

1892.  
—  
VICTORIA.

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TWENTY-SEVENTH REPORT

OF THE

BOARD OF VISITORS

TO

THE OBSERVATORY;

TOGETHER WITH THE

*Annual Report of the Government Astronomer.*

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PRESENTED TO BOTH HOUSES OF PARLIAMENT BY HIS EXCELLENCY'S COMMAND.

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By Authority:

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# TWENTY-SEVENTH REPORT

OF THE

## BOARD OF VISITORS TO THE OBSERVATORY.

TO HIS EXCELLENCY THE RIGHT HONORABLE JOHN ADRIAN LOUIS,  
*Earl of Hopetoun, Viscount Aithrie, and Baron Hope, in the Peerage of Scotland; Baron Hopetoun of Hopetoun, and Baron Niddry of Niddry Castle, in the Peerage of the United Kingdom; Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George; Governor and Commander-in-Chief in and over the Colony of Victoria and its Dependencies, &c., &c., &c.*

We have the honour to report that upon the 2nd of September we made our annual visitation of the Observatory.

We found the buildings, instruments, and records in their usual admirable order.

The Astronomer has been for some time engaged in carrying out the reductions directed by the Government, and we are glad to learn from him that, by a careful and thorough re-adjustment of the work of the Observatory and of the duties of the staff, the required savings have been effected without any serious injury to the establishment in any of its departments. This result is mainly due to the able and laborious exertions of Mr. Ellery to carry out the wishes of the Government with the least possible sacrifice of the important interests and duties committed to his charge.

It is most satisfactory to us to have the assurance that the share this Observatory has taken in the international work of photographic charting can be carried out. But this depends upon the Astronomer being authorized to retain the services of the junior assistant, Mr. Wallace, who, though at present only temporarily employed, has been specially trained for this service. We urge most strongly that Mr. Wallace be permanently appointed.

We recommended in a former report that the junior observers should have a small overtime allowance for night-work. This was granted, but was discontinued some months since, and the Astronomer informs us that he has been unable to obtain a reconsideration of the case. He represents that the alternative plan of giving equivalent time off day duty, while fair to the officers, hampers the work of the Observatory, and we beg to recommend Mr. Ellery's representations for the favorable consideration of the Government.

We append the Astronomer's Report, with a Supplement.

GEORGE VERDON, F.R.S.  
F. STANLEY DOBSON.  
W. C. KERNOT.  
M. H. IRVING, M.A.  
GEORGE ANDERSON.  
ALEXANDER BLACK.  
G. V. SMITH.

# REPORT OF THE GOVERNMENT ASTRONOMER TO THE BOARD OF VISITORS TO THE OBSERVATORY.

During the year ending 30th June, 1892, no very notable changes have been made in the Observatory, either as regards the Staff or its duties. All the routine work has been carried on as usual, and, with the exception of the operations in connexion with the Melbourne portion of the photographic charting of the heavens which at the date of my last report was only in its experimental stage, is much the same as for many years past.

## I.—THE STAFF OF THE OBSERVATORY.

No change has taken place in the Staff during the period embraced by this Report. On the 30th of June last it was as follows:—

Government Astronomer	...	...	Mr. ELLERY.
Chief Assistant	...	...	Mr. WHITE.
Assistant	...	...	Mr. MOERLIN.
„	...	...	Mr. BARACCHI.
„	...	...	Mr. SWAN.
„	...	...	Mr. QUAYLE.
„	...	...	Mr. KEMP.
„	...	...	Mr. INGAMELLS.
Weather Telegraph Clerk	...	...	Mr. HODGE.
Pupil Computer and Observer	...	...	Mr. WALLACE.
Mechanic	...	...	G. SWANSON.
Mechanical Attendant	...	...	J. BYRNE.
Junior Messenger	...	...	J. MANNIX.

The distribution of the duties amongst the Staff is generally the same as in previous years, except as regards Messrs. Baracchi, Kemp, and Wallace, who are now engaged with the astrographic work. Mr. Baracchi assists me in the supervision and the mathematical work connected with the undertaking; Mr. Wallace is the observer, and Mr. Kemp the photographer and general assistant.

## II.—BUILDINGS AND GROUNDS.

The buildings are generally in a good state. Some slight repairs have been made during the year; and the very useful addition of a new and commodious computing room, occupying the quadrangular space between the old and new transit rooms, was completed in June. Its dimensions are 28 feet long, 16 feet wide, and 13 feet high. It affords room for four or even five desks, and constitutes a great improvement, and relieves the officers from the inconvenience and discomfort of two or three having to occupy a room only large enough for one.

The various movable roofs and domes have worked well, and are in a satisfactory condition.

The grounds are also in moderately good order; the shrubberies have been much improved, and now afford a very useful shelter around our buildings.

Nothing has yet been done as regards lighting the approaches to the Observatory.

## III.—INSTRUMENTS.

The principal instruments and apparatus are for the most part in good working order. Some slight additions to our auxiliary apparatus have been acquired since my last report, notably that of a micrometric machine constructed in the Observatory workshop. This machine is named the *Slide Micrometer*, and was primarily designed by me for the examination and measurement of the photographic plates taken in the star charting work; but it is also made applicable to comparing, testing, and constructing linear scales and measures up to 12 inches, and has been found thoroughly efficient and extremely useful.

The astrographic telescope is in perfect order, and works admirably. A few little defects, inevitable in new instruments of such complexity, have been remedied or have cured themselves by wear. The guide telescope, which I spoke of in my last Report as being somewhat defective from physical defects in the glass of which the objective is constructed, has recently been furnished with a new and comparatively perfect object glass made by Sir Howard Grubb. It arrived in May. The guide telescope is now all that can be desired. The driving mechanism works splendidly, and automatically keeps the guide stars perfectly bisected for long periods.

The transit instruments (old and new) are in good condition, and continue to give satisfaction in their use. The old transit is, however, seldom used except in an emergency.

The smaller equatorials—8 and 4½ inches—are also in good working order.

The *Great Reflector* has again needed considerable attention to avoid the deterioration of the mirrors, especially during the winter months; and it almost appears as if the mirrors become more prone to tarnish with age. Owing to the extra work brought about by the astrographic undertaking, we have had to give up routine observing with this instrument.

The *Photoheliograph* has been in constant use throughout the year. It has been much improved by the alterations referred to in my last Report, and by some subsequent simplification in its moving parts.

*Magnetic and Meteorological Instruments, Clocks, &c.*—The minor instruments, such as the magnetographs, chronographs, clocks, meteorological instruments, and physical apparatus are in constant use and working order.

The Gray-Milne *Seismograph*, obtained about five years ago, and to which I referred in my Report of September, 1888, has never been in a satisfactory state, owing to the difficulties of obtaining a continuous trace of the movements of any of the three horizontal pendulums with the syphon pens. A few months since the mode of registration was altered from syphon pens to simple styles working upon a cylinder covered with smoked paper, each cylinder giving a week's record. The apparatus now works well, and is sensitive enough to indicate the occurrence of the slightest earthquake shock.

#### IV.—THE LIBRARY.

The library, which now contains 3,954 volumes, has been increased during the year by donations and exchanges 395, and by purchase 28, making an addition of 423 volumes.

A list of the works presented to the Observatory during the year is given in the Appendix.

#### V.—THE WORK OF THE OBSERVATORY.

The principal work done during the year is briefly summarized as follows:—

The transit circle has been constantly employed in determining places of guide stars used in the astrographic operations, in addition to the ordinary routine observations for clock and instrumental errors. The number of observations obtained with this instrument are—

R.A. Observations	...	...	...	...	...	3,590
N.P.D. "	...	...	...	...	...	2,233
Observations for Instrumental Errors—						
Collimation	...	...	...	...	...	151
Level	...	...	...	...	...	205
Nadir	...	...	...	...	...	199
Runs	...	...	...	...	...	50
Flexure	...	...	...	...	...	10

*The Great Telescope.*—Very little observation has been undertaken with this instrument, in consequence of the demands on the Staff arising out of the astrographic work. A good deal of attention has been necessary to keep the mirrors from deteriorating, especially in the damp weather of the winter months.

*The Astrographic Telescope.*—A good start and considerable progress has been made in the Melbourne share of the photographic chart and catalogue of the heavens. The number of photographic plates obtained of the stellar regions allotted to this Observatory up to 30th June was 278, besides these a great number have been obtained for testing the adjustment of the instrument, and for studying the important question of the relations between the photographic and photometric magnitudes of the images of stars on the plates.

The weather since May last has been very unpropitious for this work, and there have been very few nights fit for photography, nevertheless I consider we are very well advanced in the undertaking.

*Photoheliograph.*—During the year 201 sun pictures were taken with this instrument. Since February this year there has been a remarkable prevalence of sun spots, and our series of photographs gives an interesting history of their beginnings and progress.

*Terrestrial Magnetism.*—The observations and records have been continued as usual, and photographic curves of variations obtained, and the monthly determinations of absolute force have been regularly carried out.

During the year several naval officers, both British and foreign, engaged on hydrographic work have made complete series of magnetic observations at the Observatory for the purposes of reference and comparison, as this is one of the few standard Magnetic Stations in the Southern Hemisphere.

*Meteorology and Intercolonial Weather Service.*—This part of the Observatory work has gone on as in past years; there has been no noteworthy extension during the year. The number of rain-gauge stations has been increased by 24, making a total of 505 stations from which we receive regular records of rainfall. The Intercolonial Weather Telegraph Service now works satisfactorily in every respect, and the issue of weather charts and forecasts has been continued as hitherto.

*Time Distribution and Clock Control Service, Williamstown Time Ball, &c.*—The various methods of time signals, clock controlling, and time distribution have been continued as usual. The time-ball at Williamstown was dropped on 304 days; on 11 days the signals for dropping failed through defects on the telegraph lines. The positive and negative currents for clock controlling, on Jones' system, were supplied to the city and suburbs throughout the year, as were hourly clock signals on the special lines radiating from the General Post Office.

Instruments tested or rated for the public during the year—

Marine Chronometers	...	...	...	...	...	79
Thermometers	...	...	...	...	...	16
Surveyors' Chains	...	...	...	...	...	11
Aneroid Barometers	...	...	...	...	...	32
Linear Scales	...	...	...	...	...	6
Prismatic Compasses	...	...	...	...	...	2

#### VI.—PUBLICATIONS.

There has been no printing of *Astronomical Results* during the past year. In *Meteorology, &c.*, besides the usual daily weather bulletins and map, the *Monthly Record of Meteorology and Terrestrial Magnetism* has been issued up to February, 1892, and the *Rainfall Record* up to March, 1892.

#### VII.—REDUCTION IN STAFF AND EXPENDITURE AT OBSERVATORY.

In consequence of the necessity which has arisen for the reduction of expenditure in all departments of the State, I have been directed to reduce our estimates for the ensuing year. To do this it has been necessary not only to bring the contingent expenses to the lowest possible amount, but to close the Observatory workshop, and dispense with the services of our mechanic, Mr. G. Swanson. Besides this, I am sorry to report that Mr. White, the chief assistant, and Mr. Moerlin, the second assistant, having attained the age of 60 years, have been called upon to retire on their pensions on 30th September next. Although senior to both these officers, I have been informed that my services are to be retained for the

present. The loss of the services of two such experienced and efficient officers is a most serious one for the Observatory, while personally it will be a matter for deep regret, in view of the great number of years we have worked so pleasantly together. Mr. White has been my chief assistant for 31 years, and Mr. Moerlin my second assistant for 30 years, and it is a pleasant duty to state that during this large part of a life-time they have been most efficient and loyal officers to the Observatory and the State; their unremitting aim has always been to do the work intrusted to them in the best possible manner, regardless of fatigue and discomfort, and to insure as far as lay in their power that the work done at the Melbourne Observatory should be good, and at least compare favorably with that of other National Observatories. Mr. G. Swanson, the Observatory mechanic, has been in his position for 33 years, and has throughout a record of steady, useful, and intelligent service. I am glad to report that he is to be transferred to a position which will be practically a promotion to him.

Under the circumstances recited it will be absolutely necessary to bring the work of the Observatory within such limits as can be properly dealt with by our reduced Staff. Mr. Baracchi, my present third assistant, must take up as much as possible of the duties hitherto performed by both Mr. White and Mr. Moerlin, and I have at once to commence re-organization and a new distribution of duties.

A considerable portion of the regular astronomical, physical, and meteorological duty has been undertaken in co-operation with Observatories in Europe and America, and in the case of meteorology with the Australian colonies. As it will be very undesirable to abandon our share of any of these undertakings, I am making a strong endeavour to keep it up. I am afraid we shall have to give up all regular work with the great telescope for some time to come; this being so, I think it will be wise to protect the polish of the mirrors by varnishing them and keeping them properly covered. The telescope could then be restored to working order by a few days' refitting.

*The Astrographic or Star Charting work* is now in full operation, and we have up to present date secured between four and five hundred photographic plates of stars in the Melbourne portion of the charting, and although several European and other National Observatories commenced before us, I believe we are somewhat in advance. I do not think there will be any necessity to stop or even slacken this work if I am permitted to retain the assistance of Mr. Wallace, who has been now thoroughly trained in the astrographic observing, and is most efficient and expert. Mr. Wallace has been in training first as a pupil surveyor in the Lands Department, and since in the Observatory as a pupil observer for four years, but is now only employed here as a temporary assistant, which employment, in the ordinary course of events, must cease at the end of the year. With the reduced Staff it is of great importance that Mr. Wallace should be appointed to a junior position.

A very considerable part of the limited number of observing nights, as well as of the time of our observers, is given to visitors every month. It will be now necessary, with the reduced Staff, to limit the number of visitors' nights very considerably. The meteorological and physical work must also be brought within narrower limits, but I propose to continue the magnetic observations, both for absolute determination and the continuous photographic record of variation; for if these be stopped an important link in the chain of the limited number of observing stations around the world would be lost. For much the same reason I intend continuing the daily photographs of the sun. The meridian observations with the transit circle must be carried on, and although it may be possible to somewhat lessen the amount of work in this direction it will not be enough to release any of the Staff now employed on it.

In the re-organization of the duties it will be necessary, therefore, to put in abeyance observations with the great reflector; to reduce the meteorological work, including some of the photographic registration; to stop all ordinary extra-meridian observation, except the most important; to reduce our publications and issue of weather charts; and generally to limit our operations to the most important and urgent kind.

Some years ago the Board of Visitors, in their Report, advised the Government that the junior officers should be paid a gratuity for night work over and above their fixed salaries. This advice was adopted, but in May last an order was issued by the Government that all overtime payments should be stopped. I have endeavoured unsuccessfully to obtain an exception in the case of Observatory work, but I was authorized to allow officers who are in attendance during night hours to have equivalent time off day duty. This arrangement, although fair to the officers, cripples the work of the establishment, and is equivalent to the loss of one officer from the Staff.

R. L. J. ELLERY.

Melbourne Observatory, 2nd September, 1892.

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#### SUPPLEMENTARY REPORT TO THE BOARD OF VISITORS TO THE OBSERVATORY.

At the annual visitation to the Observatory on the 2nd September, the Board adjourned until to-day to receive a report from me as to how the work of the Department could be carried on with the reduced Staff after the 1st October.

The work has now been reduced and re-organized in accordance with the suggestions in my Annual Report. Messrs. White and Moerlin retired from duty on the 30th ultimo, and Mr. Baracchi has entered upon such of the duties hitherto undertaken by those officers as pertain to the somewhat reduced scope of the Observatory's undertakings.

At first all the officers will be rather hard pushed, but as Mr. Baracchi appears now to have obtained a good grasp of his new duties, I anticipate that in a month or two the work will go smoothly and well.

There is one point, however, that I must lay stress upon, viz., that the statement just made is on the supposition that our Staff remains as it is now, and that Mr. Wallace's services are retained as suggested in my Annual Report. We cannot carry on the astrographic undertaking without Mr. Wallace, as he has been fully trained in the work. Under these circumstances it will be very necessary to retain his services, and as now he is only temporarily employed until the end of this year, it is desirable to extend his engagement or appoint him to a junior position.

R. L. J. ELLERY,  
Government Astronomer.

Melbourne Observatory,  
7th October, 1892.

## APPENDIX.

## BOOKS, ETC., PRESENTED TO THE OBSERVATORY.

Title and Author.	By whom Presented.	
Spectroscopic Results at Royal Observatory, Greenwich, 1890 ...	Royal Observatory, Greenwich	England.
Position and Areas of Sun Spots and Faculæ, 1889 (3 copies) ...	Ditto ... ..	"
Note on the Recent Determination of the Longitude of Paris. H. H. Turner	Ditto ... ..	"
On a new Dome to be erected at the Royal Observatory, Greenwich. W. H. M. Christie	Ditto ... ..	"
Preliminary Note on Change of Personal Equation with Stellar Magnitude	Ditto ... ..	"
Sur la Détermination Récente de la long. Paris—Greenwich. MM. Bassot et Defforye	Ditto ... ..	"
Report of the Astronomer Royal to the Board of Visitors, 6th June, 1891	Ditto ... ..	"
Appendix to the Report of the Kew Committee, 1890 ... ..	Kew Observatory ... ..	"
Report of the Kew Committee for the Fourteen Months ending 31st December, 1891	Ditto ... ..	"
Stonyhurst College Observatory Results of Meteorological and Magnetic Observations, 1889-91	Stonyhurst College Observatory	"
Meteorological Observations, 1890 ... ..	Rousdon Observatory ... ..	"
Monthly Notices of the Royal Astronomical Society, Nos. 6-9, 1891, Nos. 1-5, 1892	Royal Astronomical Society ... ..	"
Proceedings of the Royal Society, Nos. 294-301 ... ..	Royal Society ... ..	"
Proceedings of the Rochester Academy of Sciences. Vol. I ... ..	Rochester Academy of Sciences	"
Measures of Sun Spots and Faculæ on Photographs taken at Greenwich, Dehra, Dun, and Melbourne, 1878-1881	Solar Physics Committee ... ..	"
Weather Reports, 1st July to 31st December, 1890 ... ..	Meteorological Office, London	"
The Monthly Weather Reports of the Meteorological Office from May to December, 1887	Ditto ... ..	"
Hourly Means of the Self-recording Instruments, 1887 ... ..	Ditto ... ..	"
Meteorological Observations at Stations of the Second Order, 1887 ...	Ditto ... ..	"
Cyclone Tracks in the South Indian Ocean ... ..	Ditto ... ..	"
Daily Weather Charts to illustrate the Track of Cyclones in the Arabian Sea	Ditto ... ..	"
Meteorological Charts of the portion of the Indian Ocean adjacent to Cape Guardafui and Ran Hafún	Ditto ... ..	"
Hourly Means, 1888 ... ..	Ditto ... ..	"
Harmonic Analysis of Hourly Observations ... ..	Ditto ... ..	"
Ten Years' Sunshine in the British Isles, 1881-90 ... ..	Ditto ... ..	"
Maandelyksche Windkaarten van den Noord-Atlantischen Ocean, 1 <sup>e</sup> and 2 <sup>e</sup> Series	Ditto ... ..	"
Meteorological Charts of the North Pacific Ocean ... ..	Ditto ... ..	"
Weekly Weather Report. Vol. VIII., Nos. 30-52 ... ..	Ditto ... ..	"
Longitudes, West Coast of Africa, 1889 ... ..	Hydrographer, Admiralty Office	"
Longitudes, Western Australia ... ..	Ditto ... ..	"
Cloud Nomenclature. Captain D. Wilson Barker ... ..	Captain D. Wilson Barker, F.R. Met. Soc.	"
On the Causes of the Phenomena of Terrestrial Magnetism ... ..	Henry Wilde, F.R.S.	"
How to use the Aneroid Barometer. Ed. Whympster ... ..	Edward Whympster ... ..	"
Walsingham Observatory Report for 1891 ... ..	T. E. Espin, Low Law, Darlington	"
Publications of the West Hendon House Observatory, No. 1. The Structure of the Universe	T. W. Backhouse, West Hendon House Observatory	"
Victoria Handbook, with Maps ... ..	Emigrants' Emigration Office	"
Proceedings of the Royal Irish Academy. Third Series, Vol. I., No. 5...	Royal Irish Academy ... ..	Ireland.
The Scientific Transactions of the Royal Dublin Society. Vol. IV., 2nd Series, Parts 6-9	Royal Dublin Society ... ..	"
The Scientific Proceedings of the Royal Dublin Society. Vol. VI. (N.S.), Part 10, and Vol. VII. (N.S.), Parts 1 and 2	Ditto ... ..	"
Ephemeris of the Satellites of Neptune and Saturn, 1891-2, and of the Moon, 9th November to 25th December, 1891. A. Marth	A. Marth, Markree Observatory	"
Journal of the Scottish Meteorological Society, 1890 ... ..	Scottish Meteorological Society	Scotland.
Proceedings of the Philosophical Society of Glasgow, 1890-1. Vol. XXII.	Philosophical Society of Glasgow	"
Madras Meridian Circle Observations, 1868-73 ... ..	Madras Observatory ... ..	India.
Madras Meteorological Results, 1861-90 ... ..	Ditto ... ..	"
Report of the Meteorology of India, 1889 ... ..	Meteorological Reporter to the Government of India	"
Indian Meteorological Memoirs. Vol. IV., Part 7 ... ..	Ditto ... ..	"
Report on the Administration of the Meteorological Department of the Government of India in 1890-91	Ditto ... ..	"
Meteorological Summary of the Monsoon Period, 1890-91 ... ..	Ditto ... ..	"
Results of Observations in Bengal, 19th April, 1891, to 7th May, 1892 ...	Ditto ... ..	"
Abstract of Thermometrical Observations at Chowringhee and Alipore, April, 1891 to April, 1892	Ditto ... ..	"
Rainfall in Bengal, April, 1891, to April, 1892 ... ..	Ditto ... ..	"
Memorandum on the Snowfall and Abnormal Features of the Weather in India, &c.	Meteorological Office, Calcutta	"
Cyclone Memoirs. Part IV. An Inquiry into the Storms of the Arabian Sea. W. L. Dallas	Ditto ... ..	"
Monthly Weather Review, January, 1891, to August, 1892 ... ..	Ditto ... ..	"
Meteorological Observations, 1890 ... ..	G. V. Juggarow Observatory	"
Brief Sketch of the Meteorology of the Bombay Presidency in 1890-1 ...	Meteorological Office, Bombay	"
Great Trigonometrical Survey of India, Vol. XIV., Principal Triangulation S.W. Quadrilateral	Surveyor-General, Calcutta ...	"

## APPENDIX—continued.

Title and Author.	By whom Presented.	
Transactions of the Royal Society of Victoria. Vol. II., Part 2, 1891 (two copies), and Vol. III.	Royal Society of Victoria ...	Victoria.
Report of the Melbourne Harbor Trust Commissioners ... ..	Harbor Trust Commissioners	"
Colonial Reports—No. 8, 1890, Bermuda and Bahamas; No. 9, Leeward Islands; No. 21, Trinidad and Tobago, Straits Settlements, British Guiana, St. Helena, Mauritius; No. 28, Gambia	Chief Secretary ... ..	"
Reports and Statistics of the Mining Department of Victoria, January to September, 1891	The Secretary for Mines ...	"
Annual Report of the Secretary for Mines, 1890 ... ..	Ditto ... ..	"
Victorian Year Book, 1890-1. Vols. I. and II. ... ..	Government Statist ...	"
Colonial Reports—Turks and Caicos Islands, British Honduras, and Gibraltar	Premier's Department ...	"
Victoria, Patents and Patentees, 1867-1885 ... ..	Commissioner of Patents ...	"
Victoria, Patents applied for and Patents granted, 1854-1866 ... ..	Ditto ... ..	"
Double Star Measures, H. C. Russell ... ..	Sydney Observatory ...	New South Wales.
Photographs of the Milky Way and Nubeculæ, taken at Sydney Observatory	Ditto ... ..	"
Results of Rain, River, and Evaporation Observations, New South Wales, 1889	Ditto ... ..	"
Results of Meteorological Observations made in New South Wales, 1889	Ditto ... ..	"
Results of Meteorological Observations made at Windsor, New South Wales, 1886-90	John Tebbutt, Windsor Observatory	"
Australasian Association for the Advancement of Science—Report of Meeting, Christchurch, 1891. Vol. III.	Australasian Society, A. S. ...	"
Journal and Proceedings of the Royal Society of New South Wales. Vol. XXV., 1891	Royal Society of New South Wales	"
Papers and Proceedings of the Royal Society of Tasmania for 1890 ... ..	Royal Society of Tasmania ...	Tasmania.
Rainfall Maps of Tasmania, 1889 and 1891 (two copies) ... ..	Government Meteorologist, Tasmania	"
Statistics of the Colony of Tasmania, 1890 ... ..	Government Statist, Tasmania	"
Tasmanian Official Record, 1892 ... ..	Ditto ... ..	"
Rainfall in South Australia and Northern Territory, 1890 ... ..	Adelaide Observatory ...	South Australia.
Meteorological Observations made in South Australia, 1889 ... ..	Ditto ... ..	"
Transactions of the Royal Society of South Australia. Vol. XIV., Part I.	Royal Society of South Australia	"
Report of the Board of Governors of the Public Library, Museum, and Art Gallery of South Australia, 1890-91	The Board of Governors of the Public Library, &c.	"
Evidence taken before the Public Service Commission, 1st Report ...	Public Service Commission, Adelaide	"
Report of the Hydraulic Engineer, Queensland ... ..	Government Hydraulic Engineer	Queensland.
Report of the Survey Department of New Zealand for 1890-91 ... ..	Survey Department of New Zealand	New Zealand.
Report of Geological Explorations, 1890-1 ... ..	The Director, Colonial Museum, Wellington	"
Twenty-sixth Annual Report of the Colonial Museum Laboratory ... ..	Ditto ... ..	"
Report of the Meteorological Service of the Dominion of Canada, 1887 ... ..	Meteorological Office, Toronto	Canada.
Transactions of the Astronomical and Physical Society of Toronto, 1890-1	Astronomical and Physical Society	"
Annals of the Observatory of Harvard College, New England Meteorological Society, 1889. Vol. XXI., Part II.	Harvard College ... ..	United States, America.
Discussion of Observations with the Meridian Photometer, 1882-8. Vol. XXIII., Part I.	Ditto ... ..	"
Observations made with the Meridian Photometer, 1882-8. Vol. XXIV.	Ditto ... ..	"
The Draper Catalogue of Stella Spectra. Vol. XXVII. ... ..	Ditto ... ..	"
Blue Hill Meteorological Observations. Vol. XXX., Part I. ... ..	Ditto ... ..	"
Variable Stars of Long Period ... ..	Ditto ... ..	"
History of the Harvard College Observatory ... ..	Ditto ... ..	"
Twenty-fifth Annual Report of the Director of the Astronomical Observatory of Harvard College	Ditto ... ..	"
Preparation and Discussion of the Draper Catalogue. Pickering ...	Ditto ... ..	"
Observations made at the Blue Hill Meteorological Observatory, 1890. Rotch	Ditto ... ..	"
Harvard College Observatory Time Service ... ..	Ditto ... ..	"
Forty-sixth Annual Report of Harvard College Observatory for Year ended 31st October, 1891	Ditto ... ..	"
Publications of the Washburn Observatory, Vol. VII., Part I. Meteorological Observations	Washburn Observatory ...	"
Bulletin of the Agricultural Experiment Station of Nebraska. Vol. IV.	University of Nebraska ...	"
The American Ephemeris and Nautical Almanac, 1893 and 1894 ... ..	Nautical Almanac Office ...	"
Astronomical Papers prepared for American Ephemeris, Vol. IV.; a new theory of Jupiter and Saturn; and Vol. II., Part V., a discussion of Transits of Venus, 1761-9	Ditto ... ..	"
Reports of the Superintendent of the U. S. Naval Observatory for the years ending 30th June, 1890, and 30th June, 1891, respectively ... ..	United States Naval Observatory	"
Magnetic Observations at Washington, 1886. Appendix I. ... ..	Ditto ... ..	"
The Solar Parallax and its related Constants. Harkness ... ..	Ditto ... ..	"
Washington Observations, 1885 and 1886 ... ..	Ditto ... ..	"
Report of the Chief Signal Officer, 1890 ... ..	Chief Signal Officer ...	"
Summaries of International Meteorological Observations, Jan. to June, 1889	Ditto ... ..	"
Publications of the Astronomical Society of the Pacific. Vol. III., Nos. 16-19; Vol. IV., Nos. 20-22	Astronomical Society of the Pacific	"
Smithsonian Report, 1888 and 1889, National Museum ... ..	Smithsonian Institute ...	"
An Account of the Progress in Astronomy, 1887, 1888. W. C. Winlock	W. C. Winlock ... ..	"
The Photocronograph and its Application to Star Transits ... ..	Georgetown College Observa-tory	"



## APPENDIX—continued.

Title and Author.	By whom Presented.	
Report of the Observatory of Yale University, 1890-1 ... ..	Observatory of Yale University	United States, America.
Annals of the New York Academy of Sciences. Vol. IV., Index; Vol. V., Nos. 1-8, Vol. VI., No. 1	New York Academy of Sciences	"
The Zodiacal Light. M. A. Veeder, M.D. ... ..	M. A. Veeder, M.D., Lyons, N.Y.	"
Proceedings of the American Academy of Arts and Sciences (N.S.) XVII., Whole S. XXV.	American Academy of Arts and Sciences	"
The Total Eclipse of the Sun, Jan. 1, 1889. Report of the Washington University Eclipse party	H. S. Pritchett ... ..	"
Publications of the Leander McCormick Observatory. Vol. I., Part 5	Leander McCormick Observatory	"
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