1901.

VICTORIA.

THIRTY-FIFTH REPORT

OF THE

BOARD OF VISITORS

TO

THE OBSERVATORY;

TOGETHER WITH THE

REPORT OF THE GOVERNMENT ASTRONOMER

FOR THE PERIOD FROM 1ST APRIL, 1900, TO 31ST MARCH, 1901.

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

By Authority:
ROBT. S. BRAIN, GOVERNMENT PRINTER, MELBOURNE.

No.. 22.—[9d.]—5969.

APPROXIMATE COST OF REPORT.

	£	s.	d.
Preparation.			
Printing (1,110 copies)	7	0	0

THIRTY-FIFTH REPORT OF THE BOARD OF VISITORS TO THE OBSERVATORY.

To His Excellency The Honorable Sir John Madden, *Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Lieutenant-Governor of the State of Victoria and its Dependencies, &c., &c., &c.*

We have the honour to inform Your Excellency that we made our annual visitation to the Melbourne Observatory on the 25th April last, and received the Report of the Government Astronomer (Mr. P. Baracchi), which is appended.

From this Report and from inquiries concerning the past year's work, and the general condition of the instruments and buildings, the Board found them in good order and well cared for. The routine work in connexion with astronomy, meteorology, terrestrial magnetism, &c., has been satisfactorily carried on during the period under review, and excellent progress has been made in dealing with the accumulated records of past years, an undertaking that was commenced about two years ago. The Board further finds that the reduction of the photographic plates of stars of the Melbourne and Sydney portions of the International Astrographic Survey is well in hand and making good progress, and that the scheme adopted by the Government Astronomer for training and employing young women for this special work has proved very successful. In the last paragraph of the Government Astronomer's Report he points out the urgent necessity that has now arisen for the appointment of a Chief Assistant Astronomer, and the Board having consideration for the large increase of supervision now required, recommends such an appointment should be made as soon as possible. Should this recommendation be adopted it will be of the greatest importance that a thoroughly competent person be selected for the position, and in order that the requisite qualifications of a Chief Assistant might be clearly defined, the Board appointed a committee of three of its members, with the Government Astronomer, to set out the minimum attainments it was necessary should be possessed by applicants for the office. The committee's recommendation is appended (Paper A).

In paragraph 18 also of the Report, the Government Astronomer calls the attention of the Board to the requirement of more accommodation in the Observatory buildings, and a careful inquiry into this matter showed that the officers, both permanent and temporary, are, through lack of office space, crowded to an insanitary degree, that valuable books and documents are unmethodically stowed away wherever available space can be found, rendering them to a large extent inaccessible, while some important instruments are placed, and have to be used, in buildings altogether remote from the Observatory.

Under these circumstances, we think that more accommodation as well as re-arrangement has become very necessary. The Board therefore requested the sub-committee already mentioned to formulate a scheme by which the requirements could be most efficiently and economically provided. The committee's report on this subject is appended in Paper B.

R. L. J. ELLERY, Chairman.
H. J. WRIXON.
W. C. KERNOT.
THOMAS R. LYLE.
ALFRED DEAKIN.

APPENDIX A.

QUALIFICATIONS FOR THE POSITION OF CHIEF ASSISTANT AT THE MELBOURNE OBSERVATORY.

1. Age not above 35 years (for persons outside the public service).
2. Good constitution.
3. Eye-sight strong and absolutely free from defects.
4. A thorough knowledge of mathematics as required for all astronomical and astrophysical investigations, and of astronomy both theoretical and practical.
5. Experience in the use of Observatory instruments, and in the making of astronomical observations generally.

Qualifications 4 and 5 to be chiefly based on one or more of the following lines of evidence, viz.:—

(*a*) A distinguished University career.
(*b*) To have held a responsible position as an astronomer in a reputed Observatory.
(*c*) To be favorably known in the astronomical world through astronomical work done and published.

APPENDIX B.

A request for extension of existing buildings, and addition of new ones, is made by Mr. Baracchi in his Annual Report for the following purposes, viz.:—

1st. To provide more office accommodation for the staff.
2nd. To provide a large strong-room for preserving original records, meteorological, astronomical, and photographic.
3rd. To provide more space for the library.
4th. To provide a large room for the whirling machine used for testing air-meters for the public and the Mines Department.
5th. To provide accommodation for the State standards of weights and measures.

The arguments brought forward to support the request are as follow :—

In regard to 1.—

Before retrenchment in 1892, when the staff was, up to then, at its maximum, it consisted of twelve (12) persons, including two messengers who, being then single men, occupied only two very small rooms. From 1892 to 1897 the staff was smaller, the minimum occurring in 1896–7, when it was reduced to eight (8) persons. At that time two more rooms were given to the caretaker and his family. The number of persons employed at the Observatory at any time previous to 1897 never exceeded twelve (12). There are at present eleven (11) persons in the permanent staff, and twelve (12) in the temporary staff, or nearly double the number of past years, and with less room.

For six members of the astrophotographic bureau there will be work for seven years, and for the other temporary assistants from three to five years, simply to clear up arrears. Useful work could be provided for the whole number for many more years. All National Observatories employ a large number of temporary assistants, that is, assistants who are not permanently appointed ; but who are, nevertheless, continuously employed. Seven persons of the astrophotographic bureau work in one room under difficulties and great inconvenience. They require at least twice as much space as they occupy at present. Six persons also work together in another single room, only large enough for four persons. The other five (5) officers work in three small rooms, in which a great deal of space is occupied by books and instruments.

In regard to 2.—

The original records of the Observatory, consisting of daily magnetic curves for more than thirty (30) years, daily curves of the tides in Hobson's Bay for twenty-nine (29) years, registers of meridian observations, astronomical negatives (some thousands), meteorological returns and weather charts, and a large number of other documents, are at present scattered in every room of the Observatory, quite unprotected from fire or other accident. They represent the work done in many years at a great cost, and could not be replaced.

In regard to 3.—

Every available corner and wall space in the Observatory is now fully taken up by books. Many papers, books, scientific periodicals, &c., come to the Observatory by every mail. An increasing mass of publications is accumulated without order or proper accommodation in most of the rooms used as offices, or out of the way ; and cannot be utilized for easy reference. The library is altogether in a state of great confusion chiefly for want of more space.

In regard to 4.—

The whirling machine, which is used frequently for the Mines and Railway Departments and for the public (especially in connexion with the Act on the ventilation of mines), is at present located in the model room of the Engineers, on the Yarra, near Prince's-bridge. At any time we may be told to remove it. Moreover, it causes considerable inconvenience and loss of time to have to test instruments away from the Observatory.

In regard to 5.—

As the administration of the Act on weights and measures is now under the Chief Secretary's Department, the Observatory may be called upon to take charge of the standards and apparatus in connexion thereto, which are now stored in two very large rooms at the Department of Customs. There is no room for these at the Observatory at present. No doubt the Observatory is the proper place to keep the State standards of weights and measures, and to perform the technical duties in connexion with the Act.

The committee appointed by the Board of Visitors to investigate this matter, after full consideration of the circumstances of the case, proposes and recommends to meet the requirements pointed out by Mr. Baracchi by the following scheme, viz. :—

(*a*) To build new quarters for the caretaker, detached from the main building, near the gardener's shed, between the main building and the great telescope house. Superficial space to be 1,000 square feet, a little more than the area occupied by the caretaker at present. Estimated cost, £350.

(*b*) To add a new room adjoining the prime vertical room at the south-west end of the main building, for the use of the astrophotographic bureau. Superficial space, 600 square feet; height, 15 feet. Estimated cost, £350.

(*c*) To add a new room adjoining the Board room at the north-west end of the main building for the reception of the whirling machine, and to be used as a general testing room. Superficial space, 1,200 square feet; height, 15 feet. Estimated cost, £675.

(*d*) Repairs and alterations to the part of the main building now occupied by the caretaker and his family, in order to utilize this space for storing original records, and for additional accommodation for the library and staff. Estimated cost, £275.

(*e*) Extension of closets, urinals, &c. Estimated cost, £50.

Total estimated cost, £1,700.

REPORT ON THE STATE OF THE MELBOURNE OBSERVATORY AND ON THE WORK DONE DURING THE PERIOD 1ST APRIL, 1900, TO 31ST MARCH, 1901.

1. *Grounds.*—From time to time I have had to report considerable changes in the level adjustment of the 8″ transit circle, and that I suspected that the trouble might be caused, to some extent, by rain-water penetrating into the soil near the foundations of the piers. A deep trench filled with coke and loose gravel was accordingly made all around the transit circle room in June last, and since then the level error of the instrument has been remarkably steady.

The Metropolitan Board of Works completed the sewerage service within the Observatory grounds in September last, but the house connexions have not yet been made.

The general state of the grounds, excepting the main drive and paths, is satisfactory. A plan for doing away with the open drains round the main buildings, and for improving the roadway and paths, is under consideration at the Public Works Department.

2. *Buildings.*—General repair to the roofing of the main buildings and caretaker's quarters were made last July.

A large window was opened in the south wall of the old prime vertical room in order to provide more suitable light, as the room is required for the examination and measurement of photographic plates.

New shelves were erected in the eastern passage.

The lobby of the astrophotographic house was fitted with suitable frames and accessories for the verification of barometers.

A fire-place was built in the south room of the caretaker's quarters.

The room underground formerly used for stores has been fitted for the reception of the Milne seismograph.

3. *The Instruments.*—An apparatus for measuring our cloud photographs was made here under my supervision. It consists of two reading microscopes, movable in two directions at right angle to each other, over a metallic frame, inclined at an angle of 45°, into which a pair of negatives are placed side by side with adjustments provided for orientation.

Millimeter scales cut on thin glass plates are attached to, and in focus of, the reading microscopes, which can also be adjusted in the focus of the plates, very nearly. The negatives to be measured are of the same size as the plates used for the astrophotographic telescope, and, like those, are marked with the lines of a reseau forming squares of 5 millimeters. The measures consist in determining the perpendicular distance, in millimeters, of each of a series of selected points in the image of the cloud, from the two nearest sides of the square within which each point lies, by simply reading off the scales to the nearest tenth of a millimeter, which is sufficient approximation for the purpose.

A set of three half-second invariable pendulums with suspension stand, flash apparatus, and all necessary accessories for determination of the force of gravity by the differential method, have been constructed here in Melbourne, by Mr. C. Otto, under my close supervision. These instruments, which are in every respect similar to those constructed at the Observatory workshop in 1894 (fully described in Proceedings of the Royal Society of Victoria, page 227, Vol. VI., new series), are to be lent to Professor Gregory, chief of the scientific staff of the British Antarctic Expedition, for use in high southern latitudes.

In view of the risks and perils of antarctic navigation, I did not think it desirable to part with our original pendulums, as their loss, in case of accident, would be far more deplorable than the loss of the new pendulums, for the reason that upon the former depend the results of a considerable amount of

observations made here and at various places in England, which may require verification at some future date. When the request for instrumental equipment and co-operation in gravity work was made by Professor Gregory, the Under-Secretary readily recognised that the opportunity of thus assisting the expedition should not be lost, and granted the necessary expenditure for the purpose.

Among the minor instruments made during the year may be mentioned a driving apparatus fitted to the whirling machine for testing air-meters, and a gas regulator for the registering magnetic instruments.

The list below shows the instruments purchased since 1st April, 1901.

12 Board of Trade barometers.
48 Solar radiation thermometers.
48 Maximum thermometers.
48 Minimum thermometers.
48 Dry bulb thermometers.
48 Terrestrial radiation thermometers.
1 Dial metallic thermometer.
54 Rain gauges complete.
37 Rain gauge glass measures.
13 Wind vanes.
2 Dines pressure tube anemometers.
2 Office clocks.
3 Microscopic objectives.
1 Chronograph.
4 Telephone receivers and other minor telegraphic instruments.

Additions and alterations were made at various times to the measuring machines, micrometers, and self-registering meteorological instruments. All the instrumental equipment of the Observatory has been kept in satisfactory working order, and is at present in good condition.

The Staff.

4. The following changes have occurred in the temporary staff since the date of my last Report, viz.:—

Miss C. Peel, who was temporarily transferred from the Education Department to the Observatory on 2nd November, 1898, was permanently appointed to the position of assistant astronomical computer on the 9th of November, 1900.

Miss W. Hall, of the astrophotographic measuring bureau, resigned her position on the 4th February, 1901, and was succeeded by Miss M. Suthmier, who was appointed on 12th February, 1901.

Master A. G. Corbett, who was one of the young computers engaged in the measurement of magnetic curves, severed his connexion with the Observatory on 4th January, 1901, and was succeeded by Master A. Maguire, who was appointed to the position on 21st February, 1901.

Miss Clare Besley was appointed, on 4th February, 1901, to the position of temporary assistant for the measurement and reduction of cloud photographs, in place of Miss T. Levy, who, I deeply regret to report, died suddenly on 6th January, 1901, while on her annual holidays.

Junior messenger E. M. J. Hamilton was transferred from the Observatory to the Postal Department on 6th August, 1900. J. T. Robinson was temporarily appointed to act as junior messenger, and remained on duty at the Observatory till 2nd March. On the same date A. E. Anniss was appointed junior messenger.

The staff now consists as follows:—

Chief Assistant	Vacant.
Second Assistant	Mr. W. J. Swan.
Third Assistant	Mr. E. T. Quayle, B.A.
Fourth Assistant	Mr. W. J. Wallace.
Meteorological Assistant and Photographer ...	Mr. F. Kemp.
Meteorological and General Assistant ...	Mr. F. N. Ingamells.
Weather Telegraph Clerk	Mr. D. Hodge.
Junior Clerk	Mr. N. Allen.
Astrophotographic Assistant	Miss C. E. Peel.
Caretaker, acting as Clerk	J. J. Mannix.
Senior Messenger and Mechanical Attendant	J. Byrne.
Junior Messenger	A. E. Anniss.

Temporary Staff.

Miss E. Harker Miss L. E. Lewis Miss M. A. Phillips Miss H. F. Skoglund Miss M. Suthmier	Astrophotographic measuring bureau.
Miss F. Sternberg Miss C. Besley	Measuring and reducing cloud photographs and visual cloud observations.
Master J. Moroney Master G. Macgowan Master J. Robson Master A. Maguire	Measuring and reducing the 30 years' photographic records of terrestrial magnetism.

Mr. E. J. B. White has been employed from time to time in the preparation of the third Melbourne General Catalogue for 1890.

Mr. R. Vaughan has attended daily to the time-ball and tide-gauge at Williamstown.

A gardener and a charwoman have been employed as in former years.

There are also twelve (12) meteorological observers who receive an annual bonus, and 692 honorary observers and rainfall recorders under the control of the Observatory.

Mr. McAllan was lent by the Postal Department for three weeks in September last to relieve the weather telegraph clerk, Mr. D. Hodge, during his annual holidays.

Messrs. Killen, Harvey, and Mulvaney continued to operate at the cloud station on the roof of Parliament House on the occasions when simultaneous cloud photographs were taken with the Observatory.

I regret to report that much sickness has prevailed among some of the members of the permanent staff, necessitating prolonged absence from duty, especially in the case of Mr. F. Kemp, who was absent for four months, and Mr. D. Hodge, who has been ill since Christmas, and is not expected to commence work again till May.

This interfered considerably with the proper management of the Observatory at times, and frequent changes had to be necessarily introduced in the distribution of the daily duties of officers engaged in clerical and meteorological work. I was also obliged to employ a photographer two or three days a week to develop the daily photographic records during Mr. Kemp's illness.

Messrs. Swan, Quayle, and Wallace discharged the same duties as in previous years.

No alteration was made in the distribution of the work of the temporary staff since my last Report, and the persons recently appointed to fill positions rendered vacant through death or resignation, as already referred to, were allotted the same duties as those of their respective predecessors.

Meridian Work.

5. The meridian observations were made with the 8″ transit circle which maintained a relatively steady level and azimuth since last June, when the drain around the transit-room was made as already mentioned.

The extreme range of variation in level and azimuth error was $0^{s}{\cdot}17$ and $0^{s}{\cdot}37$ respectively. The table below shows the number and distribution of the observations:—

	Observations in—	
	R.A.	N.P.D.
Azimuth stars ...	309	123
Clock stars ...	669	—
List stars ...	1,156	1,169
Total ...	2,134	1,292

Observations for Collimation	100
Runs	43
Level	144
Nadir	87
Flexure	12

The list stars were selected as in previous years from the plates of the Astrophotographic catalogue, to serve as fundamental stars for the reduction of the plates. The total number of these stars now completely observed three times or more is 3,638.

All the meridian observations for 1900 have been reduced, including the preliminary grouping of separate results, and the reduction of observations to 31st March of the current year are well in hand.

The annual catalogue for 1899 has been completed.

The third Melbourne general catalogue, comprising all the meridian observations made with the 8″ transit circle from the time of its erection in 1884 to the year 1893 inclusive, containing 3,100 stars, has also been completed, and is now undergoing revision and independent re-computation of the precessions. It will probably be ready for the printer by the end of the year.

Astrophotographic Operations.

6. The table below shows the number of plates exposed for the chart series, duplicate catalogue series, adjustments, &c.:—

	Passed as Satisfactory.	Rejected.
Chart plates with triple exposures of 30^{m} each ...	63	9
Chart plates with single exposure of 60^{m} each ...	49	8
Catalogue plates (duplicate series)	39	2
Test plates on South Polar region	30	—
Do. do. on Oxford type charts	10	—
Plates for trails, adjustment of centre, &c.	32	—
Plates for the construction of magnitude scales ...	38	—
Total	261	19

This completes the chart series with single exposure of one hour, and the duplicate series of catalogue plates for the zones $-90°$ $-85°$. A list of positions of 274 stars selected from the catalogue plates was prepared for observation with the transit instrument.

The Measurement of the Sydney and Melbourne Plates of the Astrophotographic Catalogue Series.

7. The New South Wales Government has continued to pay its share of the cost of this work which has been carried on by the Measuring Bureau at the Melbourne Observatory. The measurements were made with the same instruments and following the same methods and rules as described in the Appendix to my last Report to the Board.

In the Appendix referred to a statement is made in regard to the measuring apparatus designed by Sir David Gill, and made for us by the Repsolds, to the effect that in point of construction and workmanship it fully bore out the reputation of the makers, and confirmed the reality of all the advantages and capabilities ascribed to it by its designer.

I am now glad to add to the above statement that the instrument which has been constantly kept at work from 30 to 35 hours a week for the last twelve (12) months, continued to give complete satisfaction. The results obtained have even surpassed my expectation in point of speed, the present speed being twice as great as that stated in the Appendix referred to above. The details of the work are set forth in the Appendix attached, which is the second joint report by Mr. Russell and myself, prepared for the information of our respective Governments.

Great Telescope Photoheliograph and other Equatorials.

8. These instruments were used only on a few occasions for observation of comets and planets, and for taking sun pictures on days of some special interest, but no systematic work was done with them.

Time Service.

9. The time-ball at the Williamstown light-house was dropped at 1h. 0m. 0s. Victorian statute time, corresponding to 3h. 0m. 0s. a.m. Greenwich time on 294 days. There were thirteen failures, of which nine were traced to faults on the lines outside Observatory control and four to absence of the attendant at Williamstown.

Time signals were supplied on week days to the Post Office at Melbourne, and thence to all telegraph stations in Victoria, also to the Railways and Public Buildings.

Meteorological Service.

10. This service has been carried on as in former years. There have been fifty-three (53) new rainfall stations established since 31st March, 1900, and the total number of meteorological stations in Victoria, including all grades, is now 704.

The weather table issued daily by the Postal Department was considerably extended and modified to suit public requirements. The new arrangement, which was introduced on the 1st of January last, necessitated my visiting a number of stations over the State in order to select new observers and localities required for the purpose.

The Department of Customs, following my recommendations in regard to the coast barometers, under its control, for the service of the sea-faring communities, has provided suitable shelter for these instruments, and generally improved their condition, so that this service is gradually being placed in a satisfactory state of efficiency. I have already visited some of the localities, and purpose to complete my inspection during the winter months.

Rating Chronometers and Testing Meteorological, Nautical, and Survey Instruments for the Public.

11. This service has also been carried on as in former years. The whirling machine for testing air-meters, which is still housed in the model-room at the Engineers' Depôt for want of accommodation at the Observatory, was extensively used for testing air-meters for the Department of Mines.

Terrestrial Magnetism.

12. The magnetographs have been in continuous use for registering, photographically, the variation in the magnetic elements; but owing to abnormal diurnal changes of the gas pressure and defects in the gas service at the magnet-house, the lights in use with these instruments failed at irregular times during the winter months of last year, and many interruptions were thus caused in the records, amounting in the aggregate to 353 hours. After trying various experiments with gas regulators in September and October we succeeded in obtaining steadiness of pressure throughout the 24 hours of the day, and the lights have been very good and constant ever since.

The measurement of magnetic curves and reduction of records accumulated since 1868 have been steadily carried on by the temporary computers specially engaged for this work. The number of one-day curves measured in the year ending 31st March, 1901, is 9,143, comprising the years 1868, 1881, 1885, 1886, 1887, 1888, 1889, and 1891.

Registration of Tides.

13. The daily traces representing the continuous record of the height of tides at Point Gellibrand have been continued without interruption.

The complete reduction and discussion of the whole mass of tide curves and records accumulated at the Observatory since 1872 has never been undertaken, and the uncertain state of our knowledge of tides on the Victorian coast, and in Port Phillip Bay, makes it all the more necessary to utilize all the data in our possession.

But an investigation of this kind cannot be undertaken until some of the work in hand has been disposed of.

Cloud Photography and Reduction of Cloud Observations made in Victoria in 1896 and 1897.

14. This work, as I have mentioned in previous Reports, was undertaken in connexion with the scheme of the International Meteorological Committee. The reduction of the visual observations made at all the Victorian stations was continued by two temporary computers specially engaged for the purpose, and is now well advanced. Sixty-two (62) additional pairs of photographs were obtained to fill in gaps in the series which is now approaching completion.

The measurements of these photographs, which are made directly from the negatives with the machine described in the earlier part of this Report, will be completed, probably, in the course of the present year.

Visitors.

15. The rule of showing visitors over the Observatory on Wednesday afternoons has been adhered to, and 298 persons received admission during the year ending 31st March, 1901 ; but the old custom of setting three or four evenings apart for the public, monthly, which I found necessary to discontinue in 1896, has not been resumed, and it is not intended to re-introduce it at present, as it would interfere with the management of the Observatory. One hundred and thirteen persons were, however, admitted on appointed evenings last year, those being cases which demanded special consideration.

The Library.

16. The additions to the Observatery Library consisted of 343 books, 26 periodicals, and 154 pamphlets presented ; 73 books purchased, and 17 periodicals subscribed for ; 36 volumes were bound by the Government Printer's Department.

In late years, owing partly to the increasing necessity for more room, and partly to the want of a more efficient and systematic control, the library has been gradually drifting into disorder, which, during the last twelve months, owing to the prevailing sickness of officers already referred to, has reached a state of hopeless confusion, especially in regard to the great mass of scientific papers and pamphlets. This matter will be brought before the Under-Secretary at the proper time, with the view of obtaining the assistance of a competent person, an officer of the Public Library, if possible, to place our library in a satisfactory condition ; but, as the first requirement is more space, I must wait until the question of extending the Observatory buildings, for other purposes, will be dealt with.

Seismology.

17. The new Milne seismograph has been placed in the western underground room, formerly used for the Observatory stores. Unavoidable delay occurred in preparing and fitting this room suitably for the reception of the instrument and for the work that has to be done with it, in consequence of which, and for other reasons, I have not been able as yet to set it going. But everything is now ready, and I hope the regular photographic registration of seismic movements will be commenced in a few days.

I have made preliminary arrangements for the systematic registration of earthquakes in many parts of the State on a uniform plan and in accordance with the requirements of the science of Seismology. The organization of this service will be completed, probably, before the end of this year.

General Remarks.

18. The administration of the Act on weights and measures which was hitherto under the care of the Department of Customs is, I believe, to be taken over by the Chief Secretary's Department, and I understand that the Observatory may probably be called upon to take charge of the standards and equipment in connexion thereto.

I have already pointed out in this and in a previous Report the necessity for more building accommodation for the staff and the library, and for the permanent installation of the large whirling apparatus. I may now add that a place is also required for the storage of original records, negatives, and other important documents in perfect safety from fire. Moreover, if the standard weights and measures of the State are in future to be kept at the Observatory, for which there is no room at present, it may perhaps be advantageous and economical to consider all these matters together, so that the whole of the accommodation required may be comprised in one single scheme, and provided for by a single vote, rather than dealing with each separate item independently at different times.

I have again to inform the Board that without a Chief Assistant I am unable to exercise efficient supervision over the Observatory work, and to devote attention to other astronomical matters which now are, but should not be, neglected.

I would therefore urge the Board to take steps to secure the appointment of a competent person to the vacant post, and to define the qualifications which applicants should possess, for the information of the authorities by whom the appointment is to be made.

April, 1901. P. BARACCHI.

APPENDIX.

On the measurement of the Astrophotographic plates (catalogue series), comprising the zones allotted to the Sydney and Melbourne Observatories. Joint Report by the Government of New South Wales and Victoria.

Since our last Report, presented May, 1900, this work has been continued at the Melbourne Observatory by the Measuring Bureau appointed in November, 1898, the cost of which is paid in equal shares by the State Governments of New South Wales and Victoria.

The measurements were made with the Repsold micrometric apparatus designed by Sir David Gill, which has continued to give very great satisfaction, and with the filar-micrometer measuring machines of the Melbourne Observatory, following the same methods and rules which, as well as the said instruments, were referred to in our last report.

We are glad to state that the speed at which the measurements are made with the Repsold's instrument, at present, is about twice as fast as that of twelve months ago. We find that 170 stars can be measured in one hour, and that a plate containing 500 stars can be measured in the direct and reversed position in one working day of from six to seven hours, by two observers each acting as recorder for the other alternately in periods of one hour, including the revision of measures which, in the two positions of the plate, are found to differ by 0″6 or more. These discrepant measures, however, rarely amount to more than 2 or 3 per cent.

The number of plates and aggregate number of stars measured to 31st March, 1901, are as follows :—

Sydney plates, 58	...	...	Aggregate number of stars, 54,333
Melbourne plates, 88	...	...	„ „ „ 19,555

An order for a second measuring instrument was sent to the Repsolds last year ; but, unfortunately, the makers have informed us that they will not be able to deliver the instrument until the end of the current year. The new apparatus devised by Mr. Russell, mention of which was made in our last report, is now approaching completion, and will be ready for trial shortly.

With the present bureau equipped with three quick measuring machines, it is estimated that the work of each year would probably comprise the measures of 250,000 stars.

H. C. RUSSELL,
Government Astronomer of New South Wales.

P. BARACCHI,
Government Astronomer of Victoria.

By Authority: Robt. S. Brain, Government Printer, Melbourne.