

TIMES OF OCCURRENCE OF EARTHQUAKES AT TELEGRAPH STATIONS IN CENTRAL JAPAN.

By W. B. MASON.

[Read March 7th, 1890.]

Every day at 12 noon a signal is sent to Telegraph stations throughout Japan from the Central Office in Tokyo. At all stations on the main circuit standard time is consequently accurately known. But the stations on branch lines, to which the signal is transmitted by manual operation from where the branch line leaves the main circuit, cannot be regarded as possessing the time at all accurately. And clearly, to satisfactorily time the occurrence of an earthquake as it is felt at different localities, we must have accurately compared clocks at these localities. But besides this doubt in several cases as to the accuracy of the time record, there is further the personal difficulty of accurately timing the earthquake. The telegraph clerks, whose services were employed, had no instruments. Some might note the beginning, some the end of an earthquake—others again might take the instant of severest shock. All those various sources of uncertainty are present in the observations under discussion. Yet some results seem deducible from what are still meagre statistics. Thus of the 151 earthquakes recorded in Tokyo during the interval; only 89 were felt at the other telegraph stations. Some of those which were felt at all the stations seem to have been felt at almost exactly the same instant. In other words there was no indication of a progression of the earthquake from point to point.

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For example, the times recorded of the earthquake of the 2nd August, 1889, which was felt over a wide area, are as follows :—

Yokohama.....	10.20.0 a.m.
Chiba.....	10.20.0 a.m.
Utsunomiya	10.20.0 a.m.
Hachioji	10.21.0 a.m.
Takasaki	10.21.0 a.m.
Shirakawa	10.21.0 a.m.
Tokyo	10.21.6 a.m.

The earthquake of the 7th October, 1889, recorded only at Tokyo and Hakodate, shows a difference in the times of occurrence of but 18 seconds, and while the observations also show that several earthquakes were felt over the large extent of country between those places, others apparently having their origin near Shirakawa in the Prefecture of Iwaki are almost confined to that locality.

Only those earthquakes recorded by the Gray-Milne Seismograph at the Observatory in Tokyo and noted by the Telegraph Stations are entered in the accompanying list. Details of those not observed beyond Tokyo may be found in the Catalogue of Earthquakes issued by the Meteorological Bureau and in the Society's publications.

EARTHQUAKES RECORDED AT TELEGRAPH STATIONS IN CENTRAL
 AND NORTHERN JAPAN,

FROM 11TH AUGUST, 1888, TO 31ST DEC., 1889.

Place.	Date.	Time shown by clock at time of Signal.	Clock cor- rected.	Time shown at time of Earthquake.	Remarks.
	1888.				
Choshi	11th Aug.	11.58.30	Yes	9.31.55 a.m.	
Tokio	12th Aug.	observatory	—	11.42.27 a.m.	
Odawara ...	12th Aug.	—	—	11.42.17 a.m.	No signal
Chiba	12th Aug.	—	—	11.41.10 a.m.	No signal
Utsunomiya.	12th Aug.	—	—	11.40.50 a.m.	No signal
Shirakawa ..	12th Aug.	—	—	11.44.00 a.m.	No signal
Sendai	12th Aug.	—	—	11.40.40 a.m.	No signal
Tokio	17th Aug.	observatory	—	3.49.50 a.m.	
Shirakawa...	17th Aug.	12.00.20	Yes	3.49.20 a.m.	
Utsunomiya.	17th Aug.	12.00.00	No	3.49.30 a.m.	
Chiba	17th Aug.	11.57.00	Yes	3.50.55 a.m.	
Sendai	24th Aug.	12.00.10	Yes	9.15.00 p.m.	
Tokio	11th Sept.	observatory	—	8.34.54 a.m.	
Yokohama ..	11th Sept.	12.01.00	Yes	8.35.45 a.m.	
Hakodate ...	27th Sept.	11.59.30	Yes	11.24.30 a.m.	
Tokio	28th Sept.	observatory	—	7.05.21 a.m.	
Chiba	28th Sept.	12.00.00	Yes	7.06.10 a.m.	
Shirakawa ..	30th Sept.	—	—	7.20.10?	No signal
Choshi	19th Oct.	12.00.50	Yes	3.15.00 a.m.	
Tokio	20th Oct.	observatory	—	6.15.16 a.m.	
Choshi	20th Oct.	12.20.00	Yes	6.14.00 a.m.	
Chiba	20th Oct.	12.00.00	Yes	6.10.40 a.m.	
Yokohama ..	20th Oct.	12.00.11	Yes	6.15.00 a.m.	
Utsunomiya.	20th Oct.	12.00.00	No	6.14.30 a.m.	
Shirakawa ..	22nd Oct.	11.59.10	Yes	6.39.20?	
Tokio	2nd Nov.	observatory	—	1.48.01 p.m.	
Yokohama ..	2nd Nov.	12.00.00	No	1.47.00 p.m.	
Takasaki ...	2nd Nov.	12.00.00	Yes	1.48.30 p.m.	
Utsunomiya.	2nd Nov.	12.00.00	No	1.46.30 p.m.	
Sendai	2nd Nov.	12.00.05	Yes	8.47.00 p.m.	
Shirakawa ...	2nd Nov.	11.59.40	Yes	8.47.20 p.m.	
Takasaki ...	2nd Nov.	12.01.30	Yes	8.51.20 p.m.	
Tokio	3rd Nov.	observatory	—	8.13.33 a.m.	
Yokohama...	3rd Nov.	12.00.00	No	8.15.30 a.m.	
Choshi	3rd Nov.	11.59.10	Yes	8.12.50 a.m.	
Chiba	3rd Nov.	12.00.00	Yes	8.17.30 a.m.	
Tokio	3rd Nov.	observatory	—	0.51.14 a.m.	
Chiba	3rd Nov.	12.00.00	Yes	0.51.10 a.m.	
Tokio	5th Nov.	observatory	—	4.22.55 a.m.	
Chiba	5th Nov.	12.00.00	Yes	4.20.00 a.m.	

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Place.	Date.	Time shown by clock at time of Signal.	Clock corrected.	Time shown at time of Earthquake.	Remarks.
	1888.				
Hakodate ...	5th Nov.	11.58.30	Yes	9.05.30 a.m.	
Hakodate ...	5th Nov.	—	—	3.37.00 p.m.	No signal
Tokio	6th Nov.	observatory	—	4.38.37 p.m.	
Hakodate ...	6th Nov.	11.59.30	Yes	4.47.30 p.m.	
Tokio	7th Nov.	observatory	—	10.27.34 p.m.	
Hakodate ...	7th Nov.	11.59.40	Yes	10.24.00 p.m.	
Sendai	19th Nov.	11.59.20	Yes	11.58.00 p.m.	Lasted about one minute. Very strong.
Tokio	20th Nov.	observatory	—	0.53.29 a.m.	
Shirakawa ...	20th Nov.	12.00.00	No	0.53.40 a.m.	
Tokio	22nd Nov.	observatory	—	1.27.43 p.m.	
Sendai	22nd Nov.	11.58.25	Yes	1.25.00 p.m.	20 secs. Very strong.
Tokio	24th Nov.	observatory	—	2.03.23 a.m.	
Hakodate ...	24th Nov.	12.00.30	Yes	2.10.15 a.m.	
Sendai	24th Nov.	11.58.00	Yes	1.58.00 a.m.	40 secs. Very strong.
Utsunomiya.	24th Nov.	11.59.30	Yes	2.02.00 a.m.	
Tokio	25th Nov.	observatory	—	4.50.15 p.m.	
Chiba	25th Nov.	—	—	4.50.00 p.m.	No signal
Toko	3rd Dec.	observatory	—	0.24.47 a.m.	
Yokohama...	3rd Dec.	12.00.00	No	0.26.00 a.m.	
Utsunomiya.	3rd Dec.	11.59.45	Yes	4.06.00 a.m.	
Tokio	6th Dec.	observatory	—	7.27.42 a.m.	
Sendai	6th Dec.	11.59.20	Yes	7.24.40 a.m.	
Utsunomiya.	8th Dec.	12.00.00	No	4.15.00 a.m.	
Shirakawa...	8th Dec.	12.00.00	No	5.05.00 a.m.	
Utsunomiya.	16th Dec.	—	—	5.30.30 a.m.	No signal
Utsunomiya.	30th Dec.	—	—	11.29.30 ?	No signal
	1889.				
Tokio	1st Jan.	observatory	—	3.04.50 a.m.	
Takasaki ...	1st Jan.	—	—	3.05.00 a.m.	
Tokio	1st Jan.	observatory	—	7.05.30 p.m.	
Choshi	1st Jan.	12.00.50	Yes	7.05.30 p.m.	
Yokohama...	1st Jan.	12.00.00	No	7.05.00 p.m.	
Hachioji	1st Jan.	12.00.00	No	7.07.05 p.m.	
Odawara.....	1st Jan.	12.00.00	No	7.04.55 p.m.	45 secs., severe
Chiba	1st Jan.	12.00.00	No	7.04.15 p.m.	
Utsunomiya.	1st Jan.	—	—	7.04.30 p.m.	
Takasaki ...	1st Jan.	—	—	7.07.00 p.m.	
Shirakawa...	1st Jan.	—	—	7.10.00 p.m.	
Tokio	3rd Jan.	observatory	—	7.58.06 a.m.	
Utsunomiya.	3rd Jan.	12.00.00	No	7.58.30 a.m.	
Utsunomiya.	3rd Jan.	12.00.00	No	2.24.20 p.m.	
Tokio	12th Jan.	observatory	—	8.34.03 p.m.	
Choshi	12th Jan.	12.01.10	Yes	8.34.55 p.m.	
Utsunomiya.	15th Jan.	12.00.00	No	9.51.30 p.m.	
Shirakawa...	15th Jan.	12.00.00	No	9.52.30 p.m.	

Place.	Date.	Time shown by clock at time of Signal.	Clock Corrected.	Time shown at time of Earthquake.	Remarks.
	1889.				
Choshi	6th Feb.	12.00.00	No	3.21.00 p.m.	
Tokio	6th Feb.	observatory	No	3.20.05 p.m.	
Choshi	18th Feb.	—	No	6.06.00 a.m.	
Shirakawa ...	18th Feb.	—	No	6.10.00 a.m.	
Yokohama ...	18th Feb.	—	No	6.09.00 a.m.	
Takasaki ...	18th Feb.	—	No	6.09.30 a.m.	
Sendai	18th Feb.	—	No	6.08.00 a.m.	
Utsunomiya.	18th Feb.	—	No	6.09.00 a.m.	
Chiba	18th Feb.	—	No	6.05.00 a.m.	
Hachioji ...	18th Feb.	—	No	6.10.03 a.m.	
Odawara ...	18th Feb.	—	No	6.09.35 a.m.	
Tokio	18th Feb.	observatory	No	6.09.32 a.m.	
Hakodate ...	18th Feb.	—	No	8.20.00 a.m.	
Odawara ...	21st Feb.	12.00.18	Yes	11.01.00 a.m.	
Tokio	21st Feb.	observatory	Yes	11.01.04 a.m.	
Yokohama ...	21st Feb.	12.00.00	No	5.52.23 a.m.	
Tokio	21st Feb.	observatory	No	5.52.21 a.m.	
Chiba	4th Mar.	11.59.00	Yes	7.22.00 a.m.	
Tokio	14th Mar.	observatory	Yes	7.24.25 a.m.	
Shirakawa ...	17th Mar.	12.00.00	Yes	5.06.00 p.m.	
Hakodate ...	28th Mar.	12.00.00	Yes	9.15 a. 9.40 a.	Slight.
Choshi	28th Mar.	12.00.00	Yes	10.23.00 a.m.	
Tokio	28th Mar.	observatory	Yes	10.22.55 a.m.	
Chiba	28th Mar.	12.00.00	Yes	1.22.00 a.m.	
Tokio	28th Mar.	observatory	Yes	1.20.10 a.m.	
Chiba	28th Mar.	12.00.00	Yes	10.25.10 a.m.	
Chiba	28th Mar.	12.00.00	Yes	7.20.00 p.m.	
Tokio	28th Mar.	observatory	Yes	7.18.23 p.m.	
Yokohama ...	28th Mar.	12.00.20	Yes	1.19.50 a.m.	
Yokohama ...	28th Mar.	12.00.20	Yes	10.23.40 a.m.	
Takasaki ...	28th Mar.	11.58.00	Yes	1.20.30 a.m.	
Utsunomiya.	28th Mar.	11.58.40	Yes	1.22.00 a.m.	
Odawara ...	28th Mar.	12.00.45	Yes	1.20 07 a.m.	
Utsunomiya.	31st Mar.	Sunday	No	6.40.30 a.m.	
Tokio	31st Mar.	—	No	6.42.15 a.m.	
Utsunomiya.	31st Mar.	—	No	6.00.00 p.m.	
Takasaki ...	31st Mar.	—	No	6.42.00 a.m.	
Takasaki ...	31st Mar.	—	No	5.58.00 p.m.	
Tokio	31st Mar.	observatory	No	5.59.42 p.m.	
Sendai	31st Mar.	no signal	No	7.30.00 a.m.?	
Sendai	31st Mar.	—	No	6.00.00 p.m.	
Yokohama ...	31st Mar.	—	No	6.43.00 a.m.	
Chiba	31st Mar.	—	No	6.42.55 a.m.	
Chiba	31st Mar.	—	No	6.00.00 p.m.	
Choshi	31st Mar.	—	No	6.41.50 a.m.	
Shirakawa ..	31st Mar.	—	No	6.39.00 a.m.	
Shirakawa ..	31st Mar.	—	No	6.02.10 p.m.	

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Place.	Date.	Time shown at time of Signal.	Clock corrected.	Time shown at time of Earthquake.	Remarks.
	1889				
Hachioji ...	3rd April	11.59.00	Yes	4.28.50 p.m.	
Tokio	3rd April	observatory	Yes	4.27.21 p.m.	
Yokohama ..	3rd April	12.00.00	No	4.30.00 p.m.	
Chiba	3rd April	12.00.00	Yes	4.28.30 p.m.	
Yokohama ..	3rd April	12.00.00	No	6.42.00 p.m.	
Shirakawa ..	7th April	12.00.00	No	12.49.50 p.m.	
Utsunomiya.	8th April	—	No	12.47.00 p.m.	
Tokio	8th April	observatory	No	0.48.00 p.m.	
Sapporo	14th April	12.00.00	No	2.56.00 a.m.	
Shirakawa ..	17th April	12.00.00	No	9.41.20 p.m.	
Tokio	17th April	observatory	No	9.41.43 p.m.	
Chiba	18th April	12.00.00	Yes	2.18.00 p.m.	
Chiba	18th April	12.00.00	Yes	3.39.30 p.m.	
Yokohama ..	18th April	12.00.00	No	2.08.00 p.m.	
Tokio	18th April	observatory	No	2.07.42 p.m.	
Utsunomiya.	18th April	12.00.00	No	2.08.30 p.m.	
Odawara ...	18th April	11.59.23	Yes	2.08.35 p.m.	
Odawara ...	18th April	11.59.23	Yes	3.40.18 p.m.	
Tokio	18th April	observatory	Yes	3.39.08 p.m.	
Shirakawa ..	19th April	12.00.00	No	3.00.00 p.m.	
Tokio	19th April	observatory	No	3.00.27 p.m.	
Hakodate ...	19th April	11.58.45	Yes	7.43.00 p.m.	
Shirakawa ..	28th April	—	No	3.08.00 a.m.	
Sendai	28th April	—	No	3.07.00 a.m.	
Tokio	28th April	observatory	No	3.07.43 a.m.	
Choshi	28th April	—	No	3.15.10 a.m.	
Yokohama ..	6th May	12.00.00	No	11.41.00 p.m.	
Utsunomiya.	6th May	12.02.00	Yes	11.43.00 p.m.	
Tokio	6th May	observatory	Yes	11.41.41 p.m.	
Shirakawa...	11th May	12.00.00	No	3.00.30 a.m.	
Utsunomiya.	13th May	11.55.00	Yes	5.45.00 a.m.	
Utsunomiya.	14th May	11.59.30	Yes	6.49.00 a.m.	
Yokohama ..	17th May	12.00.00	No	1.40.00 p.m.	
Tokio	17th May	observatory	No	1.46.32 p.m.	
Shirakawa...	20th May	12.00.00	No	2.25.00 p.m.	
Utsunomiya.	30th May	12.00.00	No	10.29.30 p.m.	
Tokio	30th May	observatory	No	10.27.22 p.m.	
Shirakawa...	1st June	12.00.00	No	6.14.30 p.m.	
Tokio	1st June	observatory	No	6.15.21 p.m.	
Shirakawa...	3rd June	12.00.00	No	1.52.25 p.m.	
Shirakawa...	3rd June	12.00.00	No	1.59.45 p.m.	
Choshi	3rd June	11.58.30	Yes	1.59.10 p.m.	
Tokio	3rd June	observatory	Yes	1.56.30 p.m.	
Utsunomiya.	14th June	12.00.00	No	12.25.00 p.m.	
Tokio	14th June	observatory	No	0.26.41 p.m.	
Choshi	15th June	12.00.52	Yes	10.07.30 a.m.	
Tokio	15th June	observatory	Yes	10.10.02 a.m.	

AT TELEGRAPH STATIONS IN CENTRAL JAPAN. 37

Place.	Date.	Time shown at time of Signal.	Clock Cor- rected.	Time shown at time of Earthquake.	Remarks.
	1889				
Yokohama ..	16th June	12.00.00	No	3.30.00 p.m.	
Choshi	20th June	12.02.00	Yes	9.50.50 p.m.	
Takasaki ...	20th June	11.59.00	Yes	9.52.00 p.m.	
Utsunomiya.	20th June	12.00.00	No	9.50.00 p.m.	
Shirakawa...	20th June	12.01.15	Yes	9.50.50 p.m.	
Chiba	20th June	11.58.00	Yes	9.48.00 p.m.	
Yokohama ..	20th June	12.00.00	No	9.49.00 p.m.	
Tokio	20th June	observatory	No	9.51.10 p.m.	
Utsunomiya.	30th June	—	No	1.05.30 p.m.	Sunday.
Utsunomiya.	3rd July	11.59.30	Yes	5.40.00 p.m.	
Utsunomiya.	18th July	12.00.00	No	10.32.00 p.m.	
Tokio	18th July	observatory	No	10.33.18 p.m.	
Utsunomiya.	19th July	11.59.30	Yes	11.46.15 p.m.	
Hakodate ...	22nd July	11.55.00	Yes	11.52.00 p.m. [?]	
Chiba	29th July	11.51.00	Yes	1.59.00 a.m.	
Chiba	2nd Aug.	11.58.00	Yes	10.20.00 a.m.	
Hachioji	2nd Aug.	12.01.20	Yes	10.21.00 a.m.	
Takasaki ...	2nd Aug.	12.00.00	No	10.21.00 a.m.	
Shirakawa...	2nd Aug.	12.00.00	No	10.21.00 a.m.	
Yokohama ..	2nd Aug.	12.00.00	No	10.21.00 a.m.	
Utsunomiya.	2nd Aug.	12.00.00	No	10.20.00 a.m.	
Tokio	2nd Aug.	observatory	No	10.21.06 a.m.	
Chiba	5th Aug.	11.52.00	Yes	7.30.30 a.m.	
Hakodate ...	5th Aug.	12.00.00	No	7.35.00 a.m.	
Hakodate ...	5th Aug.	12.00.00	No	7.37.00 a.m.	
Tokio	5th Aug.	observatory	No	7.34.56 a.m.	
Hachioji	26th Aug.	12.00.05	Yes	3.23.00 p.m.	
Chiba	26th Aug.	11.59.00	Yes	3.26.00 p.m.	
Tokio	26th Aug.	observatory	No	3.27.13 p.m.	
Yokohama...	26th Aug.	12.00.00	No	3.28.02 p.m.	
Shirakawa ...	3rd Sept.	12.00.00	No	7.21.00 p.m.	
Sapporo	7th Sept.	12.00.30	Yes	1.43.00 a.m.	
Hakodate ...	8th Sept.	Sunday	No	1.46 to 1.49 a.	
Shirakawa ...	10th Sept.	12.00.00	No	7.08.40 p.m.	
Shirakawa ...	11th Sept.	12.00.00	No	7.40.00 p.m.	
Utsunomiya.	11th Sept.	12.00.00	No	7.13.30 p.m.	
Tokio	11th Sept.	observatory	No	7.14.03 p.m.	
Utsunomiya.	16th Sept.	12.00.00	No	6.38.30 a.m.	
Yokohama ..	16th Sept.	12.00.00	No	6.38.00 a.m.	
Chiba	16th Sept.	12.00.00	Yes	6.39.00 a.m.	
Odawara ...	16th Sept.	12.02.03	Yes	6.39.30 a.m.	
Tokio	16th Sept.	observatory	Yes	6.37.30 a.m.	
Shirakawa ...	6th Oct.	12.00.00	No	8.49.50 p.m.	
Hakodate ...	7th Oct.	12.00.00	No	7.41.00 p.m.	
Tokio	7th Oct.	observatory	No	7.41.18 p.m.	
Hakodate ...	8th Oct.	12.00.00	No	7.12.40 p.m.	
Odawara ...	13th Oct.	—	No	10.53.00 p.m.	

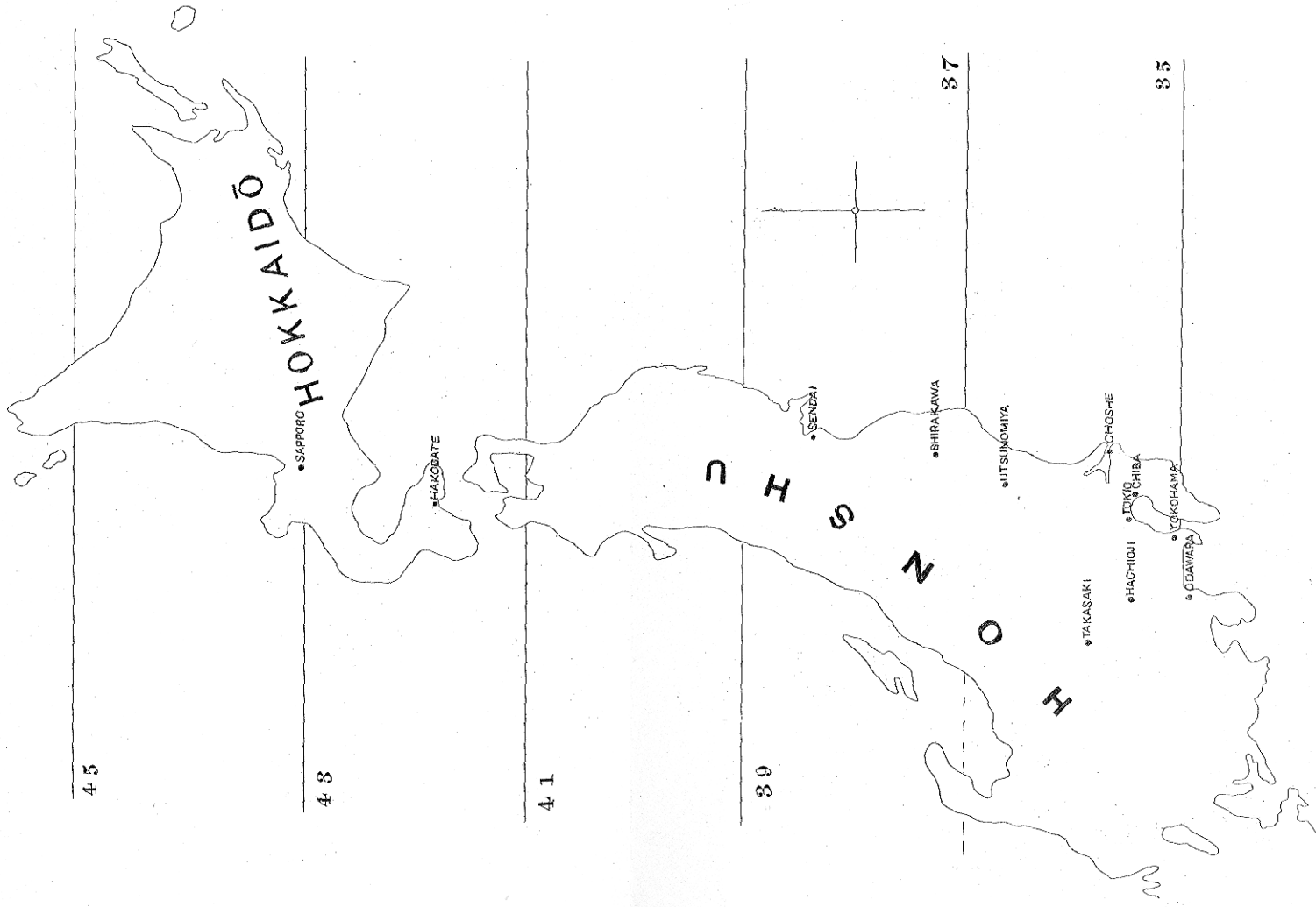
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Place.	Date.	Time shown at time of Signal.	Clock Cor-rected.	Time shown at time of Earthquake.	Remarks.
	1889				
Utsunomiya.	13th Oct.	—	No	10.56.15 p.m.	
Shirakawa ...	13th Oct.	—	No	10.52.00 p.m.	
Takasaki ...	13th Oct.	—	No	10.48.00 p.m.	
Chiba	13th Oct.	—	Yes	11.10.00 p.m.	
Chiba	14th Oct.	11.58.00	No	11.02.10 p.m.	
Tokio	14th Oct.	observatory	Yes	11.05.00 p.m.	
Yokohama ..	14th Oct.	12.00.00	No	10.48.00 p.m.	
Tokio	14th Oct.	observatory	No	10.50.24 p.m.	
Hakodate ...	23rd Oct.	12.00.00	No	8.48.00 p.m.	
Hakodate ...	23rd Oct.	12.00.00	No	11.41.00 p.m.	
Hakodate ...	24th Oct.	12.00.00	No	2.33.00 a.m.	}
				2.49.00 a.m.	
Hakodate ...	26th Oct.	11.56.00	Yes	7.21.00 p.m.	
Odawara ...	28th Oct.	12.02.30	Yes	2.16.50 a.m.	
Yokohama ...	28th Oct.	—	No	2.13.00 a.m.	
Tokio	28th Oct.	observatory	No	2.16.52 a.m.	
Utsunomiya.	28th Oct.	11.58.30	Yes	2.16.00 a.m.	
Sapporo	11th Nov.	12.00.00	No	6.46.00 ?	
Utsunomiya.	15th Nov.	11.59.45	Yes	8.45.00 p.m.	
Shirakawa ...	15th Nov.	11.58.00	Yes	8.47.55 p.m.	
Tokio	15th Nov.	observatory	Yes	8.48.40 p.m.	
Utsunomiya.	20th Nov.	12.00.00	No	12.56.00 a.m.	
Tokio	20th Nov.	observatory	No	0.56.34 a.m.	
Utsunomiya.	21st Nov.	12.02.40	Yes	2.08.00 a.m.	
Shirakawa ...	26th Nov.	12.01.00	Yes	4.46.00 p.m.	
Shirakawa ...	9th Dec.	11.59.40	Yes	3.01.40 p.m.	
Yokohama ..	28th Dec.	12.00.00	No	10.13.00 p.m.	
Hachioji ...	28th Dec.	11.59.00	Yes	10.15.20 p.m.	
Tokio	28th Dec.	observatory	Yes	10.17.55 p.m.	
Odawara ...	31st Dec.	12.00.35	Yes	1.05.15 p.m.	
Yokohama...	31st Dec.	12.00.00	No	1.06.05 p.m.	
Chiba	31st Dec.	12.02.00	Yes	1.05.17 p.m.	
Tokio	31st Dec.	observatory	Yes	1.05.13 p.m.	
Shirakawa ...	31st Dec.	12.00.00	No	1.07.00 p.m.	
Utsunomiya.	31st Dec.	12.10.00	Yes	1.07.00 p.m.	
Hachioji ...	31st Dec.	11.58.40	Yes	1.16.10 p.m.	

DISCUSSION.

Professor Milne remarked that the best thanks of the Society were due to the Telegraph Bureau for the manner in which the project had been taken up by them. There was a special scientific importance attached to observations of the kind that Mr. Mason had just discussed. By them we might reasonably

hope to get a true estimate of the velocity of transmission of seismic disturbances. From this velocity we could then calculate the elastic constants involved and settle many a problem in the physics of the earth's crust. So far, a great deal of guesswork had necessarily characterised calculations in this direction. The 62 Tokyo earthquakes which were not noted at the telegraph stations were doubtless not felt there. It was another illustration of the relatively great seismic activity in the region near Tokyo. If subsequent research should establish the fact that earthquakes are practically simultaneous over a large area, it would be an interesting point, and would considerably alter our views as to how certain earthquakes originate.



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