

INVESTIGATION OF THE ALASKAN EARTHQUAKE  
OF MAY 4, 1934

Thesis by  
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## PROCEDURE

The shock investigated occurred on May 4, 1934 at 4h. 36m. 10s. The epicenter given in The International Seismological Summary for 1934 is 61.5 degrees north latitude, 147.5 degrees west longitude and the probable error of the epicenter is  $\pm 0.21$  degrees.

The procedure of investigation consisted of using the S-P interval to find the origin time and subtracting the mean from the given times of P. However, when the residuals of given distance minus calculated distance was plotted against the azimuth, the resulting sine curve was displaced from the zero residual by three (3) seconds, indicating an incorrect origin time. A second origin time,  $O = \text{zero}$ , was calculated from the equation,  $O = (pP+P)/2 - (t_p+c)$ , and the residuals plotted. The resulting curve was symmetric to the zero residual line and showed the epicenter to be 0.3 degrees to the south of its given location.

The depth of focus was determined from the intervals of  $pP-P$ ,  $sP-P$ ,  $sS-S$ ,  $PcP-P$ , and  $ScS-S$ , each interpolated from the corresponding tables in the reference papers.

STATION	$\Delta^\circ$	AZIM.	P	S	S-P	P-O	O	P-O	$\Delta_1$	$\Delta-\Delta_1$	$\Delta_2$	$\Delta-\Delta_2$
Sitka	7.6	121	1:45	3:38	1:53	2:24		1:48	7.4	+0.2	7.1	+0.5
Victoria	18.9	123	4:22	8:02	3:40	4:35	-:13	4:25	19.5	-0.6	19.2	-0.3
Saskatoon	23.8	95	5:11	9:30	4:19	5:23	-:12	5:14	24.2	-0.4	23.9	-0.1
Bozeman	26.3	110	5:31	10:01	4:30	5:36	-:05	5:34	26.5	-0.2	26.2	+0.1
Ukiah	26.9	135	5:39	10:13	4:34	5:40	-:01	5:42	27.2	-0.3	26.9	0.0
Berkeley	28.3	135	5:51	10:39	4:48	5:57	-:06	5:54	28.6	-0.3	28.3	0.0
Tinemaha	30.5	131	6:12	11:16	5:04	6:18	-:06	6:15	30.9	-0.4	30.5	0.0
Haiwee	31.4	131	6:19	11:31	5:12	6:29	-:10	6:22	31.6	-0.2	31.2	+0.2
Mount Wilson	33.1	132	6:35	11:54	5:19	6:39	-:04	6:38	33.6	-0.5	33.4	-0.3
Pasadena	33.2	132	6:33	11:55	5:22	6:42	-:09	6:36	33.3	-0.1	32.9	-0.7
Riverside	33.5	132	6:38	12:02	5:24	6:44	-:04	6:41	33.9	-0.4	33.5	0.0
Denver	33.7	111	6:41	12:04	5:23	6:43	-:02	6:44	34.3	-0.6	33.9	-0.2
La Jolla	34.6	132	6:45	12:16	5:31	6:54	-:09	6:48	34.8	-0.2	34.4	+0.2
Tucson	37.6	124	7:14	12:46	5:32	6:55	+:19	7:17	38.1	-0.5	37.7	-0.1
Chicago	40.2	92	7:33	13:41	6:08	7:46	-:13	7:36	40.3	-0.1	39.9	+0.3
Honolulu	40.9	195	7:37	13:50	6:13	7:52	-:15	7:40	40.8	+0.1	40.4	+0.5
Florissant	41.2	97	7:41	13:57	6:16	7:56	-:15	7:44	41.3	-0.1	40.9	+0.3
Ann Arbor	41.4	87	7:50	14:08	6:18	8:00	-:10	7:53	42.3	-0.9	41.9	+0.5
St. Louis	41.4	97	7:43	13:57	6:14	7:54	-:11	7:46	41.5	-0.1	41.1	+0.3
Scoresby Sund	42.6	24	7:55	14:20	6:25	8:08	-:13	7:58	42.9	-0.3	42.5	+0.1
Toronto	42.6	82	7:55	14:13	6:18	8:00	-:05	7:58	42.9	-0.3	42.5	+0.1
Ivigtut	42.8	45	7:56	14:23	6:27	8:10	-:14	7:59	43.1	-0.3	42.7	+0.1
Ottawa	43.1	78	7:58	14:17	6:19	8:01	-:03	8:01	43.2	-0.1	42.8	-0.7
Little Rock	43.5	103	8:03	14:34	6:31	8:16	-:13	8:06	43.9	-0.4	43.5	0.0
Sapporo	44.5	280	8:11	14:44	6:33	8:19	-:08	8:14	45.1	-0.6	44.7	-0.2
Ithica	44.9	81	8:10	14:50	6:40	8:27	-:17	8:13	44.9	0.0	44.5	+0.4
Aomori	46.6	279	8:29	15:03	6:34	8:21	+:08	8:32	47.5	-0.9	47.1	-0.5
Oak Ridge	47.2	77	8:30	15:21	6:51	8:41	-:11	8:33	47.6	-0.4	47.2	0.0
Georgetown	47.4	84	8:32	15:28	6:56	8:47	-:15	8:35	47.9	-0.5	47.5	-0.1
Fordham	47.4	80	8:31	15:28	6:57	8:48	-:17	8:34	47.8	-0.4	47.4	0.0
Charlottesville	47.5	87	8:31	15:28	6:57	8:48	-:17	8:34	47.8	-0.3	47.4	+0.1
Akita	47.8	277	8:34	15:29	6:54	8:45	-:11	8:37	48.2	-0.4	47.8	0.0
Sendai	48.5	276	8:41	15:40	6:59	8:50	-:09	8:44	49.1	-0.6	48.7	-0.2
Vladivostok	48.9	287	8:43	15:45	7:02	8:33	+:10	8:46	49.3	-0.4	48.9	0.0
Hukisima	49.1	275	8:38	15:48	7:10	9:03		8:41	48.7	+0.4	48.3	+0.8
Halifax	49.2	70	8:40	15:48	7:08	9:01		8:43	49.0	+0.2	48.6	+0.6
Mito	50.2	275	8:54	16:04	7:10	9:03	-:09	8:57	50.9	-0.7	50.5	-0.3
Tyosi	50.5	274	8:57	16:12	7:15	9:08	-:11	9:00	51.3	-0.8	50.9	-0.4

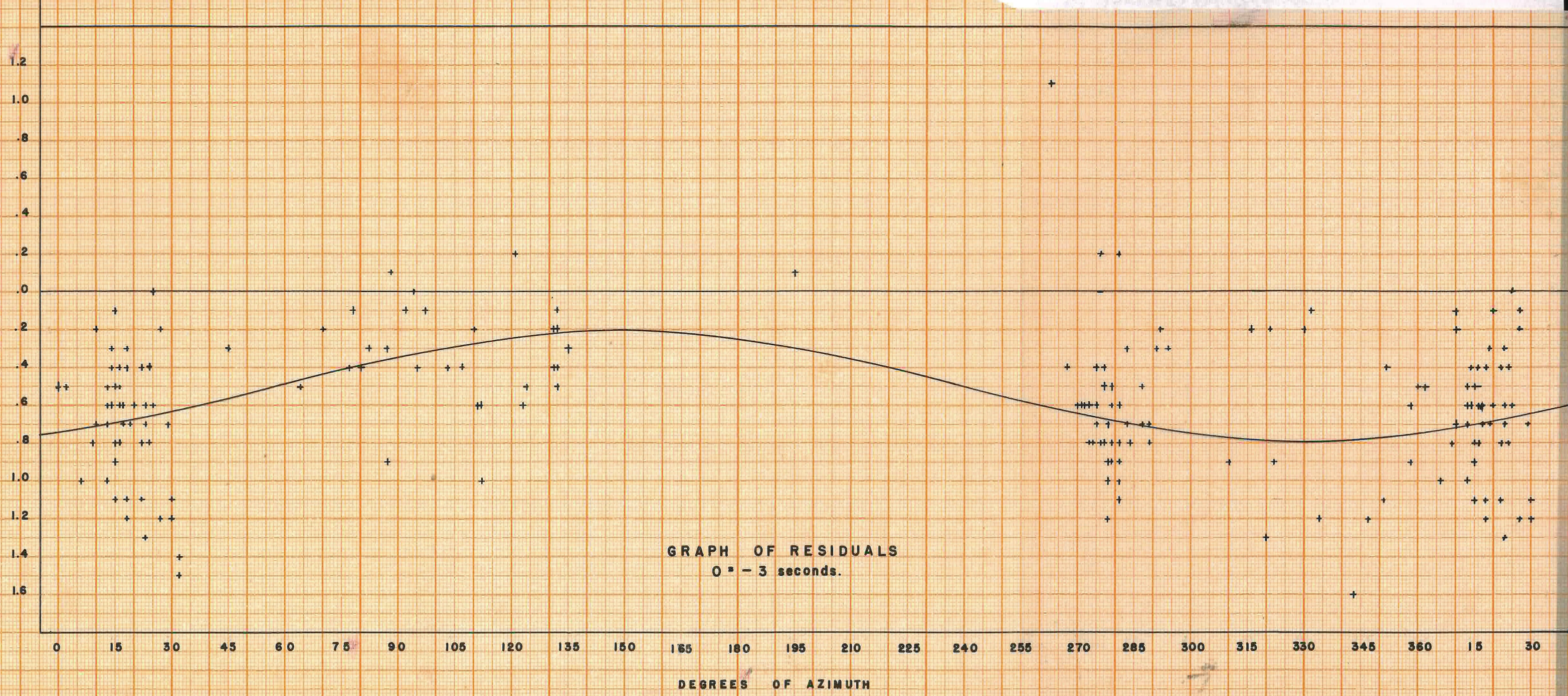
STATION	A	AZIM.	P	S	S-P	P-O	O	P-O	$\Delta_1$	$\Delta - \Delta_1$	$\Delta_2$	$\Delta - \Delta_2$
Takada	50.7	278	9:01	16:22	7:21	9:15	-:14	9:04	51.9	-1.2	51.5	-0.8
Kumagaya	50.9	277	8:58	16:14	7:16	9:09	-:11	9:01	51.4	-0.5	51.0	-0.1
Maebasi	50.8	277	8:58	16:06	7:08	9:01	-:03	9:01	51.4	-0.6	51.0	-0.2
Nagano	51.0	278	9:00	16:19	7:19	9:12	-:12	9:03	51.7	-0.7	51.3	-0.3
Oiwake	51.1	277	9:00	16:21	7:21	9:15	-:15	9:03	51.7	-0.6	51.3	-0.2
Tokyo	51.1	275	9:00	16:18	7:18	9:11	-:11	9:03	51.7	-0.6	51.3	-0.2
Matumoto	51.5	277	9:04	16:24	7:20	9:13	-:09	9:07	52.3	-0.8	51.9	-0.4
Toyama	51.5	278	9:03	16:21	7:18	9:11	-:08	9:06	52.1	-0.6	51.7	-0.2
Misima	52.0	276	9:06	16:28	7:22	9:16	-:10	9:09	52.6	-0.6	52.2	-0.2
Susaki	52.3	276	9:04	16:33	7:29	9:22	-:18	9:07	52.3	0.0	51.9	+0.4
Gihu	52.8	277	9:11	16:37	7:26	9:19	-:08	9:14	53.3	-0.5	52.9	-0.1
Omaesaki	52.8	276	9:12	16:38	7:26	9:19	-:07	9:15	53.4	-0.6	53.0	-0.2
Irkutsk	52.8	314	9:13	16:36	7:23	9:17	-:04	9:16	53.5	-0.7	53.1	-0.3
Hamamatu	52.9	276	9:14	16:46	7:32	9:25	-:11	9:17	53.7	+0.2	53.3	-0.4
Nagoya	52.9	277	9:13	16:41	7:28	9:21	-:08	9:16	53.5	-0.6	53.1	-0.2
Hikone	53.1	278	9:19	16:48	7:29	9:22	-:03	9:22	54.3	-1.2	53.9	-0.8
Hatidyozima	53.2	273	9:16	16:46	7:30	9:23	-:07	9:19	54.0	-0.8	53.6	-0.4
Tsu	53.4	277	9:18	16:49	7:31	9:24	-:06	9:21	54.2	-0.8	53.8	-0.4
Kameyama	53.4	277	9:18	16:49	7:31	9:24	-:06	9:21	54.2	-0.8	53.8	-0.4
Osaka b	53.9	278	9:22	17:00	7:38	9:31	-:09	9:25	54.8	-0.9	54.4	-0.5
Osaka	53.9	278	9:23	16:55	7:32	9:25	-:02	9:26	54.9	-1.0	54.5	-0.6
Kobe	54.1	278	9:22	16:57	7:35	9:28	-:06	9:25	54.8	-0.7	54.4	-0.3
Wakayama	54.5	278	9:26	17:02	7:36	9:29	-:03	9:29	55.4	-0.9	55.0	-0.5
Sumoto	54.5	278	9:25	17:02	7:37	9:30	-:05	9:28	55.2	-0.7	54.8	-0.3
Siomisaki	54.8	276	9:28	17:09	7:41	9:34	-:06	9:31	55.6	-0.8	55.2	-0.4
Heizyo	54.9	289	9:28	17:10	7:42	9:35	-:07	9:31	55.6	-0.7	55.2	-0.3
Keizyo	55.5	287	9:32	17:18	7:46	9:40	-:08	9:35	56.2	-0.7	55.8	-0.3
Taikyuu	56.2	284	9:38	17:29	7:51	9:45	-:07	9:41	57.0	-0.8	56.6	-0.4
Bergen	56.3	17	9:38	17:29	7:51	9:45	-:07	9:41	57.0	-0.7	56.6	-0.3
Husan	56.7	283	9:42	17:36	7:54	9:49	-:07	9:45	57.4	-0.7	57.1	-0.4
Simidu	56.7	278	9:41	17:37	7:56	9:51	-:10	9:44	57.4	-0.7	57.0	-0.3
Dairen	56.9	292	9:39	17:30	7:51	9:45	-:06	9:42	57.1	-0.2	56.7	+0.2
Titizima	57.1	267	9:42	17:37	7:55	9:50	-:08	9:45	57.5	-0.4	57.1	0.0
Hukuoka	57.2	281	9:46	17:38	7:52	9:46	-:00	9:49	58.1	-0.9	57.7	-0.5

STATION	$\Delta$	AZIM.	P	S	S-P	P-O	O	P-O	$\Delta 1$	$\Delta - \Delta 1$	$\Delta 2$	$\Delta - \Delta 2$
Koti	57.3	279	9:46	17:33	7:47	9:41	+05	9:49	58.1	-0.8	57.7	-0.4
Kumamoto	57.7	281	9:49	17:44	7:55	9:50	-01	9:52	58.5	-0.9	58.1	-0.4
Unzendake	58.0	281	9:53	17:56	8:03	9:59	-06	9:56	59.0	-1.0	58.6	-0.6
Miyazaki	58.1	279	9:52	17:52	8:00	9:55	-03	9:55	58.9	-0.8	58.5	-0.4
Upsala	58.1	10	9:51	17:50	7:59	9:55	-04	9:54	58.8	-0.7	58.4	-0.3
Helsingfors	58.2	6	9:54	17:52	7:58	9:54	:00	9:57	59.2	-1.0	58.8	-0.6
Nagasaki	58.2	281	9:51	17:48	7:57	9:52	-01	9:54	58.8	-0.6	58.4	-0.2
Pulkovo	58.7	2	9:54	17:56	8:02	9:58	-04	9:57	59.2	-0.5	58.8	-0.1
Edinburgh	59.3	23	10:04	18:13	8:09	10:08	-04	10:07	60.6	-1.3	60.2	-0.9
Sverdlovsk	59.6	343	10:08	18:13	8:05	10:02	+06	10:11	61.2	-1.6	60.8	-1.2
Durham	60.7	22	10:12	18:26	8:14	10:15	-03	10:15	61.8	-1.1	61.4	-0.7
Bidston	61.6	24	10:16	18:39	8:23	10:26	-10	10:19	62.4	-0.8	62.0	-0.4
Copenhagen	61.7	13	10:16	18:39	8:23	10:26	-10	10:19	62.4	-0.7	62.0	-0.3
Nake	62.0	279	10:18	18:41	8:23	10:26	-08	10:21	62.6	-0.6	62.2	-0.2
Königsberg	63.2	9	10:28	18:58	8:30	10:36	-08	10:31	64.0	-0.8	63.6	-0.4
Zi-ka-wei	63.4	287	10:27	18:54	8:27	10:32	-05	10:30	63.9	-0.5	63.5	-0.1
Hamburg	63.5	16	10:30	19:06	8:36	10:43	-13	10:33	64.3	-0.8	63.9	-0.4
Oxford	63.6	23	10:30	19:05	8:35	10:42	-12	10:33	64.3	-0.7	63.9	-0.3
Nanking	63.9	291	10:29	19:03	8:34	10:41	-12	10:32	64.2	-0.3	63.8	+0.1
Kew	64.0	23	10:32	19:10	8:38	10:46	-14	10:35	64.6	-0.6	64.2	-0.2
De Bilt	64.3	19	10:35	19:17	8:42	10:50	-15	10:38	65.0	-0.7	64.6	-0.3
Uccle	65.4	20	10:41	19:25	8:44	10:53	-12	10:44	66.0	-0.6	65.6	-0.2
Göttingen	65.5	16	10:42	19:29	8:47	10:56	-14	10:45	66.1	-0.6	65.6	-0.1
Jena	66.4	14	10:48	19:37	8:49	10:59	-11	10:51	67.0	-0.6	66.5	-0.1
Port au Prince	66.7	94	10:46	19:48	9:02	11:14		10:49	66.7	0.0	66.2	+0.5
Paris	67.1	22	10:51	19:47	8:56	11:07	-16	10:54	67.5	-0.4	67.0	+0.1
Cheb	67.3	14	10:52	19:46	8:54	11:05	-13	10:55	67.7	-0.4	67.2	+0.1
Prague	67.5	13	10:55	19:52	8:57	11:08	-13	10:58	68.1	-0.6	67.6	-0.1
Karlsruhe	67.6	18	10:59	19:56	8:57	11:08	-09	11:02	68.7	-1.1	68.2	-0.6
Isigakizima	68.0	281	10:53	19:53	9:00	11:12	-19	10:56	67.8	+0.2	67.3	+0.7
Stuttgart	68.1	17	10:59	19:58	8:59	11:11	-12	11:02	68.7	-0.6	68.2	-0.1
Strasbourg	68.2	18	10:58	19:59	9:01	11:13	-15	11:01	68.6	-0.4	68.1	+0.1
Basle	69.1	18	11:04	20:14	9:10	11:24	-20	11:07	69.5	-0.4	69.0	+0.1
Zurich	69.4	18	11:06	20:16	9:10	11:24	-18	11:09	69.8	-0.4	69.3	+0.1
Neuchatel	69.5	18	11:06	20:16	9:10	11:24	-18	11:09	69.8	-0.3	69.3	+0.2
San Juan	69.8	88	11:05	20:10	9:05	11:18	-13	11:08	69.7	+0.1	69.2	+0.6

STATION	Δ	AZIM.	P	S	S-P	P-O	O	P-O	ΔI	Δ-ΔI	Δ2	Δ-Δ2
Chur	70.0	18	11:09	20:21	9:12	11:26	--:15	11:12	70.3	-0.3	69.8	+0.2
Puy de Dôme	70.1	22	11:12	20:23	9:11	11:25	--:13	11:15	70.9	-0.8	70.4	-0.3
Budapest	70.5	10	11:11	20:26	9:15	11:29	--:14	11:14	70.7	-0.2	70.2	+0.3
Graz	70.6	13	11:13	20:29	9:16	11:30	--:17	11:16	71.1	-0.5	70.6	0.0
Takao	71.2	283	11:16	20:29	9:13	11:27	--:11	11:19	71.5	-0.3	71.0	+0.2
Treviso	71.5	15	11:21	20:43	9:22	11:36	--:15	11:24	72.4	-0.9	71.9	-0.4
Triest	71.7	15	11:20	20:40	9:20	11:34	--:14	11:23	72.2	-0.5	71.7	0.0
Padova	71.7	15	11:23	20:41	9:18	11:32	--:09	11:26	72.8	-1.1	72.3	-0.6
Piacenza	71.8	18	11:24	20:40	9:16	11:30	--:06	11:27	73.0	-1.2	72.5	-0.7
Venice	71.8	15	11:22	20:45	9:23	11:37	--:15	11:25	72.6	-0.8	72.1	-0.3
Serra do Pilar	72.1	32	11:27	20:50	9:23	11:37	--:10	11:30	73.5	-1.4	73.0	-0.9
Bagneres	72.2	25	11:23	20:45	9:22	11:36	--:13	11:26	72.8	-0.6	72.3	-0.1
Andijan	72.8	330	11:22	20:49	9:27	11:41	--:19	11:25	72.6	-0.2	72.1	+0.7
Tashkent	73.0	332	11:25	20:49	9:24	11:38	--:13	11:28	73.1	-0.1	72.6	+0.4
Prato	73.2	16	11:30	20:54	9:24	11:38	--:08	11:33	74.0	-0.8	73.5	-0.3
Simferopol	73.2	0	11:31	21:01	9:30	11:44	--:13	11:31	73.7	-0.5	73.2	0.0
Florence	73.3	16	11:28	20:58	9:30	11:44	--:16	11:31	73.7	-0.4	73.2	+0.1
Theodosia	73.4	353	11:30	20:58	9:28	11:42	--:12	11:33	74.0	-0.6	73.5	-0.1
Siena	73.7	16	11:31	21:02	9:31	11:45	--:14	11:34	74.2	-0.5	73.7	0.0
Yalta	73.9	0	11:32	21:04	9:32	11:46	--:14	11:35	74.4	-0.5	73.9	0.0
Hong Kong	74.3	289	11:36	21:08	9:32	11:46	--:10	11:39	75.1	-0.8	74.6	-0.3
Toledo	74.4	29	11:36	21:13	9:37	11:51	--:15	11:39	75.1	-0.7	74.6	-0.2
Tortosa	74.4	25	11:32	21:11	9:39	11:53	--:06	11:35	74.4	0.0	73.9	+0.5
Samarkand	75.0	334	11:42	21:15	9:34	11:48	--:06	11:45	76.2	-1.2	75.7	-0.7
Rome	75.4	15	11:38	21:16	9:38	11:52	--:14	11:41	75.5	-0.1	75.0	+0.4
Tiflis	76.3	352	11:45	21:28	9:43	11:57	--:12	11:48	76.7	-0.4	76.2	+0.1
Benevento	76.3	14	11:44	21:23	9:44	11:58	--:14	11:47	76.6	-0.3	76.1	+0.2
Alicante	76.6	27	11:51	21:40	9:49	12:03	--:12	11:54	77.8	-1.2	77.3	-0.7
Granada	77.0	30	11:53	21:43	9:50	12:04	--:11	11:56	78.2	-1.2	77.7	-0.7
San Fernando	77.2	32	11:56	21:50	9:54	12:08	--:12	11:59	78.7	-1.5	78.2	-1.0
Baku	77.2	347	11:54	21:33	9:44	11:58	--:04	11:57	78.4	-1.2	77.9	-0.7
Malaga	77.3	30	11:54	21:46	9:52	12:06	--:12	11:57	78.4	1.1	77.9	-0.6
Erevan	77.8	351	11:57	21:48	9:51	12:05	--:00	12:00	78.9	-1.1	78.4	-0.6
Manila	77.9	279	11:54	21:45	9:51	12:05	--:08	11:57	78.4	-0.5	77.9	0.0
Trenta	78.4	13	12:00	21:50	9:50	12:04	--:04	12:03	70.4	-1.0	78.9	-0.5



STATION	$\Delta$	AZIM.	P	S	S-P	P-O	O	P-O	$\Delta_1$	$\Delta-\Delta_1$	$\Delta_2$	$\Delta-\Delta_2$
Algiers	78.8	24	12:01	22:00	9:59	12:13	--:12	12:04	79.6	-0.8	79.6	-0.8
Phu-Lien	79.1	294	12:00	21:59	9:59	12:13	--:13	12:03	79.4	-0.3	78.9	+0.2
Tunis	80.0	27	12:04	22:10	10:06	12:19	--:15	12:07	80.2	-0.2	79.7	+0.3
Dehra Dun	81.1	321	12:10	22:20	10:10	12:23	--:13	12:13	81.3	-0.2	80.7	+0.4
Agra	84.0	320	12:30	22:49	10:19	12:22	+:08	12:33	85.3	-1.3	84.7	-0.7
Ksara	84.6	358	12:31	22:57	10:26	12:36	--:05	12:34	85.5	-0.9	84.9	-0.3
Calcutta	84.8	310	12:32	23:03	10:31	12:41	--:09	12:35	85.7	-0.9	85.2	-0.4
Amboina	90.5	263	12:50	23:54	11:04	13:14	--:07	12:53	89.4	+1.1	88.7	+1.8
Huancayo	92.4	112	13:08	24:13	11:05	13:15	--:06	13:11	93.4	-1.0	92.7	-0.3
Hyderabad	93.0	316	13:07	24:20	11:13	13:13	--:00	13:10	93.2	-0.2	92.5	+0.5
Bombay	93.4	322	13:12	24:24	11:12	13:12	:00	13:15	94.3	-0.9	93.6	-0.2
La Paz	99.5	107	13:37	25:28	11:41			13:40	99.9	-0.4	99.2	+0.3
Batavia	102.9	281	13:54	25:48	11:54			13:57	104.0	-1.1	103.3	-0.4



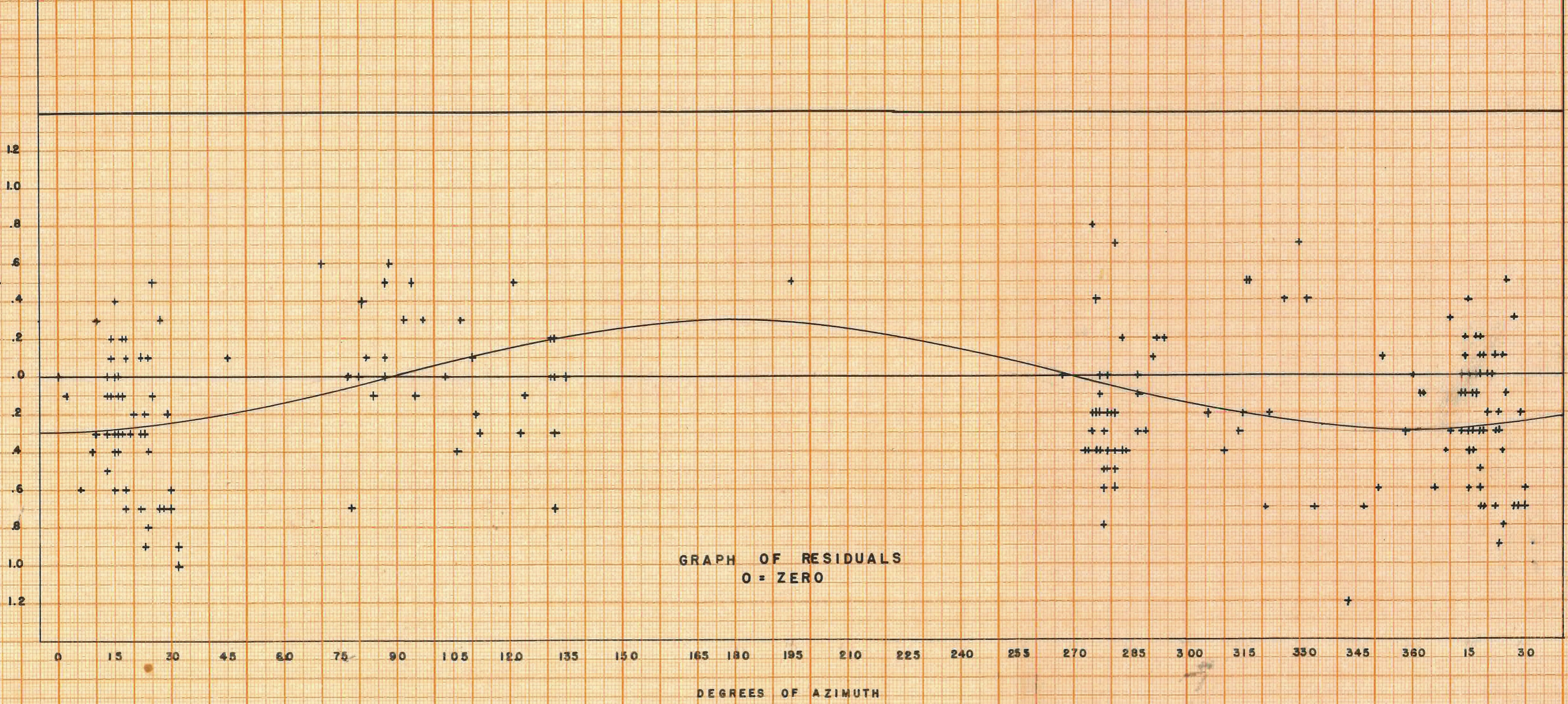
Calculation of the origin time,  $O$ , from the equation

$$O = (pP + P)/2 - (t_p + c)$$

where  $t_p$  is the travel time of longitudinal waves in a shock with normal depth assumed to be 25 kilometers.

STATION	$\Delta$	$(pP+P)/2$	$t_p+c$	$O$
Bozeman	26.3	5:40	5:44	-:04
Pasadena	33.2	6:44	6:43	+:01
Denver	33.7	6:50	6:47	+:03
Tucson	37.6	7:23	7:21	+:02
Chicago	40.2	7:43	7:44	-:01
St. Louis	41.4	7:52	7:54	-:02
Oak Ridge	47.2	8:39	8:40	-:01
Fordham	47.4	8:39	8:41	-:02
Charlottesville	47.5	8:44	8:42	+:02
Copenhagen	61.7	10:24	10:27	-:03
Triest	71.7	11:29	11:29	:00
Piacenza	71.8	11:36	11:30	+:06
Siens	73.7	11:41	11:40	+:01

The average of the differences is :02/13, so that we may assume  $O =$  zero and needs no reduction.



Calculation of the depth of focus of the shock from several phase differences.

I.  $pP - P$ .

STATION	$\Delta$	$pP$	$P$	D.F.	$pP-P$
Bozeman	26.7	5:40	5:31	90	:18
Pasadena	33.2	6:50	6:33	85	:17
Denver	33.7	6:59	6:41	90	:18
Tucson	37.6	7:31	7:14	80	:17
Chicago	40.2	7:53	7:33	95	:20
St. Louis	41.4	8:00	7:43	80	:17
Oak Ridge	47.2	8:48	8:30	75	:18
Fordham	47.4	8:47	8:31	65	:16
Charlottesville	47.5	8:51	8:36	60	:15
Copenhagen	61.7	10:32	10:16	65	:16
Triest	71.7	11:37	11:20	60	:17
Piacenza	71.8	11:44	11:24	75	:20
Sienna	73.7	11:50	11:31	70	:19

The average of the depths of focus is  $970/13 = 75$  km.

II.  $sP - P$  and  $sS - S$ .

STATION	$\Delta$	$sP$	$P$	D.F.	$sP-P$
Toronto	42.6	8:29	7:55	95	:34
Ottawa	43.1	8:32	7:58	95	:34
Strasbourg	68.2	11:32	10:58	95	:34

The depth of focus from  $sP - P$  is 95 kilometers.

STATION	$\Delta$	$sS$	$S$	D.F.	$sS-S$
Halifax	49.2	16:22	15:48	75	:34
Piacenza	71.8	21:18	20:40	80	:38
Algiers	78.8	22:42	22:00	95	:42

The depth of focus from  $sS - S$  is  $250/3 = 83$  kilometers.

## III. PcP - P.

STATION	$\Delta$	PcP	P	PcP-P	D.F.
Bozeman	26.3	8:59	5:31	3:38	90
Florissant	41.2	9:46	7:41	2:05	75
Ann Arbor	41.4	9:44	7:50	1:54	90
Scoresby Sund	42.6	9:50	7:55	1:55	80
Ivistut	42.8	9:52	7:56	1:56	75
Ithica	44.9	9:58	8:10	1:48	70
Rordham	47.4	10:01	8:31	1:30	100
Helsingfors	58.2	10:43	9:54	0:49	100
Piacenza	71.8	11:40	11:24	0:16	100

The average depth for PcP - P is  $780/9 = 87$  kilometers.

## IV. ScS - S.

STATION	$\Delta$	ScS	S	ScS-S	D.F.
Ann Arbor	41.4	17:50	14:08	3:42	(100)
Ivistut	42.8	17:59	14:23	3:36	(100)
Ithica	44.9	18:11	14:50	3:21	(100)
Charlottesville	47.5	18:30	15:26	3:04	90
Helsingfors	58.2	19:38	17:52	1:46	70
Copenhagen	61.7	20:08	18:39	1:29	60
Königsberg	63.2	20:15	18:58	1:17	70
Jena	66.4	20:38	19:37	1:01	70

The average depth for ScS - S is  $660/8 = 83$  kilometers



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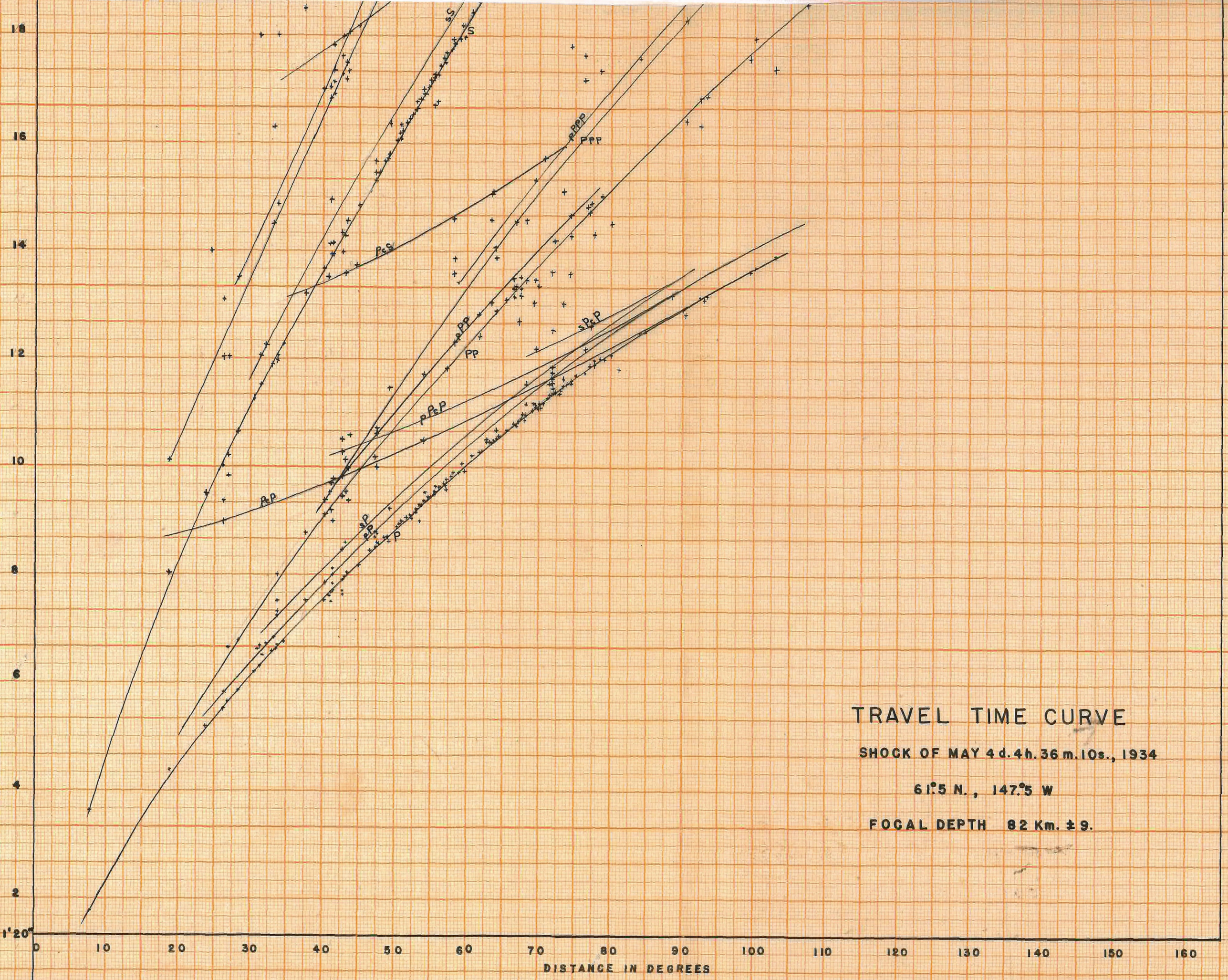
(b) Materials for the Study of Deep Focus Earthquakes,  
(First Paper)

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**TRAVEL TIME CURVE**

**SHOCK OF MAY 4 d. 4h. 36 m. 10s., 1934**

**61°5 N., 147°5 W**

**FOCAL DEPTH 82 Km. ± 9.**

1'20" 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160  
**DISTANCE IN DEGREES**

36  
34  
32  
30  
28  
26  
24  
22  
20

