Tacubaya), 3h. (College, La Paz, near Huancayo, near Gandzha, Leninakan, Stepanavan, Tiflis, and Tsikhlis-Dzhvari), 4h. (Riverside, China Lake, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Vera Cruz, near Oaxaca, Puebla, and Tacubaya), 5h. (Tacubaya), 7h. (Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, College, Puebla, Tacubaya, and Vera Cruz), 8h. (New Delhi and Tacubaya), 9h. (Mount Wilson, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Mineral, Hungry Horse (2), College (2), Paris, Strasbourg, Stuttgart, Ksara, Tamanrasset, Pretoria, Wellington, and near Apia), 12h. (Dzhergetal and Ksara), 13h. (near Dzhergetal (2)), 14h. (Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Mineral, Hungry Horse, College, and Stuttgart), 15h. (Huancayo), 16h. (Puebla and Tacubaya),17h. (Mount Wilson, Riverside, China Lake, Tinemaha, Overton, Pierce Ferry, Lick, Mineral, Ashkabad, Frunse, near Almata, Andijan, Naryn, Przhevalsk, and near Bogota), 18h. (College), 19h. (Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Fresno, Lick, Reno, Mineral, Shasta Dam, Hungry Horse, Seattle, College (2), near Dzhergetal and near Ottawa), 20h. (Palisades, Weston, College (3), Almata, Frunse, Lunacharskoe, Obi-garm, Przhevalsk, Samarkand, Stalinabad, Tashkent, near Andijan, Dzhergetal (2), Fergana, and Naryn), 21h. (Overton, La Paz, and Tamanrasset (2)), 22h. (Overton, near Vera Cruz (2), near Stepanavan, and Tsikhlis-Dzhvari), 23h. (Pavia, Stuttgart, Kew, Mount Wilson, Riverside, China Lake, Boulder City, Overton (2), and Pierce Ferry).

Dec. 20d. 2h. 13m. 3s. Epicentre 16°·3N. 98°·6W. (as on 17d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		1·9	68	0 33	− 1	—	—	—	—	0·9
Puebla		2·8	8	0 50	+ 3	—	—	—	—	1·4
Tacubaya		3·1	350	0 54	+ 3	—	—	—	—	1·6
Vera Cruz		3·7	39	1 0	0	—	—	—	—	1·8
Tucson		19·4	328	e 4 30	0	—	—	i 4 39	pP	e 10·2
Pierce Ferry		24·0	328	i 5 18	+ 1	—	—	i 5 27	pP	e 12·8
Boulder City		24·3	327	i 5 21	+ 1	—	—	i 5 30	pP	—
Riverside	z.	24·4	321	i 5 22	+ 1	—	—	i 5 30	pP	—
Overton	z.	24·6	328	i 5 24	+ 1	—	—	—	—	e 13·1
Pasadena	z.	25·0	321	i 5 26	− 1	—	—	i 5 36	pP	—
China Lake	z.	25·8	323	i 5 33	− 1	e 9 3	P_cP	i 5 42	pP	—
Haiwee	z.	26·2	324	i 5 40	+ 2	—	—	i 5 49	pP	—
Lick	z.	29·2	321	e 6 5k	0	—	—	e 6 14	pP	—
Reno		29·6	326	e 6 10k	+ 1	—	—	e 6 41	PP	—
San Juan		31·0	80	e 6 18	− 3	—	—	—	—	—
Mineral	z.	31·2	325	e 6 23	0	—	—	—	—	—
Palisades		32·6	36	e 6 33	− 2	—	—	—	—	—
Hungry Horse		34·4	341	i 6 49	− 2	—	—	i 6 57	pP	—
Ottawa	z.	34·8	28	e 6 50	− 4	—	—	—	—	—
Weston		34·9	36	e 6 58	+ 3	—	—	—	—	—
La Paz		44·3	135	8 9	− 4	—	—	—	—	—
College		58·7	338	e 9 59	− 3	—	—	i 10 9	pP	—

Long waves were also recorded at Guadalajara, Manzanillo, Merida, and Bozeman.

Dec. 20d. Readings also at 3h. (Apia, Lick, and College), 4h. (Prague and Stuttgart), 6h. (Dzhergetal), 8h. (Christchurch, Wellington, Brisbane, Riverview, Mount Wilson, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Reno, College, Dzhergetal, Strasbourg, and Stuttgart), 9h. (Dzhergetal, near Gandzha, Stepanavan, and Tsikhlis-Dzhvari), 10h. (Prague, Obi-garm, Tchimkent, near Dzhergetal (2), and Fergana), 11h. (near Dzhergetal), 13h. (Collmberg), 14h. (Dzhergetal, Boulder City, Pierce Ferry, and near Tucson), 15h. (near Ili), 16h. (Istanbul and Tamanrasset), 17h. (Pasadena, China Lake, Boulder City (2), Overton, Pierce Ferry, Lick, Reno, Hungry Horse, and near Tucson), 18h. (Guadalajara, near Puebla, Tacubaya, and Vera Cruz, Pasadena, Riverside, China Lake, Tucson, Boulder City, Overton, Pierce Ferry (2), Lick, Hungry Horse, and College), 23h. (Ksara and Tacubaya).

Dec. 21d. 11h. 36m. 49s. Epicentre 29°·5S. 71°·5W. Depth of focus 0·005.
(as on 1950, July 17d.).

Intensity V-VI in S. Latitude 30°. Epicentre 29°·5S. 71°·0W. (U.S.C.G.S.).
Depth approximately 100km.

F. Greve.
Boletin del año, 1950. Instituto sismológico, Santiago, 1951, p.15.

$A = +·2766$, $B = -·8267$, $C = -·4899$; $\delta = -6$; $h = +2$;
$D = -·948$, $E = -·317$; $G = -·155$, $H = +·465$, $K = -·871$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santiago	4·0	171	i 0 54	− 7	i 1 31	−16	—	—	—
La Plata	12·7	119	i 2 48	−12	5 16	− 4	—	—	6·3
La Paz	13·3	14	i 3 12k	+ 4	i 5 45	+11	i 3 23	pP	6·9
Huancayo	17·8	347	e 4 9	+ 4	e 7 25	+ 7	e 4 15	pP	—
Bogota	34·0	357	e 6 55	+15	e 12 7	+ 8	e 7 49	PP	—
Chinchina	34·5	354	e 6 43	− 1	e 12 13	+ 6	—	—	18·2
Washington	68·3	356	e 10 56	0	—	—	—	—	—
Palisades	70·2	0	e 11 7	− 1	—	—	—	—	—
Weston	71·5	1	e 11 15	− 1	—	—	—	—	—
Harvard	71·7	1	i 11 17	0	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		71·9	326	i 11 18	0	e 14 3	PP	i 11 43	pP	—
Ottawa	z.	74·6	358	e 11 32	− 2	—	—	—	—	—
Palomar		75·8	324	i 11 42	+ 1	—	—	—	—	—
Pierce Ferry		76·5	327	i 11 46	+ 1	—	—	i 12 11	pP	—
Riverside		76·6	322	i 11 45k	0	—	—	i 12 12	pP	—
Boulder City		76·8	326	i 11 47	+ 1	—	—	i 12 12	pP	—
Overton	z.	77·1	327	i 11 49	+ 1	—	—	i 11 59	pP	—
Pasadena		77·2	323	i 11 48k	− 1	—	—	i 12 12	pP	—
China Lake	z.	78·1	324	i 11 53k	− 1	—	—	i 12 20	pP	—
Tinemaha	z.	79·4	324	i 12 0k	− 1	—	—	e 12 22	pP	—
Fresno		80·0	323	e 12 3k	− 1	—	—	e 12 29	pP	—
Grahamstown	z.	80·5	123	e 12 4	− 3	—	—	e 12 20	pP	—
Lick	z.	81·4	323	i 12 12k	+ 1	—	—	i 12 39	pP	—
Berkeley	z.	82·1	323	i 12 16k	+ 1	—	—	i 12 35	pP	—
Reno		82·1	325	e 12 15k	0	e 15 14	PP	e 12 35	pP	—
Mineral	z.	83·6	324	e 12 21	− 2	—	—	e 12 47	pP	—
Shasta Dam		84·3	324	i 12 24	− 2	—	—	i 12 49	pP	—
Pretoria	z.	85·4	118	e 12 28	− 4	—	—	i 12 47	pP	—
Hungry Horse		86·4	333	i 12 35	− 1	—	—	—	—	—
Tamanrasset	z.	90·5	64	e 12 54	− 2	e 16 27	PP	i 13 13	pP	—
College		110·8	333	e 14 20	P	—	—	—	—	—
Ksara		119·2	66	20 16	PP	29 58	PS	—	—	—

Additional readings :—
La Plata S?N =4m.59s., SZ =5m.24s., SN =5m.29s.
La Paz iPP =3m.39s., iSS =6m.3s., iP_cP =8m.51s.
Huancayo e =4m.22s.
Bogota ePPP =8m.21s., eS_cPE =12m.31s., eS_cSE =17m.23s., eE =20m.23s.
Riverside eZ =12m.5s.
Pasadena eZ =12m.5s.
China Lake eZ =12m.11s.
Fresno eZ =12m.55s., eE =14m.30s.
Reno eZ =12m.55s., eE =16m.27s., eN =16m.50s.
Mineral eZ =13m.17s.
Long waves were also recorded at Paris.

Dec. 21d. 18h. 41m. 1s. Epicentre 41°·0N. 143°·3E. Depth of focus 0·005.
(as on 1950, Sept. 4d.).

Intensity IV at Hatinohe and Aomori; II-III at Urakawa, Miyako, and Morioka. Epicentre 41°·2N. 143°·0E. Depth of focus 50km. Macroseismic radius 200-300km.

Seismo. Bull., Cent. Met. Obs., Japan, 1950, Tokyo, 1952, p.48, with macroseismic chart.

A = −·6069, B = +·4523, C = +·6535 ; δ = −3 ; h = −2 ;
D = +·598, E = +·802 ; G = −·524, H = +·391, K = −·757.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Hatinohe	1·4	251	0 17	− 7	0 33	−10
Miyako	1·7	216	0 24	− 4	0 45	− 5
Aomori	1·9	264	0 26	− 5	0 46	− 8
Morioka	2·1	232	0 30k	− 4	0 53	− 6
Mori	2·3	298	0 36	− 1	0 59	− 5
Sapporo	2·5	325	0 33	− 6	0 57	−12
Akita	2·8	242	0 47	+ 3	1 19	+ 2
Nemuro	2·9	44	0 50	+ 5	1 14	− 5
Sendai	3·3	214	0 53	+ 2	1 31	+ 2
Hukusima	3·9	214	0 58	− 1	1 42	− 2
Onahama	4·5	205	1 49	S	(1 49)	−10
Aikawa	4·9	234	1 22	+ 9	1 58	−11
Mito	5·1	206	1 54	?	2 56	?
Utunomiya	5·2	212	1 16	− 1	2 26	+ 9
Tukubasan	5·4	208	1 27	+ 7	2 18	− 4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kumagaya		5·7	213	1 28	+ 4	2 37	+ 8
Maebasi		5·7	217	1 28	+ 4	2 30	+ 1
Nagano		5·9	224	1 27	0	2 30	− 4
Tokyo		6·0	206	1 28	0	2 31	− 6
Yokohama		6·3	208	1 40	+ 8	—	—
Hunatu		6·5	213	1 41	+ 6	2 49	0
Mera		6·6	205	2 44	S	(2 44)	− 7
Osima		7·0	206	1 47	+ 5	2 53	− 8
Nagoya		7·7	222	1 43	− 9	—	—
College		45·0	35	e 8 10	− 1	—	—
Shasta Dam		67·6	55	e 10 55	+ 3	—	—
Hungry Horse		67·9	44	i 10 54	0	—	—
Overton	z.	75·1	54	i 11 39	+ 2	—	—
Pierce Ferry		75·6	54	e 11 41	+ 1	—	—
Stuttgart	z.	81·9	332	e 12 10	− 4	—	—
Strasbourg		82·5	332	e 12 24	+ 7	—	—
Tamanrasset	z.	105·4	320	18 21	PP	—	—

Dec. 21d. 23h. 57m. 17s. Epicentre 16°·3N. 98°·6W. (as on 17d.).

		Δ	Az.	P.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.		m.
Oaxaca		1·9	68	0 35	+ 1	—	—	0·9
Puebla		2·8	8	0 49	+ 2	—	—	1·4
Tacubaya		3·1	350	0 56	+ 5	—	—	1·6
Vera Cruz		3·7	39	1 2	+ 2	—	—	1·8
Tucson		19·4	328	i 4 29	− 1	—	—	e 10·2
Palomar		23·7	321	i 5 14	0	—	—	—
Pierce Ferry		24·0	328	i 5 17	0	i 5 27	pP	e 13·0
Boulder City		24·3	327	i 5 21	+ 1	i 5 30	pP	—
Riverside	z.	24·4	321	i 5 22	+ 1	i 5 31	pP	—
Overton	z.	24·6	328	e 5 23	0	—	—	e 13·7
Mount Wilson	z.	25·0	321	e 5 26	− 1	—	—	—
China Lake	z.	25·8	323	i 5 33	− 1	i 5 43	pP	—
Tinemaha	z.	27·1	324	e 5 45	− 1	e 5 57	pP	—
Lick	z.	29·2	321	e 6 5	0	e 6 14	pP	—
Palisades		32·6	36	e 6 29	− 6	—	—	—
Hungry Horse		34·4	341	i 6 48	− 3	—	—	—
Ottawa		34·8	28	e 6 50	− 4	—	—	—
College		58·7	338	e 9 58	− 4	—	—	—

Long waves were also recorded at Guadalajara.

Dec. 21d. Readings also at 0h. (Tacubaya and Tortosa), 2h. (Mount Wilson (2), Riverside (2), China Lake (2), Tinemaha (2), Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse (2), Seattle, College, Salt Lake City, Logan, Guadalajara, near Oaxaca, Puebla, Tacubaya, and Vera Cruz), 3h. (Christchurch and Hungry Horse), 4h. (Bombay, Tamanrasset, Pierce Ferry, and Hungry Horse), 5h. (Tacubaya, Washington, and Tucson), 6h. (Tacubaya), 7h. (Dzhergetal, near Obi-garm, Stalinabad, and near Tacubaya (2)), 8h. (China Lake, Tucson, Overton, Pierce Ferry, Puebla, Vera Cruz, and near Tacubaya), 9h. (Overton, Puebla, Vera Cruz, and near Tacubaya(2)), 10h. (Mount Wilson, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, and near Dzhergetal), 11h. (Bombay and near Dzhergetal), 12h. (Tamanrasset, Stuttgart, Zürich, near Basle, Neuchatel, and near Tacubaya), 15h. (Mount Wilson, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, College, Logan, Salt Lake City, Guadalajara, Oaxaca, near Puebla, Tacubaya, and Vera Cruz), 16h. (Dzhergetal, Bozeman, Seattle, and near Ottawa), 17h. (Samarkand, near Dzhergetal, and Obi-garm), 18h. (College and near Apia), 19h. (Fergana, Lunacharskoe, Samarkand, near Dzhergetal, Obi-garm, Stalinabad, Jena, and near Collmberg), 20h. (College), 21h. (China Lake and near Naryn), 22h. (Fergana, Tchimkent, near Andijan, Dzhergetal, Obi-garm, and Stalinabad).

Dec. 22d. 9h. 10m. 40s. Epicentre 8°·0N. 91°·5E.

$A = -\cdot0259$, $B = +\cdot9901$, $C = +\cdot1383$; $\delta = +10$; $h = +7$;
$D = +1\cdot000$, $E = +\cdot026$; $G = -\cdot004$, $H = +\cdot138$, $K = -\cdot990$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	11·6	264	2 49	− 1	6 49	L	—	—	10·6
Kodaikanal	E.	14·0	280	3 20a	− 2	e 5 52	− 7	—	—	6·4
Calcutta	N.	14·8	348	i 3 25k	− 7	i 6 7	−11	6 18	SS	6·0
Hyderabad	E.	15·8	308	3 40	− 5	6 35	− 7	—	—	—
Poona		20·1	303	e 4 36	− 2	i 8 19	0	5 0	PP	9·4
Bombay		21·1	303	e 4 49	+ 1	i 8 44	+ 5	9 22	Q	10·3
New Delhi		24·5	329	i 5 21	− 1	i 9 43	+ 3	5 57	PP	11·5
Manila		29·6	74	e 6 6	− 3	—	—	—	—	—
Nanking		34·9	43	i 6 49a	− 6	i 12 15	−12	i 8 4	PP	14·6
Dzhergetal		36·0	334	i 7 6	+ 1	i 12 48	+ 4	—	—	—
Naryn		36·0	341	i 7 0	− 5	e 12 37	− 7	—	—	—
Przhevalsk		36·2	345	i 7 8?	+ 2	i 12 45?	− 2	—	—	—
Fergana		36·7	336	e 7 13	+ 3	—	—	—	—	—
Stalinabad		36·7	331	e 7 10?	0	i 12 46?	− 8	—	—	—
Andijan		36·8	336	e 7 9?	− 2	—	—	—	—	—
Frunse		37·8	340	i 7 18?	− 2	i 13 14?	+ 3	—	—	—
Samarkand		38·4	329	e 7 22	− 3	—	—	—	—	—
Luncharskoe		38·6	333	e 7 33?	+ 7	i 13 32	+ 9	—	—	—
Tashkent		38·6	333	i 7 24	− 2	i 13 18	− 5	—	—	—
Tchimkent		39·2	335	i 7 29	− 2	—	—	—	—	—
Mary		39·8	322	e 7 36?	0	—	—	—	—	—
Ashkabad		42·2	321	e 7 56	0	—	—	—	—	—
Irkutsk		45·4	11	e 8 26	+ 4	—	—	—	—	—
Baku		49·1	318	e 8 51?	0	e 15 57?	+ 1	—	—	—
Lenkoran		49·1	316	8 54	+ 3	—	—	—	—	—
Vladivostok		49·7	39	e 8 45	−11	e 16 4	0	—	—	—
Tiflis		53·1	317	e 9 21	0	—	—	—	—	—
Grozny		53·2	320	e 9 33	+11	—	—	—	—	—
Leninakan		53·4	316	e 9 41	+17	—	—	—	—	—
Sverdlovsk		54·3	340	9 28	− 2	i 17 3	− 4	—	—	—
Ksara		57·2	305	e 9 53	+ 2	e 18 8	+22	—	—	—
Helwan		60·2	300	e 10 20	+ 8	18 38	+13	—	—	—
Yalta		61·4	317	e 10 21	+ 1	—	—	—	—	—
Moscow		63·6	330	e 10 32	− 3	i 18 59	− 9	—	—	—
Istanbul		64·1	312	—	—	e 19 8	− 6	—	—	e 31·3
Kishinev		65·7	319	10 46	− 2	19 24	−10	—	—	—
Pulkovo		68·8	332	i 11 19	+11	i 20 19	+ 8	—	—	—
Brisbane		69·2	124	i 11 8	− 2	e 20 13	− 3	—	—	—
Lwow		69·4	321	e 11 17	+ 5	—	—	—	—	—
Pietermaritzburg	z.	69·6	235	e 11 16	+ 3	—	—	e 11 28	PcP	—
Pretoria	z.	70·0	240	e 11 17	+ 2	—	—	e 11 30	PcP	—
Riverview		70·1	131	i 11 31	PcP	i 20 26	− 1	i 20 46	PS	e 33·0
Helsinki		71·5	332	—	—	e 20 48	+ 5	—	—	e 37·8
Grahamstown	z.	74·0	232	e 11 49	+10	—	—	e 12 31	?	—
Messina		74·1	308	—	—	e 22 51	PPS	—	—	e 32·4
Upsala		75·0	300	i 11 54	+ 9	e 21 29	+ 6	e 26 13	SS	e 35·3
Prague		75·6	321	e 11 57	+ 9	e 21 36	+ 7	e 14 50	PP	e 39·3
Rome		76·5	312	—	—	e 21 41	+ 2	—	—	e 39·0
Collmberg	z.	76·6	321	e 11 54	0	—	—	—	—	—
Copenhagen		77·3	326	i 12 3	+ 5	i 21 57	+ 9	14 47	PP	66·3
Jena		77·5	321	e 12 7	+ 8	—	—	e 14 39	PP	—
Chur		78·7	316	e 12 4	− 2	—	—	—	—	—
Stuttgart		79·0	319	e 12 6	− 1	e 22 16	+10	e 22 40	PS	e 43·3
Zürich		79·4	317	e 12 6	− 3	—	—	—	—	—
Strasbourg		79·9	319	e 12 14?	+ 2	—	—	—	—	e 43·0
Basle		80·0	317	e 12 22	+ 9	—	—	—	—	—
Besançon		81·1	317	e 12 22	+ 4	—	—	—	—	—
Bergen	N.	81·2	331	e 15 10	PP	—	—	—	—	e 38·3
De Bilt		81·5	323	—	—	e 22 44	+12	—	—	e 39·3
Tamanrasset	z.	83·3	292	i 12 30k	0	—	—	e 15 45	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		83·4	319	e 12 29	− 1	e 23 15	+24	e 17 56	PPP	e 43·3
Algiers Univ.	z.	84·0	306	e 12 45	+12	e 16 4	PP	e 12 48	P_cP	—
Rathfarnham Castle		88·3	324	—	—	e 33 30	SSS	—	—	e 42·3
College		95·2	21	e 13 22	− 5	23 56	[− 6]	e 17 24	PP	e 36·1
Resolute Bay		97·4	2	13 33	− 4	24 24	[+10]	18 42	PP	—
Hungry Horse		119·6	19	e 18 49	[− 3]	—	—	—	—	—
Shasta Dam		122·4	29	e 18 59	[+ 2]	—	—	—	—	—
Mineral	z.	123·0	29	e 18 57	[− 1]	—	—	e 20 45	PP	—
Berkeley	z.	124·5	32	e 19 14k	[+13]	—	—	e 21 0	PP	—
Reno	z.	124·5	29	e 19 2	[+ 1]	—	—	e 20 45	PP	—
Lick	z.	125·3	32	e 19 13a	[+10]	—	—	e 21 18	PP	—
Ottawa	z.	125·6	349	e 19 9	[+ 5]	—	—	—	—	—
Tinemaha	z.	127·2	30	e 19 3	[− 4]	—	—	—	—	—
Harvard		127·4	344	e 19 24	[+17]	—	—	—	—	e 71·8
Weston		127·5	344	i 19 16	[+ 9]	—	—	e 20 55	PP	e 71·5
China Lake	z.	128·5	29	e 19 8	[− 1]	—	—	e 21 9	PP	—
Palisades		129·4	345	—	—	e 38 34	SS	e 44 1	SSS	—
Overton	z.	129·5	27	e 18 22	[−49]	—	—	e 21 17	PP	—
Pasadena		129·5	31	e 19 10	[− 1]	—	—	e 21 4	PP	e 65·0
Boulder City		129·7	27	e 19 13	[+ 2]	—	—	—	—	—
Pierce Ferry		130·0	27	e 19 12	[0]	—	—	—	—	—
Riverside	z.	130·1	31	e 19 11	[− 1]	—	—	—	—	—
Cleveland	z.	130·3	353	i 21 34	PP	i 22 19	SKP	—	—	—
Tucson		134·7	334	e 19 22	[+ 1]	e 22 45	PKS	e 22 2	PP	e 83·6
Tacubaya		150·8	20	e 20 18	PKP_2	—	—	—	—	—
La Paz		158·4	246	20 0	[+ 1]	31 22	{+18}	i 20 48	PKP_2	77·3
Huancayo		166·4	252	e 20 13	[+ 6]	32 20	{+35}	e 39 14	PPS	e 83·8

Additional readings :—
Calcutta iN =4m.40s., SSN =6m.18s., P_cPN =8m.43s., P_cSN =12m.17s., S_cSN =15m.55s.
Poona PPPEN =5m.9s., QEN =8m.22s., P_cPEN =8m.35s., SSEN =8m.50s., SSSEN =9m.1s.
New Delhi SSEN =10m.43s., SSSEN =11m.1s.
Nanking i =7m.16s.
Brisbane iZ =11m.26s.
Riverview iPPSE =21m.10s., iN =21m.23s., iSSN =24m.45s., iE =27m.53s.
Pretoria eZ =11m.49s.
Upsala eE =22m.40s., eN =28m.34s.
Prague eP =12m.0s., e =12m.13s. and 12m.21s.
Collmberg eZ =12m.25s.
Jena eE =12m.26s.
Stuttgart eZ =12m.11s., iZ =12m.19s., eZ =14m.2s.
Strasbourg e =12m.26s. and 13m.19s.
Besançon e =12m.29s., 12m.50s., and 13m.1s.
Tamanrasset iZ =12m.47s., eZ =13m.59s., ePPPZ =17m.53s.
Paris i =12m.41s., e =13m.2s., 14m.43s., and 15m.35s., eQ =33m.55s.
College e =13m.29s., epP? =14m.24s., eSS =30m.35s.
Resolute Bay SE =24m.38s., eE =25m.7s., eN =25m.10s., eE =25m.13s., PSE =26m.15s., eN =31m.17s., SSE =31m.23s., e =33m.56s.
Mineral eZ =19m.12s. and 20m.21s.
Berkeley eZ =19m.58s.
Reno eZ =21m.2s
China Lake iZ =19m.22s. and 19m.34s.
Pasadena eZ =19m.17s., 19m.23s., and 21m.39s.
Cleveland iZ =22m.49s.
Tucson i =19m.37s.
Tacubaya i =20m.25s.
La Paz PP =24m.38s., eSS =45m.8s.
Huancayo eSS =46m.20s.
Long waves were also recorded at Tananarive, Christchurch, Wellington, Kew, Potsdam, Sitka, Lincoln, Philadelphia, Bogota, and Chinchina.

Dec. 22d. 17h. Undetermined shock. Pasadena suggests Kermadec Islands.

Wellington P =37m.3s., e =38m.59s., eS =39m.9s.
Kaimata PNE =37m.30s., eNE =40m.1s., eSNE =40m.4s.
Christchurch eP =37m.44s., eS =38m.10s.
Auckland eSN? =38m.0s.
New Plymouth eS?E =38m.23s.
Brisbane ePZ =39m.15s.
Apia eP? =41m.8s., e =41m.11s.
Pasadena iPZ =46m.27s.
Lick iPZ =46m.29s.a.
Mount Wilson iPZ =46m.29s.k, eZ =47m.28s.
Riverside iPZ =46m.29s.k.
Palomar iPEN =46m.30s.
China Lake iPZ =46m.35s.k, eZ =47m.50s., and 48m.17s
Mineral ePZ =46m.39s.
Tucson iP =46m.47s.
Pierce Ferry iP =46m.47s.
Overton iPZ =46m.48s.

Dec. 22d. Readings also at 0h. (Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, College, Harvard, Weston, Palisades, Washington, Tamanrasset, and Dzhergetal), 1h. (near Port au Prince), 2h. (Tacubaya, near Overton, and Pierce Ferry), 3h. (Overton (2), College, Ksara, near Ashkabad, and near Apia), 4h. (Mount Wilson, China Lake, Tinemaha, Tucson, Overton, Pierce Ferry, College, and Stuttgart), 6h. (La Paz, China Lake, and near Prague), 8h. (Huancayo, La Paz, Puebla, Tacubaya (3), Vera Cruz, Mount Wilson, Pasadena, Palomar, Riverside, China Lake, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Reno, Hungry Horse, College, Andijan, Fergana, Stalinabad, near Dzhergetal, and near Przhevalsk), 10h. (near Andijan), 11h. (Tacubaya), 12h. (Dzhergetal and Istanbul), 13h. (near Triest), 15h. (Kluychi), 19h. (near Przhevalsk).

Dec. 23d. 8h. 53m. 4s. Epicentre 36°·9N. 141°·3E. Depth of focus 0·005.
(as on 1948, November 14d.).

Intensity V at Onahama, Shirakawa, Hukusima, and Mito; IV at Tyosi, Utunomiya, Tukubasan, Sendai, and Inawashiro; II-III at Isinomaki, Kumagaya, Tokyo, Mizusawa, Miyako, Morioka, and Ajiro. Epicentre 37°N. 141°·2E. Depth 30-40km.
Macroseismic radius >300km.

Seismo. Bull. Cent. Met. Observatory, Japan, for 1950, Tokyo, 1952, pp. 49, 50, with macroseismic chart.

$A = -\cdot6256$, $B = +\cdot5012$, $C = +\cdot5978$; $\delta = -6$; $h = -1$;
$D = +\cdot625$, $E = +\cdot780$; $G = -\cdot467$, $H = +\cdot374$, $K = -\cdot802$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Onahama	0·3	276	0 9a	− 3	0 13	− 7	—	—	—
Mito	0·8	232	0 22k	+ 5	0 34	+ 5	—	—	—
Hukusima	1·1	322	0 17k	− 3	0 28	− 8	—	—	—
Tukubasan	1·2	235	0 19k	− 3	0 34	− 4	—	—	—
Utunomiya	1·2	253	0 20k	− 2	0 35	− 3	—	—	—
Sendai	1·4	347	0 20k	− 4	0 34	− 9	—	—	—
Kumagaya	1·7	244	0 28k	0	0 44	− 6	—	—	—
Tokyo	1·7	225	0 28k	0	0 47	− 3	—	—	—
Maebasi	1·8	254	0 29	− 1	0 50	− 2	—	—	—
Hunatu	2·5	236	0 40a	+ 1	1 10	+ 1	—	—	—
Matusiro	2·5	262	0 38	− 1	1 6	− 3	—	—	—
Nagano	2·5	265	0 40k	+ 1	1 14	+ 5	—	—	—
Misima	2·6	227	0 40	− 1	1 14	+ 2	—	—	—
Osima	2·6	216	0 44	+ 3	1 16	+ 4	—	—	—
Aikawa	2·7	295	0 38	− 4	1 19	+ 5	—	—	—
Miyako	2·8	11	0 39	− 5	1 14	− 3	—	—	—
Morioka	2·8	358	0 41	− 3	—	—	—	—	—
Akita	3·0	342	0 43	− 4	1 28	+ 6	—	—	—
Shizuoka	3·0	232	0 45	− 2	1 21	− 1	—	—	—
Toyama	3·3	268	0 54	+ 3	1 30	+ 1	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Omaesaki		3·4	228	0 57	+ 5	1 35	+ 3	—	—	—
Wazima		3·5	281	0 52	− 2	—	—	—	—	—
Hatinohe		3·7	2	0 53	− 3	1 40	+ 1	—	—	—
Aomori		3·9	354	1 0	+ 1	2 5	+21	—	—	—
Nagoya		3·9	244	1 1	+ 2	1 45	+ 1	—	—	—
Gihu		4·0	250	0 59	− 2	1 47	0	—	—	—
Hikone		4·4	250	1 8	+ 2	1 54	− 3	—	—	—
Kameyama		4·4	246	1 9	+ 3	2 0	+ 3	—	—	—
Kyoto		4·9	249	1 17	+ 4	2 18	+ 9	—	—	—
Owase		5·0	238	0 56	−18	—	—	—	—	—
Osaka		5·2	247	1 17	0	2 25	+ 8	—	—	—
Kobe		5·4	244	1 19	− 1	2 26	+ 4	—	—	—
Toyooka		5·4	258	1 18	− 2	2 18	− 4	—	—	—
Siomisaki		5·7	235	1 25	+ 1	—	—	—	—	—
Sumoto		5·8	246	1 24	− 1	2 28	− 4	—	—	—
Sapporo		6·2	0	1 39	+ 8	2 40	− 1	—	—	—
Muroto		6·9	240	1 26	−15	—	—	—	—	—
Koti		7·2	245	1 42	− 3	3 12	+ 6	—	—	—
Nemuro		7·2	26	1 40	− 5	2 54	−12	—	—	—
Matuyama		7·6	249	1 50	0	3 49	+33	—	—	—
Hirosima		7·7	253	1 49	− 3	3 22	+ 3	—	—	—
Hamada		7·8	258	1 53	0	3 26	+ 5	—	—	—
Ooita		8·8	248	2 14	+ 7	4 2	+16	—	—	—
Hukuoka		9·5	253	2 26	+ 9	4 54	+51	—	—	—
Miyazaki		9·5	241	2 17 a	0	4 22	+19	—	—	—
Vladivostok		9·5	314	e 2 12	− 5	i 4 5	+ 2	—	—	—
Kumamoto		9·6	248	2 18	0	5 0	+55	—	—	—
Nagasaki		10·3	249	2 14	−13	—	—	—	—	—
Nanking		19·2	262	e 4 16	− 5	e 8 7	+18	—	—	—
Przhevalsk		47·7	298	e 8 35	+ 3	—	—	—	—	—
College		49·3	32	i 8 43	− 1	i 9 32	P_cP	i 8 59	pP	—
Naryn		49·8	296	e 8 45	− 3	—	—	—	—	—
Frunse		50·3	299	i 8 51	− 1	—	—	—	—	—
Andijan		52·6	297	e 9 8	− 1	—	—	—	—	—
Fergana		53·1	297	i 9 11	− 2	—	—	—	—	—
Tashkent		54·6	299	i 9 21	− 3	e 16 57	0	—	—	—
Sverdlovsk		55·2	319	i 9 26	− 2	e 17 4	− 1	—	—	—
Stalinabad		56·0	296	i 9 31	− 3	e 17 15	− 1	—	—	—
Samarkand		56·8	298	e 9 38	− 2	—	—	—	—	—
Mary		61·3	297	e 10 10	− 1	—	—	—	—	—
Resolute Bay		62·8	15	10 19	− 2	18 27	−17	e 19 4	PPS	32·8
Ashkabad		63·6	299	e 10 25	− 1	—	—	—	—	—
Brisbane	z.	65·0	168	i 10 49 k	+14	—	—	—	—	—
Victoria	z.	66·6	47	e 10 46	0	—	—	—	—	—
Shasta Dam		71·3	52	i 11 24	+ 9	—	—	i 11 28	pP	—
Hungry Horse		72·0	43	i 11 19	0	—	—	e 11 33	pP	—
Mineral	z.	72·0	53	e 11 20	+ 1	—	—	e 11 35	pP	—
Berkeley	z.	72·9	56	e 11 25 a	+ 1	—	—	i 11 40	pP	—
Lick	z.	73·6	56	e 11 27 a	− 1	—	—	i 11 43	pP	—
Reno	z.	73·6	52	e 11 29 a	+ 1	—	—	e 11 42	pP	—
Fresno		75·2	55	e 11 37 a	0	—	—	e 11 52	pP	—
Tinemaha	z.	75·9	54	e 11 43	+ 2	—	—	i 11 57	pP	—
China Lake	z.	77·1	55	i 11 49	+ 1	—	—	i 12 3	pP	—
Pasadena		77·7	56	e 11 52	+ 1	—	—	i 12 6	pP	—
Riverside	z.	78·4	56	e 11 55	0	—	—	i 12 10	pP	—
Overton	z.	78·7	52	i 11 59	+ 2	—	—	—	—	—
Boulder City		78·8	53	i 11 59	+ 2	e 15 10	PP	i 12 14	pP	—
Pierce Ferry		79·3	52	i 12 1	+ 1	—	—	i 12 16	pP	—
Collmberg	z.	81·2	330	e 12 9	− 1	—	—	e 12 27	pP	—
Ksara		81·2	306	e 16 12	PP	—	—	—	—	—
Prague		81·5	329	i 12 10	− 2	e 22 15	− 2	—	—	—
Jena	z.	82·0	330	—	—	e 29 48	SSP	—	—	—
Tucson		83·7	54	i 12 25	+ 2	e 15 50	PP	i 12 39	pP	—
Stuttgart	z.	84·7	330	e 12 26 a	− 2	e 15 51	PP	e 12 43	pP	—
Strasbourg		85·4	331	e 12 32	0	—	—	e 12 48	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Basle		86·3	331	e 12 36	0	—	—	—	—	—
Paris		87·1	335	i 12 39	− 1	—	—	i 12 58	pP	e 46·9
Ottawa	z.	91·5	26	e 13 1	0	—	—	—	—	—
Tamanrasset	z.	107·5	317	e 17 10	?	29 48	PPS	e 18 38	PP	—
La Paz	z.	147·0	60	i 19 39	[+ 6]	—	—	i 19 56	pPKP	—

Additional readings :—
Resolute Bay eS_cS =20m.15s., SS =22m.26s.
Mineral eZ =12m.32s.
Berkeley eZ =11m.54s.
Reno eZ =12m.16s.
Boulder City i =12m.26s.
Tamanrasset eZ =17m.26s., ePPPZ =20m.57s., eZ =27m.0s.
La Paz i =20m.12s.

Dec. 23d. 17h. 46m. 10s. Epicentre 20°·5S. 179°·0W. Depth of focus 0·080.
(as on 1950, July 10d.).

A = −·9373, B = −·0164, C = −·3481 ; δ = −3 ; h = +5 ;
D = −·017, E = +1·000 ; G = +·348, H = +·006, K = −·937.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		9·6	47	2 18	+ 3	e 4 5	+ 3	—	—
Auckland	N.	17·2	197	i 3 31	0	i 6 25	+ 4	—	—
Wellington		21·4	193	i 4 7	− 3	e 7 30	− 1	e 7 19	?
Kaimata	N.E.	23·4	198	e 4 25	− 3	e 7 51	−13	—	—
Christchurch		24·0	195	e 4 31	− 3	e 8 5	− 8	—	—
Brisbane	z.	26·4	250	i 4 57	+ 2	—	—	—	—
Riverview		29·6	237	—	—	i 9 41	0	i 15 2	S_cS
Berkeley	z.	78·8	43	i 11 11k	+ 3	—	—	—	—
Lick	z.	78·9	43	i 11 11k	+ 3	—	—	e 13 18	pP
Pasadena		79·4	47	i 11 12k	+ 1	—	—	i 13 6	pP
Palomar		79·8	48	i 11 16	+ 3	—	—	—	—
Riverside	z.	79·8	47	i 11 15k	+ 2	—	—	e 13 17	pP
Shasta Dam		80·4	39	i 11 18	+ 2	—	—	—	—
China Lake	z.	80·7	46	i 11 19k	+ 1	—	—	e 13 22	pP
Mineral	z.	80·7	40	i 11 20	+ 2	—	—	—	—
Tinemaha	z.	80·9	45	i 11 22k	+ 3	—	—	—	—
Reno		81·3	42	e 11 24k	+ 3	—	—	e 13 23	pP
Boulder City		82·7	47	i 11 30	+ 2	—	—	—	—
Overton	z.	83·2	47	i 11 33	+ 3	—	—	e 13 39	pP
Pierce Ferry		83·3	47	i 11 34	+ 3	—	—	i 13 37	pP
Tucson		83·6	52	i 11 35	+ 3	—	—	—	—
Victoria	z.	84·7	33	i 11 40k	+ 2	—	—	—	—
College		88·4	13	i 11 56	+ 1	—	—	i 12 6	pP
Hungry Horse		89·7	37	i 12 2	+ 1	—	—	—	—
Huancayo		98·2	106	i 21 14	?	—	—	—	—
Collmberg	z.	147·8	347	e 18 46	[+ 6]	—	—	—	—
Istanbul		148·6	317	e 18 48	[+ 7]	—	—	—	—
Prague		148·6	343	e 18 48	[+ 7]	—	—	—	—
Stuttgart	z.	151·0	350	e 18 46	[+ 1]	—	—	—	—
Strasbourg		151·4	351	i 18 55	[+10]	—	—	—	—
Paris		151·7	358	i 18 54	[+ 8]	—	—	—	—
Tamanrasset	z.	175·2	—	i 19 11s	[+ 4]	—	—	e 21 27	pPKP

Additional readings :—
Apia e =4m.1s.
Christchurch e =8m.26s.
Riverview iE =12m.52s.
Pasadena eZ =12m.15s.
Boulder City e =11m.40s.
Stuttgart iPKPZ =18m.54s., eZ =19m.4s.
Strasbourg i =19m.7s.
Paris i =19m.6s.
Tamanrasset ePKP_2Z =20m.52s., ePPZ =24m.46s.

Dec. 23d. Readings also at 0h. (near Przhevalsk), 1h. (Helwan, Ksara, Tamanrasset (2), Pietermaritzburg, and Pretoria), 2h. (Strasbourg, Rathfarnham Castle, and Tacubaya), 4h. (Mount Wilson, China Lake, Overton, and Pierce Ferry), 5h. (Lunacharskoe, Przhevalsk, Stalinabad, near Andijan, Fergana, Frunse, and Naryn), 6h. (Mount Wilson, China Lake, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Fresno, Lick, Reno, Mineral, and Tacubaya), 7h. (Brisbane, Boulder City, College, near Andijan, Fergana, and near Tacubaya), 8h. (Brisbane and near Tacubaya), 15h (Puebla and near Tacubaya), 18h. (Puebla and near Tacubaya), 19h. (near Andijan, Fergana (2), Obi-garm, and Stalinabad (2)), 20h. (Puebla (2), near Tacubaya (2), and near Athens), 21h. (La Paz), 22h. (Merida and Tacubaya).

Dec. 24d. 4h. 35m. 37s. Epicentre 36°·7N. 70°·5E. Depth of focus 0·030.
(as on 1950, October 10d.).
Depth ca 160km. Suggested epicentre 36°·8N. 70°·8E. (U.S.S.R.).

$A = +\cdot2683$, $B = +\cdot7576$, $C = +\cdot5951$; $\delta = +9$; $h = 0$;
$D = +\cdot943$, $E = -\cdot334$; $G = +\cdot199$, $H = +\cdot561$, $K = -\cdot804$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kulyab		1·3	335	e 0 35	0	—	—	—	—	—
Obi-garm		2·1	342	e 0 45	+ 3	—	—	—	—	—
Stalinabad		2·3	323	i 0 47	+ 3	i 1 21	+ 4	—	—	—
Fergana		3·8	15	e 1 1	0	e 1 47	− 1	—	—	—
Samarkand		4·1	319	i 1 10	+ 6	i 1 59	+ 5	—	—	—
Andijan		4·3	20	i 1 7	0	i 1 56	− 3	—	—	—
Lunacharskoe		4·7	349	i 1 14	+ 2	i 2 9	+ 1	—	—	—
Tashkent		4·7	349	i 1 15?	+ 3	i 2 11?	+ 3	—	—	—
Tchimkent		5·6	354	i 1 25	+ 2	i 2 29	+ 1	—	—	—
Naryn		6·4	41	i 1 27	− 6	—	—	—	—	—
Frunse		6·9	26	i 1 38	− 2	i 2 54	− 4	—	—	—
Mary		6·9	280	i 1 43	+ 3	e 3 1	+ 3	—	—	—
New Delhi		9·8	143	i 2 10k	− 7	i 3 48	−17	2 18	PP	3·6
Ashkabad		9·8	281	i 2 20	+ 3	4 1	− 4	—	—	—
Bombay		17·8	172	e 3 23?	?	e 7 4	+ 1	—	—	—
Poona		18·3	170	i 3 55	− 5	i 7 10	− 2	8 25	P_cP	8·2
Calcutta	E.	20·9	128	e 6 11	?	e 8 41	SS	—	—	—
Sverdlovsk		21·2	345	i 4 30	+ 1	i 8 12	+ 6	—	—	—
Moscow		29·2	322	e 5 43	0	—	—	—	—	—
Collmberg	Z.	42·8	309	e 7 38	+ 1	—	—	8 34	pP	—
Stuttgart	Z.	45·5	306	e 7 58	− 1	—	—	e 9 40	PP	—
Strasbourg		46·4	306	e 8 7	+ 1	—	—	—	—	—
Paris		49·8	307	i 8 31	− 1	—	—	—	—	—
Tamanrasset	Z.	57·1	277	e 9 24	− 1	—	—	—	—	—
College		74·4	17	e 11 12	− 3	—	—	—	—	—
Hungry Horse		95·2	4	e 13 56	+57	—	—	—	—	—

Additional readings :—
New Delhi PPPEN = 2m.25s., P*EN = 2m.32s., SSE = 4m.0s., S*N = 4m.20s.
Poona PPE = 4m.12s., PPPE = 4m.21s., QE = 7m.15s., SSE = 7m.32s., SSSE = 7m.52s., S_cPE = 11m.51s.

Dec. 24d. 5h. 10m. 11s. Epicentre 31°·8N. 131°·8E. Focus at Base of Superficial Layers.
(as on 1943, April 12d.).

Intensity V at Miyazaki ; IV at Kumamoto ; II-III at Ooita, Matsuyama.
Epicentre 31°·8N. 132°·0E. Macroseismic radius 200-300km. Depth 20km.

See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1950, Tokyo, 1952, p.50-51. Macroseismic chart p.50.

$A = -\cdot5675$, $B = +\cdot6348$, $C = +\cdot5244$; $\delta = +2$; $h = +1$;
$D = +\cdot745$, $E = +\cdot666$; $G = -\cdot350$, $H = +\cdot391$, $K = -\cdot851$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Miyazaki		0·3	292	0 7k	− 1	0 14	− 1	—	—	—
Kumamoto		1·4	315	0 25a	+ 2	0 43	+ 2	—	—	—
Ooita		1·4	354	0 24a	+ 1	0 44	+ 3	—	—	—
Simidu		1·4	41	0 23	0	0 39	− 2	—	—	—
Unzendake		1·6	305	0 25	− 1	0 52	+ 6	—	—	—
Nagasaki		1·9	300	0 29a	− 2	1 1	+ 7	—	—	—
Hukuoka		2·1	329	0 34a	+ 1	1 4	+ 5	—	—	—
Kôti		2·3	40	0 40	+ 4	1 9	+ 5	—	—	—
Muroto		2·5	55	0 56	+17	—	—	—	—	—
Hirosima		2·6	12	0 40	− 1	1 20	+ 9	—	—	—
Hamada		3·2	3	0 51	+ 2	1 33	+ 6	—	—	—
Siomisaki		3·7	64	1 1	+ 5	—	—	—	—	—
Sumoto		3·7	45	0 55k	− 1	1 41	+ 2	—	—	—
Kobe		4·0	44	1 22	+22	2 9	+22	—	—	—
Osaka		4·2	47	1 32	+29	2 18	+26	—	—	—
Owase		4·3	58	1 15	+10	2 15	+21	—	—	—
Kyoto		4·6	45	1 7	− 2	2 21	+19	—	—	—
Kameyama		4·9	51	1 17	+ 4	2 49	+39	—	—	—
Hikone		5·1	46	1 23	+ 7	2 7	− 8	—	—	—
Gihu		5·5	48	1 21	− 1	2 20	− 5	—	—	—
Nagoya		5·5	51	1 23	+ 1	—	—	—	—	—
Shizuoka		6·4	58	2 22	+48	—	—	—	—	—
Hunatu		6·9	56	1 54	+13	3 6	+ 6	—	—	—
Osima		7·0	63	1 42	− 1	—	—	—	—	—
Matusiro		7·1	47	2 26	+42	—	—	—	—	—
Nagano		7·2	45	1 59	+13	4 0	+53	—	—	—
Kumagaya		7·6	54	1 59	+ 8	3 33	+16	—	—	—
Maebasi		7·6	51	1 58	+ 7	4 3	+46	—	—	—
Tokyo		7·7	58	2 0	+ 7	3 27	+ 7	—	—	—
Utunomiya		8·2	53	2 12	+12	—	—	—	—	—
Nanking		11·0	275	i 2 40	+ 2	e 5 14	+33	i 2 57	PPP	—
Vladivostok		11·3	0	e 2 39	− 3	e 4 37	−11	—	—	—
Irkutsk		28·6	324	e 6 17?	+22	e 10 51	+11	—	—	—
Frunse		46·0	302	e 8 31	+ 9	—	—	—	—	—
Andijan		47·9	298	e 8 35	− 2	—	—	—	—	—
Fergana		48·4	298	e 8 35	− 6	—	—	—	—	—
Tashkent		50·1	300	e 8 58	+ 4	e 19 59	SS	—	—	—
Sverdlovsk		53·9	321	9 20	− 2	—	—	—	—	—
College		57·7	30	e 9 50	0	—	—	e 9 59	pP	e 28·1
Moscow		66·6	323	e 10 41	− 8	—	—	—	—	—
Resolute Bay		69·5	13	11 15	+ 8	e 25 7	SS	—	—	—
Shasta Dam		80·5	48	i 12 10	0	—	—	i 12 20	pP	—
Hungry Horse		80·9	38	i 12 13	+ 1	—	—	i 12 22	pP	—
Collmberg	z.	81·3	327	e 12 13	− 1	—	—	e 12 23	pP	—
Mineral	z.	81·3	48	e 12 15	+ 1	—	—	e 12 25	pP	—
Berkeley	z.	82·2	50	e 12 29	pP	—	—	—	—	—
Reno	z.	82·8	48	e 12 33k	pP	—	—	—	—	—
Lick	z.	82·9	50	e 12 32k	pP	—	—	—	—	—
Fresno	z.	84·5	50	e 12 41k	pP	—	—	—	—	—
Stuttgart		84·9	327	e 12 30	− 3	—	—	e 12 40	P_cP	e 45·8

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha	z.	85·3	51	e 12 35	0	—	—	i 12 43	pP	—
Strasbourg		85·7	327	e 12 44	pP	—	—	—	—	e 43·8
China Lake	z.	86·4	50	e 12 40	0	—	—	i 12 50	pP	—
Kew		87·0	333	—	—	e 34 6	PKKS	—	—	e 49·8
Pasadena	z.	87·1	52	e 12 42	− 2	—	—	i 12 53	pP	—
Riverside		87·7	52	e 12 55	+ 8	—	—	—	—	—
Rathfarnham Castle		87·8	337	i 26 58	?	e 27 4	?	e 30 40	?	—
Paris		87·9	330	—	—	e 25 49	?	45 49?	Q	e 50·8
Overton	z.	88·0	48	e 12 59	pP	—	—	—	—	—
Boulder City		88·1	49	i 12 59	pP	—	—	—	—	—
Pierce Ferry		88·6	48	e 13 1	pP	—	—	—	—	—
Tucson		93·1	49	e 13 12	0	e 17 3	PP	e 13 22	pP	—
La Paz		156·4	54	e 20 5	PKP_a	—	—	e 24 13	PP	—

Additional readings :—
Shasta Dam i = 12m.36s.
Reno eE = 13m.40s.
Fresno eZ = 13m.9s. and 13m.47s.
La Paz i = 20m.31s.
Long waves were also recorded at Copenhagen, De Bilt, Pavia, Rome, and La Plata.

Dec. 24d. 16h. 34m. 39s. Epicentre 0°·2N. 16°·9W. (as on 1946, Nov. 3d.).

A = + ·9568, B = − ·2907, C = + ·0035 ; δ = −2 ; h = +7 ;
D = − ·291, E = − ·957 ; G = + ·003, H = − ·001, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tamanrasset	z.	31·3	42	e 6 20	− 4	e 10 17	?	e 7 12	PP	—
Granada		38·8	17	e 7 21a	− 7	e 13 36	+10	—	—	—
Pavia		50·4	24	—	—	i 22 39	?	—	—	27·6
Paris		51·2	16	i 9 13	+ 6	i 16 39	+14	i 16 47	PS	e 25·4
Grahamstown	z.	52·7	133	e 8 57	−21	—	—	—	—	—
Strasbourg		52·7	20	e 9 21	+ 3	e 16 51	+ 5	—	—	e 26·4
La Paz		53·1	248	i 9 24	+ 3	17 3	+12	20 39	SS	25·6
Stuttgart		53·3	21	e 9 24	+ 1	—	—	—	—	e 30·4
Rathfarnham C.	z.	53·6	8	—	—	e 20 51	SS	—	—	—
Helwan		54·5	53	9 30	− 2	e 17 3	− 7	i 9 34	P	—
De Bilt		54·9	16	e 9 45	+10	e 17 33	+17	—	—	e 28·4
Jena		56·0	22	e 9 40	− 3	—	—	—	—	—
Prague		56·4	23	e 9 47	+ 2	17 39?	+ 3	e 10 50	P_cP	—
Collmberg	z.	56·8	22	e 9 48	0	—	—	—	—	—
Bogota		57·3	275	—	—	e 18 0	+13	e 25 10	?	e 30·4
Istanbul		58·1	39	e 9 37	−21	—	—	—	—	e 30·4
Huancayo		59·2	256	e 5 57	?	e 18 4	− 8	e 18 45	PPS	e 29·1
Ksara		59·6	50	e 10 7	− 1	e 18 27	PS	—	—	—
Sverdlovsk		83·0	33	i 12 27	− 1	e 23 40	PS	—	—	—
Tashkent		87·0	49	e 12 45	− 3	—	—	—	—	—
Tucson		93·2	302	e 13 18	+ 1	—	—	e 13 46	?	—
Pierce Ferry		95·6	306	e 12 32	−56	—	—	—	—	—

Additional readings :—
Paris i = 9m.41s. and 11m.29s., eSSS = 21m.40s.
La Paz PS = 17m.25s.
Jena eN = 9m.28s.?, eEN = 9m.45s.
Prague e = 10m.32s. and 11m.41s.
Long waves were also recorded at Bermuda, College, Clermont-Ferrand, Copenhagen, and Kew.

Dec. 24d. 20h. 36m. 50s. Epicentre 17°·3S. 168°·6E. (as on 1950, Dec. 2d.).

$A = -·9365$, $B = +·1888$, $C = -·2955$; $\delta = 0$; $h = +5$;
$D = +·198$, $E = +·980$; $G = +·290$, $H = -·058$, $K = -·955$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	17·6	232	i 3 54k	−14	—	—	—	—	—
Apia		19·2	83	e 4 27	− 1	—	—	—	—	—
Riverview		22·7	220	i 5 4a	0	i 9 12	+ 3	i 8 54	P_cP	e 10·7
Berkeley	z.	84·9	48	e 12 38k	0	—	—	—	—	—
Lick	z.	85·1	48	e 12 40a	+ 1	—	—	i 13 0	?	—
Shasta Dam		86·1	45	i 12 45	+ 1	—	—	—	—	—
Fresno	z.	86·2	50	e 12 44a	0	—	—	e 15 27	?	—
Pasadena		86·4	53	i 12 44a	− 1	—	—	i 13 0	pP	—
Riverside	z.	86·9	53	i 12 47a	− 1	—	—	—	—	—
Palomar		87·0	54	i 12 48	0	—	—	—	—	—
Reno	z.	87·4	47	e 12 50a	0	—	—	e 13 5	pP	—
China Lake	z.	87·5	51	i 12 49a	− 2	—	—	—	—	—
Tinemaha	z.	87·5	50	i 12 51	0	—	—	—	—	—
College		88·4	17	e 12 56	+ 1	—	—	—	—	—
Boulder City		89·6	52	i 13 0	− 1	—	—	—	—	—
Overton	z.	90·1	52	i 13 4	+ 1	—	—	—	—	—
Pierce Ferry		90·3	52	i 13 4	0	—	—	—	—	—
Tucson		91·4	57	i 13 9	0	—	—	e 13 28	pP	—
Collmberg	z.	140·9	334	e 19 26	[− 6]	—	—	—	—	—
Prague		141·3	333	e 15 49	?	—	—	e 21 2	?	—
Jena		141·7	336	e 19 29?	[− 4]	—	—	e 19 35	PKP	—
Rathfarnham C.	z.	143·8	354	e 19 54	[+17]	—	—	—	—	—
Stuttgart	z.	144·4	336	e 19 36	[− 2]	—	—	—	—	—
Strasbourg		145·1	337	i 19 40a	[+ 1]	—	—	—	—	—
Zürich		145·8	336	i 19 41k	[0]	—	—	—	—	—
Basle		146·0	337	e 19 42k	[+ 1]	—	—	—	—	—
Paris		146·6	343	i 19 44	[+ 2]	—	—	—	—	—
Besançon		146·9	338	e 19 45	[+ 3]	—	—	—	—	—
Tamanrasset	z.	163·2	292	e 20 0	[− 4]	—	—	i 20 55	PKP_2	—

Additional readings :—
Riverview iSEN = 8m.48s.
Strasbourg e = 19m.55s. and 20m.8s.
Paris i = 19m.48s.
Tamanrasset eZ = 20m.19s., ePPZ = 24m.52s.

Dec. 24d. Readings also at 1h. (near Tacubaya), 2h. (College), 3h. (College, Overton, and Pierce Ferry), 4h. (near Balboa Heights, Tacubaya, Tucson, Overton, Pierce Ferry, Tinemaha, Shasta Dam, Riverside, Hungry Horse, China Lake, Tamanrasset, and near La Paz), 5h. (near Obi-garm), 7h. (Ksara), 8h. (Tacubaya), 9h. (College, Mineral, Tinemaha, Hungry Horse, Shasta Dam, China Lake, Reno, Pierce Ferry, Overton, Boulder City, Tucson, Pasadena, Pavia, Collmberg, Stuttgart, and Nanking), 10h. (near Istanbul), 11h. (near Huancayo), 12h. (near Collmberg and Jena), 15h. (Tacubaya (2) and Tananarive), 17h. (College, Tacubaya, near Tsikhlis-Dzhvari, Stepanavan and Gandzha), 18h. (La Paz, Overton, Pierce Ferry, Puebla, and near Tacubaya), 23h. (Tinemaha, China Lake, Pierce Ferry, Overton, Mount Wilson, Tamanrasset, and Pretoria).

Dec. 25d. 20h. 48m. 15s. Epicentre 36°·7N. 24°·9E.

Intensity IV at Pholegandros, Cyclades Isles. Epicentre given by Strasbourg.

A. Galanopoulos.
Seismological Institute Bulletin, 1950. Athens, 1951, p. 24.

$A = +\cdot7290$, $B = +\cdot3384$, $C = +\cdot5951$; $\delta = +10$; $h = 0$;
$D = +\cdot421$, $E = -\cdot907$; $G = +\cdot540$, $H = +\cdot251$, $K = -\cdot804$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		1·6	324	i 0 30a	0	i 0 53	+ 2	—	—	—
Istanbul		5·4	36	e 1 35?	P*	e 2 50	S*	—	—	—
Prague		15·4	334	i 3 46	+ 6	e 6 37	+ 5	—	—	—
Stuttgart	z.	16·6	321	e 3 54	− 2	—	—	—	—	—
Collmberg	z.	16·9	334	e 4 0	+ 1	—	—	—	—	—
Jena	N.	17·1	330	e 4 3	+ 1	—	—	—	—	—
Strasbourg		17·3	319	e 4 7	+ 3	—	—	—	—	—
Besançon		17·5	313	e 4 7	0	—	—	e 4 26	PP	—
Paris		20·3	313	i 4 37	− 3	—	—	e 5 1	PP	—
Tamanrasset	z.	21·7	236	e 4 51	− 4	—	—	i 5 28	PP	—

Additional readings :—
Prague e = 3m.55s., 4m.5s., and 4m.13s.
Stuttgart eZ = 3m.59s. and 4m.5s.
Jena eE = 4m.9s., eN = 4m.14s.
Strasbourg e = 4m.52s.
Long waves were also recorded at Ksara, Rome, and Taranto.

Dec. 25d. Readings also at 0h. (Pretoria, Tucson, College, near Boulder City, Overton, and Pierce Ferry), 1h. (Overton and Pierce Ferry), 3h. (near Kulyab), 4h. (Overton), 6h. (College), 10h. (Stuttgart), 12h. (Tacubaya (3), Vera Cruz, and near Athens), 13h. (Prague), 14h. (Tamanrasset), 15h. (Christchurch, Wellington, Stuttgart, Overton (2), Pierce Ferry, College, and near Santa Clara), 18h. (near Przhevalsk), 19h. (College), 21h. (Collmberg, Paris, Stuttgart, Tamanrasset, Nanking, La Plata, Shasta Dam, Hungry Horse (2), and College (2)), 22h. (near Obi-garm), 23h. (La Plata).

Dec. 26d. 13h. 51m. 37s. Epicentre 16°·3N. 98°·6W. (as on 21d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Puebla		2·8	8	0 52	+ 5	1 31	+ 9	—	—	—
Tacubaya		3·1	350	0 54a	+ 3	—	—	—	—	1·7
Vera Cruz		3·7	39	1 6	+ 6	—	—	—	—	2·2
Guadalajara		6·3	315	1 34	− 2	—	—	—	—	3·1
Merida		9·7	61	e 2 29	+ 7	e 4 11	− 4	—	—	—
Chihuahua		14·1	332	e 3 25	+ 2	—	—	—	—	i 7·4
Tucson		19·4	328	i 4 30	0	e 8 16	+12	—	—	e 9·3
St. Louis		23·4	16	e 5 9	− 2	i 9 24	+ 3	e 5 42	PP	i 10·9
Florissant		23·6	16	i 5 12	− 1	—	—	—	—	—
Palomar		23·7	321	i 5 15a	+ 1	—	—	i 5 38	?	—
Pierce Ferry		24·0	328	i 5 18	+ 1	—	—	—	—	i 12·7
Boulder City		24·3	327	i 5 22	+ 2	—	—	e 5 52	PP	e 13·0
Riverside		24·4	321	i 5 22a	+ 1	—	—	i 6 20	PPP	—
Overton	z.	24·6	328	e 5 24	+ 1	—	—	—	—	e 13·1
Pasadena		25·0	321	i 5 27	0	e 10 6	+17	i 16 31	S_cS	e 11·8
Chinchina		25·2	113	i 5 25	− 4	i 9 52	0	e 16 27	S_cS	—
China Lake	z.	25·8	323	i 5 34	0	—	—	i 5 42	pP	—
Cincinnati		25·9	25	i 5 33	− 2	i 10 14	+10	—	—	—
Bogota		26·7	113	i 5 57	+14	i 10 26	+ 9	—	—	—
Salt Lake City		27·0	338	e 5 45	0	e 10 23	+ 1	—	—	e 15·2
Tinemaha	z.	27·1	324	i 5 47	+ 1	—	—	i 5 59	pP	—
Chicago		27·2	17	i 5 41	− 6	e 10 15	−10	—	—	e 14·8
Fresno		27·7	322	e 5 52k	0	—	—	e 6 48	PP	e 14·8
Cleveland		29·1	26	i 6 1k	− 3	e 11 3	+ 7	i 12 8	SS	—
Lick	z.	29·2	321	i 6 7a	+ 2	—	—	—	—	e 16·0

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Clara		29·4	321	e 17 4	?	e 18 33	?	—	—	e 19·3
San Juan		31·0	80	e 6 17	− 4	e 11 31	+ 5	—	—	e 13·6
Bozeman		31·1	344	e 6 23	+ 1	e 11 32	+ 4	—	—	e 13·8
Mineral		31·2	325	e 6 23	0	e 10 59	−30	—	—	e 16·7
Buffalo		31·4	28	e 6 23	− 2	e 12 45	SS	e 7 44	PP	—
Butte	N.	31·8	344	e 6 28	0	—	—	—	—	e 17·1
Shasta Dam		31·9	325	i 6 27	− 2	—	—	—	—	e 17·0
Palisades		32·6	36	i 6 32k	− 3	—	—	i 14 53	Q	i 19·6
Hungry Horse		34·4	341	i 6 49	− 2	—	—	—	—	e 18·5
Bermuda		34·6	56	e 7 56	+63	—	—	—	—	e 18·5
Ottawa		34·8	28	e 6 51	− 3	12 31	+ 6	—	—	—
Harvard		34·9	36	e 6 51	− 4	—	—	—	—	e 20·2
Weston		34·9	36	i 6 45	−10	—	—	—	—	—
Fort de France		36·2	87	e 9 55	P_cP	—	—	—	—	—
Huancayo		36·4	139	e 7 15	+ 7	i 12 55	+ 5	—	—	e 15·7
Seattle		36·9	334	i 7 12a	0	—	—	i 8 31	PP	e 18·4
Shawinigan Falls	N.	37·0	30	e 8 10	+57	—	—	—	—	—
Victoria		37·9	334	i 7 22k	+ 2	—	—	—	—	—
Seven Falls	E.	38·4	31	e 8 21	+56	—	—	—	—	—
La Paz		44·3	135	8 25	+12	i 14 51	+ 3	i 9 59	PP	21·8
Resolute Bay		58·4	1	e 9 56	− 4	17 54	− 8	19 53	S_cS	e 28·9
College		58·7	338	i 10 0	− 2	—	—	i 10 32	P_cP	e 22·7
Scoresby Sund		70·3	20	i 11 15	− 2	e 20 41	+12	—	—	36·4
Rathfarnham Castle		78·5	38	e 14 38	PP	—	—	—	—	e 43·4
Granada		84·2	53	i 12 55a	+21	23 37	PS	28 52	SS	38·3
Paris		85·0	42	i 12 37	− 1	i 23 4	− 3	e 15 54	PP	e 43·4
De Bilt		85·5	37	e 12 39	− 2	e 23 23	+11	—	—	e 45·4
Besançon		87·7	42	e 12 50	− 2	—	—	—	—	—
Strasbourg		88·3	40	e 13 2	+ 7	—	—	—	—	e 40·4
Stuttgart		89·1	39	e 12 57	− 1	—	—	e 16 23	PP	e 48·4
Collmberg	Z.	90·3	36	e 13 2	− 2	—	—	—	—	—
Pavia		90·6	42	—	—	e 25 0	PS	—	—	e 51·5
Rome		94·2	45	—	—	e 25 2	PS	—	—	—
Tamanrasset	Z.	96·2	65	i 13 31a	0	—	—	e 17 22	PP	—
Istanbul		105·1	38	e 18 17	PP	—	—	—	—	e 56·4
Ksara		113·9	42	e 19 49	PP	e 29 29	PS	—	—	—

Additional readings :—
Tucson i = 5m.12s. and 5m.29s.
St. Louis iP = 5m.12s., i = 5m.20s., ipPP = 5m.54s., eSS = 10m.23s.
Riverside isP?Z = 5m.35s.
Pasadena isP?Z = 5m.42s., iPPZ = 6m.32s.
China Lake iZ = 6m.30s.
Fresno eZ = 7m.0s., eN = 7m.44s.
Cleveland iSSN = 12m.14s.
Lick iZ = 6m.16s.
Shasta Dam e = 6m.55s.
Hungry Horse i = 6m.55s.
Seattle i = 7m.17s., 7m.28s., 7m.46s., and 9m.14s.
Resolute Bay SS = 22m.17s.
Paris e = 12m.42s., i = 13m.7s. and 16m.47s., iS_cS? = 23m.14s., ePS? = 24m.2s.
Besançon e = 13m.16s. and 13m.49s.
Strasbourg e = 13m.29s. and 13m.55s.
Tamanrasset eZ = 14m.38s. and 14m.55s.
Long waves were also recorded at Berkeley, Ukiah, Saskatoon, Lincoln, Copenhagen, Kew, and Christchurch.

Dec. 26d. Readings also at 0h. (Pierce Ferry), 4h. (College and near Tamanrasset), 6h. (Tucson, Overton, Pierce Ferry, Lick, Shasta Dam, Mineral, Hungry Horse, Mount Wilson, Riverside, China Lake, Tinemaha, Huancayo, and near La Paz), 7h. (Tucson, Overton, Pierce Ferry, Riverside, China Lake, Tinemaha, Guadalajara, Vera Cruz (2), near Oaxaca (2), and Puebla (2)), 8h. (Tucson and Overton), 9h. (Lunacharskoe, near Andijan, Kulyab, and Stalinabad), 10h. (Tamanrasset), 11h. (Andijan, Przhevalsk, Almata, and Semipalatinsk), 12h. (near Overton, Pierce Ferry, and near Balboa Heights), 14h. (Tucson, Boulder City, Overton, Pierce Ferry, Mineral, Mount Wilson, China Lake, Riverside, Tinemaha, and Shasta Dam), 16h. (Shasta Dam), 21h. (Brisbane, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, La Paz, Pasadena, Riverside, China Lake, Tinemaha, and Tamanrasset), 23h. (College).

Dec. 27d. 4h. Chile, probably deep.
La Paz iP_g = 35m.1s.k, iS = 35m.31s.
Huancayo iP = 36m.24s., eS? = 38m.24s., e = 38m.47s.
La Plata PE = 38m.31s., PEN = 38m.35s., E = 42m.0s., SN = 42m.5s., E = 44m.18s.
Bogota ePZ = 39m.25s., e = 39m.54s., eS?EN = 45m.41s.
Tucson iP = 44m.44s.
Pierce Ferry iP = 45m.14s.
Boulder City iP = 45m.16s., ipP = 45m.46s.
Riverside iPZ = 45m.17s., eZ = 45m.47s. and 45m.59s.
Overton iPZ = 45m.18s., ipPZ = 45m.48s.
Pasadena iPZ = 45m.20s., iZ = 45m.51s., eZ = 46m.5s.
China Lake iPZ = 45m.25s., eZ = 45m.45s., iZ = 45m.56s.
Lick ePZ = 45m.46s.a, iZ = 46m.3s., ipP?Z = 46m.18s.
Reno ePZ = 45m.48s.a, epP?Z = 46m.20s., eN = 46m.34s.
Mineral ePZ = 45m.56s., epP?Z = 46m.26s., eZ = 47m.9s.
Hungry Horse iP = 46m.3s.
Tamanrasset iPZ = 46m.37s.k, epPZ = 47m.10s.

Dec. 27d. 23h. 9m. 59s. (I)
23h. 19m. 20s. (II)
Epicentre 17°·0N. 62°·5W.
Depth of focus 0·005.

Fore-shocks of 29d. 20h.

A = +·4418, B = −·8488, C = +·2906; δ = +10; h = +5;
D = −·887, E = −·462; G = +·134, H = −·258, K = −·957.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Fort de France	2·6	150	i 0 34	− 7	i 1 9	− 3	—	—	—
II		2·6	150	i 0 35	− 6	i 1 8	− 4	—	—	—
I	San Juan	3·7	292	e 0 55	− 1	i 1 47	+ 8	—	—	i 2·0
II		3·7	292	i 0 55	− 1	i 1 28	−11	—	—	i 1·8
I	Bermuda	15·4	353	e 4 7	+32	e 7 2	+38	—	—	—
I	Bogota	16·7	224	e 4 13	PP	e 7 29	SS	—	—	e 9·0
I	Chinchina	17·5	228	e 3 58	− 3	e 7 43	SS	—	—	—
II		17·5	228	e 4 2	+ 1	e 8 23	SSS	—	—	—
I	Philadelphia	25·4	338	e 5 45	pP	e 9 57	+15	—	—	e 12·2
I	Palisades	25·9	341	e 5 43	pP	i 10 31	sS	—	—	e 13·2
II		25·9	341	e 5 27	− 1	—	—	—	—	—
I	Weston	26·4	346	i 5 46	pP	—	—	—	—	—
II		26·4	346	i 5 32	0	—	—	—	—	—
I	Harvard	26·6	346	e 5 48	pP	—	—	—	—	e 12·9
I	Cleveland	29·4	330	—	—	i 12 8	SS	e 12 36	SSS	e 15·6
II		29·4	330	e 6 31	?	—	—	e 7 0	PP	—
I	Ottawa	z. 30·4	342	e 6 23	pP	—	—	—	—	—
I	Huancayo	31·5	204	e 6 22	+ 4	—	—	e 6 36	pP	—
I	La Paz	33·8	189	e 6 37	− 1	14 51	SSS	—	—	18·5
II		33·8	189	6 40	+ 2	—	—	—	—	18·2
I	Tucson	46·1	299	e 8 23	+ 4	e 15 28	sS	i 8 36	pP	—
II		46·1	299	e 8 20	+ 1	—	—	e 8 35	pP	—
I	Pierce Ferry	49·2	303	e 8 45	+ 1	—	—	i 9 0	pP	—
II		49·2	303	i 8 44	0	—	—	—	—	—
I	Overton	z. 49·7	304	e 9 12	pP	—	—	—	—	—
II		z. 49·7	304	e 8 49	+ 2	—	—	—	—	—
I	Boulder City	49·9	303	i 9 4	pP	—	—	—	—	—
I	Riverside	z. 51·7	301	e 9 18	pP	—	—	e 9 35	sP	—
II		z. 51·7	301	e 9 3	0	—	—	—	—	—
I	China Lake	z. 52·1	303	e 9 5	− 1	—	—	i 9 20	pP	—
II		z. 52·1	303	e 9 4	− 2	—	—	—	—	—
I	Hungry Horse	52·1	319	e 9 8	+ 2	i 9 37	sP	i 9 20	pP	—
II		52·1	319	i 9 5	− 1	—	—	—	—	—
I	Mount Wilson	z. 52·3	301	e 9 22	pP	—	—	—	—	—
I	Lick	z. 55·1	305	i 9 45k	pP	—	—	—	—	—
II		z. 55·1	305	i 9 31a	+ 3	—	—	—	—	—
I	Mineral	55·7	308	i 9 45	pP	—	—	e 10 6	sP	—
II		55·7	308	e 9 32	0	—	—	e 9 50	pP	—
I	Victoria	z. 58·2	317	e 10 1	pP	—	—	—	—	—
I	Tamanrasset	z. 63·7	72	e 10 31	+ 4	—	—	e 10 45	pP	—
II		z. 63·7	72	e 10 31	+ 4	—	—	e 10 56	pP	—
I	Stuttgart	z. 65·4	44	e 10 38	0	—	—	e 10 55	pP	—
II		65·4	44	e 10 38	0	—	—	—	—	e 28·7

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
I College	72·8	334	e 11 23	0	—	—	i 11 38	pP	e 36·2
II	72·8	334	e 11 23	0	—	—	—	—	—
II Christchurch	126·7	229	e 20 40?	PP	—	—	—	—	—

Additional readings :—
Tucson I ePP? =10m.34s.
Tamanrasset II ePPZ =12m.51s.
Long waves to shock I were also recorded at Bozeman and Paris and to shock II at Huancayo.

Dec. 27d. Readings also at 1h. (Hungry Horse), 4h. (Tacubaya, Hungry Horse, Ashkabad, Lunacharskoe, Tchimkent, Naryn, Frunse, near Obi-garm, Stalinabad, Kulyab, Fergana, Samarkand, Andijan, and Tashkent), 5h. (College), 6h. (La Paz, Overton, Ashkabad, Obi-garm, Fergana, Lunacharskoe, Samarkand, near Andijan, and Kulyab), 7h. (La Paz, Huancayo, Tacubaya, Overton, Pierce Ferry, and Hungry Horse), 9h. (Overton, Pierce Ferry, and China Lake), 10h. (near Tacubaya), 11h. (Pierce Ferry), 12h. (College), 13h. (Hungry Horse, Boulder City, Overton, Pierce Ferry, and Tucson), 14h. (College and La Paz), 15h. (College, Overton, and Pierce Ferry), 16h. (Ksara), 19h. (La Paz, Pierce Ferry, Tucson, Overton, Hungry Horse, Samarkand, Fergana (2), Tchimkent, Andijan (3), Tashkent, near Kulyab, Przhevalsk, Naryn, Almata, Frunse, Obi-garm (2), and Stalinabad), 20h. (Ksara), 21h. (near Obi-garm), 22h. (Pierce Ferry), 23h. (Overton (2), Pierce Ferry (2), Riverside, and China Lake (2)).

Dec. 28d. 14h. 17m. 29s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·100. (as on 11d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		5·7	228	i 1 40	− 2	i 3 1	− 3	—	—	—
La Paz		8·7	162	i 2 9k	+ 1	i 3 55	+ 5	—	—	5·5
Bogota		13·1	346	i 2 50	+ 1	i 5 8	+ 3	i 3 4	PP	—
Fort de France		24·8	24	—	—	e 8 5	−10	—	—	—
San Juan		26·9	10	—	—	i 8 41	− 7	—	—	e 11·8
Tacubaya		39·0	316	e 6 32	− 2	e 11 28	−22	e 12 2	P_cS	—
Washington		47·2	355	i 7 38	0	—	—	—	—	—
Weston		50·3	1	i 7 59	− 1	—	—	i 10 8	pP	—
Harvard		50·5	1	e 7 59	− 3	—	—	—	—	—
Tucson		55·3	320	i 8 34	− 2	e 15 45	+13	i 12 24	P_cS	—
Pierce Ferry		59·8	321	i 9 5	− 1	—	—	—	—	—
Palomar		60·0	317	i 9 7	0	—	—	—	—	—
Boulder City		60·2	320	i 9 8	0	—	—	—	—	—
Overton	z.	60·3	321	i 9 9	0	e 12 45	S_cP	i 10 55	pP	—
Riverside	z.	60·8	317	i 9 11	− 1	—	—	—	—	—
Pasadena		61·4	317	i 9 15k	− 1	—	—	e 11 28	pP	—
China Lake	z.	61·9	318	i 9 19k	0	—	—	i 11 46	pP	—
Tinemaha		63·1	319	i 9 27k	0	—	—	e 11 33	pP	—
Fresno		63·9	318	e 9 31a	− 1	—	—	—	—	—
Reno	z.	65·5	321	e 9 43k	+ 1	—	—	e 12 15	pP	—
Lick	z.	65·5	318	i 9 42k	0	—	—	—	—	—
Berkeley	z.	66·2	318	i 9 47k	+ 1	—	—	—	—	—
Mineral	z.	67·1	320	e 9 51	− 1	—	—	—	—	—
Hungry Horse		67·8	331	i 9 56	0	i 18 4	0	i 12 26	pP	—
Shasta Dam		67·8	320	i 9 53	− 3	—	—	—	—	—
Seattle		71·7	327	i 10 21a	+ 2	—	—	—	—	—
Victoria		72·8	327	e 10 25	0	—	—	—	—	—
Tamanrasset	z.	80·9	65	i 11 11k	+ 3	e 21 21	SP	i 13 23	pP	—
College		91·8	335	e 11 59	− 1	i 15 53	PP	i 14 15	pP	—

Additional readings :—
Bogota iSSS =5m.44s.
Pasadena eZ =10m.37s., 11m.44s., and 12m.50s.
China Lake eZ =9m.33s. and 9m.47s.
Fresno eZ =10m.15s.
Lick iZ =10m.34s.
Mineral eEZ =10m.33s.
Hungry Horse ePKP,PKP =37m.17s., eSKP,PKP =40m.32s.
Seattle i =10m.26s., 10m.54s., and 11m.56s.
Tamanrasset esPZ =14m.24s., ePPZ =14m.32s., esSPZ =25m.9s., eSKP,PKPZ = 40m.8s.

Dec. 28d. 21h. 6m. 16s. Epicentre 14°·6S. 76°·3W. Focus at base of superficial layers. (as on 10d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		2·7	20	i 0 41	− 1	i 1 8	− 6	—	—	—
La Paz		8·1	105	i 1 56k	− 2	i 3 12	−18	—	—	—
Bogota		19·2	5	i 4 26	+ 2	i 7 51	− 2	i 4 43	pP	—
Chinchina		19·5	2	e 4 26	− 1	e 8 7	+ 7	e 8 36	sS	—
Weston		56·9	5	e 9 1	−43	—	—	—	—	—
Harvard		57·0	5	e 9 42	− 3	—	—	—	—	—
Tucson		57·1	325	i 9 47	+ 1	—	—	e 10 16	pP	—
Palomar	N.	61·4	321	i 10 16	+ 1	—	—	—	—	—
Pierce Ferry		61·8	326	i 10 19	+ 1	—	—	—	—	—
Boulder City		62·1	325	i 10 21	+ 1	—	—	—	—	—
Riverside	Z.	62·2	321	i 10 21	+ 1	—	—	i 10 37	pP	—
Overton	Z.	62·3	326	i 10 23	+ 2	—	—	—	—	—
Pasadena	Z.	62·7	321	i 10 25	+ 1	—	—	i 10 40	pP	—
China Lake	Z.	63·6	323	i 10 29a	− 1	—	—	i 10 44	pP	—
Tinemaha	Z.	64·8	323	i 10 38	0	—	—	e 10 55	pP	—
Lick	Z.	67·0	322	i 10 53a	+ 1	—	—	e 11 6	pP	—
Reno	Z.	67·4	325	e 10 55k	+ 1	—	—	e 11 42	sP	—
Berkeley	Z.	67·7	322	e 10 58k	+ 2	—	—	e 11 13	pP	—
Hungry Horse		71·1	335	i 11 16	− 1	—	—	—	—	—
Tamanrasset	Z.	88·2	66	i 12 48	− 1	—	—	e 13 6	pP	—
College		95·5	336	i 13 22	− 1	—	—	—	—	—

Additional readings :—
Bogota iSS = 8m.24s.
Pierce Ferry i = 11m.2s.
Pasadena iZ = 10m.54s.
Tinemaha eZ = 11m.6s.
Tamanrasset eZ = 13m.2s., ePPZ = 16m.40s.

Dec. 28d. 22h. 31m. 25s. Epicentre 35°·5N. 27°·2E. (as on 1950, May 30d.).

A = +·7258, B = +·3730, C = +·5781 ; δ = +11 ; h = 0 ;
D = +·457, E = −·889 ; G = +·514, H = +·264, K = −·816.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		3·7	313	e 0 58	− 2	—	—	—	—	—
Istanbul		5·8	14	e 2 31	S	(e 2 31)	− 7	—	—	—
Helwan		6·6	147	e 1 43	+ 2	e 2 31	?	—	—	—
Ksara		7·4	101	e 0 51	−61	e 2 54	?	—	—	—
Yalta		10·4	28	—	—	e 4 45	+13	—	—	—
Kishinev		11·6	6	2 51	+ 1	—	—	—	—	—
Rome		13·1	304	—	—	e 4 37	−61	—	—	e 7·3
Triest		14·4	319	e 4 7	PP	i 6 42	+33	i 7 53	SS	e 9·0
Pavia		16·8	311	—	—	i 7 47	+42	—	—	e 9·8
Prague		17·3	333	e 4 20?	+16	e 7 38	+22	—	—	e 9·6
Stuttgart		18·7	322	e 4 23	+ 1	e 7 54	+ 6	—	—	e 10·6
Jena		19·1	330	e 4 27	0	e 8 7?	+10	—	—	—
Strasbourg		19·4	320	e 4 30	0	—	—	—	—	7·6
Besançon		19·8	313	e 4 34	− 1	—	—	—	—	—
Moscow		21·5	16	e 4 48	− 4	e 8 50	+ 3	—	—	—
Paris		22·5	314	i 5 3	+ 1	i 9 14	+ 9	—	—	e 11·6
Tamanrasset	Z.	22·7	242	e 5 21	+17	—	—	—	—	e 11·4
Ashkabad		25·0	75	e 5 26	− 1	e 9 52	+ 3	—	—	—
Upsala		25·2	349	—	—	e 8 35?	?	—	—	e 13·6
Kew		25·3	319	—	—	e 10 27	+33	—	—	e 13·6
Fergana		35·2	68	e 6 54	− 4	—	—	—	—	—
Weston		72·6	310	i 9 9	?	—	—	—	—	—
Hungry Horse		89·6	335	i 12 54	− 6	—	—	—	—	—

Additional readings :—
Helwan iZ = 2m.35s., 4m.48s., and 6m.11s.
Besançon e = 4m.48s.
Paris i = 5m.8s. and 5m.17s., e = 9m.22s.
Tamanrasset eZ = 5m.59s. and 8m.46s.
Long waves were also recorded at Budapest, De Bilt, and Copenhagen.

Dec. 28d. 22h. 41m. 15s. Epicentre 22°·5N. 143°·5E. Depth of focus 0·010.
(as on 1950, June 5d.).

$A = -·7434$, $B = +·5501$, $C = +·3805$; $\delta = +3$; $h = +4$;
$D = +·595$, $E = +·804$; $G = -·306$, $H = +·226$, $K = -·925$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		22·7	338	i 4 49	− 5	i 8 51	0	—	—	—
Nanking		23·9	299	i 5 4	− 2	9 12	0	i 5 47	PP	—
Irkutsk		42·2	326	e 7 44?	− 1	e 13 52	− 5	—	—	—
Brisbane	z.	50·5	169	i 8 52	+ 2	—	—	—	—	—
Przhevalsk		57·0	308	i 9 38	0	—	—	—	—	—
Naryn		58·9	306	i 9 48	− 3	—	—	—	—	—
Frunse		59·8	308	i 9 57	0	e 18 1	+ 2	—	—	—
College		60·8	27	e 10 2	− 2	—	—	i 10 28	pP	—
Andijan		61·7	305	10 10	0	i 18 25	+ 2	—	—	—
Fergana		62·1	305	e 10 11	− 2	e 18 27	− 1	—	—	—
Tchimkent		63·5	308	i 10 22?	0	—	—	—	—	—
Kulyab		64·0	303	e 10 23	− 2	—	—	—	—	—
Obi-garm		64·0	304	e 10 27	+ 2	e 18 52	0	—	—	—
Stalinabad		64·7	304	i 10 29	− 1	i 18 59	− 2	—	—	—
Samarkand		65·9	305	e 10 37	− 1	—	—	—	—	—
Sverdlovsk		67·6	325	i 10 45	− 3	19 33	− 3	—	—	—
Victoria	z.	75·5	44	e 11 35	0	—	—	—	—	—
Resolute Bay	z.	76·2	14	i 11 38	− 1	—	—	e 12 3	pP	—
Shasta Dam		78·7	51	i 11 54	+ 1	—	—	i 12 19	pP	—
Mineral		79·3	51	i 11 58	+ 2	—	—	e 12 25	pP	—
Berkeley	z.	79·7	54	i 12 0k	+ 1	—	—	i 12 27	pP	—
Lick	z.	80·4	53	i 12 3k	+ 1	—	—	i 12 30	pP	—
Reno	z.	80·9	51	e 12 5	0	—	—	e 12 34	pP	—
Hungry Horse		81·4	42	i 12 9	+ 1	e 22 9	0	e 12 34	pP	—
Fresno	z.	82·0	54	e 12 11k	0	—	—	e 12 41	pP	—
Tinemaha	z.	83·0	53	i 12 17k	+ 1	—	—	i 12 44	pP	—
China Lake	z.	84·0	54	i 12 21k	0	—	—	i 12 47	pP	—
Pasadena	z.	84·2	56	i 12 22	0	—	—	i 12 49	pP	—
Riverside	z.	84·8	56	i 12 26	+ 1	—	—	e 12 54	pP	—
Palomar		85·5	56	i 12 30	+ 2	—	—	i 12 57	pP	—
Boulder City		85·9	53	i 12 33	+ 3	—	—	—	—	—
Overton	z.	86·0	53	i 12 33	+ 2	—	—	e 12 59	pP	—
Pierce Ferry		86·5	53	i 12 35	+ 2	e 22 54	− 6	i 13 3	pP	—
Tucson		90·5	55	i 12 55	+ 3	—	—	e 13 13	pP	—
Collmberg	z.	94·6	331	e 13 10	− 1	—	—	e 16 56	PP	—
Stuttgart	z.	98·2	332	e 13 26?	− 1	—	—	e 17 15	PP	—
Tamanrasset	z.	119·2	315	e 18 44	[+ 6]	e 22 3	PKS	e 19 57	PP	—
Pretoria	z.	121·4	253	e 18 45	[+ 3]	—	—	—	—	—
La Paz	z.	149·6	84	i 19 47	[+14]	—	—	—	—	—

Additional readings :—
Mineral eZ = 12m.21s.
Lick iZ = 12m.8s. and 12m.20s.
Hungry Horse i = 12m.54s., iPP = 15m.36s.
China Lake iZ = 12m.54s.
Pasadena iZ = 12m.43s.
Riverside eZ = 12m.44s.
Long waves were also recorded at Paris.

Dec. 28d. Readings also at 0h. (La Paz, Ksara, and near Ashkabad), 1h. (La Paz), 2h. (Mount Wilson Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Reno, Mineral, Hungry Horse, College, Stuttgart, Andijan, Samarkand, near Kulyab, Obi-garm, and Stalinabad), 3h. (Tacubaya and College), 4h. (near Tacubaya), 6h. (China Lake, Tinemaha, Tucson, College, Tortosa, Huancayo, and near La Paz), 7h. (Overton (2), Pierce Ferry, and La Paz), 8h. (Overton (2) and Pierce Ferry), 9h. (Bombay), 10h. (near Obi-garm), 12h. (Nanking and Tacubaya), 13h. (Hungry Horse), 14h. (College, Andijan, Samarkand, and near Obi-garm (2)), 16h. (Mount Wilson, Pasadena, China Lake, Tinemaha, and Stuttgart), 18h. (Ottawa and near Klyuchi), 19h. (Hungry Horse and College), 20h. (College), 21h. (Ksara and near Overton), 22h. (La Paz and De Bilt), 23h. (Paris, Fergana, Lunacharskoe, near Andijan, Kulyab, Obi-garm, Stalinabad, near Athens, and near Granada).

Dec. 29d. 11h. Region of Samoa.

Apia eP = 16m.27s., eS = 17m.5s.
Mount Wilson ePZ = 26m.51s.
Shasta Dam iP = 26m.57s.
China Lake iPZ = 26m.59s.
Mineral ePZ = 27m.0s.
Tinemaha ePZ = 27m.1s.
Boulder City eP = 27m.11s.
Overton iPZ = 27m.14s.
Pierce Ferry iPZ = 27m.14s.
Tucson eP = 27m.15s.
Hungry Horse iP = 27m.48s.
College iP = 27m.50s.
Collmberg eZ = 34m.58s.
Paris iPKP = 35m.4s.
Stuttgart eZ = 35m.6s.
Strasbourg ePKP = 35m.7s.
Besançon ePKP = 35m.14s.

Dec. 29d. 11h. 56m. 2s. Epicentre 32°·7N. 88°·0E.

A = +·0294, B = +·8427, C = +·5377 ; δ = +13 ; h = +1 ;
D = +·999, E = −·035 ; G = +·019, H = +·537, K = −·843.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dehra Dun	N.	8·8	257	e 2 16	+ 5	—	—	—	—	—
Calcutta	E.	10·1	178	e 2 31	+ 3	e 4 30	+ 5	4 40	SS	4·4
New Delhi		10·2	249	i 2 31k	0	i 4 20	− 7	2 39	PP	—
Przhevalsk		12·4	325	i 3 2	+ 1	—	—	—	—	—
Naryn		12·9	316	e 3 9	+ 2	e 5 46	SS	—	—	—
Almata		13·7	324	i 3 19	+ 1	—	—	—	—	—
Frunse		14·7	318	i 3 32	+ 1	i 6 32	SS	—	—	—
Andijan		14·9	307	3 34	0	i 6 46	SS	—	—	—
Fergana		15·1	305	i 3 36	0	—	—	—	—	—
Kulyab		15·7	294	e 3 42	− 2	—	—	—	—	—
Obi-garm		16·0	297	i 3 44	− 4	e 7 5	SS	—	—	—
Stalinabad		16·7	296	i 3 54	− 3	i 7 19	SS	—	—	—
Lunacharskoe		17·2	305	4 4	+ 1	—	—	—	—	—
Tashkent		17·2	305	i 4 2	− 1	i 7 29	SS	—	—	—
Samarkand		18·3	297	e 4 18	+ 1	e 7 58	SS	—	—	—
Poona		19·0	226	i 4 23	− 3	i 7 58	+ 3	4 40	PP	9·0
Bombay		19·3	229	e 4 31	+ 2	i 8 15	+13	—	—	—
Ashkabad		24·7	291	5 29	+ 5	—	—	—	—	—
Nanking		26·0	83	e 5 43	+ 7	10 37	+31	—	—	—
Colombo	E.	26·8	199	6 41	+57	10 38	+19	13 1	Q	15·6
Lenkoran		32·2	293	—	—	e 11 52	+ 7	—	—	—
Grozny		34·6	301	e 6 55	+ 2	—	—	—	—	—
Tiflis		35·3	298	e 6 58	− 1	—	—	—	—	—
Abastumanj		36·7	298	e 7 15	+ 5	—	—	—	—	—
Moscow		41·6	320	e 7 53	+ 2	e 14 13	+ 5	—	—	—
Yalta		43·0	303	e 8 2	− 1	14 33	+ 4	—	—	—
Ksara		43·2	286	e 12 5?	?	e 18 13	SSS	—	—	—
Kishinev		46·5	307	—	—	e 15 35?	+16	—	—	—
Helwan	N.	48·0	283	—	—	e 15 52	+11	e 18 34	ScS	—
Helsinki	N.	49·0	325	—	—	e 19 51	SS	—	—	e 25·5
Lwow		49·5	311	e 8 55	+ 1	—	—	—	—	—
Skalnate Pleso		52·0	310	e 9 16	+ 3	e 16 46	+10	e 20 10	SS	—
Upsala		52·6	324	(e 9 12)	− 6	(e 16 58?)	+14	(e 10 38)	PcP	—
Budapest		53·1	308	e 9 23	+ 2	e 20 58?	SS	e 27 58?	Q	30·0
Prague		55·6	312	e 9 39	− 1	e 17 16	− 9	e 17 40	PS	e 28·0
Copenhagen		55·8	320	i 9 42	+ 1	i 17 36	+ 8	21 28	SS	30·0
Taranto		56·0	300	e 16 13	?	—	—	—	—	—
Collmberg		56·3	313	e 9 45	0	—	—	—	—	e 30·5
Triest		57·1	307	—	—	e 22 27	SS	—	—	—
Jena	E.	57·2	313	e 9 52	+ 1	e 18 7?	+21	e 18 19	PPS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		59·0	303	—	—	e 18 9	− 1	e 22 15	SS	e 27·6
Stuttgart		59·2	312	e 10 6	+ 1	e 18 17	+ 5	e 10 38	P_cP	e 33·0
Karlsruhe		59·7	312	e 10 9	0	e 18 16	− 3	—	—	e 34·0
Zürich		60·0	310	e 10 10a	− 1	—	—	—	—	—
Strasbourg		60·2	312	i 10 14k	+ 2	e 18 29	+ 4	e 10 56	P_cP	e 31·0
Pavia		60·3	308	—	—	e 18 14	−12	e 24 10	?	i 33·0
Basle		60·6	310	e 10 17	+ 2	—	—	—	—	—
De Bilt		60·8	316	e 14 8	PPP	e 18 38	+ 5	e 24 58?	SSS	e 28·0
Besançon		61·7	311	e 10 21	− 1	—	—	—	—	—
Paris		63·4	314	i 10 34	0	i 19 14	+ 8	i 11 20	P_cP	e 30·0
Durham		63·8	320	—	—	i 26 26	SSS	—	—	—
Kew		64·2	317	—	—	e 19 19	+ 3	e 26 23	SSS	e 31·0
Scoresby Sund		65·8	340	i 10 51	+ 2	—	—	—	—	26·0
Rathfarnham Castle		66·9	320	e 10 26	−30	i 19 27	−22	e 28 8	Q	e 33·0
Toledo		71·3	306	i 11 27	+ 4	—	—	e 12 40	?	—
Tamanrasset	z.	72·0	287	i 11 25a	− 3	—	—	i 11 52	PcP	—
Resolute Bay		72·9	2	11 33	0	e 21 4	+ 5	e 25 34	SS	—
College		73·5	22	i 11 37	+ 1	e 20 13	−53	i 14 20	PP	e 37·4
Hungry Horse		96·9	15	i 13 32	− 2	—	—	e 17 3	PP	—
Mineral	z.	102·3	23	e 18 12	PP	—	—	—	—	—
Tinemaha	z.	106·4	21	e 18 7	[−19]	—	—	—	—	—
China Lake	z.	107·8	21	e 18 14	[−15]	—	—	—	—	—
Overton	z.	108·0	19	e 18 50	PP	—	—	—	—	—
Pierce Ferry		108·5	18	e 18 34	[+ 4]	—	—	—	—	—
La Paz		153·1	301	20 4	[+12]	i 27 44	PPP	73 58?	Q	77·0
Huancayo		154·4	320	e 20 1	[+ 7]	e 44 26	SSP	e 25 40	?	e 73·5

Additional readings and notes :—
New Delhi PPPEN =2m.46s., SSEN =4m.33s., SSSEN =4m.43s.
Poona PPPE =4m.48s., QE =8m.6s., P_cPE =8m.25s., SSE =8m.29s.
Nanking e =5m.49s.
Upsala eE =(10m.52s.), ePPE =(11m.11s.), eE =(11m.38s.), and (13m.12s.), eN = (13m.15s.) and (15m.54s.), eL?E =(19m.58s.); readings have been reduced by 10 minutes.
Budapest eN =9m.58s.
Prague i =9m.50s., e =9m.54s., 11m.7s., and 16m.26s.
Jena ePN =10m.12s., eE =10m.15s.
Stuttgart e =19m.13s. and 21m.58s., eSS =22m.22s., eSSS =24m.34s.
Strasbourg e =10m.18s. and 10m.34s., eSS =22m.38s., e =23m.58s.
Paris i =10m.38s., e =11m.56s., ePPP =14m.33s., eSS =23m.38s., eSSS? =26m.24s.
Tamanrasset eZ =12m.56s.
Resolute Bay S =20m.44s., PSE =21m.20s., e =21m.38s.
College i =12m.8s., eSSS =29m.22s.
Long waves were also recorded at Warsaw, Potsdam, Bermuda, Palisades, Philadelphia, Chicago. Bozeman, Pasadena, and Sitka.

Dec. 29d. 20h. 16m. 28s. Epicentre 17°·0N. 62°·5W. (as on 27d.). Depth of focus 0·005.

Epicentre 17°·0N. 62°·5W., depth 100km. (U.S.C.G.S.).

P. L. Willmore.
The Earthquake Series in St. Kitts-Nevis, 1950-1951. "Nature," May 10d., 1952, vol. 169, pp.770-775, with isoseismic chart.

P. Molard.
Tremblements de terre des Petites Antilles (1944-1951). Annales de Géophysique, p.8, Paris, 1952, pp.309-310, 1 fig.

$A = +·4418$, $B = -·8488$, $C = +·2906$; $\delta = +10$; $h = +5$;
$D = -·887$, $E = -·462$; $G = +·134$, $H = -·258$, $K = -·957$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France	2·6	150	i 0 39	− 2	i 1 20	+ 8	—	—	—
San Juan	3·7	292	e 0 52	− 4	i 1 34	− 5	i 0 56	P	i 2·1
Bermuda	15·4	353	e 3 30	− 5	e 6 36	+12	—	—	e 6·8
Bogota	16·7	224	i 3 54	+ 3	i 7 11	SS	—	—	8·6
Chinchina	17·5	228	i 3 1	−60	e 6 22	−50	—	—	7·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Washington		25·3	333	e 5 20	− 2	—	—	—	—	e 12·6
Philadelphia		25·4	338	e 5 42	pP	i 9 42	0	—	—	e 11·7
Palisades		25·9	341	e 5 30a	+ 2	e 10 11	sS	e 5 53	pP	e 12·0
Weston		26·4	346	e 5 37	+ 5	—	—	i 6 6	sP	—
Harvard		26·6	346	e 5 36	+ 2	e 10 15	+13	—	—	e 12·2
Cleveland	N.	29·4	330	e 6 0	+ 1	i 11 51	+64	i 6 46	PP	—
Ottawa		30·4	342	e 6 14	+ 6	11 14	+11	—	—	—
Huancayo		31·5	204	e 6 21	+ 3	e 11 30	+10	—	—	e 15·8
La Paz		33·8	189	6 44	+ 6	i 12 4	+ 8	7 56	PP	16·7
Tucson		46·1	299	e 8 20	+ 1	e 15 41	+41	e 19 9	SSS	e 24·1
Salt Lake City		48·5	310	—	—	e 19 38	SSS	—	—	e 24·0
Pierce Ferry		49·2	303	i 8 44	0	—	—	—	—	—
Overton	Z.	49·7	304	i 8 48	+ 1	—	—	e 9 6	pP	—
Boulder City		49·9	303	e 8 49	0	—	—	—	—	—
Palomar		51·3	300	i 9 1	+ 1	—	—	—	—	—
Riverside	Z.	51·7	301	i 9 3	0	—	—	—	—	—
La Plata		51·8	175	—	—	17 38	?	20 14	SS	25·1
China Lake	Z.	52·1	303	i 9 5	− 1	—	—	—	—	—
Hungry Horse		52·1	319	i 9 5	− 1	—	—	i 10 51	PP	—
Pasadena		52·4	301	i 9 8a	0	—	—	i 9 25	pP	i 27·4
Tinemaha	Z.	52·8	305	e 9 11	0	—	—	—	—	—
Reno	Z.	54·3	307	e 9 22k	0	—	—	—	—	—
Lick	Z.	55·1	305	e 9 31a	+ 3	—	—	—	—	—
Mineral	Z.	55·7	308	e 9 31	− 1	—	—	e 10 41	PcP	—
Shasta Dam		56·4	308	i 9 34	− 3	—	—	—	—	—
Victoria		58·2	317	e 10 48	PcP	—	—	—	—	—
Resolute Bay		60·3	350	10 3	− 1	e 18 4	− 8	e 22 35	SS	—
Paris		61·0	43	—	—	i 18 24	+ 3	i 25 32?	Q	e 27·5
Tamanrasset	Z.	63·7	72	e 10 30	+ 3	—	—	e 10 55	pP	—
Strasbourg		64·4	44	—	—	e 19 16	+13	—	—	—
Karlsruhe		64·9	43	e 10 32?	− 3	—	—	—	—	—
Stuttgart		65·4	44	e 10 38	0	e 19 26	+10	e 20 32	ScS	—
Copenhagen		67·7	36	—	—	i 19 53	+ 9	—	—	31·5
Rome		67·8	51	—	—	e 20 53	ScS	—	—	—
Prague		68·8	42	e 10 59	0	e 19 50	− 7	—	—	—
College		72·8	334	e 11 22	− 1	—	—	i 11 55	pP	e 31·1

Additional readings :—
San Juan eS = 1m.28s.
Palisades iP = 5m.37s., ipP = 5m.58s., iPP = 6m.28s.
Cleveland eE = 12m.0s.
La Paz SS = 14m.22s.
China Lake iZ = 9m.35s., eZ = 10m.18s.
Resolute Bay SN = 17m.48s., e = 18m.26s., eN = 23m.16s. and 27m.24s.
Tamanrasset ePPZ = 12m.50s.
College i = 11m.25s. and 11m.38s.
Long waves were also recorded at Bozeman, Butte, Sitka, Scoresby Sund, Kew, De Bilt, and Pavia.

Dec. 29d. 22h. 35m. 20s. Epicentre 24°·0N. 91°·8E. (given by Strasbourg).

$A = -\cdot0287$, $B = +\cdot9141$, $C = +\cdot4045$; $\delta = +2$; $h = +4$;
$D = +1\cdot000$, $E = +\cdot031$; $G = -\cdot013$, $H = +\cdot404$, $K = -\cdot915$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	3·5	246	i 1 1	P*	1 40	0	1 13	Pg	—
New Delhi		13·9	292	e 3 18	− 3	i 5 49	− 8	3 29	PP	—
Poona	E.	17·6	255	i 4 5	− 3	e 7 18	− 5	4 22	PP	8·2
Bombay		18·4	257	e 4 21	+ 3	e 7 57	SS	—	—	11·0
Kodaikanal	E.	19·3	228	i 4 33k	+ 4	e 8 13	+11	—	—	9·2
Colombo	E.	20·5	216	4 40	− 2	8 40	+13	—	—	11·2
Naryn		21·8	328	i 4 58	+ 2	i 9 4	+12	—	—	—
Almata		22·8	332	i 5 7	+ 2	i 9 23	+12	—	—	—
Andijan		23·3	320	e 5 12	+ 2	e 9 30	+10	—	—	—
Kulyab		23·3	312	e 5 12	+ 2	e 9 30	+10	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fergana		23·4	320	e 5 12	+ 1	—	—	—	—	—
Frunse		23·6	327	i 5 17	+ 4	i 9 38	+13	—	—	—
Obi-garm		23·8	314	i 5 19	+ 4	i 9 41	+13	—	—	—
Stalinabad		24·4	313	i 5 23	+ 2	i 9 47	+ 8	—	—	—
Lunacharskoe		25·5	318	5 33	+ 1	10 9	+12	—	—	—
Tashkent		25·5	318	i 5 32	0	i 10 15	+18	—	—	—
Tchimkent		25·9	320	i 5 34	− 1	—	—	—	—	—
Samarkand		26·1	312	e 5 39	+ 2	—	—	—	—	—
Mary		28·9	305	i 6 4	+ 1	—	—	—	—	—
Irkutsk		29·8	15	e 6 11	0	—	—	—	—	—
Ashkabad		31·7	304	e 6 30	+ 3	—	—	—	—	—
Vladivostok		38·0	50	—	—	e 12 59	−15	—	—	—
Baku		38·6	306	e 7 33	+ 7	—	—	—	—	—
Lenkoran		39·2	304	7 32	+ 1	—	—	—	—	—
Grozny		42·3	309	e 8 1	+ 4	—	—	—	—	—
Tiflis		42·7	306	e 8 0	0	—	—	—	—	—
Moscow		50·5	324	e 8 59	− 3	e 16 17	+ 1	—	—	—
Yalta		50·7	309	9 3	0	16 22	+ 4	—	—	—
Helwan	E.	53·7	290	—	—	e 17 40	PPS	e 21 53	?	—
Kishinev		54·6	312	9 32	0	—	—	—	—	—
Pulkovo		55·3	327	e 9 36	− 2	—	—	—	—	—
Lwow		57·8	315	e 9 46	− 9	—	—	—	—	—
Prague		64·0	317	e 10 34	− 4	e 19 14	+ 1	e 19 46	PPS	e 30·7
Copenhagen		64·6	323	i 10 43	+ 2	e 19 18	− 3	13 10	PP	31·7
Collmberg	Z.	64·8	318	e 10 40	− 3	—	—	—	—	—
Jena	E.	65·7	317	e 10 45	− 3	—	—	e 11 26	PcP	—
Rome		66·7	307	—	—	e 20 31	PPS	e 27 27	SSS	—
Stuttgart		67·6	315	i 10 58	− 3	e 20 1	+ 4	e 30 40	Q	e 36·2
Karlsruhe	Z.	68·1	316	e 11 1	− 3	—	—	—	—	—
Zürich		68·3	314	e 11 7	+ 2	—	—	—	—	—
Pavia		68·4	311	—	—	e 20 7	0	—	—	e 37·4
Strasbourg		68·6	315	e 11 5k	− 2	—	—	—	—	e 35·7
Basle		68·9	314	e 11 6	− 3	—	—	—	—	—
De Bilt		69·4	319	e 11 9	− 3	e 20 28	+10	e 13 48	PP	e 36·7
Paris		71·9	317	i 11 22	− 5	i 21 26	PPS	i 14 5	PP	e 37·7
Kew		72·9	319	e 11 33	0	e 21 3	+ 4	—	—	e 34·7
Tamanrasset	Z.	77·8	290	i 11 59k	− 2	—	—	e 14 58	PP	—
Pietermaritzburg	Z.	79·5	231	e 12 7	− 3	—	—	—	—	—
College		80·3	22	e 12 9	− 5	—	—	e 15 17	PP	e 43·0
Hungry Horse		104·4	17	e 14 8	0	—	—	—	—	—
China Lake	Z.	114·3	26	e 18 36	[− 6]	—	—	e 19 36	PP	—
Boulder City		115·3	23	e 18 43	[− 1]	—	—	—	—	—
Pierce Ferry		115·4	22	e 18 21	[−23]	—	—	—	—	—
Tucson		120·0	21	e 18 51	[− 2]	—	—	—	—	—

Additional readings :—
Calcutta PPPE =1m.25s., S*E =1m.46s., S_gE =1m.59s.
New Delhi PPPEN =3m.36s., SSSEN =6m.14s.
Poona PPPE =4m.34s., SSE =7m.44s., iSSSE =7m.56s., P_cPE =8m.28s., S_cPE = 11m.50s.
Prague e =10m.38s., 11m.10s., 11m.43s., and 21m.14s.
Jena eN =11m.46s.
Stuttgart eZ =11m.4s.
Strasbourg i =11m.10s., e =11m.49s.
Paris i =11m.28s., 11m.55s., 12m.4s., and 14m.11s., iPPP =15m.50s., e =22m.38s., eSS? =26m.14s., eSSS? =29m.14s.
Tamanrasset eZ =12m.39s.
Long waves were also recorded at Ksara, Potsdam, and Upsala.

Dec. 29d. Readings also at 1h. (near Ashkabad), 2h. (China Lake, Tinemaha, Overton, Pierce Ferry, and Tucson), 3h. (Lick, China Lake, Tinemaha, Overton, Pierce Ferry, and Tucson), 4h. (Merdia, Vera Cruz, Tacubaya, and China Lake), 7h. and 8h. (near Ashkabad), 9h. (Riverview and Wellington), 10h. (near Tacubaya and near Kulyab), 12h. (near Kulyab), 14h. (near Obi-garm), 15h. (near Granada (11), Malaga, and Toledo), 16h. (College, Hungry Horse, Pietermaritzburg, Przhevalsk, Tchimkent, Kulyab, Fergana, Lunacharskoe, Tashkent, Stalinabad, near Naryn, Andijan, Frunse, Almata, and near Granada), 17h. (Mary, Kulyab, Andijan, Fergana, Tashkent, Lunacharskoe, near Stalinabad, Obi-garm, and Samarkand, Tamanrasset, and near Algiers Univ.), 18h. (near Granada), 19h. (Samarkand, near Kulyab, Stalinabad, and Obi-garm), 20h. (La Paz, Tamanrasset, Mount Wilson, Riverside, China Lake, Tinemaha, Hungry Horse, Overton, Pierce Ferry, Washington, and Granada (2)), 21h. (Sverdlovsk and Pierce Ferry), 23h. (Granada (2)).

Dec. 30d. 6h. 43m. 6s. Epicentre 31°·8S. 176°·5W. Depth of focus 0·020.

$A = -·8499$, $B = -·0520$, $C = -·5244$; $\delta = +3$; $h = +1$;
$D = -·061$, $E = +·998$; $G = +·523$, $H = +·032$, $K = -·852$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	8·8	232	—	—	e 3 54?	+11	—	—	—
Wellington		11·8	214	e 2 41	− 3	e 4 44	− 9	e 6 24	Q	e 7·1
Kaimata	N.E.	14·4	218	e 3 12	− 5	e 5 43	−10	—	—	—
Christchurch		14·5	213	e 3 24	+ 5	e 5 50	− 5	—	—	—
Apia		18·4	15	e 4 3	− 2	e 7 1	−21	—	—	—
Brisbane		26·8	270	i 5 23a	− 4	i 9 58	+ 8	—	—	—
Riverview		27·2	255	e 5 36	+ 5	i 10 11	+15	i 6 8	pP	e 12·6
Pasadena	z.	85·5	45	i 12 20k	− 1	—	—	i 12 35	pP	—
Berkeley	z.	85·8	40	i 12 23	+ 1	—	—	e 13 3	sP	—
Lick	z.	85·8	40	e 12 22k	0	—	—	i 12 37	pP	—
Palomar		85·8	46	i 12 24	+ 2	—	—	—	—	—
Riverside	z.	85·9	45	i 12 22k	− 1	—	—	i 12 36	pP	—
Fresno	z.	86·4	42	e 12 26k	+ 1	—	—	e 12 58	sP	—
China Lake	z.	87·0	44	i 12 28k	0	—	—	i 12 42	pP	—
Tinemaha	z.	87·5	43	i 12 30	− 1	—	—	—	—	—
Shasta Dam		87·8	37	i 12 31	− 1	—	—	—	—	—
Mineral	z.	87·9	38	e 12 32	− 1	—	—	—	—	—
Reno		88·3	40	e 12 34a	0	—	—	e 12 50	pP	—
Boulder City		88·8	45	i 12 37	0	—	—	—	—	—
Tucson		88·9	49	i 12 39	+ 2	—	—	—	—	—
Overton	z.	89·4	45	i 12 41	+ 1	—	—	—	—	—
Pierce Ferry		89·4	46	i 12 40	0	—	—	—	—	—
Huancayo		93·0	106	i 13 4	+ 8	e 23 43	− 2	e 30 36	SS	e 43·6
Hungry Horse		97·4	37	e 13 13	− 3	—	—	—	—	—
College		98·9	11	e 13 20	− 3	—	—	—	—	—
Kew		160·1	6	e 20 21	PKP_2	—	—	—	—	e 81·9
Stuttgart		162·5	348	e 19 44	[+ 2]	e 34 34	PSKS	e 20 29	PKP_2	—
Strasbourg		162·9	350	e 19 46	[+ 4]	e 34 46	PSKS	e 20 32	PKP_2	—
Paris		163·0	3	e 19 43	[0]	i 24 15	PP	e 20 42	PKP_2	e 80·9
Tamanrasset	z.	170·9	192	i 19 54a	[+ 6]	e 25 0	PP	e 20 13	pPKP	—

Additional readings :—
Brisbane iE = 8m.4s.
Riverview iE = 6m.22s. and 8m.3s.
Pasadena iZ = 12m.25s.
Lick iZ = 12m.30s.
China Lake iZ = 12m.33s.
Mineral eZ = 13m.51s.
Stuttgart ePP = 24m.6s.
Strasbourg ePP = 24m.16s.
Paris e = 20m.57s.
Tamanrasset $iPKP_2Z$ = 21m.15s., $epPKP_2Z$ = 21m.33s., ePPPZ = 29m.2s., eZ = 30m.25s.
Long waves were also recorded at Harvard, Weston, Palisades, and La Plata.

Dec. 30d. 13h. 2m. 19s. Epicentre 1°·8S. 77°·7W. Depth of focus 0·025.
(as on 1948, June 25d.).

$A = +·2129$, $B = -·9766$, $C = -·0312$; $\delta = +5$; $h = +7$;
$D = -·977$, $E = -·213$; $G = -·007$, $H = +·030$, $K = -1·000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chinchina		7·0	17	i 1 37	− 4	i 3 0	0	—	—	—
Bogota		7·3	30	i 1 44	− 1	i 2 41	−26	—	—	—
Huancayo		10·5	167	i 2 35	+ 8	e 4 29	+ 8	—	—	—
Balboa Heights		10·8	350	i 2 29	− 2	i 4 23	− 6	—	—	—
San Juan		23·1	29	i 4 48	− 2	e 8 44	+ 1	—	—	e 9·9
Weston		44·4	7	i 7 52	− 1	—	—	—	—	—
Harvard		44·5	7	i 7 53	− 1	—	—	—	—	—
Tucson		46·1	320	i 8 7	0	e 14 44	+ 7	—	—	—
Ottawa	Z.	47·0	3	i 8 11	− 3	—	—	—	—	—
Shawinigan Falls	N.	48·3	6	i 8 21	− 3	—	—	—	—	—
Pierce Ferry		50·7	322	i 8 42	0	—	—	i 9 26	pP	—
Palomar		50·8	318	i 8 43	0	—	—	—	—	—
Boulder City		51·1	321	i 8 45	0	—	—	e 9 30	pP	—
Overton	z.	51·2	323	i 8 46	0	—	—	—	—	—
Riverside	z.	51·5	318	i 8 48k	0	—	—	i 9 33	pP	—
Pasadena		52·2	318	i 8 53k	0	—	—	i 9 38	pP	—
China Lake	z.	52·8	321	i 8 57a	− 1	—	—	i 9 40	pP	—
Tinemaha	z.	53·9	320	i 9 6	0	—	—	—	—	—
Lick	z.	56·3	319	i 9 23a	0	—	—	i 10 7	pP	—
Reno	z.	56·4	323	e 9 23k	− 1	—	—	—	—	—
Berkeley	z.	57·0	319	i 9 28k	0	—	—	—	—	—
Mineral	z.	58·0	322	e 9 33	− 2	—	—	e 10 21	pP	—
Shasta Dam		58·7	322	i 9 37	− 3	—	—	—	—	—
College		83·3	337	i 12 6	− 1	—	—	e 15 18	PP	—
Tamanrasset	z.	84·4	68	i 12 10k	− 2	e 15 21	PP	i 13 1	pP	—
Stuttgart	z.	89·3	42	e 12 35	− 1	—	—	e 13 22	pP	—

Additional readings :—
Pasadena eZ = 9m.57s.
China Lake iZ = 9m.2s.
Lick iZ = 9m.35s. and 9m.55s.
Berkeley iZ = 9m.32s.
Mineral eZ = 10m.8s.
Tamanrasset esP?Z = 13m.12s.

Dec. 30d. 21h. 14m. 48s. Epicentre 18°·5S. 175°·0W. Depth of focus 0·030.
(as on 1938, January 16d.).

$A = -·9454$, $B = -·0827$, $C = -·3154$; $\delta = +10$; $h = +5$;
$D = -·087$, $E = +·996$; $G = +·314$, $H = +·027$, $K = -·949$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		5·6	34	1 24	+ 1	e 2 25	− 3	—	—	—
Auckland	N.	20·4	203	e 4 21	0	e 7 55	+ 3	—	—	—
New Plymouth	E.	22·6	201	e 4 45	+ 3	—	—	—	—	—
Wellington		24·3	199	i 4 55	− 3	i 8 56	− 3	i 15 32	SeS	—
Kaimata	N.E.	26·6	203	e 5 15	− 5	e 9 25	−11	—	—	—
Christchurch		27·0	199	e 5 23	0	e 9 42	0	e 11 3	SS	—
Brisbane		30·7	247	i 5 49k	− 7	i 10 31	−10	—	—	—
Riverview		33·8	235	i 7 47	PP	i 11 18	−11	i 16 22	SeS	—
Lick	z.	74·9	41	i 11 19a	+ 1	—	—	e 12 18	pP	—
Pasadena		75·3	45	i 11 20	0	—	—	i 12 21	pP	—
Fresno	z.	75·7	43	e 11 22k	0	—	—	e 12 23	pP	—
Palomar		75·7	47	i 11 24	+ 2	—	—	—	—	—
Riverside	z.	75·7	45	i 11 23	+ 1	—	—	i 12 22	pP	—
Shasta Dam		76·5	38	i 11 27	0	—	—	i 12 27	pP	—
China Lake	z.	76·6	44	i 11 27	0	—	—	i 12 26	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mineral	z.	76·8	39	e 11 28	0	—	—	i 12 28	pP	—
Tinemaha	z.	76·9	43	i 11 29	0	—	—	i 12 29	pP	—
Reno	z.	77·4	40	e 11 32k	0	—	—	e 12 30	pP	—
Boulder City		78·5	45	e 11 39	+ 1	—	—	e 12 38	pP	—
Overton	z.	79·1	45	e 11 42	+ 1	e 21 43	+23	i 12 42	pP	—
Pierce Ferry		79·2	46	i 11 42	0	e 21 25	+ 4	i 12 42	pP	—
Tucson		79·5	50	i 11 45	+ 2	—	—	i 12 44	pP	—
College		85·7	11	i 12 12	− 3	—	—	i 13 17	pP	—
Hungry Horse		85·9	36	i 12 14	− 2	—	—	i 13 17	pP	—
Collmberg	z.	146·7	351	e 19 14	[+ 1]	—	—	—	—	—
Jena		147·2	352	e 19 16	[+ 2]	—	—	e 20 22	pPKP	—
Prague		147·6	349	e 19 16	[+ 1]	e 22 12	PP	e 20 29	pPKP	—
Stuttgart	z.	149·6	355	e 19 17	[− 1]	—	—	e 20 30	pPKP	—
Paris		149·7	3	i 19 21	[+ 3]	i 32 45	PS	i 20 28	pPKP	e 84·2
Strasbourg		149·9	357	i 19 24k	[+ 6]	—	—	e 20 27	pPKP	—
Besançon		151·3	358	e 19 25	[+ 5]	—	—	e 20 39	pPKP	—
Triest	z.	152·0	347	i 19 25	[+ 3]	—	—	i 19 35	PKP_2	—
Helwan	z.	153·5	301	19 30	[+ 6]	23 18	PP	i 19 43	PKP_2	—
Algiers Univ.	z.	161·7	5	e 20 20	PKP_2	—	—	—	—	—
Tamanrasset	z.	175·7	—	i 19 44s	[+ 1]	e 25 14	PP	e 20 51	pPKP	—

Additional readings :—
Riverview iN =14m.2s., iZ =14m.12s.
Lick iZ =11m.27s.
Boulder City e =11m.46s.
Jena eE =19m.27s. and 19m.35s.
Prague e =19m.31s., 19m.41s., and 20m.10s.
Stuttgart iPKPZ =19m.23s.
Paris i =20m.43s., e =20m.52s., i =21m.4s., iPS? =33m.8s.
Strasbourg e =19m.30s.
Besançon e =19m.34s.
Tamanrasset $iPKP_2Z$ =21m.22s., eZ =25m.22s.

Dec. 30d. Readings also at 3h. (Mount Wilson, China Lake (2), Tinemaha, Boulder City (2), Overton (3), Pierce Ferry (3), Reno, Shasta Dam (2), Hungry Horse, College (2), Copenhagen, and Granada), 4h. (Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College (2), Scoresby Sund, Stuttgart (2), Bucharest, Kishinev, Tamanrasset, and near Granada), 6h. (Riverside, China Lake, Tinemaha, Pierce Ferry, College, New Delhi, Andijan, Fergana, Frunse, Naryn, Obi-garm, Samarkand, Tchimkent, and near Stalinabad), 7h. (Pierce Ferry and Kodaikanal), 8h. (Pavia and near Messina), 9h. Pierce Ferry and Hungry Horse), 10h. (near Granada), 11h. (Overton, Hungry Horse, and near Apia), 12h. (Wellington, China Lake (2), Tucson (2), Boulder City, Overton (2), Pierce Ferry (2), Shasta Dam, Hungry Horse, and College (2)), 14h. (College and near Obi-garm), 16h. (Overton and College), 17h. (Nanking, Przhevalsk, Sverdlovsk, Tchimkent, Mount Wilson, Riverside, China Lake (2), Tinemaha, Tucson, Boulder City, Overton (2), Pierce Ferry (2), Shasta Dam, Hungry Horse (2), College (2), Guadalajara, Vera Cruz, near Puebla, and Tacubaya), 19h. (near Obi-garm), 21h. (Pasadena, Riverside, Tinemaha, Pierce Ferry, College, and near Ashkabad), 22h. (Overton, Pierce Ferry, College, and near Apia).

Dec. 31d. Readings at 1h. (Naryn, Stalinabad, Tchimkent, near Fergana, Obi-garm, and Andijan), 2h. (Granada, Pierce Ferry, Hungry Horse, College, near Erevan, and Leninakan), 3h. (near Ashkabad), 5h. (near Basle), 7h. (College (2)), 9h. (Tucson, Hungry Horse, College, Harvard, Bermuda, Tamanrasset, Bogota, near Fort de France, and San Juan), 10h. (Huancayo, Guadalajara, Vera Cruz, near Puebla, and Tacubaya), 11h. (Boulder City, Overton, Pierce Ferry, Tucson, Pasadena, China Lake, near Tinemaha, and near Huancayo), 14h. (Grahamstown, Pietermaritzburg, Pretoria, and near Granada), 15h. (Puebla, Vera Cruz, China Lake, Tucson, Pierce Ferry, Hungry Horse, and College), 16h. (Ashkabad), 17h. (Andijan, Kulyab, Stalinabad, and near Obi-garm), 23h. (near Victoria, near Gandzha, Stepanavan, and Tsikhlis-Dzhvari).

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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