

P R E F A C E.

THIS volume is considerably smaller than the corresponding volumes in recent years. The diminution has been effected partly by giving the observations in less detail, and partly by omitting certain sections which are not very suitable for annual publication, and can be given more shortly and conveniently in periods of a number of years.

The principal sections whose publication is discontinued entirely, are those giving the full details of the Daily Observations made with the Transit-Circle, and with the Altazimuth in the Meridian. From the year 1897 the publication of the full details of these observations was restricted to the Sun, Moon, Planets, Fundamental and Adjustment Stars. The increased number of observations in astronomical work generally, makes it desirable to publish only so much detail as is necessary for the effective criticism of the methods and results. It is considered that this is sufficiently met by the publication of results in ledger form, and by tables showing the daily changes of the Instrumental and Clock errors.

The Extra-Meridian Observations with the Altazimuth are given in detail, as the methods of observation and reduction are less simple and familiar than those of Meridian instruments.

The Observations with the Reflex Zenith-Tube occupy a disproportionately large space in this volume; but as the observations with this instrument have now been discontinued, it was not considered worth while to make changes in the form of publication for the last two years.

For two of the sections publication is deferred. The Ledgers of the Zone Stars observed with the Transit-Circle will be given in a collected form for all the observations, when the Catalogue is completed. The Double Star Observations are not given this year, as a Catalogue to contain all the observations made with the 28-inch refractor since their commencement is in preparation. They will be included in this Catalogue.

Further condensation has been effected by various minor changes which have been made in the Tables and Introductions in both the Astronomical and Magnetical and Meteorological Sections.

Advantage has been taken of these changes to make some simplifications in the pagination. The volume is now divided into five principal sections: the Transit-Circle,

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indicated by the letter A; the Altazimuth (B); Reflex Zenith-Tube and Equatorial Observations (C); Photoheliographic Observations (D); Magnetic and Meteorological Observations (E). The Introduction to the whole volume has been discontinued, and a short Introduction or Note given to each Section.

The rates of Chronometers and Watches at the Annual Trials are also included in the volume, and the Report of the Astronomer Royal to the Board of Visitors.

The sections A, B, and C are issued in a separate volume as the Greenwich Astronomical Results. Sections D and E are also issued separately.

A list will be found at the end of the Preface of the various appendices which have from time to time appeared in the different volumes of *Greenwich Observations*, and most of which have been issued separately; also of other Greenwich publications which have not been included in the *Greenwich Observations*.

At the beginning of the year 1910 the Established Staff of the Observatory consisted of the following persons, the names in each class being arranged alphabetically:—

Chief Assistants,—Philip Herbert Cowell, M.A., F.R.S., formerly Fellow of Trinity College, Cambridge; Arthur Stanley Eddington, M.A., M.Sc., Fellow of Trinity College, Cambridge.

Assistants,—Walter William Bryant, B.A.; Andrew Claude de la Cherois Crommelin, B.A., D.Sc.; Henry Park Hollis, B.A.; Thomas Lewis; Edward Walter Maunder; William Grasett Thackeray.

Clerical Assistant,—Henry Outhwaite.

Established Computer (Higher Grade),—Charles Davidson.

Established Computers,—William Bowyer; William Wood Burkett; Richard Thomas Cullen; David J. R. Edney; Benjamin D. Evans; Joseph Edward Evans; Herbert Henry Furner; Philibert Melotte; William Stevens; William Moody Witchell, B.Sc.

Mr. Cowell resigned on May 2, having been appointed Superintendent of the Nautical Almanac Office. Mr. S. Chapman, B.Sc., was appointed Chief Assistant on December 13 to fill the vacancy.

The Chief Assistants have the general superintendence of all the work of the Observatory. Mr. Maunder is charged with the Heliographic photography and reductions. Mr. Lewis has charge of the clocks, time-signals, and chronometers, and of the 28-inch equatorial. Mr. Thackeray superintends the meridian work with the

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Transit-Circle, and miscellaneous astronomical computations. Mr. Hollis superintends the photographic mapping of the heavens, the measurement of the plates, and the computations for the Astrographic Catalogue. Mr. Crommelin has charge of the Altazimuth and of the observations of occultations. Mr. Bryant is superintendent of the Magnetic and Meteorological Department. Mr. Davidson has charge of the Thompson equatorial and the measurement of the photographs taken with it. Mr. Outhwaite acts as responsible accountant officer, has charge of the library manuscripts and stores, and conducts the official and general correspondence. Mr. Bowyer, Mr. Cullen, and Mr. Furner assist Mr. Lewis, Mr. Thackeray, and Mr. Crommelin respectively. Mr. Witchell and Mr. B. D. Evans, under Mr. Thackeray's direction, respectively undertake the reduction of the transits and of meridian zenith distances observed with the Transit-Circle; Mr. Witchell is also charged with the reduction of the Reflex Zenith-Tube observations. Mr. Melotte is engaged in the reproduction of the photographs taken with the Thompson equatorial. Mr. Stevens and Mr. J. E. Evans assist Mr. Hollis, Mr. Edney assists Mr. Bryant, and Mr. Burkett assists Mr. Outhwaite.

The regular observers with the Transit-Circle are Mr. Witchell, Mr. J. Evans, Mr. Cullen, and Mr. B. Evans. The same four observers undertake the Reflex Zenith-Tube observations. Observations with the 28-inch equatorial are generally made by Mr. Lewis, Mr. Bryant, Mr. Bowyer, and Mr. Furner. Observations with the Altazimuth are made by Mr. Crommelin, Mr. Furner, or one of the Computers. Photographs with the Astrographic equatorial are generally taken by Mr. Stevens or one of the Computers, and with the Thompson equatorial by Mr. Davidson, Mr. Edney, or Mr. Melotte. Photographs of the Sun with the Thompson or Dallmeyer photoheliograph are taken by Mr. Maunder, or by one of the Computers under his direction.

The following are the signatures of the observers:—

W. H. M. Christie - WC	C. Davidson - CD	B. D. Evans - BE
F. W. Dyson - D	D. J. R. Edney - DE	Š. Daniels - SD
P. H. Cowell - C	W. Bowyer - WB	J. Shepperd - S
A. S. Eddington - SE	H. H. Furner - HF	H. Acton - HA
E. W. Maunder - M	W. M. Witchell - W	A. Witney - AW
T. Lewis - L	W. Stevens - WS	G. Cody - GC
W. G. Thackeray - T	P. Melotte - PM	F. Jeffries - J
H. P. Hollis - H	J. E. Evans - E	A. Rotherham - R
A. C. D. Crommelin AC	R. T. Cullen - RC	W. G. Davies - WD
W. W. Byrant - B		

1912 *March* 8.

F. W. DYSON.

GREENWICH ASTRONOMICAL RESULTS, 1910.

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LIST OF APPENDICES IN VOLUMES OF GREENWICH OBSERVATIONS.

(Most of these have also been issued separately.)

Volume.	Title.
1836.	Bessel's Refraction Tables. Table of Factors for converting Errors of R.A. and N.P.D. into Errors of Longitude and Ecliptic Polar Distance.
1837.	Logarithms of Sines and Cosines for every 10 seconds of time.
1842.	Catalogue of 1439 Stars for 1840, from Observations made in 1836-41.
1845.	Longitude of Valentia (Chronometrical).
1847.	Catalogue of 2156 Stars for the twelve years 1836-47.
1851.	Results in Right Ascension of Stars observed by Dr. Maskelyne.
1852.	Regulation of the Royal Observatory. Description of the Transit-Circle.
1853.	Refraction Tables.
1854.	Description of the Reflex Zenith-Tube. Catalogue of 1576 Stars for 1850, from Observations made in the years 1848-53.
1856.	Description of the Galvanic Chronographic Apparatus used for recording Observations.
1859.	Errors of the Moon's Tabular Place as deduced from the Tables of Burckhardt and Hansen, 1847-58. Reduction of Magnetic Observations, 1848-57, with reference to the Positions of the Sun and Moon.
1860.	Reduction of Deep Thermometer Observations, 1846-59.
1862.	Seven-Year Catalogue of 2022 Stars reduced to Epoch 1860, from Observations made in the years 1854-60. Plan of Ground and Buildings. Longitude of Valentia (Galvanic).
1864.	Moon's Semidiameter from Occultations. Planetary Reductions, 1831-35.
1867.	Description of the Altazimuth. Description of the Transit-Circle.
1868.	Corrections of Elements of Jupiter and Saturn. Second Seven-Year Catalogue of 2760 Stars for 1864, from Observations made in the years 1861-67. Description of the Great Equatorial.
1869.	Reprint of Halley's Magnetic Chart.

LIST OF APPENDICES, ETC.

Volume.	Title.
1871.	History and Description of the Water Telescope.
1873.	Regulations of the Royal Observatory.
1876.	Nine-Year Catalogue of 2263 Stars for the Epoch 1872.
1877.	Mean Temperature of the Air at every hour of the day in each year from 1849-68.
1879.	Description of the Greenwich Time Signal System.
1884.	Magnetic Diagrams, 1841-76.
1887.	Reduction of the Photographic Records of the Barometer, 1874-76, and of the Dry and Wet Bulb Thermometers, 1869-76 (Meteorological Reductions, Part II.).
	Ten-Year Catalogue of 4059 Stars for 1880.
	Recomputation of the Position of the Ecliptic, and Corrections to Refraction of Stars, Sun, Moon, and Planets, 1877-86.
1889.	Observations of the Time of Swing of the Indian Invariable Pendulums.
1891.	Greenwich Five-Year Catalogue of 258 Fundamental Stars for 1890.
1898.	Refraction Tables arranged for use at the Royal Observatory.
	Second Ten-Year Catalogue of 6892 Stars for 1890.0.
1899.	Tables for reducing Transits arranged for use at the Royal Observatory.
1904.	Meridian Zenith Distances of γ Draconis, from Observations made with the Reflex Zenith-Tube, 1886-99.
1907.	Catalogue of Recurrent Groups of Sun-Spots, 1874-1906, compiled from the Ledgers of Groups of Sun-Spots, published in the Greenwich Observations, 1886-1907.
1908.	Precession Tables for use in connection with the Third Ten-Year Catalogue, 1910.
1909.	Investigation of the Motion of Halley's Comet from 1759-1910.

SEPARATE PUBLICATIONS.

(Not in the Greenwich Volumes.)

Title.	Year of Publication.
Groombridge's Circumpolar Catalogue for 1810	1838
Reductions of the Observations of Planets, 1750-1830	1845
Lunar Observations, 1750-1830, Vol. I.	1848
" " " " Vol. II.	1848
Tables of the Moon, by P. H. Hansen	1857
Lunar Observations, 1831-51	1859
Transit of Venus, 1874	1881
Astrographic Catalogue, Vol. I.	1904
" " Vol. II.	1908
New Reduction of Groombridge's Catalogue	1905
Longitudes, 1888-1902	1906
Photoheliographic Results, 1874-85	1907
Observations of the Planet Eros, 1900-01, for the Determination of the Solar Parallax	1908

LIST OF APPENDICES, ETC.

Title.	Year of Publication.
Second Nine-Year Catalogue, 1900, from Observations made in the years 1897-1905	1909
Greenwich Meteorological Reductions :—	
Part I.	1878
Barometer, 1854-73.	
Thermometers, 1849-68.	
Earth Thermometers, 1847-73.	
Part II.	1887
Barometer, 1874-76.	
Thermometers, 1869-76.	
Part III.	1896
Temperature of the Air, 1841-90.	
Part IV.	1906
Temperature of the Air, 1891-1905.	