

R E P O R T
OF THE
ASTRONOMER ROYAL
TO THE
BOARD OF VISITORS
OF THE
ROYAL OBSERVATORY, GREENWICH.

Read at the Annual Visitation of the Royal Observatory, 1926 June 5.

THE BOARD OF VISITORS.

The President of the Royal Society - - SIR ERNEST RUTHERFORD.

The President of the Royal Astronomical Society DR. J. H. JEANS.

Nominated as Fellows of the Royal Society	-	{	SIR WILLIAM BRAGG. PROF. A. FOWLER. DR. J. H. JEANS. SIR JOSEPH LARMOR. SIR ARTHUR SCHUSTER. SIR NAPIER SHAW.
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Nominated as Fellows of the Royal Astronomical Society.	-	{	DR. J. W. L. GLAISHER. MR. E. B. KNOBEL. SIR GERALD LENOX-CONYNGHAM. PROF. H. F. NEWALL. MR. J. H. REYNOLDS. COL. F. J. M. STRATTON.
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Savilian Professor of Astronomy at Oxford - PROF. H. H. TURNER.

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REPORT OF THE ASTRONOMER ROYAL
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The Report here presented refers to the year from 1925 May 11 to 1926 May 10, and exhibits the state of the Observatory on the last-named day.

An event of exceptional interest to be reported this year is the celebration in July of the 250th anniversary of the foundation of the Observatory. Their Majesties the King and Queen graciously paid a visit to the Observatory on July 26. In commemoration of his visit His Majesty has kindly presented a signed portrait of himself, which has been hung in the Octagon Room. By a happy coincidence, the Meeting of the International Astronomical Union was at Cambridge this year, so that we were honoured by the presence of many distinguished foreign astronomers on this occasion. In the evening a reception was given by the President and Council of the Royal Society. On July 27 a number of guests were entertained at an official luncheon given by H.M. Government, at which the First Lord of the Admiralty took the chair.

I.—Buildings and Grounds, Movable Property, and Library :—

Between May 25 and July 18, 1925, a number of rooms were repainted. These include the Transit Circle room, the South room and staircase in the New Building,

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and the inside of the Thompson dome. The external painting of this dome was commenced on March 16 and completed on April 6. The external painting of the New Building is in progress.

The historic instruments in the Transit Circle room were removed for the painting, and the opportunity was taken to clean and to varnish or repaint them.

The walls and floor of the cellar under the Octagon room, in which the Standard Clock is mounted, have been rendered with a waterproof cement. Ventilation by a four-inch shaft extending to the roof of the building has also been arranged. Nevertheless, the cellar remains damp. As the clock is in a sealed case, moisture in the atmosphere, though inconvenient, has no effect on the clock. The room has been found very suitable for a standard clock both on account of the substantial foundation on which the clock is mounted, and also of its freedom from rapid changes of temperature.

The masts supporting the wireless aerial have been renewed. The aerial has been raised about 6 feet and a single wire has been substituted for a double one.

The principal movable instruments are thus distributed :—

At Greenwich—

Transits B, C, D, and E.—Transit B is fitted with an impersonal Micro-meter.

Altazimuths D and E.

Equatorials (6-inch).—Cooke No. 2, Simms No. 1.

Photoheliographs Nos. 2 and 3 complete and the mechanical parts of Nos. 1 and 5.

Detached Telescopes (on tripod stands).—Three 4-inch (Simms Nos. 1 and 2 and R.O. No. 2).

Cooke 6-inch triplet Photographic Objective.

Two Hilger Chronographs.

A single-prism Spectroscope.

On loan—

Transit A, at the Cape Observatory.

Transit, with axis view, at the Science Museum, South Kensington.

Altazimuths.—A, at the Imperial College of Science and Technology, South Kensington; B, at the Cape Observatory.

Equatorials.—Simms No. 2 (6-inch), at the Imperial College of Science and Technology.

Two Heliotropes at the Science Museum, South Kensington.

Photoheliographs:—

No. 1. Object-glass at the Cape Observatory.

No. 5. Object-glass to Professor Newall, Cambridge.

Harrison's Time Machine No. 2, Whewell's Anemometer, Airy's Dip Circle, and the large Bar Magnets in use from 1841 to 1915 at the Science Museum.

Clocks.—Dent No. 1916 and Dent 2013 at the Cape Observatory; Arnold 2 at the University Observatory, Oxford.

Clock Dent 2011 has been permanently transferred to the Air Ministry in exchange for magnetic apparatus of equivalent value. Clock Graham 2 has been returned by the Admiralty in consequence of the closing of the Chart and Chronometer Depot at Rosyth Dockyard.

On loan to the Royal Observatory—

The Cookson Floating Zenith Telescope from the Cambridge Observatory, for a third period of seven years from July, 1925.

A 7-inch Prism of 40° angle, from the Joint Permanent Eclipse Committee.

A Position Micrometer for measuring solar photographs, from the Solar Physics Observatory, Cambridge.

Astrographic Micrometer from Prof. Turner.

Schuster-Smith Coil Magnetometer from the National Physical Laboratory.

A Bendorff Electrometer, two Kelvin-White Multicellular Voltmeters, and a Flame Collector, from Dr. G. A. Carse, University of Edinburgh.

One seven-valve Amplifier and one C.W. Syntonsiser, from the Royal Air Force.

A battery of 72 Leclanché cells, from the Director of Scientific Research of the Admiralty.

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A battery of 72 Leclanché cells, from the Director of Scientific Research of the Admiralty.

To meet the requirements of the Exchequer and Audit Department a new inventory of instruments and movable property has been made.

The annual examination of the Library has been made. Thirteen books are reported missing, and cannot be accounted for at present, including eight reported last year. None of the books missing last year have been found.

II.—Astronomical Observations :—

Transit Circle.—The Sun, Moon, major planets and fundamental stars have been regularly observed. In 1922 a programme for obtaining five observations of all stars brighter than $8^m.0$ between declinations $+32^\circ$ and $+64^\circ$ was commenced. Half of the observations have been secured.

The total number of observations made during the year is as follows :—

Transits	-	-	-	10,878	Circle Observations	-	-	9,387
Collimation	-	-	-	294	Nadir point	-	-	593
Level	-	-	-	696				

The Sun was observed on 136 days and the Moon on 97 days.

Observations are all reduced as far as apparent place to April 30, and as far as mean place to 1925, Dec. 31. The mean places for the Equinox 1925.0 have been collected on catalogue forms as far as 1924, March 31.

The ledgers of Sun, Moon and planets are completed to 1925, Dec. 31.

A comparison of the observed positions of the Moon with those given in the *Nautical Almanac* for the three years during which Brown's Tables have been used gives the following results :—

Year.	No. of Obs.	R.A. s	Tabular—Observed.		
			N.P.D. "	Long. "	E.N.P.D. "
1923	- - - 103	— .473	— .73	— 7.12	— .55
1924	- - - 89	— .472	— .59	— 7.11	— .76
1925	- - - 92	— .455	— .78	— 6.74	— .84

A discussion of the motion of the Equinox, derived from Greenwich observations of the Sun for the period 1851–1924, has been communicated to the Royal Astronomical Society.

In view of the wearing of the graduated circle, in consequence of the frequent necessity for cleaning, it was thought that possibly slight changes in the division errors might have taken place, which might account for some small systematic differences between the declinations determined at Greenwich and at some other observatories. A new determination of the errors of the 5° divisions, made between November and February, confirmed the division errors in use since 1898.

From the two lists of comparison stars for the Opposition of Eros, 1930-31, published by Dr. Kopff, 430 stars, suitable for observation at Greenwich, have been selected and placed on the Working Catalogue.

Altazimuth.—The instrument has been used during the year to determine declinations of fundamental stars by observation of transits across the prime vertical. The number of transits observed in the year is 2655. The result of a preliminary discussion of the observations to the end of 1925 is shown in the following table.

Limits of Declination.	Altazimuth—Boss.		No. of Observations.	Raymond —Boss.
° °	R.A. s	Dec. "		"
$47\frac{1}{2} - 50$	— .039	+ .26	367	+ .27
$45 - 47\frac{1}{2}$	— .017	+ .14	462	+ .29
$40 - 45$	— .003	+ .25	1,000	+ .31
$35 - 40$	+ .010	+ .30	1,024	+ .33
$30 - 35$	.000	+ .34	945	+ .33
$25 - 30$	— .003	+ .32	1,092	+ .32
$20 - 25$	— .003	+ .48	1,176	+ .30
$15 - 20$	— .004	+ .42	980	+ .28
$11\frac{1}{2} - 15$	+ .004	+ .39	585	+ .24

The adopted value of the colatitude of the Altazimuth is $38^\circ 31' 23''.54$, corresponding to $38^\circ 31' 21''.87$ for the transit circle. The last column of the above table gives Raymond's corrections to Boss's Declinations (A.J. 857) reduced to 1925.0. The agreement is very close from Dec. 25° to 50° , but from $11\frac{1}{2}^\circ$ to 25° the correction given by the Altazimuth is $+ 0''.16$ greater than that found by Raymond.

The Cookson Floating Zenith Telescope.—During the year 238 photographs were taken. The measurements are completed to the end of 1925, and a preliminary determination has been made of the variation of latitude and communicated to the

Royal Astronomical Society. A final reduction of the observations for the second period of seven years has been begun.

28-inch Equatorial.—During the year 487 observations of 336 double stars were obtained. They are distributed as follows :—

31 double stars, separation $< 0''.5$.			
81	„	„	$0''.5$ to $1''.0$.
103	„	„	$1''.0$ to $2''.0$.
121	„	„	$> 2''.0$.

Copy for press has been prepared for a preliminary catalogue of 400 stars observed at least three times.

Thompson Equatorial.—With the 26-inch Refractor 834 plates have been taken for Stellar Parallax and 1,292 plates have been measured. The number of determinations of parallax made during the year is 50, making the total to date 316. In November, 1925, the parallaxes of 32 stars were published in the *Monthly Notices of the Royal Astronomical Society*.

A volume containing the determinations of the parallax of 266 stars has been published.

With the 30-inch Reflector a number of spectra have been photographed with the prism crossed by grating in order to determine the relative temperatures of B and A type stars. The stars have been photographed in pairs, each pair consisting of a B type and an A type star photographed at approximately equal altitudes. Thirty-seven pairs have been photographed and 34 pairs have been measured with satisfactory results. In addition, five pairs of spectra have been taken for the determination of the effect of atmospheric absorption, each pair consisting of two stars of the same spectral type and photographed at different altitudes.

As mentioned in the last report, some work has been done on stellar temperatures by comparing the stellar spectra with the positive crater of the carbon arc. A preliminary note on the work was published in the November number of the *Monthly Notices of the Royal Astronomical Society*. A paper on the Effective Wavelengths of Stars from Dec. 80° to the North Pole was also published in the same number.

Astrographic Equatorial.—The determination of proper motions by comparison with photographs taken 25 to 30 years ago has been continued throughout the year.

During the year, 99 plates have been taken, 59 in Zone 69° and 13 in Zone 71° . Measures have been made of 27 plates completing Zone 67° and of 42 plates between 0^h and 14^h in Zone 69° . Reductions are completed to 12^h in Zone 69° . So far, in the examination of 700 square degrees, 194 stars have been found with proper motions greater than $20''$ a century. Of these, 108 are stars contained in the *Bonn Durchmusterung* and 86 of fainter stars. Of the latter, 17 have proper motions greater than $30''$ a century.

Three photographs of the Pleiades were taken for Prof. Hertzsprung and two photographs of Wolf's Nova.

Miscellaneous Equatorial Observations.—One disappearance of a star occulted by the Moon was observed during the year. Peltier-Wilk's and van Biesbroeck's comets were observed with the Sheepshanks Equatorial on three nights and one night respectively. Orbits and ephemerides were computed by Dr. Crommelin and Mr. Merton.

Heliographic Observations.—In the year ended 1925, May 10, photographs of the Sun were obtained on 251 days with either the Dallmeyer 4-inch photoheliograph or the Thompson 9-inch. The number of photographs selected for preservation is 520, including 36 with double images of the Sun for the determination of the zeros of position angle. The zeros of position angle have also been determined regularly by visual observations.

H.M. Astronomer at the Cape has reported that the Sun was photographed there on 330 days in the year 1925, and on 88 days in the first three months of 1926. The Director of the Kodaikanal Observatory has reported that plates were taken there on 328 days in the year 1925, and on 85 days during the first three months of 1926.

Photographs have been received from the Royal Observatory, Cape of Good Hope, to 1926 February 8. Photographs have been received from the Kodaikanal Observatory and also from Dehra Dûn, through the Solar Physics Committee, thus completing the series for 1925 except for two days, July 23 and November 26. Photographs for these days were kindly loaned for measurement by the Director of the Ebro Observatory, Spain.

The measurement of the combined series has been made from 1925 January 7 to 1926 January 8.

The reductions of positions and areas of spot groups and their principal components have been completed from 1924 November 11 to 1925 November 5.

During the period covered by this report, the solar activity has been considerable. This was especially marked from October to March by the successive appearance of twelve very large groups of spots, each visible to the naked eye. Magnetic disturbances of considerable magnitude occurred when two of these groups were within a short distance of the Sun's central meridian, viz. : (1) on January 26 and February 23; (2) on March 5. A great magnetic disturbance also took place on April 14-15, when a moderate-sized spot (previously visible to the naked eye in December, January and February) was within a few degrees of the central meridian.

III. Magnetic Observations :—

The variations of magnetic declination, north force and vertical force, have been recorded photographically. Absolute observations of declination are made five or six times a week, of horizontal force twice a week, and of dip three times a week.

On February 28, 1926, regular train service began on the electrified section of the Southern Railway passing through New Cross and Lewisham (little more than a mile distant from the Observatory). The vertical force traces were from that date so strongly disturbed that further observations were deemed valueless and were discontinued. On May 10, 1926, additional sections were brought into operation, and simultaneously disturbances to the declination and north force traces increased to an extent which makes the continuance of records of little value. The complete electric train service is expected to be working from the middle of July next, and magnetic observations at Greenwich will then cease.

As regards the reduction of observations, the mean hourly ordinates of the declination traces are read off to date. The ordinates of the north and vertical force traces are read off to the end of 1925. The reduction of absolute observations is completed to the end of 1925; with provisional constants to the end of April, 1926. The tabulation of results for 1925 is well advanced and copy for press is partly prepared.

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The mean values of the magnetic elements for 1925 are given below, with those of immediately preceding years for comparison.

	Dec. W.	Hor. Force.	Vert. Force.	Dip.
		(C.G.S. units.)		
1921 -	13 57.6	0.18449	0.43218	66 53.0
1922 -	46.7	447	176	52.3
1923 -	35.1	431	137	51.9
1924 -	22.8	426	112	51.6
1925 -	10.0*	413*	081*	51.5*

* Provisional values.

Abinger Magnetic Observatory.—As stated in the last Report, the new magnetic observing station at Abinger, near Dorking, Surrey, was in full working order at the beginning of 1925. Every week-day absolute observations are made of horizontal force at least once, of dip (with the earth inductor) as a rule twice, and of declination five or six times. Continuous records of magnetic elements have been made throughout the period covered by this report. Certain difficulties were experienced in obtaining a satisfactory suspension of the magnetograph declination needle and its mirror, and the uniformity of the records of declination was thereby considerably affected. Records of the horizontal and vertical components of force, however, are available for detailed comparison with those made at Greenwich throughout 1925. A practically complete series of declination records extending from April, 1925, to the present date is similarly available. Absolute observations are reduced (with provisional constants), and the traces are read off to the current week. A weekly report of two-hourly variations of declination has been issued since the beginning of 1925, and is sent to certain offices for publication or information. This is in continuation of a service formerly carried out by the Kew Observatory.

Some progress has been made with the comparison of results at Greenwich and Abinger. The mean difference Abinger *minus* Greenwich for the several elements is found to be—

Dec. W.	Hor. Force.	Vert. Force.	Dip.
+12' 8	+183 γ	—132 γ	—16' 2

A comparison between the traces on 30 selected disturbed days showed that in declination the movements at Abinger are on the average 2 per cent. smaller in extent than at Greenwich. In this connection, a comparison of the traces obtained

at Stonyhurst College Observatory on the same days was also made, which showed a magnification at Stonyhurst of about 20 per cent. Similar comparisons are in hand for the traces of horizontal force.

Schuster Coil Magnetometer.—As stated in the last Report, this instrument was temporarily erected at Greenwich in April, 1925, and it remained in regular use until the end of July. Very consistent results were obtained, although the auxiliary apparatus was largely improvised and of a quite temporary character. At the end of July the magnetometer was returned to the National Physical Laboratory for the determination of its constants by the department of metrology.

A detailed report of a comparison between this Magnetometer and the original standard at the National Physical Laboratory has been forwarded by the Director. The accordance of the two instruments is extremely close, the difference from two independent series of comparisons being in each case 0.6γ .

The Observatory is greatly indebted to the National Physical Laboratory for the installation of this instrument at Abinger, and to Mr. Dye, Principal Assistant of the Electricity Department, for the personal interest he has taken in the matter.

In connection with the standardisation and certification of magnetometers, some pieces of apparatus have been transferred from Kew to Greenwich in exchange for the clock Dent 2011 previously on loan to that Observatory. These include apparatus used in determining temperature and induction coefficients of magnets and the instrument designed by the late Dr. W. Watson for the comparison of inertia cylinders, together with six cylinders, including the gilt cylinder with bevelled ends, designated by him No. 10, which it was suggested should be constituted a standard after its moment had been accurately determined. It is proposed to compare cylinder No. 10 with each of the five cylinders whose moments of inertia have been obtained from measurements of dimensions and mass made at the National Physical Laboratory, and from the mean to determine its moment of inertia. It will then be considered as the Standard.

Three unifilar magnetometers, two additional collimator magnets, one dip circle, and one dip inductor have been examined for certification in continuance of the service previously carried out at Kew Observatory. It has been found possible to carry out the work of standardisation at Greenwich hitherto, though selected times were always necessary, but in future this work must be done at Abinger. A special hut with provision for comparison of instruments has been sanctioned by the Admiralty and will be put in hand shortly.

In connection with the Magnetic Survey of the British Isles by the Ordnance Survey Department, Mr. H. L. P. Jolly paid visits to Greenwich in June, 1925, and Abinger in April, 1926, for comparison of his instruments. Arrangements have been made to supply the values of the magnetic elements at Abinger at the times of field observations.

IV.—Meteorological Observations :—

The registration of atmospheric pressure, temperature of the air and of evaporation, the direction, pressure and velocity of the wind, the amount of rainfall, sunshine, and cloudiness at night has been continuously maintained. Estimates of visibility are now included in the meteorological observations made by eye. The potential gradient of atmospheric electricity has been registered with a radium collector and Kelvin-White quadrant electrometer. Successful registration depends very largely upon keeping the hut warm and dry.

The following details of the weather refer to the period ended 1926 April 30.

The mean temperature was $50^{\circ}\cdot4$, or $0^{\circ}\cdot9$ above the average of the 75 years 1841–1915. The highest temperature in the shade was $89^{\circ}\cdot5$, on July 22 and the temperature exceeded 80° on 22 days. The lowest temperature was $16^{\circ}\cdot0$, on January 16. On 34 days the temperature was at or below freezing point. The months January to April of this year have been warmer than the average, and in February the mean temperature was $5^{\circ}\cdot8$ above the normal. September was a relatively cool month, being $3^{\circ}\cdot4$ below the normal. The mean daily horizontal movement of the air was 275 miles, which is 9 miles below the average of the 50 years 1867–1916. The greatest daily movement, 741 miles, was recorded on December 29, and the least, 65 miles, on October 6. The greatest pressure was 18·9 lbs. to the square foot on December 31. The greatest velocity in one hour, 41 miles, was registered on March 4. The duration of bright sunshine registered by the Campbell-Stokes instrument was 1,312 hours out of a possible 4,446 hours or 29·5 per cent. The total rainfall was 24·88 inches, that is, 0·64 inches above the average for the period 1841–1915. The number of rainy days (0·005-inch or over) was 163. The wettest month was April with 3·87 inches—a total only surpassed for April in 1878, when 4·31 inches fell. The driest months were June, 1925, and March, 1926, with 0·12 and 0·14 inches respectively. These low totals have not been paralleled at Greenwich since records began. The nearest approach for March was in 1852 and for June in 1849.

V.—Printing and Distribution of Greenwich Publications :—

The volume for 1923 and its separate parts have been distributed, as well as a volume of parallax observations. The printing of the volume for 1924 is complete.

VI.—Chronometers :—

The number of chronometers and watches belonging to the Admiralty now at the Observatory is 3,100. Of this total 282 chronometers, 169 chronometer watches, 316 hack watches and 68 pocket watches are being rated. The remainder, consisting of 373 chronometers, 1,154 chronometer watches, 153 hack watches and 581 pocket watches, are kept in storage.

In addition to Admiralty chronometers there are 30 chronometers and 11 watches deposited at the Observatory for various reasons.

During the year ended 1926 April 30 a total of 2,376 chronometers and watches have been received and 2,165 issued. The number sent for repair was 1,420—namely, 1,400 for the Admiralty, 17 for the Indian, 2 for the Australian, and 1 for the New Zealand Governments.

The annual trials of chronometers and watches have not been reinstated.

VII.—Time Service :—

An additional standard clock similar in all essentials to the clock purchased during 1924-25 has been ordered. The master pendulum will be mounted in the cellar under the Octagon Room and the slave clock in the clock room.

The daily time signals to the General Post Office and the British Broadcasting Company have been transmitted regularly throughout the year.

The Time Balls at Greenwich and Deal have been operated regularly.

The performance of the time balls at the Admiralty Signal stations and of the Westminster Clock is shown by the following table of the errors of the return signals :—

Error of Return Signal.	Portsmouth.	Portland.	Devonport.	Rosyth.	Westminster.
Not greater than 0 ^s .2 - - - -	272	267	242	44	95
0 ^s .3 to 0 ^s .5 - - - -	0	5	4	4	98
0 ^s .6 to 1 ^s .0 - - - -	0	0	2	0	81
Greater than 1 ^s .0 - - - -	0	0	5	0	29

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The error of the Westminster Clock never exceeded $2^s.0$ on any of the 306 days on which signals were received. The clocks at Portsmouth, Portland, Devonport and Rosyth are corrected daily by the 10^h signal from Greenwich.

The acknowledgment signal from Rosyth was in operation only between October and January and has now been discontinued.

Wireless time signals have been received regularly from the Eiffel Tower, Nauen, Bordeaux and Annapolis. They are registered automatically on a syphon recorder operated by an oscillating valve relay system. The signals from Annapolis were recorded on 49 per cent. of the possible number of days during 1925.

The monthly means of the differences from Greenwich shown by the various wireless time-signals, using the final clock errors, and in addition correcting the Annapolis signals for lag on the land line from Washington to Annapolis, $0^s.02$ for time of travel, and $0^s.05$ for difference in the adopted right ascensions of the clock stars, are as follows:—

Month.	Rhythmic Time Signals.			Ordinary Time Signals.		
	Paris 10^h .	Nauen 12^h .	Bordeaux 20^h .	Paris $10^h 45^m$.	Nauen Noon.	Annapolis 17^h .
	^s	^s	^s	^s	^s	^s
January - -	+ 0.17	+ 0.03	+ 0.15	+ 0.16	+ 0.01	+ 0.06
February - -	+ .08	+ .02	+ .06	+ .06	.00	+ .02
March - -	+ .05	+ .05	+ .04	+ .04	+ .03	+ .05
April - -	+ .15	+ .10	+ .13	+ .13	+ .09	+ .10
May - -	+ .14	+ .07	+ .14	+ .13	+ .10	+ .10
June - -	+ .13	+ .07	+ .09	+ .12	+ .08	+ .07
July - -	+ .14	+ .04	+ .10	+ .13	+ .04	+ .08
August - -	+ .14	+ .06	+ .11	+ .14	+ .06	+ .10
September - -	+ .17	+ .11	+ .15	+ .21	+ .10	+ .12
October - -	+ .10	+ .04	+ .08	+ .03	+ .02	—
November - -	+ .05	+ .01	+ .03	+ .05	— .01	+ .04
December - -	+ .06	— .00	+ .04	+ .04	.00	.00
Mean - -	+ .114	+ .050	+ .092	+ .101	+ .041	+ .064
Number of comparisons }	277	272	310	286	270	179

The sign + means late on Greenwich. The reference point for the rhythmic signals is the commencement of the signals.

VIII.—Personal Establishment :—

The permanent staff at the present time is constituted as follows :—

Chief Assistants.—Mr. Greaves, Dr. Jackson.

Assistants.—Mr. Bowyer, Dr. Crommelin, Mr. Davidson, Mr. Witchell.

Junior Assistants (Higher Grade).—Mr. Cullen, Mr. Furner, Mr. Melotte, Mr. Stevens.

Junior Assistants.—Mr. Acton, Mr. Barton, Mr. Chamberlain, Mr. Finch, Mr. Jeffries, Mr. Martin, Mr. Newton, Mr. Rickett, Mr. Symms, Mr. Wells.

Clerical Assistant.—Mr. Edney.

18 Computers, including 3 ladies, are employed at the Observatory.

Mr. Stevens, assisted by Mr. Finch, has charge of the Magnetic Station at Abinger. The station is visited periodically by Mr. Greaves and Mr. Witchell.

The present arrangement of the staff under the general superintendence of the Chief Assistants is as follows :—

Branch.	Established Staff.	Unestablished Staff.
<i>Transit Circle, Altazimuth and Zenith Telescope.</i>	Dr. Crommelin, Mr. Furner, Mr. Cullen, Mr. Acton, Mr. Symms.	Mr. Fellows, Mr. Davies, Mr. Stephens, Mr. Rood, Mr. Ware, Mr. Bennett, Mr. Slator.
<i>Time Signals and Chronometers</i> -	Mr. Bowyer, Mr. Rickett -	Mr. Alcock, Mr. Sizer, Mr. McKenzie.
<i>Thompson Equatorial</i> - - -	Mr. Davidson, Mr. Martin -	Miss Jeffries, Mr. Rickerby.
<i>28-inch Equatorial</i> - - -	Mr. Furner - - - -	
<i>Astrographic Equatorial</i> - - -	Mr. Melotte, Mr. Jeffries - -	Mr. Smith.
<i>Photoheliograph</i> - - - -	Mr. Newton, Mr. Barton - -	Miss Jackson.
<i>Magnetic and Meteorological</i> -	Mr. Witchell, Mr. Stevens, Mr. Wells, Mr. Finch.	Miss Clack, Mr. Oliver, Mr. Burridge.
<i>Secretariat and Library</i> - -	Mr. Edney, Mr. Chamberlain -	Mr. Cox.

The staff of workmen now employed consists of a foreman of works, two joiners, a mechanic, a boy assistant mechanic, a gate porter, two messengers, a night watchman, a gardener, three labourers and a charwoman. There is also a mechanic at Abinger who has charge of the engines and acts as caretaker.

IX.—General Remarks :—

Mr. Davidson was absent from the Observatory from November 11 to April 1 to take part with Col. Stratton in the expedition sent out by the Joint Permanent Eclipse Committee to observe the total Solar Eclipse of January 14 at Benkoelen, in Sumatra. Preparations for this expedition occupied several months, during which Col. Stratton and Mr. Barton, who accompanied the expedition as a volunteer, were at the Observatory. Successful results happily rewarded the time and thought given by the Observers.

Mr. Merton continued his work throughout the year at the Observatory on the determination of Cometary Orbits, particularly that of Comet Grigg (1902, II). During absence of regular observers he has assisted in parallax observations.

Dr. Steavenson has continued observations of variable stars with the 28-inch Equatorial on Sunday nights and a few other occasions when the instrument was not in use.

Observations for a redetermination of the longitude Greenwich-Pulkovo were made by MM. Beljaieff and Dnieprovsky during the months September to November. Their instruments, Repsold reversible transits with axis view and self-registering micrometers, were mounted in the transit pavilion. A large number of full nights of observation were secured, but the result of the determination has not yet been published.

Dr. Lundmark, of Upsala, worked at the Observatory during the summer months. During part of the time he and Mr. Melotte were engaged in an examination of the Franklin-Adams plates. They have drawn up a complete descriptive list of the vacant areas or regions of very low star density in the sky. Mr. Asklöf, also of Upsala, took part at the same time in the Observatory work on stellar parallax.

Mr. Horrocks, Isaac Newton student in the University of Cambridge, was at the Observatory from March 13 to April 20 studying the methods of observation and reduction carried on in various departments of the Observatory.

The record of the work of the Observatory for the year is the best testimony of the zeal and spirit of the staff. In all departments observation and measurement has been carried on industriously and the reduction of observations kept up to date.

18 REPORT OF THE ASTRONOMER ROYAL TO THE BOARD OF VISITORS, 1926 JUNE 5.

The volume of determinations of stellar parallax which has been published during the year is the result of many years' hard and careful work. Approximately 5,000 photographs were taken and measured so as to give an average probable error of $\pm 0''.024$ for one plate. This result indicates not only the care with which the photographs were measured, but also the care which was taken in the avoidance of instrumental errors.

The second Free Pendulum Clock mentioned earlier in the Report was delivered on May 20, and is now being adjusted. The Free Pendulum Clock Shortt No. 3 brought into use on January 1, 1925 has been very satisfactory. The daily losing rate has increased slightly during this period. From September 1 to the present time this increase has been very uniform and amounts to $0^s.011$ per day per month. With the exception of a period during February and March when work was in progress in the cellar in connection with the erection of the second clock, the daily rate calculated from 5-day intervals has not varied more than $0^s.01$ from the mean value. Owing to the reliability of this Standard Sidereal Clock and to the frequent comparisons made with it a very accurate daily time service has been maintained.

The installation of the Schuster Magnetometer is a most valuable addition to the equipment of the Magnetic Station at Abinger. It was brought into regular use on May 1, and will make a great improvement in the observations of Horizontal Force. Observations have been carried out fully at Greenwich and Abinger during the year, and a complete comparison is in progress. The staff both at Greenwich and Abinger have been very fully occupied during the year, and have done all in their power to make the new station a success.

F. W. DYSON

Royal Observatory,
Greenwich.

1926 May 27.