

RATES OF CHRONOMETERS

ON TRIAL

FOR PURCHASE BY THE BOARD OF ADMIRALTY,

AT THE

ROYAL OBSERVATORY, GREENWICH.

1886.

RATES OF CHRONOMETERS ON TRIAL FOR PURCHASE BY THE ADMIRALTY.

NAME or MAKER.	No.	Whether for Day.	Construction of Escapement and Balance, from the Description furnished by the Maker.		(L)-WEEKLY SUMS OF DAILY RATES																			
					Jan. 9-16	Jan. 16-23	Jan. 23-30	Jan. 30 to Feb. 6	Feb. 6-13	Feb. 13-20	Feb. 20-27	Feb. 27 to Mar. 6	March 6-13	March 13-20	March 20-27									
Uhlig	453	2	Ordinary balance, with continually acting auxiliary.	-	30	-	15	-	20	15	-	07	-	20	-	08	-	36	-	33	-	22	-	28
Uhlig	451	2	Ordinary balance, with continually acting auxiliary.	-	31	-	08	-	15	17	-	12	-	18	-	11	-	33	-	44	-	24	-	28
Mann	4973	2	Auxiliary compensation.	-	21	00	08	00	-	20	21	12	07	40	47	40	40	40	40	40	40	40	40	40
Skinner	970	2	Auxiliary compensation.	-	20	50	44	56	66	55	70	42	55	87	73	73	73	73	73	73	73	73	73	
Hume	9012	2	Auxiliary compensation for heat.	-	14	-	08	-	76	-	87	-	72	-	81	-	77	-	69	-	66	-	90	
Keys	689	2	Ordinary balance, with auxiliary compensation.	+	100	+ 127	+ 150	+ 153	+ 156	+ 159	+ 170	+ 113	+ 100	+ 104	+ 100	+ 104	+ 100	+ 104	+ 100	+ 104	+ 100	+ 104	+ 100	
Wheeler	4075	2	Reversed decent, with short spring.	-	40	-	83	-	98	-	94	-	96	-	105	-	94	-	38	-	15	-	14	
Klean & Co.	4712	2	Poor's auxiliary.	+	22	+ 40	+ 20	+ 29	+ 32	+ 15	+ 40	+ 67	+ 55	+ 86	+ 87	+ 86	+ 86	+ 86	+ 86	+ 86	+ 86	+ 86	+ 86	
Kullberg	4356	2	Reversed decent, with short spring. (true.)	-	21	-	00	-	12	-	12	-	12	-	12	-	12	-	71	-	99	-	99	
Wheyle & Co.	3561	2	Auxiliary compensation for extremes of temperature.	+	02	+ 27	+ 13	07	+ 38	+ 31	+ 59	28	+ 43	+ 86	+ 73	+ 73	+ 73	+ 73	+ 73	+ 73	+ 73	+ 73	+ 73	
Reid & Son	1783	2	Auxiliary compensation. Palladium spring.	+	17	+ 47	+ 68	74	+ 93	+ 94	+ 150	- 76	+ 131	+ 145	+ 158	+ 158	+ 158	+ 158	+ 158	+ 158	+ 158	+ 158	+ 158	
Pennington	2762	2	Ordinary balance.	-	00	-	63	-	93	-	78	-	83	-	60	-	94	-	03	-	79	-	76	
Reid	578	2	Ordinary balance, with auxiliary compensation.	-	175	- 195	- 189	- 199	- 183	- 201	- 228	- 101	- 168	+ 204	- 232	- 232	- 232	- 232	- 232	- 232	- 232	- 232	- 232	
Reid	77	2	Auxiliary compensation.	-	08	-	43	-	25	-	49	-	24	-	33	-	19	-	103	-	108	-	98	
J. Poole & Co.	876	2	Poor's auxiliary.	-	06	-	28	-	44	-	27	-	00	-	41	-	29	-	97	-	122	-	120	
Lister & Sons	824	2	Airy's compensation. Poor's auxiliary.	-	195	- 186	- 200	- 192	- 214	- 187	- 216	- 198	- 119	- 87	- 89	- 89	- 89	- 89	- 89	- 89	- 89	- 89	- 89	
David Reid	850	2	Auxiliary compensation.	+	100	+ 173	+ 160	+ 169	+ 184	+ 211	+ 206	+ 126	+ 102	+ 172	+ 232	+ 232	+ 232	+ 232	+ 232	+ 232	+ 232	+ 232	+ 232	
Hume	2013	2	Auxiliary compensation for heat.	-	10	-	40	-	25	-	49	-	24	-	33	-	19	-	103	-	108	-	98	
Reid & Sons	578	2	Auxiliary compensation.	-	33	-	28	-	37	-	48	-	11	-	57	-	04	-	31	-	38	-	44	
Keys	886	2	Ordinary balance, with auxiliary compensation.	+	96	+ 113	+ 141	+ 129	+ 104	+ 136	+ 125	+ 156	+ 140	+ 204	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	+ 210	
Moore	3562	2	Airy's compensation. Poor's auxiliary.	-	192	- 166	- 198	- 173	- 209	- 131	- 188	- 166	- 147	- 147	- 161	- 161	- 161	- 161	- 161	- 161	- 161	- 161	- 161	
Wheyle & Co.	5750	2	Auxiliary compensation for heat.	-	111	- 118	- 116	- 123	- 116	- 130	- 140	- 31	- 27	+ 65	+ 68	+ 68	+ 68	+ 68	+ 68	+ 68	+ 68	+ 68	+ 68	
Wheyle & Co.	4315	2	Ordinary balance.	-	184	- 184	- 189	- 167	- 200	- 186	- 203	- 100	- 101	- 123	- 123	- 123	- 123	- 123	- 123	- 123	- 123	- 123	- 123	
David Reid	1788	2	Auxiliary compensation.	-	137	- 117	- 114	- 116	- 131	- 112	- 132	- 192	- 106	- 88	- 97	- 97	- 97	- 97	- 97	- 97	- 97	- 97	- 97	
Cole	3779	2	Auxiliary compensation for extremes of temperature.	+	70	+ 84	+ 83	+ 79	+ 93	+ 79	+ 103	- 29	- 52	- 93	+ 04	+ 04	+ 04	+ 04	+ 04	+ 04	+ 04	+ 04	+ 04	
Pfrott	687	2	Ordinary balance, with auxiliary compensation.	+	69	+ 75	+ 77	+ 29	+ 127	+ 37	+ 124	+ 102	+ 120	+ 158	+ 166	+ 166	+ 166	+ 166	+ 166	+ 166	+ 166	+ 166	+ 166	
Kullberg	1070	2	Balance without auxiliary.	+	18	+ 20	+ 23	+ 29	+ 32	+ 15	+ 40	+ 67	+ 55	+ 86	+ 87	+ 86	+ 86	+ 86	+ 86	+ 86	+ 86	+ 86	+ 86	
Johnson & Son	1840	2	Compensation for extremes of temperature.	+	67	+ 81	+ 92	+ 103	+ 106	+ 111	+ 134	- 21	- 32	+ 99	+ 24	+ 24	+ 24	+ 24	+ 24	+ 24	+ 24	+ 24	+ 24	
Shepherd & Son	3750	2	Auxiliary to balance and Airy's compensation bar.	-	150	- 110	- 99	- 99	- 110	- 86	- 110	- 189	- 263	- 317	- 340	- 340	- 340	- 340	- 340	- 340	- 340	- 340	- 340	
Williams	4463	2	Ordinary balance, with auxiliary compensation.	-	51	-	88	-	99	-	113	-	117	-	151	-	96	-	122	-	120	-	53	
Hosp.	7591	2	Auxiliary for cold. Airy's compensation.	-	229	- 815	- 1894	- 166	- 127	- 144	- 109	- 160	- 145	+ 135	+ 69	+ 69	+ 69	+ 69	+ 69	+ 69	+ 69	+ 69	+ 69	
Glover	280	2	Ordinary balance, with auxiliary for heat.	-	31	-	07	-	02	-	20	-	89	-	13	-	70	-	393	-	416	-	419	
Glover	366	2	Ordinary balance, with auxiliary for heat.	-	114	-	106	-	81	-	24	-	121	-	83	-	114	-	177	-	143	-	143	
J. Poole & Co.	8418	2	Poor's auxiliary.	-	271	-	244	-	227	-	238	-	280	-	222	-	268	-	127	-	164	-	183	
* Edward and Sons	3688	2	Improved ordinary balance.	-	66	-	62	-	74	-	79	-	87	-	87	-	87	-	87	-	87	-	87	
* Lister and Sons	824	2	Poor's auxiliary.	-	195	- 186	- 200	- 192	- 214	- 187	- 216	- 198	- 119	- 87	- 89	- 89	- 89	- 89	- 89	- 89	- 89	- 89	- 89	
* Weichert	2355	2	Kullberg's flat rim balance.	+	137	+ 149	+ 135	+ 144	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	+ 151	
Chromometer Thermometer. ....	.....	.....	.....	.....	+ 13895	+ 12832	+ 12094	+ 12323	+ 14132	+ 14141	+ 14042	- 26770	- 26882	- 24952	- 23073	- 23073	- 23073	- 23073	- 23073	- 23073	- 23073	- 23073	- 23073	
Mean Weekly Temperature .....	.....	.....	.....	.....	47	49	49	49	49	46	50	47	92	93	91	89	89	89	89	89	89	89	89	
Extremes of Temperature as shown by the Self-Registering .....	.....	.....	.....	.....	43-54	44-55	44-55	45-55	42-54	45-55	42-54	87-95	91-97	90-93	88-91	88-91	88-91	88-91	88-91	88-91	88-91	88-91	88-91	

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 flames are exterior to the chamber, into which none of the injurious products of combustion can enter.

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

AT THE ROYAL OBSERVATORY, GREENWICH, 188

IN THE ORDER OF TIME.																	NAME OR MAKER.		No.
Mar. 27 to Apr. 3	April 3—10	April 10—17	April 17—24	Apr. 24 to May 1	May 1—8	May 8—15	May 15—22	May 22—29	May 29 to June 5	June 5—12	June 12—19	June 19—26	June 26 to July 3	July 3—10	July 10—17	July 17—24			
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
- 33	- 31	- 38	- 35	- 43	- 42	- 39	- 32	- 44	- 31	- 26	- 38	- 41	- 47	- 47	- 34	- 46	Uhrig.....	453	
+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Uhrig.....	453	
+ 06	+ 15	+ 14	+ 01	+ 08	+ 07	+ 08	+ 44	+ 45	+ 13	+ 10	+ 19	+ 17	+ 08	+ 14	+ 13	+ 10	Uhrig.....	453	
+ 08	+ 02	+ 07	+ 81	+ 69	+ 07	+ 09	+ 33	+ 34	+ 20	+ 13	+ 14	+ 05	+ 06	+ 20	+ 18	+ 23	Uhrig.....	453	
+ 06	+ 15	+ 14	+ 01	+ 08	+ 07	+ 08	+ 44	+ 45	+ 13	+ 10	+ 19	+ 17	+ 08	+ 14	+ 13	+ 10	Uhrig.....	453	
+ 112	+ 109	+ 123	+ 126	+ 140	+ 130	+ 120	+ 74	+ 85	+ 83	+ 73	+ 85	+ 97	+ 66	+ 47	+ 89	+ 82	Uhrig.....	453	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
+ 110	+ 138	+ 178	+ 176	+ 165	+ 166	+ 153	+ 144	+ 108	+ 124	+ 134	+ 96	+ 116	+ 100	+ 139	+ 118	+ 160	Uhrig.....	453	
+	81	91	95	68	78	71	42	26	129	98	13	42	43	26	41	10	Uhrig.....	453	
+ 126	+ 86	+ 98	+ 102	81	77	+ 43	+ 111	+ 98	+ 100	+ 111	+ 13	+ 12	+ 56	+ 77	+ 42	+ 49	Kien & Co.....	4471	
+ 12	+ 27	+ 04	+ 45	+ 59	+ 27	+ 06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Kien & Co.....	4471	
+ 19	+ 43	+ 45	35	08	01	+ 11	+ 87	75	+ 77	+ 66	+ 14	+ 12	+ 106	+ 114	+ 103	+ 93	Whyte & Co.....	3361	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
+ 07	+ 8	+ 96	+ 133	+ 124	+ 139	+ 133	+ 170	+ 130	+ 168	+ 179	+ 103	+ 126	+ 144	+ 138	+ 141	+ 156	Reid & Sons.....	1783	
+ 04	+ 11	+ 07	+ 15	+ 14	+ 18	+ 15	+ 55	+ 75	+ 44	+ 18	+ 04	+ 07	+ 20	+ 38	+ 25	+ 40	Pennington.....	1796	
+ 175	+ 195	+ 216	+ 212	+ 211	+ 193	+ 183	+ 265	+ 240	+ 265	+ 268	+ 107	+ 210	+ 263	+ 294	+ 285	+ 303	Pennington.....	1796	
+ 109	+ 90	+ 64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Pennington.....	1796	
- 28	- 23	- 11	07	41	30	- 44	- 110	- 117	- 118	- 129	- 56	- 64	- 111	- 140	- 113	- 140	J. Poole & Co.....	5796	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
- 112	- 123	- 160	- 141	- 115	- 101	- 83	- 106	- 133	- 108	- 89	- 64	- 68	- 68	- 67	- 56	- 77	Lister & Sons.....	824	
+ 150	+ 204	+ 235	+ 234	+ 204	+ 324	+ 190	+ 249	+ 205	+ 236	+ 278	+ 246	+ 231	+ 275	+ 287	+ 244	+ 262	David Reid.....	8785	
+ 20	+ 208	+ 208	+ 180	+ 133	+ 123	+ 103	+ 138	+ 159	+ 175	+ 179	+ 148	+ 159	+ 159	+ 151	+ 134	+ 68	David Reid.....	8785	
- 134	- 140	- 151	- 151	- 141	- 144	- 151	- 79	- 21	- 31	- 63	- 154	- 159	- 159	- 148	- 146	- 183	David Reid.....	8785	
+ 184	+ 194	+ 201	+ 213	+ 242	+ 245	+ 255	+ 250	+ 239	+ 256	+ 275	+ 264	+ 309	+ 324	+ 311	+ 329	+ 337	Whyte & Co.....	3361	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
- 8	- 106	- 88	- 106	- 88	- 85	- 52	- 140	- 95	- 105	- 97	- 49	- 52	- 59	- 23	- 18	- 11	Moore.....	3754	
+ 97	+ 138	+ 134	+ 160	+ 130	+ 103	+ 107	+ 48	+ 33	+ 57	+ 47	+ 110	+ 96	+ 84	+ 89	+ 97	+ 91	Whyte & Co.....	3361	
+ 208	+ 208	+ 208	+ 180	+ 133	+ 123	+ 103	+ 138	+ 159	+ 175	+ 179	+ 148	+ 159	+ 159	+ 151	+ 134	+ 68	Pennington.....	1796	
- 134	- 140	- 151	- 151	- 141	- 144	- 151	- 79	- 21	- 31	- 63	- 154	- 159	- 159	- 148	- 146	- 183	David Reid.....	8785	
- 21	+ 42	+ 45	+ 43	+ 94	+ 97	+ 64	+ 39	- 21	- 41	- 61	- 59	- 70	- 92	- 42	- 46	- 10	Cole.....	3779	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
+ 73	+ 89	+ 125	+ 90	+ 68	+ 119	+ 125	+ 213	- 218	+ 248	+ 262	+ 175	+ 152	+ 176	+ 267	+ 269	+ 211	Doane.....	887	
+ 47	+ 45	+ 66	33	+ 68	+ 110	+ 116	+ 203	- 218	+ 248	+ 262	+ 175	+ 152	+ 176	+ 267	+ 269	+ 211	Doane.....	887	
+ 56	+ 57	+ 64	83	+ 79	+ 68	+ 87	+ 26	- 10	+ 07	+ 32	+ 41	+ 17	+ 53	+ 73	+ 72	+ 0	Johnson & Son.....	3460	
- 122	- 123	- 150	- 131	- 78	- 95	- 12	- 160	- 155	- 160	- 149	- 143	- 68	- 79	- 100	- 121	- 116	Williams.....	4485	
- 93	- 20	24	- 20	- 27	- 23	- 47	- 153	- 160	- 149	- 143	- 68	- 79	- 100	- 121	- 116	- 135	Williams.....	4485	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
- 23	- 30	- 19	- 70	- 129	- 60	- 45	+ 70	+ 159	+ 173	+ 205	+ 126	+ 20	- 51	- 07	+ 24	+ 09	Heay.....	7591	
- 28	- 42	- 42	- 40	- 42	- 39	- 40	- 37	- 49	- 37	- 53	- 53	- 48	- 44	- 54	- 53	- 51	Glover.....	5810	
- 29	- 20	- 20	- 103	- 75	- 144	- 103	- 158	- 175	- 205	- 209	- 184	- 169	- 227	- 187	- 211	- 170	Glover.....	5810	
- 44	- 85	- 119	- 120	- 70	- 44	- 01	- 134	- 193	- 213	- 226	- 73	- 96	- 157	- 201	- 162	- 183	J. Poole & Co.....	3880	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Uhrig.....	453	
***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	*Edward & Sons.....	3588	
***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	*Lister & Sons.....	8245	
***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	*Weicht.....	2365	
+ 7059	+ 8441	+ 11009	+ 9570	+ 7055	+ 5312	+ 3773	+ 2500	+ 2760	+ 2581	+ 2216	+ 1624	+ 2013	+ 3383	+ 6998	+ 1093	+ 4139	Chronometrical Thermometers	.....	
54.8	52.7	49.9	51.2	54.6	56.4	58.6	92.9	95.6	92.8	91.1	60.7	60.2	66.6	71.1	65.4	67.9	Mean Weekly Temperature	.....	
60—62	49—56	48—52	49—54	51—58	51—63	53—63	91—95	93—97	92—94	90—92	57—64	58—63	64—70	64—77	64—67	64—72	Extremes of Temperature as shown by the Self-Recording Thermometers	.....	

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

* These Chronometers having been purchased by the Admiralty were withdrawn from the Annual Trial by permission of the Astronomer Royal.

Extremes of Temperature
shown by the Self-Registering
Thermometers.

A 2

RATES OF CHRONOMETERS ON TRIAL FOR PURCHASE BY THE ADMIRALTY.

NAME OF MAKER.	No.	Wholesale or Retail.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(II).—WEEKLY SUMS OF DAILY RATES											
				Feb. 6-13	Feb. 13-20	Feb. 20-27	Jan. 27-30	Jan. 30-Feb.	Jan. 30-31	Feb. 1-10	Feb. 10-17	April 17-24	April 24-30	April 30-May	April 30-May
Uhrig	453	2	Ordinary balance, with continually acting auxiliary.	-07	-04	-30	-15	-18	-20	-20	-38	-35	-21	-43	
Uhrig	453	2	Ordinary balance, with continually acting auxiliary.	-12	-11	-21	-09	-17	-15	-18	-14	-01	-15	-08	
Man...	4072	2	Auxiliary compensation.	-30	-12	-21	00	00	-08	-21	-01	-14	-02	-19	
Skinner	470	2	Auxiliary compensation.	-58	-70	-20	-50	-56	-44	-55	-57	-21	-83	-59	
Hume...	4073	2	Auxiliary compensation for heat.	+72	+77	+04	+88	+87	+76	+81	+125	+138	+109	+140	
Keys	889	2	Ordinary balance, with auxiliary compensation.	+156	+170	+100	+127	+153	+150	+159	+178	+176	+138	+183	
Kullberg	4075	2	Reversed dent, with short spring.	-06	-04	-09	-85	-95	-94	-102	-91	-95	-81	-86	
Klan & Co.	4171	2	Pool's auxiliary.	+23	+40	+22	+40	+29	+29	+15	+98	+102	+86	+81	
Kullberg	4146	2	Reversed dent, with short spring.	+11	+40	+17	+38	+41	+34	+39	+04	+43	+27	+59	
Whyte & Co.	3361	2	Auxiliary compensation for extremes of tempera...	+38	+59	+02	+27	+07	+13	+21	+49	+25	+43	+08	
Reid & Sons...	1783	2	Auxiliary compensation. Palladium spring.	+95	+150	+17	+47	+74	+66	+94	+96	+133	+82	+124	
Pennington	1796	2	Ordinary balance.	-86	-94	-90	-63	-58	-60	-07	-15	-11	-14	-14	
Pyott...	678	2	Ordinary balance, with auxiliary compensation.	+153	+208	+178	+193	+199	+189	+201	+218	+212	+193	+211	
Isaac	5796	2	Auxiliary compensation.	-24	-19	-39	-41	-49	-55	-53	-58	-64	-90	-80	
J. Poole & Co.	876	2	Pool's auxiliary.	-60	-29	-69	-28	-27	-44	-41	-11	-07	-23	-41	
Lister & Sons	824	2	Airy's compensation. Pool's auxiliary.	-214	-216	-195	-186	-192	-200	-187	-160	-141	-123	-115	
David Reid	850	2	Auxiliary compensation.	+104	+208	+150	+173	+169	+160	+191	+235	+234	+204	+203	
Hume...	2013	2	Auxiliary compensation for heat.	+79	+99	+60	+95	+93	+103	+48	+27	+31	+00	+00	
Reid & Sons...	875	2	Auxiliary compensation.	+11	+04	-23	-28	-48	-37	-67	-33	-30	-33	-34	
Keys	886	2	Ordinary balance, with auxiliary compensation.	+104	+125	+95	+113	+129	+141	+136	+201	+213	+194	+242	
Moore...	3554	2	Airy's compensation. Pool's auxiliary.	-209	-188	-123	-106	-173	-138	-131	-88	-105	-106	-98	
Whyte & Co.	2760	2	Auxiliary compensation for heat.	+136	+140	+111	+116	+128	+118	+130	+134	+140	+138	+130	
Pennington	4515	2	Ordinary balance, with auxiliary compensation.	+230	+233	+184	+164	+197	+190	+192	+208	+191	+163	+149	
David Reid	1788	2	Auxiliary compensation.	-131	-123	-137	-117	-116	-114	-112	-151	-151	-140	-141	
Cole...	3779	2	Auxiliary compensation for extremes of tempera...	+98	+103	+70	+84	+79	+93	+79	+45	+43	+42	+54	
Pyott...	887	2	Ordinary balance, with auxiliary compensation.	+127	+124	+69	+75	+29	+77	+37	+125	+90	+88	+68	
Isaac	1870	2	Balance without auxiliary.	+89	+40	+18	+22	+41	+24	+34	+74	+45	+45	+69	
Shepherd & Son	1640	2	Compensation for extremes of temperature.	+106	+134	+67	+81	+103	+92	+111	+64	+83	+57	+79	
Williams	4455	2	Auxiliary to balance and Airy's compensation bar.	-110	-110	-126	-110	-93	-96	-86	-150	-121	-123	-78	
			Ordinary balance, with auxiliary compensation.	-117	+98	+51	+58	+119	+95	+111	-24	-20	-20	-27	
Heap...	7591	2	Auxiliary for cold. Airy's compensation.	-127	-109	-229	-215	-186	-184	-144	-119	-70	-30	-139	
Glover	380	2	Ordinary balance, with auxiliary for heat.	-99	-70	-21	-07	+20	-92	-13	-426	-423	-433	-396	
Glover	382	2	Ordinary balance, with auxiliary for heat.	-129	-114	-114	-105	-74	-83	-83	-103	-73	-102	-144	
J. Poole & Co.	5818	2	Pool's auxiliary.	-280	-268	-271	-244	-238	-237	-222	-139	-120	-85	-70	
*Edward & Sons...	3688	2	Improved ordinary balance.	-87	...	-66	-62	-79	-74	...	...	...	...	...	
*Lister & Sons	825	2	Pool's auxiliary.	...	...	-03	00	-03	01	...	...	...	...	...	
*Weichert	2505	2	Kullberg's flat rim balance.	-191	...	+137	+149	+144	+139	...	...	...	...	...	
Chronometrical Thermometer.	...	...	...	+1419.5	+1404.2	+1325.5	+1283.2	+1253.6	+1209.4	+1161.6	+1100.9	+957.0	+844.1	+705.5	
Mean Weekly Temperature.	...	...	...	46.8	47.7	47.9	49.2	49.4	48.4	49.5	49.9	51.2	52.7	56.6	
Extremes of Temperature as shown by the Self-registering Thermometers.	...	...	...	42-54	42-54	42-54	44-56	45-55	44-58	45-58	46-52	49-54	49-52	51-58	

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 flames are exterior to the chamber, into which none of the injurious products of combustion enter.

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

AT THE ROYAL OBSERVATORY, GREENWICH, 1856.

IN THE ORDER OF TEMPERATURE, AS DETERMINED GENERALLY BY THE CHRONOMETRICAL THERMOMETER.																			
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
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Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
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Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
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Mar. 27 to April 1	May 1 to 8	May 8-15	June 15-26	June 26-30	July 1-10	July 10-17	July 17-24	July 24-30	July 30-10	July 10-12	March 12-20	March 20-27	March 27-13	March 13-22	March 22-29	March 29-10	March 10-13	March 13-10	March 10-29
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NAME or MAKER.	No.	ADDRESS or MAKER.	Construction of Escapement and Balance, from the Description furnished by the Maker.	(III).—ABSTRACT OF THE			
				First Day of Rating.	Last Day of Rating.	Number of Weeks.	Least Weekly Sum.
Uhrig.....	453	2, 8, Quadrant Road, Essex Road, N.	Ordinary balance, with continually acting auxiliary.	January 9	July 24	28	- 4.7
Uhrig.....	451	2, 8, Quadrant Road, Essex Road, N.	Ordinary balance, with continually acting auxiliary.	January 9	July 24	28	- 4.5
Uhrig.....	463	2, 8, Quadrant Road, Essex Road, N.	Auxiliary compensation.	January 9	July 24	28	- 3.0
Skinner.....	970	130, Parades, Leamington.	Auxiliary compensation.	January 9	July 24	28	+ 2.0
Hume.....	2012	No. 6 Site, near the Quay, Newcastle-on-Tyne.	Auxiliary compensation for heat.	January 9	July 24	28	+ 4.7
Key.....	889	2, 15, Craven Street, Strand, W.C.	Ordinary balance, with auxiliary compensation.	January 9	July 24	28	+ 9.6
Kulberg.....	4075	2, 105, Liverpool Road, N.	Reversed detent, with short spring.	January 9	July 24	28	-10.2
Klean & Co.....	4171	70, Middleton Street, Clerkenwell, E.C.	Poole's auxiliary.	January 9	July 24	28	+ 1.2
Kulberg.....	4146	2, 105, Liverpool Road, N.	Reversed detent, with short spring.	January 9	July 24	28	- 0.1
Whyte & Co.....	3361	2, 144, Broomfield, Glasgow.	Auxiliary compensation for extremes of temperature.	January 9	July 24	28	- 0.1
Reid & Sons.....	1783	2, 41, Grey Street, Newcastle-on-Tyne.	Auxiliary compensation. Palladium spring.	January 9	July 24	28	+ 1.7
Penlington.....	1796	2, 2 and 3, St. George's Crescent, Liverpool.	Ordinary balance.	January 9	July 24	28	- 9.4
Pyott.....	878	74, West India Dock Road, E.	Ordinary balance, with auxiliary compensation.	January 9	July 24	28	+16.8
Isaac.....	76	10, Spencer Street, Clerkenwell, E.C.	Auxiliary compensation.	January 9	July 24	28	-10.9
J. Poole & Co.....	5796	2, 33, Spencer Street, Clerkenwell, E.C.	Poole's auxiliary.	January 9	July 24	28	-14.0
Lister & Sons.....	824	(on-Tyne.) 2, 12, 14, and 15, Moyley Street, Newcastle.	Airy's compensation. Poole's auxiliary.	January 9	July 24	28	-21.6
David Reid.....	850	2, 33, Grey Street, Newcastle-on-Tyne.	Auxiliary compensation.	January 9	July 24	28	+10.2
Hume.....	2013	No. 6 Site, near the Quay, Newcastle-on-Tyne.	Auxiliary compensation for heat.	January 9	July 24	28	- 7.2
Reid & Sons.....	5785	(on-Tyne.) 2, 41, Grey Street, Newcastle-on-Tyne.	Auxiliary compensation.	January 9	July 24	28	- 9.4
Keys.....	888	2, 15, Craven Street, Strand, W.C.	Ordinary balance, with auxiliary compensation.	January 9	July 24	28	+ 9.6
Moore.....	5754	2, 162, High Street, Belfast.	Airy's compensation. Poole's auxiliary.	January 9	July 24	28	-20.8
Whyte & Co.....	3360	2, 144, Broomfield, Glasgow.	Auxiliary compensation for heat.	January 9	July 24	28	- 9.3
Penlington.....	4515	2, 2 and 3, St. George's Crescent, Liverpool.	Ordinary balance.	January 9	July 24	28	- 10.0
David Reid.....	1788	2, 33, Grey Street, Newcastle-on-Tyne.	Auxiliary compensation.	January 9	July 24	28	-24.7
Cole.....	3779	2, 1, Thornhill Road, Barnsley, N.	Auxiliary compensation for extremes of temperature.	January 9	July 24	28	- 5.2
Pyott.....	887	2, 74, West India Dock Road, E.	Ordinary balance, with auxiliary compensation.	January 9	July 24	28	+ 2.9
Isaac.....	1670	10, Spencer Street, Clerkenwell, E.C.	Balance without auxiliary.	January 9	July 24	28	- 9.1
Johnson & Son.....	3780	2, 3, Victoria Street, Derby.	Compensation for extremes of temperature.	January 9	July 24	28	+ 10.0
Shepherd & Son.....	1840	2, 14, Talbot Court, E.C.	Auxiliary to balance, and Airy's compensation bar.	January 9	July 24	28	-31.7
Williams.....	4465	2, 2, Rite Docks, Cardiff.	Ordinary balance, with auxiliary compensation.	January 9	July 24	28	-16.0
Heap.....	7591	2, 124, New North Road, London.	Auxiliary for cold. Airy's compensation.	January 9	July 24	28	-22.9
Glover.....	380	2, 8, Wrotham Road, Camden New Town.	Ordinary balance, with auxiliary for heat.	January 9	July 24	28	-56.7
Johnson & Son.....	386	2, 3, Wrotham Road, Camden New Town.	Ordinary balance, with auxiliary for heat.	January 9	July 24	28	-56.5
J. Poole & Co.....	5818	2, 33, Spencer Street, Clerkenwell, E.C.	Poole's auxiliary.	January 9	July 24	28	-28.0

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 flames are exterior to the chamber, into which none of the various products of combustion can enter. In the column "Before and after what Day" the positions of the symbol (†), before or after the date, indicate respectively exposure to heat in the week immediately preceding, or in the week immediately following.

PRINCIPAL CHANGES OF RATE.										NAME OF MAKER.	No.		
In what Week.	Greatest Weekly Sum.	In what Week.	Difference between the Greatest and Least.	Greatest Difference between one Week and the next.	Before and after what Day.								
{ June 26 to July 3 July 3 to 10 May 22 to 29† February 6 to 13 January 9 to 16 July 3 to 10	- 0.7 + 1.9 + 4.9 + 13.3 + 14.0	February 6 to 13 June 12 to 19 March 6 to 13† July 17 to 24 April 24 to May 1	4.0 6.4 7.9 11.3 9.3	2.8 4.2 4.2 3.2 4.6	February 27† May 15† March 6 March 13 May 15†	Uhrig..... Uhrig..... Mann..... Skinner..... Hume.....	453 451 4673 970 2012						
June 12 to 19 February 13 to 20 June 19 to 26 April 3 to 10 May 1 to 8	+ 17.8 - 0.8 + 11.1 + 9.8 + 11.4	April 10 to 17 June 5 to 12† May 15 to 22† March 13 to 20† July 3 to 10	8.2 9.4 9.9 13.5 11.5	5.7 5.6 9.1 8.3 9.4	February 27† February 27† † June 12 † March 27 June 26	Keys..... Kulberg..... Klean & Co..... Kulberg..... Whyte & Co.....	889 4075 4171 4146 3361						
January 9 to 16 February 20 to 27 March 6 to 13† March 27 to April 3 { July 3 to 10 July 17 to 24	+ 17.9 + 4.0 + 30.2 + 4.3 - 0.7	June 5 to 12† July 17 to 24 June 5 to 12† July 10 to 17 April 17 to 24	16.3 13.4 13.4 15.2 13.3	7.4 8.9 9.1 8.6 9.6	February 27† February 27† June 12 February 27† † March 27	Reid & Sons..... Penlington..... Pyott..... Isaac..... J. Poole & Co.....	1783 1796 878 76 5796						
February 20 to 27 March 6 to 13† March 27 to April 3 January 9 to 16	- 3.6 + 28.7 + 10.5 + 33.7	July 10 to 17 July 3 to 10 February 13 to 20 July 3 to 10	16.0 18.5 17.7 17.4	8.8 8.0 8.9 9.7	February 27† February 27† March 6 June 26	Lister & Sons..... David Reid..... Hume..... Reid & Sons.....	824 850 2013 5785						
January 9 to 16 February 6 to 13 July 17 to 24 February 27 to March 6† July 3 to 10 March 6 to 13†	+ 33.7 - 2.1 + 10.3	July 17 to 24 February 20 to 27 April 17 to 24 May 22 to 29† February 20 to 27	24.1 13.3 22.6 27.7 15.5	6.4 9.7 13.3 8.9 13.2	March 13 June 26 June 12 February 27† February 27†	Keys..... Keys..... Keys..... Keys..... Keys.....	888 888 888 888 888						
February 6 to 13 July 17 to 24 February 27 to March 6† July 3 to 10 March 6 to 13†	- 1.1 + 14.0 + 33.3 - 2.1 + 10.3	July 17 to 24 February 20 to 27 April 17 to 24 May 22 to 29† February 20 to 27	19.8 14.2 13.3 22.6 15.5	8.8 11.3 13.3 8.9 13.2	May 15† February 27† February 27† † June 12 February 27†	Moore..... Whyte & Co..... Penlington..... David Reid..... Cole.....	5754 3360 4515 1788 3779						
January 30 to February 6 February 27 to March 6† March 6 to 13† March 13 to 20† May 22 to 29†	+ 26.2 + 9.7 + 13.4 - 0.6 + 11.7	June 5 to 12† July 17 to 24 February 20 to 27 July 10 to 17 February 6 to 13	23.3 18.8 16.6 21.1 27.7	9.3 15.1 15.5 12.8 25.0	† March 27 February 27† February 27† May 15† February 27†	Pyott..... Isaac..... Johnson & Son..... Shepherd & Son..... Williams.....	887 1670 3780 1840 4465						
January 9 to 16 May 22 to 29† March 27 to April 3 February 6 to 13	+ 20.5 + 2.0 + 20.2 + 22.6	June 5 to 12† January 30 to Feb. 6 May 29 to June 5† June 5 to 12†	43.4 58.7 46.7 50.6	26.9 32.3 40.2 42.5	February 27† February 27† † March 27 February 27†	Heap..... Glover..... † Glover..... J. Poole & Co.....	7591 380 386 5818						

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.