

*Monthly Means of the Daily Rates of the Riefler Clock
in the Tôkyô Astronomical Observatory and their
Bearing on the Occurrence of Earthquakes.*

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東京天文台に於けるリーフラー時計の遅速度變化と地震發生

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一九一五年十一月より一九二八年十月に至る東京天文台に於けるリーフラー時計の遅速度變化と地震發生との間に多少の關係あるらしく思はれるため報告するものなり。

In the following table are given the monthly means of the daily rates of a Riefler clock maintained in the Tôkyô Astronomical Observatory. These values have been corrected for the effect of the change of pressure inside of the clock vessel according to the empirical formula

$$\frac{\Delta t}{\Delta p} = 0.181 \frac{\text{sec.}}{\text{mm.}}$$

and have been reduced to the rates corresponding to a reference pressure. The correction for the effect of the change of length of the clock pendulum caused by its temperature change has not been made, for the rates due to this effect is very small and is only 0.001 sec. for the temperature change of 1°C. When the daily rate of the clock became large, it was adjusted by means of a suitable regulation of the pressure inside of the clock vessel. For each of these cases, the means of the daily rates are given separately in the table corresponding to before and after the adjustment. Small circles marked in the graph denote the time of these adjustments. After the Kwantô great earthquake of 1923, the daily rate of the clock increased gradually until April of 1927 when it was found necessary to made an adjustment on the mass of the pendulum. The clock is now operating under the conditions $p = 656 \text{ mm.}$, $t = 30^\circ \text{C}$ with the mean daily rate -0.589 sec.

MONTHLY MEANS OF THE DAILY RATES OF A RIEFLER CLOCK
 IN THE TÔKYÔ ASTRONOMICAL OBSERVATORY
 (from November 1914 to October 1928)

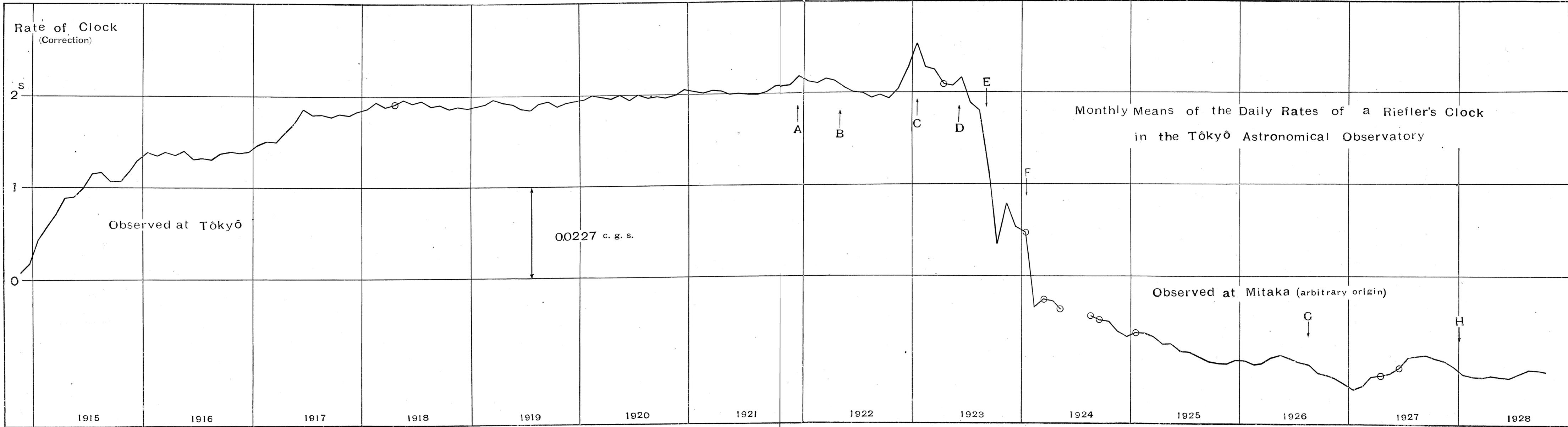
corrected for the pressure change inside of the vessel of the clock.

I	—	1.460	1.926	1.963	2.518	-0.517
II	—	1.502	1.974	1.974	2.248	-0.556
III	—	1.493	1.956	1.956	2.220	-0.534
IV	—	1.660	1.933	1.933	{ 2.059 (1-26) 1.966 (27-29)	-0.475
V	—	1.695	1.972	1.972	1.961	-0.446
VI	—	1.854	1.910	1.910	2.056	-0.483
VII	—	1.797	1.975	1.975	1.777	-0.523
VIII	—	1.792	1.938	1.938	1.082	-0.549
IX	—	1.769	1.951	1.951	1.084	-0.640
X	— sec.	1.801	1.939	1.939	0.247	-0.662
XI	0.069	1.782	1.961	1.961	0.692	-0.692
XII	0.163	1.825	2.021	2.021	0.421	-0.759
I	0.423	1.857	2.001	2.001	{ 0.379 (1-14) 1.131 (15-23) 1.902 (24-31)	-0.800
II	0.577	1.930	1.991	1.991	1.087	-0.781
III	0.705	1.875	2.011	2.011	{ 1.177 (1-8) 1.199 (9-14) 1.047 (14-31)	-0.681
IV	0.889	{ 1.887 (1-18) 1.893 (19-30)	2.005	2.005	1.028	{ -0.677 (2-10) -0.677 (18-30)
V	0.903	1.930	1.967	1.967	{ 0.952 (1-19) 0.929	-0.643
VI	0.999	1.889	1.977	1.977		{ -0.582 -0.788 -0.679
VII	1.160	1.913	1.967	1.967		
VIII	1.172	1.861	1.969	1.969	{ 0.175 (1-6) 0.104 (7-14) 0.091 (16-30)	-0.664
IX	1.066	1.877	1.991	1.991	{ 0.040 (1-17) 0.029 (18-30)	-0.656
X	1.064	1.832	2.052	2.052	0.003	-0.691
XI	1.170	1.849	2.059	2.059	-0.105	-0.719
XII	1.309	1.829	2.160	2.160	-0.160	-0.774
I	1.382	1.856	2.093	2.093	{ -0.119 (1-12) -0.209 (14-31)	-0.855
II	1.343	1.878	2.079	2.079	-0.219	-0.885
III	1.383	1.931	2.130	2.130	-0.254	-0.887
IV	1.349	1.891	2.107	2.107	-0.336	-0.878
V	1.394	1.877	2.033	2.033	-0.336	-0.922
VI	1.302	1.823	1.988	1.988	-0.406	-0.957
VII	1.314	1.814	1.970	1.970	-0.423	-0.850
VIII	1.301	1.891	1.917	1.917	-0.472	-0.804
IX	1.371	1.912	1.952	1.952	-0.521	-0.819
X	1.386	1.856	1.910	1.910	-0.543	-0.828
XI	1.366	1.891	2.028	2.028	-0.544	—
XII	1.381	1.901	2.222	2.222	-0.505	—

Remarks:—From November 1914 to May 1924—observed at Tôkyô.
 From August 1924 to October 1928—observed at Mitaka.

TABLE OF LARGE EARTHQUAKES FELT AT TÔKYÔ DURING THE OBSERVATION.

	Name of earthquake	Date	Position of epicentre	
<i>A</i>	Ryûgasaki	Dec. 8, 1921	140°21"E 35°56"N	
<i>B</i>	Uraga-suidô	April 26, 1922	139 47	35 11
<i>C</i>	Tukubasan	Jan. 14, 1923	140 03	36 04
<i>D</i>	Kasimaoki	June 2, 1923	140 53	36 05
<i>E</i>	Kwantô	Sept. 1, 1923	139 22	34 59
<i>F</i>	Sagami	Jan. 15, 1924	139 17	35 26
<i>G</i>	Tôkyôwan	Aug. 3, 1926	139 48	35 33
<i>H</i>	Tonegawa	Jan. 1, 1928	139 58	36 03



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