PROCEEDINGS OF

THE ROYAL SOCIETY.

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Price Two Shillings.

May 13, 1897.

Report of the Kew Observatory Committee for the Year ending December 31, 1896.

The operations of The Kew Observatory, in the Old Deer Park, Richmond, Surrey, are controlled by the Kew Observatory Committee, which is constituted as follows :—

Mr. F. Galton, *Chairman.*

Captain W. de W. Abney, C.B., R.E.	Prof. A. W. Rücker.
Prof. W. G. Adams.	Mr. R. H. Scott.
Captain E. W. Creak, R.N.	Mr. W. N. Shaw.
Prof. G. C. Foster.	Lieutenant-General R. Strachey, C.S.I.
Prof. J. Perry.	Rear Admiral W. J. L. Wharton, C.B.
The Earl of Rosse, K.P.	

On February 16 the Committee sustained a severe loss by the death of General J. T. Walker, C.B., who had been a member and constant attendant of the Committee during ten years, and whose valuable assistance was of special importance to them in furthering pendulum experiments made for geodetic purposes.

The vacancy on the Committee thus occasioned was filled by the appointment of Dr. John Perry, Professor of Mechanics and Mathematics in the Royal College of Science, South Kensington.

The work at the Observatory may be considered under the following heads:—

1st. Magnetic observations.
2nd. Meteorological observations.
3rd. Solar observations.
4th. Experimental, in connexion with any of the departments.
5th. Verification of instruments.
6th. Rating of Watches and Marine Chronometers.
7th. Miscellaneous.

I. Magnetic Observations.

The Magnetographs have been in constant operation throughout the year, and the usual determinations of the Scale Values were made in January.

The ordinates of the various photographic curves representing Declination, Horizontal Force, and Vertical Force were then found to be as follows:—

Declinometer: 1 inch = 0° 22′·04. 1 cm. = 0° 8′·7.

Bifilar, January 15, 1896, for 1 inch δH = 0·0280 foot grain units.
„ 1 cm. „ = 0·00051 C.G.S. units.
Balance, January 16, 1896, for 1 inch δV = 0·0276 foot grain units.
„ 1 cm. „ = 0·00050 C.G.S. units.

The magnetic curves during the past year have been quite free from any very large fluctuations. Some of the principal variations that were recorded took place on the following days:—

January 3—9, 19—20, 30—31; February 1—4, 13—14, 28—29; March 4, 26—28; April 21—25; May 2—3; June 16; September 18; October 9—12; November 7—8; and December 3—4.

The earthquake of December 17 was shown slightly on the Declination curve, but more distinctly on the Horizontal Force curve, though the disturbance on the latter curve only equalled that due to a change of 0·00004 in the Horizontal Force in the C.G.S. units.

The hourly means and diurnal inequality of the magnetic elements for 1896, for the quiet days selected by the Astronomer Royal, will be found in Appendix I.

The mean values at the noons preceding and succeeding the selected quiet days are also given, but these of course are not employed in calculating the daily means or inequalities.

The following are the mean results for the entire year:—

Mean Westerly Declination	17° 10′·8.
Mean Horizontal Force.....	0·18309 C.G.S. units.
Mean Inclination	67° 22′·3.
Mean Vertical Force	0·43924 C.G.S. units.

Observations of Absolute Declination, Horizontal Intensity, and Inclination have been made weekly, as a rule.

A "Richard" Thermograph has been in constant action in the Magnetograph Room all through the year in order that its readings may be compared with the observed readings of the Thermometer placed under the Vertical Force shade.

As in 1895, a Table of recent values of the Magnetic Elements at the Observatories whose publications are received at Kew was contributed to 'Science Progress,' appearing in the August number. A similar table, but containing more recent data, will be found in Appendix IA to the present Report.

With the consent of the Committee, an analysis of the non-cyclic effects in the Declination, Horizontal Force, and Vertical Force results for the selected "quiet days" of the six years 1890 to 1895 was drawn up and discussed by the Superintendent, and appears as the Report of 'the B. A. Committee for the Comparison and Reduction of Magnetic Observations,' Liverpool, 1896.

At the request of Professors von Bezold and Eschenhagen, the Observatory participated in a combined scheme of eye observations of the Declination and Horizontal Force at intervals of five seconds during an hour on each of the four days February 27, 28, and March 12, 13. On the two last occasions use was made of a very delicate declinometer with quartz fibre suspension, specially devised by Professor C. V. Boys, F.R.S., enthusiastic assistance being given by Messrs. Cooper and Sansom, students at the Royal College of Science, South Kensington.

Owing to the erratic behaviour of the limelight employed to illuminate the declinometer mirror, the results were unfortunately less successful than might have been desired.

The Magnetic Instruments have been studied, and a knowledge of their manipulation obtained, by Commanders Smyth and Heming and Lieutenants Monro and Somerville, of the Royal Navy.

Information as to magnetic data or experimental details has been supplied to Professor Rücker, Dr. E. Atkinson, Lieutenant-Colonel Gore (Trigonometrical Survey of India), Captain Lyons, R.E., and Captain Schück, and the two latter gentlemen compared their instruments with the Observatory standards.

Copies of magnetic curves were supplied to Dr. J. A. Fleming, F.R.S., for use in his lecture before the British Association on "The Earth as a Great Magnet."

II. Meteorological Observations.

The several self-recording instruments for the continuous registration of Atmospheric Pressure, Temperature of Air and Wet-bulb, Wind (direction and velocity), Bright Sunshine, and Rain, have been maintained in regular operation throughout the year, and the standard eye observations for the control of the automatic records duly registered.

The tabulations of the meteorological traces have been regularly made, and these, as well as copies of the eye observations, with

notes of weather, cloud, and sunshine, have been transmitted, as usual, to the Meteorological Office.

With the sanction of the Meteorological Council, data have been supplied to the Council of the Royal Meteorological Society, the Institute of Mining Engineers, and the editor of 'Symons' Monthly Meteorological Magazine.'

During the year there occurred the death of Mr. E. Dagwell, an assistant principally occupied in the Meteorological Department; his connection with the Observatory had lasted since 1881.

Electrograph.—As a result of experimental investigations made in the present and preceding year, several important changes have been made in the water-dropping apparatus. A new water reservoir and overflow tube have been obtained, and the jet has been brought much nearer the electrometer. The auxiliary battery having considerably deteriorated, it was sent to the makers on November 20, and the instrument in consequence remained out of action until the end of the year.

Determinations of the scale value were made on March 30, June 27, July 27, and October 24, by direct comparison with the Portable Electrometer, White No. 53.

Inspections.—In compliance with the request of the Meteorological Council, the following Observatories and Anemograph Stations have been visited and inspected:—Yarmouth, North Shields, Alnwick Castle, Fort William, Glasgow, Aberdeen, and Deerness (Orkney) by Mr. Baker; and Radcliffe Observatory (Oxford), Holyhead, Fleetwood, Stonyhurst, Armagh, Dublin, Valencia, and Falmouth by Mr. Constable.

III. Solar Observations.

Sun-spots.—Sketches of Sun-spots have been made on 161 days, and the groups numbered, after Schwabe's method.

Particulars will be found in Appendix II, Table IV.

IV. Experimental Work.

Fog and Mist.—The observations of a series of distant objects, referred to in previous Reports, have been continued. A note is taken of the most distant of the selected objects which is visible at each observation hour.

Atmospheric Electricity.—The eye observations referred to in last year's Report have been discussed ('Roy. Soc. Proc.,' vol. 60, 1896, p. 96). Some further experiments have been carried out on

similar lines, and in particular comparisons have been made of the potential at the spot where the jet of the water-dropper breaks up with that at a station outside the immediate influence of the Observatory buildings.

Aneroid Barometers.—A large number of experiments have been made in continuation of those mentioned last year, and the readings have been reduced. Further experiments are contemplated. In the meantime the results are being worked up by the Superintendent.

Nocturnal Radiation.—The observations with minimum thermometers referred to last year have been continued.

Platinum Thermometers.—Observations have been made from time to time of the readings of six platinum thermometers in ice and steam, and of certain of the number in sulphur vapour and in molten silver, special attention being paid to changes of zero.

A series of comparisons of mercury and platinum thermometers at temperatures above 100° C. has been made, the thermometers being immersed in a well-stirred fusible metal bath, kindly lent by Mr. C. T. Heycock, F.R.S., and Mr. Neville. The comparisons were initiated by these gentlemen, who visited the Observatory during several days in January.

Early in the year a platinum resistance thermometer was buried underground along with two iron resistance thermometers of a type invented by Professor H. Callendar, F.R.S., and Mr. E. H. Griffiths, F.R.S. During the year readings of earth temperatures have been taken usually twice a day, and a report on the behaviour of the instruments has been submitted to the Meteorological Council, on whose behalf the experiments were undertaken.

Small inconsistencies in the behaviour of the resistance box used with the platinum thermometers having been brought to light, the Committee have arranged with Dr. Harker, late of Owens College, Manchester, to investigate the matter, so that the defect may be remedied.

Photographic Test for Lenses.—Difficulties having been repeatedly met with in applying the present tests for curvature, astigmatism, and definition, experiments have been made which may lead to replacing or supplementing these tests by direct observations and measurements on a photographic plate.

V. Verification of Instruments.

The subjoined is a list of the instruments examined in the year 1896, with the corresponding results for 1895:—

	Number tested in the year ending December 31.	
	1895.	1896.
Air-meters	5	5
Anemometers	7	12
Aneroids	254	113
Artificial horizons	15	21
Barometers, Marine	151	84
„ Standard	64	72
„ Station	25	40
Binoculars	376	455
Compasses	244	3
Deflectors	20	—
Hydrometers	187	374
Inclinometers	4	8
Photographic Lenses	14	14
Magnets	2	4
Navy Telescopes	456	546
Rain Gauges	9	17
Rain Measuring Glasses	90	26
Scales	4	1
Sextants	532	591
Sunshine Recorders	0	2
Theodolites	7	5
Thermometers, Avitreous or Immisch's	39	7
„ Clinical	16,699	13,772
„ Deep sea	125	74
„ High Range	34	52
„ Hypsometric	25	34
„ Low Range	114	62
„ Meteorological	2,647	4,098
„ Solar radiation	3	2
„ Standard	81	69
Unifilars	4	3
Vertical Force Instruments	34	0
Total	22,271	20,566

Duplicate copies of corrections have been supplied in 98 cases.

The number of instruments rejected in 1895 and 1896 on account of excessive error or for other reasons was as follows :—

	1895.	1896.
Thermometers, clinical	195	161
,, ordinary meteorological	48	56
Sextants	83	79
Telescopes	10	30
Various	38	43

Five Standard Thermometers have been supplied during the year.

There were at the end of the year in the Observatory undergoing verification 10 Barometers, 962 Thermometers, 22 Sextants, 30 Hydrometers, 2 Air Meters, and 1 Sunshine Recorder.

VI. Rating of Watches and Chronometers.

The high standard of excellence to which attention was drawn in last year's Report has been fully maintained, and there has been a marked increase in the number of watches which have obtained the highest possible form of certificate—the class A especially good—(involving the attainment of 80 per cent. of the total marks), no less than 96 being so classed.

The 583 watches received were entered for trial as below :—

For class A, 400 ; class B, 115 ; class C, 50 ; and 18 for the subsidiary trial. Of these 14 passed the subsidiary test, 118 failed from various causes to gain any certificate ; 25 were awarded class C certificates, 111 class B, and 315 class A ; of the latter, 96 obtained the highest form of certificate, class A, *especially good.*

In Appendix III will be found a table giving the results of trial of the 96 watches which gained the highest number of marks during the year. The first place was taken by Messrs. Stauffer, Son, & Co., London, with a keyless, going-barrel, chronometer-watch, No. 147,545, with the "Tourbillon" escapement, which obtained 89·4 marks out of a maximum of 100. The performance of the first 4 watches on the list, embracing 1 "Tourbillon" movement, 2 Bar-levers, and 1 "Karrusel," is very fine, and the marks obtained are unusually close.

Owing to considerations of space, it is intended to publish in future annual Reports particulars as to the first 50 watches only which come up to the standard of 80 marks and over. If a larger number should reach that standard, they will be mentioned in a full list which will be sent for publication to the horological journals.

It is intended shortly to suspend the class C test for watches.

Marine Chronometers.—During the year, 61 chronometers have been entered for the Kew A and B trials, of which 51 were certificated, and 10 failed to pass.

The new gas boiler for the watch oven has been very successful, and the difficulty of regularly maintaining the temperature at about 90° F. has been greatly reduced, and a considerably higher temperature could be easily obtained.

The improvements to the refrigerator mentioned in last year's Report have also proved of considerable advantage.

The mean time standard clock "French" has had new seconds contact pieces, &c., fitted to it by Dent & Co., and has been fixed in a new position in the South Hall, where the daily range of temperature is but small.

VII. Miscellaneous.

Paper.—Prepared photographic paper has been supplied to the Observatories at Hong Kong, Lisbon, Mauritius, St. Petersburg, Toronto, Oxford (Radcliffe), and Stonyhurst, and through the Meteorological Office to Aberdeen, Batavia, Fort William, and Valencia.

Anemograph and Sunshine Sheets have also been sent to Hong Kong and Mauritius, and *papier Saxe* to Coimbra.

Exhibition at Glasgow.—A selection of photographic curves from the various self-recording instruments, along with photographs of clouds and of sun spots, was shown during the summer at an exhibition promoted by the Corporation of Glasgow. The exhibits have all been safely returned.

House, Grounds, and Paths.—These have been kept as usual throughout the year.

Dines' Pressure Tube Anemometer.—A self-recording tube anemometer belonging to the Meteorological Office was erected on the roof early in December. Its vane is approximately at the same level as the cups of the standard "Robinson" Anemometer.

Ships' Compasses.—The test applied to ships' compasses has been revised and extended, with the kind assistance of Captain E. W. Creak, R.N., F.R.S., so as to bring it more into line with that approved by the Admiralty; and it is intended shortly to put the new regulations into operation. With a view to doing so, an apparatus has been obtained from Mr. A. W. Dover, similar to that employed at Deptford, for determining the accuracy of the compass bowl and card and the strength of the magnets.

Travellers' Azimuth Compasses.—Special experiments, approved by Mr. Francis Galton, Chairman of the Committee, have been applied to a variety of old and new compasses, submitted on behalf of the

Kew Observatory. Account of Receipts and Payments for the year ending December 31st, 1896.

RECEIPTS.

	£	s.	d.	£	s.	d.
To Balance from Year 1895				341	7	9
Royal Society:—						
Gassiot Trust. Annual payment				444	11	4
Meteorological Council:—	£	s.	d.			
Allowance	400	0	0			
Postages, &c.	18	3	1			
				418	3	1
Tests:—						
Verifications	1378	10	8			
Rating	615	9	4			
Lenses	2	3	10			
				1996	3	10
Commissions executed for Colonial and Foreign Institutions, &c.				205	1	1
Rents				11	10	6
Dividends on India Stock				30	9	0
London and County Bank for Unused Cheques				0	4	10
				£3507	11	5

PAYMENTS.

	£	s.	d.	£	s.	d.
By Normal Observatory:—						
Salaries—Observations, Tabulations, &c.	301	17	8			
Incidental Expenses, Instruments, &c.	77	1	4			
Proportion of Administration Expenditure	237	0	0			
				615	19	0
Researches:—						
Purchase of Apparatus, &c.	153	6	1			
Proportion of Administration Expenditure	355	10	0			
				508	16	1
Tests:—						
Salaries	812	3	6			
Incidental Expenses—Instruments, Postages, &c.	189	14	11			
Proportion of Administration Expenditure	475	19	6			
				1477	17	11
Commissions:—						
Purchase of Instruments and Photographic Paper for Colonial and Foreign Institutions, &c.	185	6	3			
Proportion of Administration Expenditure	118	10	0			
				303	16	3
Purchase of £400 India 3½ per cent. Stock				471	1	0
Balance in London and County Bank	119	18	8			
Balance in hand (Petty Cash)	10	2	6			
				130	1	2
				£3507	11	5

Audited on behalf of the Royal Society and found correct.
12th of January, 1897.
(Signed) W. B. KEEN, *Chartered Accountant.*

Examined on the part of the Committee and found correct.
14th of January, 1897.
(Signed) ROBERT H. SCOTT.

ADMINISTRATION EXPENDITURE.

Particulars.	£	s.	d.
Superintendent	500	0	0
First Assistant, Librarian, &c.	379	10	1
Rent, Fuel, &c.	88	13	3
Caretaker, Repairs, &c.	218	16	2
	£1186	19	6

Apportionment.	£	s.	d.
Observatory	237	0	0
Researches	355	10	0
Tests	475	19	6
Commissions	118	10	0
	£1186	19	6

ESTIMATED ASSETS.

	£	s.	d.	£	s.	d.
By Balance as per Statement				130	1	2
£1300 India 3½ per cent. Stock, value on January 1, 1897				1542	2	6
Payments due:—						
Meteorological Council—Allowance, Postages, &c.	109	4	2			
Test Fees	600	13	4			
Commissions	34	4	0			
				744	1	6
Stock:—						
Blank Forms and Certificates	45	9	5			
Standard Thermometers	79	0	0			
				124	9	5
				£2540	14	7

January 22nd, 1897.

ESTIMATED LIABILITIES.

	£	s.	d.
To Administration accounts—Gas, Rent, Repairs, &c.	33	13	5
Observatory accounts—Photographic Paper, &c.	8	2	0
Tests accounts—Repairs, Apparatus, &c.	38	0	3
Commissions	26	19	0
General Balance	2433	19	11
	£2540	14	7

(Signed) CHARLES CHREE,
Superintendent.

Royal Geographical Society, to whom a report will shortly be submitted.

Library.—During the year the Committee lost the valuable services of Mr. R. S. Whipple, son of the late Superintendent, who had acted as Librarian and Accountant. The vacancy thus occasioned on the staff has been filled by the appointment of Mr. G. E. Bailey, previously employed in library and bursarial work at King's College, Cambridge.

The number of publications received during the year was much as usual. Volumes 14 to 36 of the 5th Series of the 'Philosophical Magazine' have been purchased to fill a gap.

Audit, &c.—The accounts for 1896 have been audited by Mr. W. B. Keen, Chartered Accountant, on behalf of the Royal Society, and by Mr. R. H. Scott on behalf of the Committee.

The present system of book-keeping having now been in operation for two years, the comparison of the expenditure of the present and previous years, suspended in 1895, has been resumed; it will be found on the opposite page.

The Committee found themselves in a position to purchase in November £400 India 3½ per cent. Inscribed Stock.

Personal Establishment.

The staff employed is as follows:—

C. Chree, Sc.D., Superintendent.
T. W. Baker, Chief Assistant.
E. G. Constable, Observations and Rating.
W. Hugo, Verification Department.
J. Foster ,, ,,
T. Gunter ,, ,,
W. J. Boxall ,, ,,
G. E. Bailey, Accounts and Library.
E. Boxall, Observations and Rating, and six other Assistants.
A Caretaker and Housekeeper are also employed.

(Signed) FRANCIS GALTON,
Chairman.

Comparison of Expenditure during the Years 1895 and 1896.

Expenditure.	1895.			1896.			Increase.			Decrease.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
Administration :—												
Superintendent	400	0	0	500	0	0	100	0	0			
First Assistant	275	6	0	273	18	0				1	8	0
Office	106	10	0	105	12	1				0	17	11
Rent, Fuel, Lighting, &c.	88	18	11	88	13	3				0	5	8
Caretaker	68	18	0	68	18	0						
Incidental Expenses	140	12	5	149	18	2	9	5	9			
	1080	5	4	1186	19	6	109	5	9	2	11	7
Normal Observatory :—												
Salaries—Observations, &c.	351	19	6	301	17	8				50	1	10
Incidental Expenses	56	9	3	77	1	4	20	12	1			
Prop. Adm. Expenditure	108	0	0	237	0	0	129	0	0			
Researches :—												
Purchase of Apparatus	75	19	1	153	6	1	77	7	0			
Platinum Thermometer Room	123	14	6							123	14	6
Prop. Adm. Expenditure	216	0	0	355	10	0	139	10	0			
Tests :—												
Salaries	797	4	6	812	3	6	14	19	0			
Incidental Expenses	167	15	3	189	14	11	21	19	8			
Prop. Adm. Expenditure	648	5	4	475	19	6				172	5	10
Commissions :—												
Purchases for Colonial Institutions, &c.	269	11	3	185	6	3				84	5	0
Prop. Adm. Expenditure	108	0	0	118	10	0	10	10	0			
Construction of Fence and Roadway	74	0	0							74	0	0
Purchase of Stock	1039	4	6	471	1	0				568	3	6
Gross Expenditure (showing a decrease of £658 12*s.* 11*d.*).	4036	3	2	3377	10	3	413	17	9	1072	10	8
Extraordinary Expenditure.												
Researches :—												
Purchase of Apparatus, &c.	70	2	2	150	4	2	80	2	0			
Platinum Thermometer Room	123	14	6							123	14	6
Commissions :—												
Purchases for Colonial Institutions, &c.	269	11	3	185	6	3				84	5	0
Construction of Fence and Roadway	74	0	0							74	0	0
Purchase of Stock	1039	4	6	471	1	0				568	3	6
	1576	12	5	806	11	5	80	2	0	850	3	0
Leaving for Ordinary Nett Expenditure (showing an increase of £111 8*s.* 1*d.*).	2459	10	9	2570	18	10	333	15	9	222	7	8

List of Instruments, Apparatus, &c., the Property of the Kew Observatory Committee, at the present date out of the custody of the Superintendent, on Loan.

To whom lent.	Articles.	Date of loan.
G. J. Symons, F.R.S.	Portable Transit Instrument	1869
The Science and Art Department, South Kensington.	Articles specified in the list in the Annual Report for 1893.....	1876
Professor W. Grylls Adams, F.R.S.	Unifilar Magnetometer, by Jones, No. 101, complete.....	1883
	Pair 9-inch Dip-Needles with Bar Magnets ...	1887
Lord Rayleigh, F.R.S.	Standard Barometer (Adie, No. 655)	1885
The "Jackson-Harmsworth" Polar Expedition.	Unifilar Magnetometer, by Jones, marked N.A.B.C., complete. Dip-Circle, by Barrow, with two Needles and Bar Magnets. Two Tripod Stands	1894

APPENDIX I.

MAGNETICAL OBSERVATIONS, 1896.

Made at the Kew Observatory, Old Deer Park, Richmond, Lat. 51° 28′ 6″ N. and Long. $0^h\ 1^m\ 15^s{\cdot}1$ W.

The results given in the following tables are deduced from the magnetograph curves which have been standardised by observations of deflection and vibration. These were made with the Collimator Magnet K.C. I. and the Declinometer Magnet marked K.O. 90 in the 9-inch Unifilar Magnetometer by Jones.

The Inclination was observed with the Inclinometer by Barrow, No. 33, and needles 1 and 2, which are $3\frac{1}{2}$ inches in length.

The Declination and Force values given in Tables I to VIII are prepared in accordance with the suggestions made in the fifth report of the Committee of the British Association on comparing and reducing Magnetic Observations.

The following is a list of the days during the year 1896 which were selected by the Astronomer Royal, as suitable for the determination of the magnetic diurnal inequalities, and which have been employed in the preparation of the magnetic tables :—

January	1, 2, 21, 24, 29.
February	7, 18, 20, 23, 24.
March	11, 16, 17, 18, 21.
April.....	7, 14, 16, 20, 30.
May	5, 6, 9, 26, 29.
June.....	2, 7, 20, 23, 24.
July	2, 9, 17, 19, 31.
August.....	5, 13, 16, 27, 28.
September	8, 9, 10, 25, 28.
October.....	6, 7, 18, 25, 26.
November	3, 12, 22, 24, 25.
December.....	8, 12, 18, 19, 24.

Table I.—Hourly Means of Declination, as determined from the

Hours	Preceding noon.	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	(17° +) West						Winter.						
1896. Months.	′	′	′	′	′	′	′	′	′	′	′	′	′
Jan. ..	14·7	11·8	12·4	12·8	12·9	13·0	13·1	12·9	12·8	12·3	11·9	12·7	14·7
Feb. ..	17·0	12·1	12·6	12·8	12·6	12·5	12·4	12·4	12·2	11·9	12·3	13·2	14·9
March.	18·4	12·2	12·2	12·4	12·1	12·1	11·9	11·8	11·3	9·9	9·6	11 ·8	14·8
Oct. ..	14·3	9·0	8·8	9·1	9·0	9·0	8·7	8·4	7·9	7·2	7·6	9·6	12·2
Nov. ..	12·6	8·5	8·7	8·9	9·1	9·2	9·2	8·7	8·5	8·2	7·9	9·1	10·8
Dec. ..	10·7	7·4	7·8	8·1	8·3	8·5	8·5	8·3	8·2	8·2	8·3	8·3	9·3
Mean	14·6	10·2	10·4	10·7	10·7	10·7	10·6	10·4	10·2	9·6	9·6	10·8	12·8
	Summer.												
	′	′	′	′	′	′	′	′	′	′	′	′	′
April ..	15·4	9·6	10·0	10·2	10·3	9·9	9·8	8·6	7·1	6·3	6·2	8·2	11·4
May ..	14·5	9·9	9·8	9·6	9·2	8·4	7·3	6·2	5·4	5·6	6·5	9·0	11·4
June ..	14·9	8·8	8·8	8·3	8·2	7·7	6·4	5·3	5·2	5·7	7·1	9·1	11·6
July ..	14·2	9·6	9·6	9·4	8·8	8·4	7·4	6·3	5·8	6·3	7·6	9·5	11·8
Aug. ..	15·3	8·5	8·8	8·6	8·2	7·9	7·3	6·7	6·3	6·5	7·8	10·2	12·9
Sept. ..	16·0	8·7	8·8	8·7	8·5	8·2	7·7	6·9	6·0	5·3	6·4	9·8	13·2
Mean	15·1	9·2	9·3	9·1	8·9	8·4	7·6	6·7	6·0	6·0	6·9	9·3	12·0

Table II.—Diurnal Inequality of the Kew

Hours	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	Summer Mean.											
	′	′	′	′	′	′	′	′	′	′	′	′
	−1·1	−0·9	−1·1	−1·4	−1·8	−2·6	−3·6	−4·3	−4·3	−3·3	−0·9	+1·8
	Winter Mean.											
	′	′	′	′	′	′	′	′	′	′	′	′
	−1·2	−1·0	−0·7	−0·7	−0·7	−0·8	−1·0	−1·2	−1·8	−1·8	−0·6	+1·4
	Annual Mean.											
	′	′	′	′	′	′	′	′	′	′	′	′
	−1·1	−1·0	−0·9	−1·0	−1·3	−1·7	−2·3	−2·7	−3·0	−2·6	−0·8	+1·6

NOTE.—When the sign is + the magnet

selected quiet Days in 1896. (The Mean for the Year = 17° 10′·8 West.

Noon.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.	Succeeding noon.
Winter.													
′	′	′	′	′	′	′	′	′	′	′	′	′	′
16·0	16·9	16·4	15·2	14·4	13·7	13·3	13·0	12·8	12·4	12·1	11·3	11·0	16·0
16·1	17·0	17·1	16·7	15·2	14·6	13·7	13·3	13·1	12·4	12·4	11·7	11·5	16·7
17·7	19·1	18·8	17·4	15·5	14·0	13·6	13·2	12·8	12·4	12·3	12·3	12·2	18·1
14·2	14·7	13·8	12·4	11·2	10·6	10·4	10·0	9·7	9·5	9·3	9·2	8·9	14·5
12·0	12·2	11·5	10·6	10·1	9·6	9·3	9·1	8·9	8·8	8·3	8·2	8·4	12·2
9·9	10·5	10·0	9·7	9·0	8·8	8·3	8·3	8·1	8·0	7·7	8·0	7·9	11·2
14·3	15·1	14·6	13·7	12·6	11·9	11·4	11·1	10·9	10·6	10·3	10·1	10·0	14·8
Summer.													
′	′	′	′	′	′	′	′	′	′	′	′	′	′
15·1	17·1	17·0	15·8	14·4	12·8	11·7	11·4	11·0	11·0	10·7	10·5	10·2	16·2
13·8	15·2	15·6	14·8	13·1	12·1	11·0	10·8	10·5	10·2	10·1	9·7	9·6	14·4
14·3	15·4	15·3	14·2	12·9	12·1	11·6	11·4	11·1	10·5	10·4	10·3	9·6	14·1
14·2	15·9	15·9	14·8	12·9	11·6	11·2	10·8	10·6	10·4	10·6	10·1	9·7	14·6
15·1	16·1	15·4	13·7	11·8	10·7	9·8	9·6	9·3	9·3	9·0	8·7	8·7	14·5
15·8	16·5	15·5	13·5	11·1	10·0	9·4	9·2	8·7	8·6	8·3	8·4	8·3	16·3
14·7	16·0	15·8	14·5	12·7	11·5	10·8	10·5	10·2	10·0	9·9	9·6	9·4	15·0

Declination as derived from Table I.

Noon	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.
Summer Mean.												
′	′	′	′	′	′	′	′	′	′	′	′	′
+4·5	+5·8	+5·5	+4·2	+2·5	+1·3	+0·5	+0·3	0·0	−0·2	−0·4	−0·6	−0·9
Winter Mean.												
′	′	′	′	′	′	′	′	′	′	′	′	′
+2·9	+3·7	+3·2	+2·3	+1·2	+0·5	+0·1	−0·2	−0·5	−0·8	−1·0	−1·3	−1·4
Annual Mean.												
′	′	′	′	′	′	′	′	′	′	′	′	′
+3·7	+4·7	+4·4	+3·3	+1·8	+0·9	+0·3	0·0	−0·3	−0·5	−0·7	−1·0	−1·1

points to the west of its mean position.

Table III.—Hourly Means of the Horizontal Force in C.G.S. units (corrected
(The Mean for the

Hours	Preceding noon.	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
0·18000 +						Winter.							
1896. Months.													
Jan. ...	284	297	300	299	300	304	304	306	307	308	300	294	292
Feb. ...	280	299	297	296	296	299	302	304	302	301	294	288	282
March ..	279	299	300	301	301	300	301	301	299	292	282	278	275
Oct. ...	304	326	325	324	323	325	325	324	321	315	307	301	300
Nov. ...	308	320	319	319	319	320	322	324	322	319	314	309	307
Dec. ...	310	318	318	319	319	320	322	323	324	324	322	318	317
Mean..	294	310	310	310	310	311	313	314	312	310	303	298	295
						Summer.							
April...	281	306	306	306	309	310	308	311	308	301	290	283	280
May ...	278	304	303	303	302	302	302	300	296	290	287	285	284
June ...	292	310	307	306	305	306	306	301	294	290	287	287	295
July ...	300	323	322	322	322	322	321	317	313	307	303	300	303
Aug. ...	299	317	316	315	313	311	311	309	305	294	287	283	287
Sept. ...	295	312	313	313	312	311	310	307	299	288	278	275	281
Mean..	291	312	311	311	311	310	310	308	303	295	289	286	288

Table IV.—Diurnal Inequality of the Kew

Hours	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
					Summer Mean.							
	+ ·00003	+ ·00002	+ ·00002	+ ·00002	+ ·00001	+ ·00001	− ·00001	− ·00006	− ·00014	− ·00020	− ·00023	− ·00021
					Winter Mean.							
	+ ·00001	+ ·00001	+ ·00001	+ ·00001	+ ·00002	+ ·00004	+ ·00005	+ ·00003	+ ·00001	− ·00006	− ·00011	− ·00014
					Annual Mean.							
	+ ·00002	+ ·00002	+ ·00001	+ ·00001	+ ·00002	+ ·00002	+ ·00002	− ·00002	− ·00007	− ·00013	− ·00017	− ·00017

NOTE.—When the sign is + the

for Temperature) as determined from the selected quiet Days in 1896. Year = 0·18309.)

Noon.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.	Succeeding noon.
						Winter.							
292	295	298	301	302	303	305	307	305	304	304	300	299	281
284	289	294	294	294	293	294	299	302	304	304	305	304	287
281	290	298	301	302	302	305	306	306	306	308	305	305	283
305	309	315	317	317	320	324	329	329	329	327	326	326	311
311	317	319	321	322	325	325	324	323	323	323	321	320	317
318	320	319	319	320	322	322	322	323	322	321	322	320	315
298	303	307	309	309	311	312	314	315	315	314	313	312	299
						Summer.							
284	294	304	311	314	318	318	318	319	318	317	317	316	284
286	289	296	303	309	313	317	318	315	314	315	313	311	288
297	301	310	313	315	317	319	321	320	319	317	315	314	294
309	312	318	325	327	330	332	332	333	331	329	329	326	309
298	309	314	318	318	318	321	321	322	321	319	319	318	299
294	306	312	314	314	315	316	320	321	320	319	318	317	290
295	302	309	314	316	319	321	322	322	321	319	319	317	294

Horizontal Force as deduced from Table III.

Noon	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.
					Summer Mean.							
−·00014	−·00007	·00000	+·00005	+·00007	+·00010	+·00012	+·00013	+·00013	+·00012	+·00010	+·00010	+·00008
					Winter Mean.							
−·00011	−·00006	−·00002	·00000	·00000	+·00002	+·00003	+·00005	+·00006	+·00006	+·00005	+·00004	+·00003
					Annual Mean.							
−·00012	−·00007	−·00001	+·00002	+·00004	+·00006	+·00008	+·00009	+·00009	+·00009	+·00008	+·00007	+·00006

reading is above the mean.

Table V.—Hourly Means of the Kew Vertical Force in C.G.S. units (corrected
(The Mean for the

Hours	Preceding noon.	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	0·43000 +					Winter.							
1896. Months.													
Jan. ...	888	889	889	889	889	889	889	889	889	888	888	888	888
Feb. ...	875	884	883	882	883	884	884	884	884	885	885	883	882
March ..	902	914	914	913	912	912	911	911	911	911	907	901	897
Oct. ...	924	932	931	932	933	933	933	933	933	933	929	924	922
Nov. ...	944	943	943	943	944	944	943	943	942	943	942	938	937
Dec. ...	900	907	908	907	908	909	909	909	909	908	908	907	908
Mean	905	911	911	911	911	912	911	911	911	911	909	907	906
						Summer.							
April ...	916	932	932	932	932	931	933	934	934	932	927	919	912
May ...	926	941	941	941	941	942	942	942	941	936	930	922	914
June ...	945	962	962	962	963	965	967	964	962	960	955	948	943
July ...	955	973	973	973	974	976	978	977	976	974	969	966	963
Aug. ...	908	925	924	925	926	929	930	932	931	929	924	917	912
Sept. ...	897	907	907	907	907	907	908	910	910	909	904	896	893
Mean	924	940	940	940	941	942	943	943	942	940	935	928	923

Table VI.—Diurnal Inequality of the Kew

Hours	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
					Summer Mean.							
	+ ·00003	+ ·00003	+ ·00003	+ ·00004	+ ·00005	+ ·00006	+ ·00006	+ ·00005	+ ·00003	− ·00002	− ·00009	− ·00014
					Winter Mean.							
	·00000	·00000	·00000	·00000	+ ·00001	·00000	·00000	·00000	·00000	− ·00002	− ·00004	− ·00006
					Annual Mean.							
	+ ·00001	+ ·00002	+ ·00001	+ ·00002	+ ·00003	+ ·00003	+ ·00003	+ ·00003	+ ·00002	− ·00002	− ·00007	− ·00010

NOTE.—When the sign is + the

for Temperature), as determined from the selected quiet Days in 1896. Year = 0·43924.)

Noon.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.	Succeeding noon.
Winter.													
890	891	894	894	894	893	892	891	891	891	891	890	891	888
881	883	884	887	891	891	890	889	888	888	888	887	886	883
897	900	904	909	911	911	910	909	908	907	906	906	906	889
924	927	931	937	938	937	936	935	934	934	934	934	934	926
937	940	942	945	945	944	943	943	942	942	941	941	941	945
908	909	911	912	915	914	914	913	912	912	911	911	911	907
906	908	911	914	916	915	914	913	912	912	912	911	911	906
Summer.													
909	913	920	924	927	929	930	930	929	927	926	925	925	908
913	916	920	925	928	929	930	929	929	928	928	928	927	904
943	946	952	957	962	963	963	963	963	962	961	959	959	936
962	962	968	973	976	978	978	977	976	974	973	972	973	954
914	921	928	931	932	933	933	932	931	931	930	930	930	912
893	897	902	907	911	912	911	911	910	911	909	910	909	893
922	926	932	936	939	941	941	940	940	939	938	937	937	918

Vertical Force as deduced from Table V.

Noon	1.	2.	3.	4.	5.	6.	7.	8.	9.	10	11.	Mid.
Summer Mean.												
−·00015	−·00011	−·00005	−·00001	+·00002	+·00004	+·00004	+·00003	+·00003	+·00002	+·00001	·00000	·00000
Winter Mean.												
−·00005	−·00003	·00000	+·00003	+·00004	+·00004	+·00003	+·00002	+·00001	+·00001	+·00001	·00000	·00000
Annual Mean.												
−·00010	−·00007	−·00003	+·00001	+·00003	+·00004	+·00003	+·00003	+·00002	+·00002	+·00001	·00000	·00000

reading is above the mean.

Table VII.—Hourly Means of the Inclination, calculated from the Horizontal

Hours	Preceding noon.	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	67° +						Winter.						
1896. Months.	′	′	′	′	′	′	′	′	′	′	′	′	′
Jan.....	23·0	22·1	21·9	22·0	21·9	21·7	21·7	21·5	21·5	21·4	21·9	22·3	22·4
Feb.....	22·9	21·9	22·0	22·0	22·0	21·9	21·7	21·5	21·7	21·8	22·2	22·6	23·0
March..	23·7	22·7	22·6	22·5	22·5	22·6	22·5	22·5	22·6	23·1	23·6	23·7	23·8
Oct.....	22·7	21·4	21·4	21·5	21·6	21·5	21·5	21·6	21·8	22·2	22·6	22·9	22·9
Nov. ...	22·9	22·1	22·2	22·2	22·2	22·1	22·0	21·8	21·9	22·2	22·5	22·7	22·8
Dec.....	21·6	21·2	21·3	21·2	21·2	21·2	21·0	21·0	20·9	20·9	21·0	21·2	21·3
Mean..	22·8	21·9	21·9	21·9	21·9	21·8	21·7	21·6	21·7	21·9	22·3	22·6	22·7
							Summer.						
	′	′	′	′	′	′	′	′	′	′	′	′	′
April...	24·0	22·7	22·7	22·7	22 5	22·4	22·6	22·5	22·7	23·1	23·7	23·9	23·9
May....	24·4	23·1	23·2	23·2	23 2	23·3	23·3	23·4	23·7	23·9	24·0	23·9	23·7
June ...	24·0	23·3	23·5	23·6	23·7	23·7	23·7	24·0	24·4	24·6	24·6	24·5	23·8
July....	23·8	22·8	22·8	22·8	22·8	22·9	23·0	23·3	23·5	23·8	24·0	24·1	23·8
Aug. ...	22·5	21·8	21·9	22·0	22·1	22·3	22·3	22·5	22·8	23·4	23·8	23·9	23·4
Sept....	22·5	21·6	21·6	21·6	21·6	21·7	21·8	22·1	22·6	23·3	23·8	23·8	23·3
Mean..	23·5	22·6	22·6	22·7	22·7	22·7	22·8	23·0	23·3	23·7	24·0	24·0	23·7

Table VIII.—Diurnal Inequality of the

Hours	Mid.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	
						Summer Mean.						
	′	′	′	′	′	′	′	′	′	′	′	′
	−0·1	−0·1	0·0	0·0	0·0	+0·1	+0·3	+0·6	+1·0	+1·3	+1·3	+1·0
						Winter Mean.						
	′	′	′	′	′	′	′	′	′	′	′	′
	−0·1	−0·1	−0·1	−0·1	−0·1	−0·2	−0·3	−0·2	0·0	+0·4	+0·6	+0·8
						Annual Mean.						
	′	′	′	′	′	′	′	′	′	′	′	′
	−0·1	−0·1	0·0	0·0	0·0	−0·1	0·0	+0·2	+0·5	+0·8	+1·0	+0·9

NOTE.—When the sign is +

and Vertical Forces (Tables III and V). (The Mean for the Year = 67° 22′·3.)

Noon.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.	Succeeding noon.
						Winter.							
′	′	′	′	′	′	′	′	′	′	′	′	′	′
22·5	22·3	22·2	22·0	22·0	21·9	21·7	21·5	21·7	21·7	21·7	22·0	22·1	23·2
22·8	22·5	22·2	22·3	22·4	22·5	22·4	22·0	21·8	21·6	21·6	21·6	21·6	22·6
23·4	22·9	22·5	22·4	22·4	22·4	22·2	22·1	22·1	22·0	21·9	22·1	22·1	23·1
22·6	22·4	22·1	22·1	22·2	21·9	21·6	21·3	21·2	21·2	21·4	21·4	21·4	22·2
22·5	22·2	22·1	22·1	22·0	21·8	21·8	21·8	21·9	21·9	21·8	22·0	22·0	22·4
21·3	21·2	21·3	21·3	21·3	21·2	21·2	21·1	21·1	21·1	21·2	21·1	21·2	21·4
22·5	22·2	22·1	22·0	22·0	21·9	21·8	21·6	21·6	21·6	21·6	21·7	21·7	22·5
						Summer.							
′	′	′	′	′	′	′	′	′	′	′	′	′	′
23·6	23·0	22·5	22·2	22·1	21·9	21·9	21·9	21·8	21·8	21·9	21·8	21·9	23·6
23·5	23·4	23·1	22·8	22·4	22·2	21·9	21·9	22·1	22·1	22·0	22·2	22·3	23·2
23·7	23·5	23·0	23·0	23·0	22·9	22·7	22·6	22·7	22·7	22·8	22·9	23·0	23·6
23·4	23·2	22·9	22·6	22·6	22·3	22·2	22·2	22·1	22·1	22·3	22·3	22·6	23·2
22·8	22·2	22·1	21·9	21·9	22·0	21·8	21·7	21·6	21·7	21·8	21·8	21·9	22·6
22·5	21·8	21·5	21·5	21·6	21·6	21·5	21·2	21·1	21·2	21·2	21·3	21·4	22·7
23·3	22·9	22·5	22·3	22·3	22·2	22·0	21·9	21·9	21·9	22·0	22·1	22·2	23·2

Inclination as deduced from Table VII.

Noon	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mid.
					Summer Mean.							
′	′	′	′	′	′	′	′	′	′	′	′	′
+0·6	+0·2	−0·2	−0·4	−0·4	−0·5	−0·7	−0·8	−0·8	−0·8	−0·7	−0·6	−0·5
					Winter Mean.							
′	′	′	′	′	′	′	′	′	′	′	′	′
+0·6	+0·3	+0·1	+0·1	+0·1	0·0	−0·1	−0·3	−0·3	−0·4	−0·4	−0·3	−0·2
					Annual Mean.							
′	′	′	′	′	′	′	′	′	′	′	′	′
+0·6	+0·2	0·0	−0·1	−0·2	−0·3	−0·4	−0·5	−0·6	−0·6	−0·5	−0·4	−0·4

the reading is above the mean.

APPENDIX Ia.

MEAN VALUES, for the years specified, of the Magnetic Elements at Observatories whose Publications are received at Kew Observatory.

Place.	Latitude.	Longitude.	Year.	Declination.	Inclination.	Horizontal Force. C. G. S. Units.	Vertical Force. C. G. S. Units.
Pawlowsk	59° 41′ N.	30° 29′ E.	1894	0° 10·5 E.	70° 43·6 N.	·16456	·47061
Katharinenburg	56 49 N.	60 38 E.	1894	9 39·4 E.	70 40·0 N.	·17799	·50729
Kasan	55 47 N.	49 8 E.	1892	7 30·8 E.	68 36·2 N.	·18551	·47345
Copenhagen ...	55 41 N.	12 34 E.	1894	10 41·3 W.	—	·17373	—
Stonyhurst	53 51 N.	2 28 W.	1895	18 37·8 W.	68 59·2 N.	·17148	·44637
Hamburg.....	53 34 N.	10 3 E.	1895	11 42·7 W.	67 44·3 N.	·18009	·43994
Wilhelmshaven	53 32 N.	8 9 E.	1895	12 52·5 W.	67 54·5 N.	·17983	·44305
Potsdam	52 23 N.	13 4 E.	1895	10 19·9 W.	66 39·8 N.	·18720	·43392
Irkutsk.....	52 16 N.	104 16 E.	1894	2 8·0 E.	70 10·5 N.	·20116	·55796
Utrecht*.....	52 5 N.	5 11 E.	1894	14 21·1 W.	67 10·1 N.	·18416	·43737
Kew.....	51 28 N.	0 19 W.	1896	17 10·8 W.	67 22·3 N.	·18309	·43924
Greenwich†....	51 28 N.	0 0	1895	16 57·4 W.	67 15·9 N. 67 14·9 N.	·18323	·43727 ·43692
Uccle (Brussels)	50 48 N.	4 20 E.	1893	14 48·7 W.	66 28·4 N.	·1877	·4311
Falmouth	50 9 N.	5 5 W.	1895	18 54·5 W.	67 0·4 N.	·18547	·43708
Prague	50 5 N.	14 25 E.	1895	9 31·5 W.	—	·19834	—
Parc St. Maur (Paris)	48 49 N.	2 29 E.	1894	15 15·2 W.	65 5·2 N.	·19631	·42264
Vienna.....	48 15 N.	16 21 E.	1894	8 43·6 W.	63 12·1 N.	·20740	·41061
O'Gyalla (near Buda Pesth)..	—	—	1894	7 58·2 W.	—	·21054	—
Pola (on Adriatic).....	44 52 N.	13 51 E.	1895	9 47·0 W.	60 34·0 N.	·22026	·39038
Nice.....	43 43 N.	7 16 E.	1893	12 32·7 W.	60 26·4 N.	·22198	·39139
Toronto.....	43 40 N.	79 30 W.	1895	4 45·3 W.	74 34·3 N.	·16645	·60313
Perpignan	42 42 N.	2 53 E.	1894	14 5·7 W.	60 10·4 N.	·22326	·38943
Rome...	41 54 N.	12 27 E.	1891	10 45·1 W.	58 4·6 N.	·2324	·3730
Tiflis	41 43 N.	44 48 E.	1894	1 43·1 E.	55 46·9 N.	·25680	·37761
Madrid	40 25 N.	3 40 W.	1895	16 6·6 W.	—	—	—
Coimbra.....	40 12 N.	8 25 W.	1895	17 42·0 W.	59 43·6 N.	·22581	·38685
Washington‡ ..	38 55 N.	77 4 W.	1894	3 39·9 W.	70 34·3 N.	·19979	·56646
Lisbon§.....	38 43 N.	9 9 W.	1895	17 39·1 W.	58 15·7 N.	·23344	·37731
Zi-ka-wei	31 12 N.	121 26 E.	1894	2 16·5 W.	46 0·7 N.	·32613	·33785
Hong Kong....	22 18 N.	114 10 E.	1895	0 27·8 E.	31 46·6 N.	·36480	·22589
Colaba.....	18 54 N.	72 49 E.	1895	0 36·9 E.	20 48·5 N.	·37444	·14230
Manila.....	14 35 N.	127 11 E.	1895	0 51·6 E.	16 49·0 N.	·37808	·11426
Batavia	6 11 S.	106 49 E.	1894	1 27·6 E.	29 13·7 S.	·36749	·20563
Mauritius	20 6 S.	57 33 E.	1894	9 59·4 W.	54 41·6 S.	·23958	·33829
Melbourne.....	37 50 S.	144 58 E.	1894	8 13·6 E.	67 16·9 S.	·23426	·55956

* The Inclination and Vertical Force are from eye observations at 2 P.M.

† Of the two values of the Inclination and Vertical Force, the first is based on observations with 3-inch dip needles only, the second on combined observations with needles of 3, 6, and 9 inches.

‡ At new observatory, situated some little distance from old station.

§ New dip needles.

APPENDIX II.—Table I.

Mean Monthly Results of Temperature and Pressure. Kew Observatory. 1896.

Months.	Thermometer.								Barometer.*					Mean vapour-tension.
	Mean.	Means of—			Absolute Extremes.				Mean.	Absolute Extremes.				
		Max.	Min.	Max. and Min.	Max.	Date.	Min.	Date.		Max.	Date.	Min.	Date.	
1896.	°	°	°	°	°	d. h.	°	d. h.	ins.	ins.	d. h.	ins.	d. h.	in.
Jan.....	40·9	44·6	36·6	40·6	52·3	15 2 & 3 P.M.	27·2	20 8 A.M.	30·362	30·936†	30 10 A.M.	29·339	14 8 A.M.	·216
Feb.	40·4	45·4	35·1	40·3	55·5	12 3 ,,	22·8	26 2 ,,	30·342	30·743	3 10 ,,	29·683	20 3 ,,	·209
March..	46·2	52·4	40·2	46·3	67·4	24 3 ,,	32·6	15 7 ,,	29·825	30·353	10 10 ,,	28·844	4 11 ,,	·248
April...	48·8	56·4	41·1	48·8	65·0	27 3 ,,	33·1	24 5 ,,	30·168	30·529	21 8 ,,	29·700	29 3 P.M.	·251
May ...	53·9	63·2	44·8	54·0	75·5	12 6 ,,	35·1	2 2 ,,	30·235	30·502	25 7 ,,	29·887	20 10 A.M. & NOON.	·272
June...	62·9	72·3	53·1	62·7	82·5	15 3 ,,	38·0	1 4 ,,	29·947	30·282	19 10 P.M.	29·481	9 6 A.M.	·391
July ...	64·3	74·4	54·2	64·3	84·3	14 3 ,,	45·3	29 4 ,,	30·022	30·308	11 11 ,,	29·709	26 2 P.M.	·389
Aug....	59·2	67·2	51·8	59·5	73·7	12 5 ,,	45·6	27 1 ,,	30·032	30·303	11 8 A.M.	29·625	26 1 A.M.	·368
Sept....	56·8	62·7	51·6	57·2	68·2	8 1 ,, / 9 2 ,,	40·0	21 6 ,,	29·773	30·516	30 MIDT.	28·739	25 10 ,,	·386
Oct.....	46·2	52·2	40·2	46·2	61·7	3 4 ,, / 8 1 ,,	27·1	28 7 & 8 ,,	29·741	30·516	1 0·5 A.M.	29·191	19 2 P.M.	·261
Nov.	40·4	45·1	35·2	40·2	49·8	12 2 ,,	25·6	7 4 ,,	30·139	30·649	24 10 ,,	29·217	14 10 ,,	·205
Dec.	40·1	43·7	35·4	39·6	51·8	27 2 A.M.	26·2	24 8 ,,	29·789	30·453	27 5 P.M.	28·485	5 1 A.M.	·216
Yearly Means	50·0	56·6	43·3	50·0	..	....	..	....	30·031	..	....	..	....	·284

* Reduced to 32° at M.S.L. † On January 9th the value was 30·931 inches.

This Table is compiled from "Hourly Means," vol. 1896, of the Meteorological Office.

Meteorological Observations.—Table II.

Kew Observatory.

Months.	Mean amount of cloud (0=clear, 10=overcast).	Rainfall.*			Weather. Number of days on which were registered							Wind.† Number of days on which it was								
		Total.	Maximum.	Date.	Rain. ‡	Snow.	Hail.	Thunderstorms.	Clear sky.	Overcast sky.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
1896.		ins.	ins.																	
January.....	8·0	0·600	0·155	25	9	1	..	..	2	20	1	7	1	4	2	4	5	5	3	10
February....	6·9	0·280	0·115	20	7	..	..	..	6	14	..	2	2	10	1	3	4	6	1	6
March	7·4	2·870	0·625	17	21	..	2	..	2	16	2	4	1	1	2	2	9	8	4	3
April	6·8	0·585	0·160	10	10	..	1	..	3	11	..	5	4	2	..	..	4	6	9	7
May.....	4·8	0·175	0·155	21	3	..	..	1	10	6	..	10	11	4		..	2	2	2	3
June	6·4	1·640	0·435	10	15	..	..	2	3	9	..	5	1	4	3	5	7	3	2	3
July.....	5·9	1·280	0·430	26	8	..	..	2	6	10	..	5	2	1	2	6	7	5	3	7
August	7·0	1·875	0·400	31	15	..	..	1	1	13	..	9	5	1	..	1	7	4	4	6
September...	7·3	5·065	0·870	12	21	..	..	..	3	16	..	2	2	1	2	5	13	3	2	3
October	6·6	2·380	0·540	6	18	..	1	1	7	15	1	7	3	..	..	3	11	4	3	5
November...	6·4	1·085	0·470	7	8	..	..	..	8	15	2	8	7	3	1	1	4	4	2	7
December ...	8·4	3·145	0·550	2	20	1	..	..	2	21	..	4	1	2	2	8	7	5	2	4
Totals and means.	6·8	20·980			155	2	4	7	53	166	6	68	40	33	15	38	80	55	37	64

* Measured at 10 A.M. daily by gauge 1·75 feet above ground.

† As registered by the anemograph.

‡ The number of rainy days are those on which 0·01 inch rain or melted snow was recorded.

Meteorological Observations.—Table III.

Kew Observatory.

Months.	Bright Sunshine.				Maximum temperature in sun's rays. (Black bulb *in vacuo*.)			Minimum temperature on the ground.			Horizontal movement of the air.*		
	Total number of hours recorded.	Mean percentage of possible sunshine.	Greatest daily record.	Date.	Mean.	Highest.	Date. †	Mean.	Lowest.	Date. ‡	Average hourly velocity.	Greatest hourly velocity.	Date.
1896.	h. m.		h. m.		deg.	deg.		deg.	deg.		miles.	miles.	
January	29 12	11	5 42	29	63	92	17	32	16	20	8·7	35	15
February	59 48	21	7 48	12	74	99	12	28	9	26	8·6	28	8
March	87 6	23	9 6	31	97	116	24	32	18	30	12·8	40	3
April	144 18	34	11 18	28	109	124	26	32	20	2	8·5	28	11, 12
May	233 24	48	13 48	10	118	130	19	37	20	2	10·1	30	9
June	228 0	46	14 18	1	130	139	28	46	26	1	8·5	26	9
July	225 48	45	14 18	5, 6	131	146	7	46	35	23, 28	8·4	25	25
August	141 24	31	11 18	20	120	134	23	44	34	27	7·2	21	9
September	94 24	25	10 0	19	108	126	5	46	30	21	10·0	31	23, 25, 27
October	96 36	30	8 36	5	94	116	2	34	20	28	10·3	35	6
November	67 48	26	6 36	19	69	91	3	29	17	30	10·2	36	28
December	28 42	11	5 42	25	61	85	3	28	18	19	11·5	34	14
Totals and Means	1436 30	29	..	..	98	..	..	36	..	..	9·6	..	..

* As indicated by a Robinson's anemograph, 70 feet above the general surface of the ground.
† Read at 10 A.M., and entered to previous day. ‡ Read at 10 A.M., and entered to same day.

Table IV.

Summary of Sun-spot Observations made at the Kew Observatory.

Months.	Days of observation.	Number of new groups enumerated.	Days apparently without spots.
1896.			
January	11	8	—
February.....	15	14	—
March.....	16	7	1
April.....	17	8	3
May.....	15	8	—
June	17	9	—
July.....	15	8	—
August	9	5	1
September.....	12	7	—
October.....	14	6	1
November.....	13	9	1
December	7	10	—
Totals for 1896	161	99	7

APPENDIX III.—Table I.

Results of Watch Trials. Performance of the 96 Watches which obtained the highest number of marks during the year.

Watch deposited by	Number of watch.	Balance spring, escapement, &c.	Mean daily rate.					Mean variation of daily rate. ±	Mean change of rate for 1° F.	Difference between extreme gaining and losing rates.	Marks awarded for			Total Marks.
			Pendant up.	Pendant right.	Pendant left.	Dial up.	Dial down.				Daily variation of rate.	Change of rate with change of position.	Temperature compensation.	
											0—40	0—40	0—20	0—100.
			secs.	secs.	secs.	secs.	secs.	secs.	secs.	secs.				
Stauffer, Son, & Co., London.....	147545	Single overcoil, g.b., "tourbillon" chronometer	−1·9	−1·8	−2·4	−1·9	−2·6	0·25	0·06	4·0	34·5	38·8	16·1	89·4
U. Montandon-Robert, Geneva ...	1058	Single overcoil, d.r., g.b.	+2·4	+1·8	+2·0	+1·9	+3·2	0·4	0·03	3·5	32·9	38·2	18·2	89·3
A. E. Fridlander, Coventry	25510	Single overcoil, s.r., g.b., "Karrusel".....	−4·5	−4·3	−4·7	−4·1	−4·3	0·4	0·02	2·0	31·4	39·2	18·5	89·1
U. Montandon-Robert, Geneva...	1053	Single overcoil, d.r., g.b.	−1·1	−1·0	−1·7	−1·2	−1·8	0·4	0·04	4·0	32·7	38·8	17·6	89·0
A. E. Fridlander, Coventry	25513	Single overcoil, s.r., g.b., "Karrusel".....	+4·0	+3·4	+4·7	+5·1	+6·3	0·4	0·04	4·2	33·0	36·9	17·4	87·3
U. Montandon-Robert, Geneva...	1059	Single overcoil, d.r., g.b.	−0·5	−2·5	−0·7	−0·9	−0·5	0·3	0·06	3·5	33·8	37·5	15·9	87 2
Baume & Co., London..... ...	103037	Single overcoil, g.b., "tourbillon" chronometer.....	+1·0	+0·6	+0·5	+1·8	+3·3	0·25	0·07	5·5	35·4	36·4	15·3	87·1
U. Montandon-Robert, Geneva...	1061	Single overcoil, d.r., g.b.	+2·7	+1·8	+0·9	+0·8	+3·0	0·4	0·03	5·5	31·9	36·7	17·9	86·5
J. Adams, Coventry.....	463560	Single overcoil, s.r., g b., "Karrusel".....	+2·2	+1·4	+1·1	+3·3	+2·8	0·4	0·03	4·0	31·5	37·1	17·9	86·5
T. Russell & Son, Liverpool..... .	89598	Single overcoil, s.r., g.b., "Karrusel"	−2·0	−1·6	−2·2	−1·1	−4·4	0·4	0·05	5·2	32·7	36·6	16·7	86·0
S. Yeomans, Coventry	73931	Single overcoil, s.r., g.b., "Karrusel".....	−1·7	−1·6	−1·6	−0·3	−0·3	0·5	0·03	3·7	30·4	37·4	18·2	86·0
Wright and Craighead, London	8104	Single overcoil, s.r., g b., "Karrusel".....	−3·2	−3·4	−2·5	−1·2	+0·1	0·4	0·02	5·0	31·8	35·2	18·6	85·6
P. Ditisheim, Chaux-de-Fonds ...	1190	Single overcoil, s.r., g.b., "Karrusel".....	+1·5	+1·0	+1·9	+0·6	+2·7	0·5	0·02	5·0	29·2	37·6	18·8	85·6
Baume & Co., London.....	103031	Single overcoil, g.b., "tourbillon" chronometer.....	+2·8	+3·5	+3·3	+2 6	+4·7	0·25	0·12	7·0	35·3	37·8	12·3	85·4
U. Montandon-Robert, Geneva...	1055	Single overcoil, d.r., g.b.	−2·9	−2·7	−2·5	−2·3	−0·3	0·4	0·06	4·5	32·0	37·1	16·3	85·4
A. E. Fridlander, Coventry	52909	Single overcoil, d.r., g.b.	−1·2	−3·7	−2·0	+0·7	−1·7	0·4	0·04	5·7	32·4	35·7	17·1	85·2
U. Montandon-Robert, Geneva .	1056	Single overcoil, d.r., g.b.	+2·1	+2·8	+3·7	+4·5	+4·1	0·5	0·02	4·7	29·9	36·6	18·7	85·2
S. Smith & Son, London.....	1896–1	Double overcoil, s.r., g.b., "Karrusel"....	+2·7	+1·6	+2·5	+3·3	+3·4	0·5	0·06	3·7	30·9	37·9	16·3	85·1
,, ,, ,, ...	1896–2	Single overcoil, s.r., g.b., "Karrusel".....	−0·2	−1·3	−1·2	+2·4	+3·1	0·3	0·02	5·7	33·3	33·0	18·3	84·6
Evan Roberts, London	19833	Single overcoil, s.r., g.b., "Karrusel".....	+0·6	+1·6	+1·2	+1·1	+3·6	0·5	0·04	5·3	30·1	36·8	17·5	84·4
Jos. White & Son, Coventry	35451	Single overcoil, s.r., g.b., "Karrusel".....	−0·3	−0·8	−0·7	−0·4	+0·7	0·5	0·06	4·5	29·8	38·4	16·2	84·4
A. & N.C.S., Limited, London ...	2444	Cylindrical, fusee, chronometer.....	+2·0	+4·7	+1·6	+4·2	+3·8	0·4	0·03	5·0	31·2	35·2	17·7	84·1
A. E. Fridlander, Coventry	25507	Single overcoil, s.r., g.b., "Karrusel".....	+4·4	+4·3	+5·0	+2·9	+4·9	0·5	0·06	6·7	30·5	37·7	15·9	84·1

Table I—*continued.*

Watch deposited by	Number of watch.	Balance spring, escapement, &c.	Mean daily rate. Pendant up.	Pendant right.	Pendant left.	Dial up.	Dial down.	Mean variation of daily rate. ±	Mean change of rate for 1° F.	Difference between extreme gaining and losing rates.	Marks awarded for: Daily variation of rate. 0—40	Change of rate with change of position. 0—40	Temperature compensation. 0—20	Total Marks. 0—100.
			secs.	secs.	secs.	secs.	secs.	secs.	secs.	secs.				
Newsome & Co., Coventry	129635	Single overcoil, s.r., g.b., "Karrusel"	+4·5	+3·0	+3·3	+3·1	+5·1	0·5	0·03	5·7	29·3	36·8	17·9	84·0
S. Smith & Son, London	1896-5	Double overcoil, s.r., g.b., "Karrusel"	+3·3	+2·7	+3·6	+3·0	+3·4	0·5	0·08	6·0	30·0	38·9	14 9	83·8
U. Montandon-Robert, Geneva	1046	Single overcoil, d.r., g.b.	+0·1	−0·2	+3·0	+1·1	+0·9	0·5	0 04	5·7	30·0	36·9	17·0	83·6
Evan Roberts, London	19198	Single overcoil, s.r., g.b., "Karrusel"	+5·5	+5·7	+5·6	+1·6	+5·6	0·5	0·02	7·0	30·1	35·0	18·4	83·5
C. J. Hill, Coventry	149623	Single overcoil, s.r., g.b., "Karrusel"	+2·4	+2·3	+2·6	+4·6	+5·4	0·4	0·05	5·2	31·5	35·2	16·7	83·4
J. Kellie, Liverpool	88 / 86960	Single overcoil, s.r., g.b., "Karrusel"	+0·6	+0·5	+0·4	+4·0	+6·0	0·4	0·01	6·7	32·9	31·4	19·0	83·3
C. J. H. Marlow, Coventry	19907	Single overcoil, s.r., g.b., "Karrusel"	+2·1	+1·8	+2·1	+4·2	+6·4	0·4	0·04	6·0	32·4	33·6	17·3	83·3
T. Russell & Son, Liverpool	89597	Single overcoil, s.r., g.b., "Karrusel"	+3·9	+5·4	+4·3	+3·9	+4·9	0·5	0·05	4·5	29·2	37·8	16·3	83·3
Carley & Co., London	49906	Single overcoil, s.r., g.b., "Karrusel"	+3·5	+3·5	+3·1	+5·2	+4·2	0·5	0·06	6·2	29·9	37·4	15·8	83·1
B. Bonniksen, Coventry	19973	Single overcoil, s.r., g.b., "Karrusel"	−0·4	−0·9	−0·5	−1·9	−1·3	0·6	0·05	6·7	28·1	38·1	16·8	83·0
W. Matthews, Coventry	34139	Single overcoil, s.r., g.b.	−0·5	−2 2	−4·0	−3·0	−1·2	0·6	0·03	6·5	28·9	35·8	18·2	82·9
Jos. White & Son, Coventry	35118	Single overcoil, s.r., g.b.	+1·9	−0·6	+1·2	−0·7	+1·9	0·5	0·04	6·0	30·0	35·5	17·2	82·7
Newsome & Co., Coventry	125069	Single overcoil, s.r., g.b., "Karrusel"	−3·6	−4·8	−4·4	−1·8	+1·2	0·4	0·03	8·2	31·8	32·4	18·3	82·5
" " "	129113	Single overcoil, s.r., g.b., "Karrusel"	+1·8	+2·8	+3·1	+2·6	+0·9	0·4	0 07	5·7	31·1	34·0	17·4	82·5
Jos. White & Son, Coventry	35161	Single overcoil, s.r., g.b.,	+2·3	+2·2	+0·4	+1·3	+2·7	0·6	0·04	5·5	28·3	37·0	17·2	82·5
J. Adams, Coventry	6314	Single overcoil, s.r., g.b., "Karrusel"	+1·8	+0·1	+0·5	−0·1	+2·4	0·6	0·02	7·7	27·8	36·2	18·5	82·5
A. E. Fridlander, Coventry	25508	Single overcoil, s.r., g.b., "Karrusel"	−0·5	−1·9	−1·3	+0·6	−1·2	0·6	0·05	4·0	29·0	37·0	16·4	82·4
" " "	25509	Single overcoil, s.r., g.b., "Karrusel"	+1·1	+1·2	+0·4	+3·8	+4·5	0·4	0·04	6·0	31·2	33·8	17 3	82·3
S. Yeomans, Coventry	73564	Single overcoil, s.r., g.b., "Karrusel"	+3·3	+3·1	+3·2	+2·6	+2·3	0·6	0·08	7·5	28·9	38·6	14·7	82·2
" " "	73561	Single overcoil, s.r., g.b., "Karrusel"	−0·6	+0·3	+0·1	−2·2	+0·3	0·7	0·02	6·0	26·8	36·9	18·5	82·2
A. & N.C.S., Limited, London	7163	Single overcoil, s.r., g.b., "Karrusel"	−1·9	−1·6	−1·8	−1·5	−2·4	0·7	0·03	4·7	25·0	38·9	18·3	82·2
Newsome & Co., Coventry	125138	Single overcoil, s.r., g.b., "Karrusel"	+4·3	+3·1	+3·9	+2·9	+6·2	0·6	0·03	9·0	27·7	36·3	18·1	82·1
Evan Roberts, London	19834	Single overcoil, s.r., g.b., "Karrusel"	−4·4	−5·4	−5·8	−2·8	−7·5	0·6	0·03	6·5	28·9	35·0	18·0	81·9
W. Matthews, Coventry	34855	Single overcoil, s.r., g.b., "Karrusel"	−4·2	−3·1	−4·2	−6·5	−2·7	0·6	0·03	7·2	27·6	36·0	18·3	81·9
A. E. Fridlander, Coventry	52900	Single overcoil, s.r., g.b., non-magnetic	−7·7	−7·9	−7·3	−6·2	−7·0	0·4	0·12	7·5	31·5	38·0	12·3	81·8
C. J. H. Marlow, Coventry	19595	Single overcoil, s.r., g.b., "Karrusel"	0·0	+0·7	+1·5	−0·4	+4·1	0·4	0·06	7·2	31·0	34·9	15·9	81·8
J. Hewitt, Coventry	53085	Single overcoil, s.r. g.b., "Karrusel"	+4·8	+4·3	+5·2	+3·4	+2·6	0·6	0·06	6·5	28·9	36·6	16·3	81·8
Coventry Co-operat. Watch Soc.	54413	Single overcoil, s.r., g.b., "Karrusel"	+4·2	+3·9	+5·0	+1·5	+4·4	0·6	0·05	8·5	28·6	36·4	16·8	81·8
Thomas Hill & Co., Coventry	2665 / 65319	Single overcoil, s.r., g.b., "Karrusel"	+4·2	+3·2	+4·3	+5·8	+6·1	0·4	0·09	4·7	31·9	36·0	13·8	81·7
Thos. Russell & Son, Liverpool	89574	Single overcoil, s.r., g.b., "Karrusel"	+3·1	+3·8	+3·5	−0·3	+4·4	0·5	0·04	9·0	29·5	34·9	17·3	81·7
Jos. White & Son, Coventry	35581	Single overcoil, s.r., g.b.	+1·6	+1·3	+1·0	+2·3	+2·2	0·6	0·06	5·3	27·5	38·1	16·1	81·7

Denny Bros., Coventry	25100	Single overcoil, s.r., g.b., "Karrusel"	+2·9	+3·6	+3·9	+3·0	+7·8	0·5	0·04	8·5	30·1	34·3	17·1	81·5
Newsome & Co., Coventry	127070	Single overcoil, s.r., g.b., "Karrusel"	−1·5	−1·0	−2·4	+1·2	−0·5	0·6	0·03	5·0	27·4	36·2	17·9	81·5
D. Buckney, London	11944	Double overcoil, d.r., g.b.	−0·2	+2·0	+4·5	+0·8	−1·1	0·5	0·03	7·5	29·9	33·4	18·1	81·4
A. E. Fridlander, Coventry	14156	Single overcoil, s.r., g.b.	+1·3	−3·4	+0·7	+1·6	−0·3	0·6	0·02	7·0	28·8	34·2	18·4	81·4
" " "	25501	Single overcoil, s.r., g.b., "Karrusel"	+0·1	−2·7	−1·3	+2·8	−0·4	0·4	0·08	7·0	32·5	34·4	14·4	81·3
Jos. White & Son, Coventry	35757	Single overcoil, s.r., g.b.	+0·5	+0·7	−0·7	+1·3	+2·6	0·5	0·07	7·0	29·3	36·5	15·4	81·2
J. Adams, Coventry	6316	Single overcoil, s.r., g.b., "Karrusel"	+2·3	+1·8	+2·9	+0·3	+3·3	0·7	0·02	9·7	26·2	36·6	18·4	81·2
A. & N.C.S., Limited, London	6340	Single overcoil, d.r., g.b., chronograph	−1·8	−0·9	−3·4	+0·5	−1·1	0·6	0·06	5·7	29·0	36·0	16·1	81·1
	88													
J. Kellie, Liverpool	86923	Single overcoil, s.r., g.b. "Karrusel"	−1·3	−0·9	−0·2	+0·3	+1·0	0·6	0·07	5·8	28·3	37·2	15·6	81·1
J. Adams, Coventry	463682	Single overcoil, s.r., g.b., "Karrusel"	+3·3	+2·6	+2·1	+3·2	+4·9	0·7	0·04	5·0	26·2	37·2	17·7	81·1
Rotherham & Sons, Coventry	21648	Single overcoil, s.r., g.b.	+4·5	−0·5	+0·6	+2·9	+1·7	0·5	0·04	7·5	30·0	34·0	17·0	81·0
A. E. Fridlander, Coventry	14415	Single overcoil, s.r., g.b.	−2·7	−4·2	−3·0	−0·9	−2·0	0·5	0·07	6·0	29·4	36·4	15·2	81·0
A. M. Jacobs and Co., London	11935	Single overcoil, s.r., g.b., "Karrusel"	−4·6	−5·2	−4·8	−1·4	−6·5	0·5	0·05	6·2	29·3	35·0	16·7	81·0
S. Yeomans, Coventry	73566	Single overcoil, s.r., g.b., "Karrusel"	+4·4	+3·4	+4·1	+3·6	+8·3	0·6	0·03	7·5	28·9	34·4	17·7	81·0
Wright & Craighead, London	8072	Single overcoil, s.r., g.b., "Karrusel"	−4·2	−5·1	−3·1	−2·4	−1·2	0·6	0·04	6·5	28·3	35·4	17·3	81·0
Usher & Cole, London	28369	Single overcoil, s.r., g.b.	−3·8	+1·5	−4·8	−3·6	−3·8	0·5	0·03	8·0	30·1	33·0	17·8	80·9
A. E. Fridlander, Coventry	14113	Single overcoil, s.r., g.b.	−2·3	−0·3	+1·0	−2·4	−5·0	0·5	0·03	8·2	29·7	33·1	18·1	80·9
H. Golay, London	1896	Single overcoil, s.r., g.b., "Karrusel," chronograph	+3·4	+3·6	+2·1	+0·9	+0·9	0·6	0·06	7·2	28·9	35·7	16·3	80·9
A. Taylor, London	7556	Single overcoil, d.r., g.b., annular "tourbillon"	+0·1	−0·8	+0·3	+1·9	+1·5	0·6	0·05	4·8	28·1	36·5	16·3	80·9
T. Russell & Son, Liverpool	89573	Single overcoil, s.r., g.b., "Karrusel"	+0·1	+1·0	+1·9	+3·1	+0·6	0·5	0·10	6·0	30·8	36·4	13·6	80·8
J. Adams, Coventry	464319	Single overcoil, s.r., g.b., "Karrusel"	−2·4	−2·6	−3·8	−3·4	−1·6	0·6	0·06	7·5	27·6	37·3	15·9	80·8
T. Russell & Son, Liverpool	90191	Single overcoil, s.r., g.b., "Karrusel"	+4·2	+3·2	+4·8	+4·6	+7·0	0·6	0·05	6·5	27·5	36·4	16·9	80·8
Jos. White & Son, Coventry	35439	Single overcoil, s.r., g.b., "Karrusel"	+2·8	+3·0	+3·6	+3·1	+5·4	0·7	0·03	5·5	25·5	37·0	18·3	80·8
A. E. Fridlander, Coventry	25503	Single overcoil, s.r., g.b., "Karrusel," non-magnetic	+1·9	0·0	+0·5	+1·6	+5·5	0·4	0·09	7·2	32·7	34·2	13·8	80·7
" " "	52764	Single overcoil, d.r., g.b.	+2·4	+5·0	+2·1	+2·7	+0·7	0·4	0·10	7·2	31·7	35·9	13·1	80·7
J. R. Harris, London	10294	Single overcoil, d.r., g.b.	+0·7	−0·2	−2·8	+1·3	+4·3	0·5	0·05	8·2	30·9	33·1	16·7	80·7
J. Player & Son, Coventry	18075	Single overcoil, d.r., fusee	+5·1	+7·3	+2·1	+7·0	+5·1	0·5	0·05	7·5	30·1	34·2	16·3	80·6
Jos. White & Son, Coventry	33581	Single overcoil, d.r., g.b.	+0·9	−2·0	+0·8	+1·6	+3·4	0·6	0·05	7·0	28·9	35·0	16·7	80·6
Newsome & Co., Coventry	127069	Single overcoil, s.r., g.b., "Karrusel"	+7·8	+6·6	+6·3	+6·0	+6·1	0·6	0·09	9·0	28·5	38·0	14·1	80·6
Jos. White & Son, Coventry	35792	Single overcoil, d.r., g.b.	+2·7	+1·3	+1·9	+3·2	+7·3	0·4	0·06	7·7	31·4	33·4	15·7	80·5
" " "	35508	Single overcoil, s.r., g.b.	−0·6	−0·7	−0·8	−0·2	+2·7	0·6	0·05	7·5	28·0	35·8	16·7	80·5
Usher & Cole, London	28398	Single overcoil, s.r., g.b., "Karrusel"	+3·0	+2·5	+2·7	+3·5	+3·7	0·7	0·07	7·2	26·8	38·4	15·3	80·5
A. E. Fridlander, Coventry	14110	Single overcoil, s.r., g.b.	−0·6	−2·7	−0·7	0·0	+4·2	0·5	0·05	8·5	30·6	33·3	16·5	80·4
S. Yeomans, Coventry	73563	Single overcoil, s.r., g.b., "Karrusel"	+0·8	−0·1	+0·8	+2·2	+3·4	0·5	0·07	6·0	29·5	35·6	15·3	80·4
C. J. H. Marlow, Coventry	19594	Single overcoil, s.r., g.b., "Karrusel"	−0·5	−0·7	−0·3	+0·4	+5·3	0·6	0·02	7·5	28·9	32·8	18·7	80·4
Jos. White & Son, Coventry	35242	Single overcoil, d.r., g.b.	+1·4	−1·9	−0·6	+0·6	−2·5	0·6	0·03	8·5	27·8	34·9	17·7	80·4
A. E. Fridlander, Coventry	13763	Single overcoil, s.r., g.b.	+0·7	+3·8	−5·3	−0·7	−1·2	0·5	0·02	10·2	30·5	31·1	18·7	80·3
Newsome and Co., Coventry	125328	Single overcoil, s.r., g.b., "Karrusel"	−0·4	+0·3	+0·7	+4·5	+1·3	0·4	0·09	6·0	31·4	35·0	13·8	80·2
J. Player & Son, Coventry	25861	Single overcoil, d r., g.b.	+4·1	+5·8	+1·3	−0·3	+0·7	0·5	0·02	7·2	30·1	31·6	18·5	80·2
Jos. White & Son, Coventry	35515	Single overcoil, s.r., g.b., "Karrusel"	+5·5	+6·1	+5·8	+3·9	+7·4	0·5	0·10	8·5	30·0	36·7	13·5	80·2
" " "	35779	Single overcoil, s.r., g.b., "Karrusel"	+3·2	+2·8	+1·9	+3·2	+7·4	0·5	0·07	8·2	30·9	34·1	15·1	80·1
S. Yeomans, Coventry	73559	Single overcoil, s.r., g.b., "Karrusel"	−0·7	−0·9	−1·1	+1·2	+0·9	0·7	0·04	5·8	26·7	36·2	17·2	80·1

In the above List, the following abbreviations are used, viz.:—s.r. for single roller; d.r. for double roller; g.b. for going barrel; + for gaining rate; − for losing rate.

Table II.

Highest Marks obtained by Complicated Watches during the year.

Description of watch.	Number.	Received from.	Marks awarded for			Total marks,
			Variation.	Position.	Temperature.	
			0—40	0—40	0—20	0—100.
Minute chronograph and repeater (minute)	2199	S. Smith and Son, London	28·5	29·7	13·8	72·0
,, ,, ,, (quarter)....	1957	L. Rozat, Chaux-de-Fonds	23·7	28·1	18·9	70·7
Minute and split seconds chronograph	1896	H. Golay, London	28·9	35·7	16·3	80·9
,, ,, ,, ...	60291	Antoine Frères, Besançon.....	28·7	33·7	16·4	78·8
,, ,, ,, ...	3250	Baume and Co., London	27·2	33·4	17·1	77·7
,, ,, ,, ...	3146	S. Smith and Son, London	23·8	32·2	16·4	72·4
Minute and seconds chronograph	6340	A. & N. C. S., Limited, London	29·0	36·0	16·1	81·1
,, ,, ,, ...	166277	Stauffer, Son, and Co., London	25·2	33·1	17·1	75·4
,, ,, ,, ...	147416	,, ,, ,,	25·2	34·1	14·1	73·4
Minute repeater	48900	Carley and Co., London	29·5	34·9	11·1	75·5
,, ,, ...	3418	H. Golay, London	30·3	31·9	12·4	74·6
,, ,, ...	38361	Clemence Frères, London.....	27·8	31·0	14·6	73·4
"Non-magnetic" watches.....	52900	Fridlander, Coventry	31·5	38·0	12·3	81·8
,, ,, ...	25503	,, ,, ...	32·7	34·2	13·8	80·7
,, ,, ...	52838	,, ,, ...	27·8	37·8	12·3	77·9