

RATES OF BOX AND POCKET CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY

AT THE

ROYAL OBSERVATORY, GREENWICH.

BOX CHRONOMETERS—FROM 1913 JUNE 21 TO 1914 JANUARY 10.

POCKET CHRONOMETERS—FROM 1913 AUGUST 2 TO 1913 NOVEMBER 22.

Order of Merit.	NAME OF MAKER.	No.	Whether 2 or 3 Days.	(1) WEEKLY RATES														
				June 21-28	June 28 to July 5	July 5-12	July 12-19	July 19-26	July 26 to Aug. 2	Aug. 2-9	Aug. 9-16 +	Aug. 16-23 +	Aug. 23-30 +	Aug. 30 to Sept. 6 +	Sept. 6-13	Sept. 13-20	Sept. 20-27	
1	V. Kullberg.....	8472	2	+ 1.1	+ 0.1	- 1.0	- 0.9	- 1.1	- 1.0	0.0	+ 2.1	+ 1.0	+ 1.0	+ 0.5	+ 0.8	+ 0.1	- 0.5	
2	V. Kullberg.....	8465	2	+ 1.8	+ 0.2	+ 1.2	- 0.8	+ 1.1	+ 0.4	+ 1.2	+ 1.8	+ 0.8	+ 0.4	+ 1.0	+ 0.7	- 0.8	- 1.5	
3	V. Kullberg.....	8450	2	+ 1.9	+ 2.0	+ 2.0	+ 2.0	+ 1.2	+ 1.6	+ 1.3	+ 2.9	+ 2.9	+ 2.8	+ 4.3	+ 3.9	+ 2.8	+ 2.0	
4	V. Kullberg.....	8452	2	- 0.1	- 0.1	- 0.2	+ 0.2	0.0	+ 0.4	+ 1.2	+ 1.5	+ 0.8	+ 0.5	+ 2.8	+ 1.8	- 0.5	- 1.5	
5	V. Kullberg.....	8141	2	- 1.1	- 2.0	- 1.7	- 2.7	- 3.2	- 4.2	- 3.7	- 0.9	+ 1.7	+ 4.4	+ 5.6	+ 2.4	- 0.1	- 0.8	
6	V. Kullberg.....	8202	2	+ 0.6	- 0.8	+ 0.1	- 0.1	- 0.2	- 0.6	- 0.2	- 1.2	- 4.8	- 2.8	+ 1.1	+ 1.8	+ 0.9	- 0.4	
7	V. Kullberg.....	8461	2	- 3.2	- 3.0	- 4.1	- 3.5	- 4.0	- 4.4	- 4.8	- 3.1	- 3.6	- 4.0	- 3.7	- 4.2	- 5.3	- 6.2	
8	V. Kullberg.....	8475	2	- 0.5	- 1.5	- 1.9	- 0.6	- 2.4	- 2.4	- 2.9	- 0.8	+ 0.2	+ 1.5	+ 1.6	- 0.9	- 1.5	- 3.1	
9	Olivant & Botsford.....	31946	2	- 5.1	- 5.8	- 4.2	- 5.5	- 4.5	- 5.0	- 4.8	- 6.8	- 8.0	- 5.3	- 3.2	- 0.3	- 0.8	- 2.9	
10	A. Johansen & Co.....	6666	2	+ 4.2	+ 5.6	+ 4.8	+ 4.4	+ 4.4	+ 4.5	+ 6.0	+ 9.9	+11.1	+13.8	+15.5	+10.6	+ 8.7	+ 6.8	
11	V. Kullberg.....	8470	2	+ 2.1	+ 1.4	+ 0.8	0.0	+ 0.9	+ 0.5	+ 1.6	+ 4.9	+ 4.1	+ 6.1	+ 7.5	+ 4.3	+ 4.9	+ 3.0	
12	A. Johansen & Co.....	6618	2	+ 4.5	+ 6.0	+ 7.4	+ 7.3	+ 7.7	+ 8.7	+10.9	+15.8	+20.7	+24.3	+28.8	+20.4	+19.6	+14.9	
13	A. Johansen & Co.....	6732	2	- 2.0	- 2.1	- 0.9	- 2.2	- 2.0	- 1.3	- 1.5	- 5.9	+ 6.0	+10.0	+13.2	+ 9.0	+ 4.6	+ 2.8	
14	V. Kullberg.....	8440	2	+ 3.8	+ 4.3	+ 4.8	+ 5.0	+ 4.1	+ 3.8	+ 5.1	+ 1.4	- 7.3	- 8.4	- 3.8	- 0.1	+ 1.9	+ 3.2	
15	A. Johansen & Co.....	6672	2	- 5.8	- 6.7	- 6.5	- 8.6	- 8.1	- 8.2	- 8.6	- 0.3	+ 3.8	+ 6.8	+ 6.8	+ 1.4	- 1.5	- 5.5	
16	A. W. Webb.....	5699	2	-11.0	-11.0	-11.0	- 9.2	- 9.3	- 8.5	-10.0	- 9.1	- 7.8	- 8.1	- 8.6	- 8.1	-16.5	-16.8	
17	J. F. Woods.....	122	2	-10.1	-10.6	-11.2	- 8.1	- 5.8	- 6.2	- 6.0	-10.0	-17.0	-13.8	- 5.8	- 0.7	- 7.1	- 7.6	
18	A. Johansen & Co.....	6681	2	+ 1.8	- 1.4	- 3.6	- 4.8	- 5.0	- 6.0	- 1.6	+ 7.1	+10.3	+11.9	+ 8.3	+ 2.7	+ 1.6	- 5.0	
19	A. Johansen & Co.....	6741	2	- 8.0	- 9.8	-11.3	- 7.9	- 9.8	- 8.3	- 6.3	+ 1.1	- 0.7	- 1.4	+ 0.8	- 2.1	- 4.1	- 9.3	
20	A. Johansen & Co.....	6749	2	- 5.2	- 5.5	- 4.2	- 4.3	- 4.8	- 4.5	- 5.4	+ 3.8	+ 1.1	+ 0.2	+ 8.7	+ 7.1	+ 3.2	+ 0.9	
21	Usher & Cole.....	1955	2	-24.1	-23.7	-22.1	-31.2	-30.1	-37.1	-35.6	-38.5	-36.7	-30.6	-32.4	-37.6	-37.0	-41.3	
22	Kendal & Dent.....	7649	2	-23.4	-25.7	-23.8	-32.9	-33.0	-34.9	-31.0	-19.8	-21.8	-19.6	-11.9	-7.6	-10.0	-13.3	
23	Usher & Cole.....	2087	2	-18.2	-21.0	-21.0	-25.8	-27.7	-31.2	-32.1	-33.0	-30.2	-28.6	-22.7	-24.5	-28.5		
Chronometrical Thermometer.....				-589.8	-623.4	-599.1	-591.2	-459.8	-523.9	-506.6	-2297.7	-3483.8	-3325.6	-2881.7	-478.7	-507.0	-508.8	
Mean Weekly Temperature.....				65.1	65.3	63.6	65.1	64.0	64.8	64.0	85.0	90.4	97.4	85.6	84.0	63.7	64.6	
Extremes of Temperature as shown by the Self-Registering Thermometers.....				62.9	62.1	62.1	63.3	62.3	63.5	60.3	83.0	97.2	89.9	83.9	62.3	62.0	62.6	
				68.1	67.9	67.6	66.3	64.6	66.3	65.4	89.0	104.9	102.4	87.4	65.2	67.4	68.1	

The Chronometers are placed in order of merit, their respective positions being determined by consideration of the irregularities of rate exhibited in Table II.

The sign + indicates that the rate is gaining.

† During these weeks the Chronometers were placed in the chamber of a stove heated by jets of gas, the temperature being regulated by Kullberg's automatic governor which controls the supply of gas. The gas flames are exterior to the chamber, into which none of the injurious products of combustion can enter.

IN ORDER OF TIME.

THERMOMETER RECORD FOR THE YEAR 1892.														NAME OF MAKER.		No.
Sept. 27 to Oct. 4	Oct. 4-11	Oct. 11-18	Oct. 18-25	Oct. 25 to Nov. 1	Nov. 1-8	Nov. 8-15	Nov. 15-22	Nov. 22-29	Nov. 29 to Dec. 6	Dec. 6-13	Dec. 13-20	Dec. 20-27	Dec. 27 to Jan. 3	Jan. 3-10		
-0.8	-0.1	-0.4	-0.3	+2.0	+0.5	+1.2	-0.2	-0.7	-2.2	-2.4	-2.8	-2.7	-2.1	-2.5	V. Kullberg.....	8472
+0.2	+1.0	-0.1	0.0	+3.8	+0.2	+0.9	+0.8	-1.2	-1.8	-2.1	-1.6	-2.1	-3.1	-3.4	V. Kullberg.....	8465
+2.7	+2.0	-1.0	-0.2	+3.1	+3.4	+5.5	+4.6	+1.7	+0.4	-2.0	-1.0	-1.4	-2.1	-1.2	V. Kullberg.....	8450
-1.0	-1.5	-1.0	-0.8	+2.8	+2.8	+3.1	+2.5	-1.2	-2.1	-3.3	-4.6	-3.5	-4.0	-2.4	V. Kullberg.....	8452
-1.8	-2.2	-2.1	-2.6	-1.3	+1.9	+4.7	+3.8	+2.6	0.0	-0.1	+0.2	+1.1	+1.3	+0.2	V. Kullberg.....	8141
-0.7	+0.8	-0.2	+0.3	0.0	-2.2	+1.2	+3.1	+5.0	+3.7	+0.3	-0.7	0.0	-0.8	+0.6	V. Kullberg.....	8202
-7.5	-6.5	-7.8	-7.4	-4.8	-5.9	-5.0	-7.2	-10.7	-11.0	-12.5	-12.5	-14.2	-13.9	-14.0	V. Kullberg.....	8461
-4.0	-4.8	-6.2	-5.1	-0.6	+0.1	+2.8	-1.9	-3.1	-4.8	-5.3	-6.9	-8.2	-8.6	-3.6	V. Kullberg.....	8475
-2.5	-1.3	-1.8	-1.4	-3.9	-4.1	-1.6	+1.4	+5.5	+3.2	+3.0	+2.9	+4.6	+4.1	+3.0	Olivant & Botsford.	31946
+7.5	+7.1	+5.0	+4.7	+11.4	+12.6	+14.7	+13.4	+8.4	+6.7	+5.9	+5.0	+5.3	+5.1	+4.2	A. Johansen & Co.	6666
+2.2	-0.9	-2.0	-1.1	+5.8	+6.3	+8.0	+6.1	+0.6	-0.7	-1.2	-2.7	-3.0	-3.8	-1.4	V. Kullberg.....	8470
+15.5	+15.6	+13.6	+13.7	+16.0	+16.0	+21.8	+21.1	+21.3	+20.4	+19.3	+19.2	+20.9	+20.0	+19.4	A. Johansen & Co.	6618
+2.4	+3.1	+2.5	+3.0	+4.1	+4.8	+12.6	+13.8	+11.3	+9.8	+10.4	+11.6	+13.3	+13.8	+13.7	A. Johansen & Co.	6732
+4.7	+6.1	-1.2	+1.3	+1.1	-6.2	-5.0	-2.1	-3.3	-3.9	0.0	+0.2	-1.1	0.0	+2.5	V. Kullberg.....	8440
-7.2	-5.3	-5.5	-5.6	-3.6	+3.9	+6.1	+1.4	+1.7	-2.7	-4.4	-5.0	-2.3	-2.9	-3.6	A. Johansen & Co.	6672
-17.1	-18.9	-14.1	-7.9	-4.8	-4.0	-0.9	-9.1	-15.4	-13.8	-11.3	-7.9	-8.1	-5.7	-2.7	A. W. Webb.....	5699
-8.3	-8.9	-7.5	-6.5	-9.1	-10.2	-10.1	-5.7	-1.0	-5.7	-7.3	-7.0	-9.4	-13.8	-9.7	J. F. Woods.....	122
-5.1	-1.9	-1.0	-0.2	+7.7	+12.1	+13.0	+11.0	+1.7	+6.9	+4.8	+4.6	+11.0	+11.1	+7.9	A. Johansen & Co.	6681
-11.7	-11.1	-9.0	-10.0	+1.8	+4.7	+3.6	+4.5	-1.4	-2.4	-4.8	-4.8	-2.6	-3.3	-3.3	A. Johansen & Co.	6741
+0.1	-1.0	-2.7	-2.5	+8.5	+11.8	+13.4	+13.5	+9.9	+5.9	+3.1	+2.1	+6.7	+4.4	+3.5	A. Johansen & Co.	6749
-43.4	-46.5	-45.0	-46.0	-42.2	-41.0	-35.0	-32.8	-39.2	-45.8	-45.2	-47.9	-50.8	-54.1	-56.5	Usher & Cole.....	1955
-17.0	-17.4	-17.8	-19.0	-16.8	-11.1	-11.9	-11.9	-8.1	-15.0	-15.0	-15.2	-11.0	-15.8	-22.2	Kendal & Dent.....	7649
-28.0	-25.8	-23.1	-24.1	-30.0	-27.9	-20.1	-20.9	-15.0	-14.3	-13.3	-10.8	-5.9	-1.5	-11.8	Usher & Cole.....	2087
-610.2	-243.1	-73.8	-86.8	-1672.9	-2718.3	-2767.0	-1559.5	+94.3	+65.5	+252.6	+295.1	+624.1	+711.4	+550.4	Chronometrical Thermometer.	
65.9	61.9	60.2	60.6	79.5	91.3	92.8	77.3	58.2	58.6	56.5	58.3	52.3	51.9	53.4	Mean Weekly Temperature.	
63.9	59.6	59.4	59.4	77.0	86.0	91.5	75.5	54.5	53.6	51.2	54.2	50.0	50.2	50.5	Extremes of Temperature as shown by the Self-Registering Thermometer.	
69.0	64.7	62.7	61.8	81.4	95.2	94.0	82.9	59.8	61.4	60.2	63.8	54.0	54.0	59.3		

The Chronometrical Thermometer differs from an ordinary Chronometer only in the construction of the balance, the position of the metals forming the compensating rim being reversed. By this arrangement the effect of temperature is much magnified.

Only those Chronometers have been included in this list for which 3 did not exceed 12 seconds.

Order of Merit.	NAME OF MAKER.	No.	Watch as Days.	ADDRESS OF MAKER.	Construction of Escapement, Balance, and Spring, from a Description furnished by the Maker.	(II.) ABSTRACT OF	
						Least Weekly Sum.	Extremes of Temperature.
1	V. Kullberg.....	8472	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 2.8	54.2- 63.8
2	V. Kullberg.....	8465	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 3.4	50.5- 59.3
3	V. Kullberg.....	8450	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 2.1	50.2- 54.0
4	V. Kullberg.....	8452	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 4.6	54.2- 63.8
5	V. Kullberg.....	8141	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 4.2	63.5- 66.3
6	V. Kullberg.....	8202	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 4.8	97.2-104.9
7	V. Kullberg.....	8461	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 14.2	50.0- 54.0
8	V. Kullberg.....	8475	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 8.6	50.2- 54.0
9	Olivant & Botsford.....	31946	2	12/14 St. Ann Street, Manchester.	Ordinary compensation balance; palladium spring.	- 8.0	97.2-104.9
10	A. Johansen & Co.....	6666	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	+ 4.2	(62.9- 68.1) (50.5- 59.3)
11	V. Kullberg.....	8470	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 3.8	50.2- 54.0
12	A. Johansen & Co.....	6618	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	+ 4.5	62.9- 68.1
13	A. Johansen & Co.....	6732	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	- 2.2	63.3- 66.3
14	V. Kullberg.....	8440	2	105 Liverpool Road, London, N.	Reversed detent; Kullberg's auxiliary balance; palladium spring.	- 8.4	89.9-102.4
15	A. Johansen & Co.....	6672	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	- 8.6	(63.3- 66.3) (60.3- 65.4)
16	A. W. Webb.....	5699	2	69 Charlton Road, Blackheath, S.E.	Auxiliary to balance; bright steel spring.	- 18.9	59.6- 64.7
17	J. F. Woods.....	122	2	7 Harley Street, Cavendish Sq., W.	Ordinary compensation balance; blue steel spring.	- 17.0	97.2-104.9
18	A. Johansen & Co.....	6681	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	- 6.0	63.5- 66.3
19	A. Johansen & Co.....	6741	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	- 11.7	63.9- 69.0
20	A. Johansen & Co.....	6749	2	149 Minories, London, E.	Auxiliary to balance; palladium spring.	- 5.5	62.1- 67.9
21	Usher & Cole.....	1955	2	339 St. John Street, Clerkenwell, E.C.	Auxiliary to balance; acting in cold; palladium spring.	- 56.5	50.5- 59.3
22	Kendal & Dent.....	7649	2	106 Cheapside, London, E.C.	Ordinary compensation balance; blue steel spring.	- 84.9	63.5- 66.3
23	Usher & Cole.....	2087	2	339 St. John Street, Clerkenwell, E.C.	Auxiliary to balance; acting in cold; palladium spring.	- 88.0	88.9- 89.0

The Chronometers are placed in order of merit, their respective positions being determined by consideration of the irregularities of rate exhibited in the Table above.

The sign + indicates a gaining rate.

THE PRINCIPAL CHANGES OF RATE DURING THE 29 WEEKS.

Mean Temperature.	Greatest Weekly Sum.	Extremes of Temperature.	Mean Temperature.	Difference between Greatest and Least. (a)	Greatest Difference between one Week and the next. (b)	Mean Temperature for these Two Weeks.	Trial No. a + 29.	NAME OF MAKER.	No.
58.3	+ 2.1	83.0 - 89.0	85.0	4.9	2.5	79.5 - 91.3	9.9	V. Kullberg.....	8472
53.4	+ 3.3	77.0 - 81.4	79.5	6.7	3.3	60.6 - 79.5	13.8	V. Kullberg.....	8465
51.9	+ 5.5	91.5 - 94.2	92.8	7.6	3.3	60.6 - 79.5	14.2	V. Kullberg.....	8450
58.3	+ 3.1	91.5 - 94.2	92.8	7.7	3.7	77.3 - 88.2	15.1	V. Kullberg.....	8452
64.8	+ 5.6	83.9 - 87.4	85.6	9.8	3.2	{ 85.6 - 64.0 } { 79.5 - 91.3 }	16.2	V. Kullberg.....	8141
99.4	+ 5.0	54.5 - 59.8	58.2	9.8	3.9	97.4 - 85.6	17.6	V. Kullberg.....	8202
52.3	- 3.0	62.1 - 67.9	65.3	11.2	3.5	77.3 - 58.2	18.2	V. Kullberg.....	8461
51.9	+ 2.8	91.5 - 94.2	92.8	11.4	5.0	51.9 - 53.4	21.4	V. Kullberg.....	8475
99.4	+ 5.5	54.5 - 59.8	58.2	13.5	4.1	77.3 - 58.2	21.7	Olivant & Botsford.....	31946
{ 65.1 } { 59.4 }	+ 15.5	83.9 - 87.4	85.6	11.3	6.7	60.6 - 79.5	24.7	A. Johansen & Co.....	6666
51.9	+ 8.0	91.5 - 94.2	92.8	11.8	6.9	60.6 - 79.5	25.6	V. Kullberg.....	8470
65.1	+ 24.3	89.9 - 102.4	97.4	19.8	4.9	{ 64.0 - 85.0 } { 85.0 - 99.4 }	29.6	A. Johansen & Co.....	6618
65.1	+ 13.8	{ 75.5 - 83.9 } { 59.3 - 54.0 }	77.3 (51.9)	16.0	7.4	64.0 - 85.0	30.8	A. Johansen & Co.....	6732
97.4	+ 6.1	59.7 - 64.7	61.9	14.5	8.7	85.6 - 99.4	31.9	V. Kullberg.....	8440
{ 65.1 } { 64.0 }	+ 6.8	89.9 - 102.4	97.4	15.4	8.3	64.0 - 85.0	32.0	A. Johansen & Co.....	6672
61.9	- 0.9	91.5 - 94.2	92.8	18.0	8.4	64.0 - 63.7	34.8	A. W. Webb.....	5699
99.4	+ 1.0	54.5 - 59.8	58.2	18.0	8.5	97.4 - 85.6	35.0	J. F. Woods.....	122
64.8	+ 13.0	91.5 - 94.2	92.8	19.0	8.7	64.0 - 85.0	36.4	A. Johansen & Co.....	6681
65.9	+ 4.7	86.0 - 90.2	91.3	16.4	11.8	60.6 - 79.5	40.0	A. Johansen & Co.....	6741
65.3	+ 13.5	75.5 - 82.9	77.8	19.0	11.0	60.6 - 79.5	41.0	A. Johansen & Co.....	6749
53.4	- 24.1	62.9 - 68.1	65.1	32.4	7.0	64.0 - 64.8	46.4	Usher & Cole.....	1955
64.8	- 7.6	62.3 - 65.2	64.0	27.3	11.2	64.0 - 85.0	49.7	Kendal & Dent.....	7649
85.0	- 1.5	50.2 - 54.0	51.9	31.5	10.3	51.9 - 53.4	52.1	Usher & Cole.....	2087

The Trial No. a + 29 is taken as a measure of the irregularities of rate.

Only those Chronometers have been included in this list for which θ did not exceed 12 seconds.

(1) WEEKLY RATES IN

Order of Merit	NAME OF MAKER.	No.	ADDRESS OF MAKER.	Aug. 2-9	Aug. 9-16	Aug. 16-23	Aug. 23-30	Aug. 30 to Sept. 6	Sept. 6-13	Sept. 13-20	Sept. 20-24	Sept. 24-27	Sept. 27-30	Sept. 30 to Oct. 4	
				Pocket Chronometer Horizontal. Dial up.								Chron. Vertical. Pendant up. †	Chron. Vertical. Pendant right. †	Chron. Vertical. Pendant left. †	Chron. Vertical. Pendant up. †
1	Wales & M'Culloch.	3685	20 Ludgate Hill, London, E.C.	+65.1	+67.2	+70.5	+70.3	+68.0	+70.8	+70.0	+80.1	+80.8	+88.8	+88.8	+41.8
2	V. Kullberg.....	8646	105 Liverpool Road, London, N.	- 6.1	- 7.4	- 8.7	- 7.8	- 7.4	-13.7	+ 1.2	-62.8	+23.1	- 9.6	-55.1	
	Mean Weekly Temperature.			64°0	65°0	68°5	68°5	65°9	64°0	88°9	90°8				87°9
	Extremes of Temperature as shown by the Self-Registering Thermometer.			60.3 65.4	63.9 66.2	64.9 68.7	66.4 70.6	64.2 69.8	62.3 65.2	84.2 91.6	89.3 91.8				87.5 90.2

* The weekly rates have been computed from the rates for three days. + The weekly rates have been computed from the rates for four days.
During the period from Sept. 13 to Oct. 11, the Pocket Chronometers were placed in an oven heated by jets of gas, the temperature being regulated by Kullberg's automatic governor which controls the supply of gas. The gas flames are exterior to the chamber, into which none of the injurious products of combustion can enter.

ORDER OF TIME.

(3) ABSTRACT OF THE PRINCIPAL
CHANGES OF RATE.

CHANGES OF RATE.																
Oct. 1-11	Oct. 11-18	Oct. 18-25	Oct. 25 to Nov. 1	Nov. 1-8	Nov. 8-15	Nov. 15-22	Difference of Weekly Rates.					Trial Number.	NAME OF MAKER.	No.	Order of Merit.	
Pocket Chronometer Horizontal. Dial up.							Difference between greatest and least Weekly Rate.	Constant difference between one week and the next. Dial up.	Pendant up Dial up.	Pendant right Dial up.	Pendant left Dial up.					
a	b	c	d	e	f	g	a	b	c	d	e	f	g	h	i	j
+56.9	+47.0	+59.9	+62.7	+67.9	+71.2	+68.7	24.2	12.9	-27.5	-33.2	-23.7	50.0	74.3	Wales & M'Culloch..	3686	1
-12.0	- 2.8	- 0.9	- 2.2	- 4.7	- 2.4	- 2.8	14.9	14.9	-53.3	+28.5	- 4.2	44.7	76.9	V. Kullberg.....	8646	2
87.9	60.2	60.6	68.7	62.8	61.7	60.2	Mean Weekly Temperature.					The sign + indicates a gaining rate.				
86.8	59.4	59.4	59.5	60.4	58.5	57.2	Extremes of Temperature as shown by the Self-Registering Thermometer.									
89.1	62.7	61.8	66.1	65.1	65.0	61.9										

The quantities a, b, c, d, e , in the formula $a + 2b + \frac{1}{2}(c + \frac{d+e}{2})$ are taken numerically without regard to sign.

Only three Chronometers have been included in the above list for which "b" did not exceed 15 seconds or $a + 2b$ did not exceed 60, or the trial number did not exceed 100.