

1902.  
VICTORIA.

---

THIRTY-SIXTH REPORT

OF THE

BOARD OF VISITORS

TO

THE OBSERVATORY;

TOGETHER WITH THE

REPORT OF THE GOVERNMENT ASTRONOMER

FOR THE PERIOD FROM THE 1ST APRIL, 1901, TO THE 31ST MARCH, 1902.

---

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

---

By Authority:

ROBT. S. BRAIN, GOVERNMENT PRINTER, MELBOURNE.



# THIRTY-SIXTH REPORT OF THE BOARD OF VISITORS TO THE OBSERVATORY.

---

To HIS EXCELLENCY SIR GEORGE SYDENHAM CLARKE, *Knight  
Commander of the Most Distinguished Order of Saint Michael  
and Saint George; Fellow of the Royal Society; Governor of the  
State of Victoria and its Dependencies in the Commonwealth of  
Australia, &c., &c., &c.*

We have the honour to inform Your Excellency that we made our annual visitation to the Melbourne Observatory on the 7th May last, and received the Government Astronomer's Report of the last year's proceedings, the condition of the grounds, buildings, and instruments. We also inspected the records of reductions of past year's observations, which are now in progress. From these sources we have ample evidence that the special duties of this establishment in all its branches have been assiduously and efficiently carried on during the period under review, and that the various instruments and apparatus are in good condition and well cared for.

Excellent progress has also been made with the tabulation of the results of the Melbourne and Sydney portion of the astrophotographic survey of the southern heavens, for which a special staff of young ladies has been trained and temporarily employed at the joint expense of both Observatories, a method for accomplishing this great task that appears to us to be very successful, satisfactory, and most economical.

We are glad to find that steps have already been taken to supply the extra accommodation so urgently required and referred to in our Report of last year.

We regret, however, to hear that the position of chief assistant has not yet been filled, for it has become more and more urgent from the fact, among other reasons, that new and important duties will shortly devolve on the Astronomer in connexion with the bureau of standard weights and measures, which, we are informed, is to be placed in Mr. Baracchi's charge. Mr. Baracchi's predecessor always had two trained astronomers as assistants, but now what was formerly the work of three men falls entirely on his shoulders.

All the present staff except Mr. Baracchi are either observers or computers, each doing the work he has been trained to do accurately and well, but among them all there is no one competent to take charge of an Observatory even for 24 hours. The Observatory, one of the most important in the Southern Hemisphere, is primarily a place for astronomical research, and its existence can only be justified by research work carried on in it. Mr. Baracchi has already proved himself to be eminently qualified to conduct astronomical research, but he is practically unable to attempt such investigations, as his time is more than fully occupied with the routine work of administration and detail that could equally well be done by a chief assistant. We cannot expect the reputation of our Observatory to be maintained if we compel the director to spend his time conducting correspondence, arranging details of the work, supervising computers, and travelling about the country inspecting barometers and rain-gauges.

Under the head of "Time Service" in the Government Astronomer's Report, he refers to a suggestion made by the Engineer of Ports and Harbors, that owing to most of the shipping now berthing at the Port Melbourne piers, a new site for the time-ball now at Point Gellibrand is very desirable. The Board, therefore, has requested one of its members, the Naval Commandant, to confer with the Engineer of Ports and Harbors and favour it with a definite recommendation on the matter.

R. L. J. ELLERY.  
H. J. WRIXON.  
F. TICKELL.  
ALFRED DEAKIN.  
THOMAS R. LYLE.  
W. C. KERNOT.

## REPORT ON THE STATE OF THE MELBOURNE OBSERVATORY AND ON THE WORK DONE DURING THE PERIOD 1st APRIL, 1901, TO 31st MARCH, 1902.

*Buildings and Grounds.*—I am pleased to report that the erection of the new buildings specified in Appendix B of last year's Report has been authorized by the Government.

Unfortunately the final approval was delayed until the end of last January, and the original amount of £1,700 recommended by the Board for the purpose was reduced to £1,500, involving further alterations of the plans as at first prepared by the Public Works Department, in consequence of which only one of the buildings, the caretaker's cottage, has been commenced, but it is expected that the other buildings will be erected within the next six months.

The repairs, alterations, and additions to the existing buildings were as follow, viz.:—

Re-adjustment of the level of gas-pipes leading to the magnetic houses.

Repairs to the roof and shutters of the 8" transit circle room.

New ventilators, new piers, and fittings to the underground seismograph room.

New shelvings for storing rainfall records.

Other miscellaneous repairs of minor importance, and addition of two gas stoves in messenger's quarters.

A general cutting down of trees within the Observatory grounds was done last winter. This unpleasant task was rendered necessary for observations of celestial objects at low altitudes. Many more trees still require to be cut down for the same purpose, outside the Observatory enclosure, but I have found it very difficult to obtain permission to make a complete clearance owing, it is alleged, to a strong public feeling against the disfiguring of the parks, especially in regard to the adjoining Government House grounds.

This interference of trees with Observatory work is becoming worse every year, and I would urge the Board to take decisive steps to insure for the Observatory permanent freedom from obstructions of this or any other kind.

*Instruments.*—Since the date of my last report, the following new instruments were obtained for Observatory purposes, and for renewal at country meteorological stations, viz.:—

Chronometer Lachlan, No. 450.

Apparatus for testing aneroids.

Four (4) aplanatic magnifiers.

One (1) 3-in. dial stop-watch, for use in testing air-meters.

Eight (8) thermometers.

Six (6) Stevenson's screens.

Fifty-five (55) rain-gauges and 110 glass measures.

Alterations in the gear of the driving clock of the magnetograph were made for the purpose of obtaining a faster speed of the revolving drums (one revolution in two hours) on special occasions to be mentioned later. Alterations in the driving gear of the whirling machine for testing air-meters were made for the purpose of obtaining finer gradation of velocities.

Electric contacts for chronographic registration were mounted in chronometer Lachlan, No. 450. The astrophotographic telescope, the 8" transit circle, and the machines used for measuring astrophotographic plates were thoroughly examined periodically, once every fortnight, cleaned and adjusted, when necessary.

The 8" and 4½" equatorials were overhauled in the winter. The tide-gauge and wells were thoroughly cleaned in April, 1901. The instrumental equipment in general was maintained in good working order, and is at present in a satisfactory state. I am sorry to report that the second micrometer for the measuring of astrophotographic plates which was ordered from Repsold and Söhne in July, 1900, has not yet been delivered by the makers.

*The Permanent Staff.*—No changes have occurred in the permanent staff since my last Report.

Mr. D. Hodge resumed his duties on 1st May last, after a long and severe illness.

Mr. N. Allen has been absent since 16th October last, on account of illness, and is still in a very precarious condition.

### THE PERMANENT STAFF.

Chief Assistant ... ..	...	...	Vacant.
Assistant Observer and Computer ... ..	...	...	Mr. W. J. SWAN.
Assistant Observer and Computer ... ..	...	...	Mr. E. T. QUAYLE, B.A.
Assistant Observer and Computer ... ..	...	...	Mr. W. J. WALLACE.
Meteorological and Photographic Assistant ... ..	...	...	Mr. F. KEMP.
Meteorological and General Assistant ... ..	...	...	Mr. F. N. INGAMILLS.
Weather Telegraph Clerk ... ..	...	...	Mr. D. HODGE.
Clerk ... ..	...	...	Mr. N. ALLEN.
Assistant Astronomical Computer ... ..	...	...	Miss C. E. PEEL.
Caretaker, acting as Clerk ... ..	...	...	Mr. J. J. MANNIX.
Senior Messenger and Mechanical Attendant ... ..	...	...	Mr. J. BYRNE.
Office Cleaner ... ..	...	...	Mr. A. E. ANNISS.

The following changes occurred in the temporary staff:—

Miss H. Skoglund resigned 30th November, 1901, succeeded by Miss E. Langley on 2nd December, 1901.

Miss C. Besley resigned 31st August, 1901, succeeded by Miss Queenie Sloman on 2nd September, 1901.

Miss L. A. Saunders appointed for temporary clerical work, 23rd April, 1901, resigned 30th November, 1901, succeeded by Miss R. Rayson on 2nd December, 1901.

Miss F. I. Chapman appointed 23rd April, 1901, resigned 31st May, 1901, succeeded by Miss M. Brennan on 15th July, 1901.

Mrs. MacWilliam appointed 23rd April, 1901.

Mr. W. Roycraft temporarily appointed during the absence of Mr. N. Allen.

The temporary staff consists at present as follows:—

Miss E. HARKER	}	Astrophotographic measuring bureau.
Miss E. LANGLEY		
Miss L. E. LEWIS		
Miss M. A. PHILLIPS		
Miss M. SUTHMER		
Miss M. BRENNAN	}	Engaged in reducing arrear meteorological records of all country stations.
Mrs. L. MACWILLIAM		
Miss R. RAYSON		
Miss Q. SLOMAN		
Miss F. STERNBERG		
Mr. J. MORONEY	}	Engaged in reducing the 30 years' photographic records of terrestrial magnetism.
Mr. G. MACGOWAN		
Mr. J. ROBSON		
Mr. A. MAGUIRE		

Mr. W. Roycraft appointed temporarily in lieu of Mr. Allen, absent on sick leave.

The Telegraph Operator, Mr. E. McAllan, was supplied by the Postal Department on payment at the rate of 10s. per day, to relieve the Weather Telegraph Clerk, Mr. D. Hodge, during his three weeks' annual leave of absence.

Mr. (now Rev.) E. J. B. White was occasionally employed during the last year in astronomical computations chiefly for the preparation of the third Melbourne Catalogue.

He relinquished his connexion with the Observatory last December, and Mr. H. J. R. Lawrence is now on probation with a view to continuing this class of work whenever extra assistance may be required.

Mr. R. Vaughan has attended daily to the dropping of the time-ball and to the self-registering tide-gauge at Point Gellibrand (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 of £10, and 748 honorary observers and rainfall recorders, under the control of the Observatory.

*The Work.*—No alterations were made since my last report in the distribution of the Observatory work, which has, in every respect, been carried on by the permanent and temporary staffs as in previous years, and the persons recently appointed to fill temporary positions rendered vacant through resignation, were allotted the same duties as those of their respective predecessors.

#### MERIDIAN WORK.

The instrument employed was the 8" transit circle.

The trouble experienced in regard to the unsteadiness of instrumental errors (level and azimuth), previously to the winter of 1900, when a new drain was constructed around the transit-room, has since entirely disappeared, showing that imperfect drainage was the primary, and perhaps the only, cause of the evil.

The observations made with this instrument since 1st April, 1901, are as follows:—

	Observations in—	
	R. A.	N. P. D.
Azimuth stars ... ..	322	138
Clock stars ... ..	612	—
List stars ... ..	1,059	1,064
Cape stars ... ..	216	217
Miscellaneous observations	12	12
<b>Total ... ..</b>	<b>2,221</b>	<b>1,431</b>
Observations for Collimation ... ..	...	100
Level ... ..	...	95
Nadir ... ..	...	93
Runs ... ..	...	41
Flexure ... ..	...	26

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 these plates.

The total number of these stars now completely observed three times or more is 3,944.

The Cape stars which have been observed since the beginning of the current year, form part of the series selected by Sir David Gill, of the Cape Observatory, for heliometric comparison with the major planets at forthcoming oppositions.

The whole series published by the Cape Observatory contains some 200 stars which, I hope, will all be completely observed here, at Melbourne, by the end of 1903.

The current reductions in R.A. and N.P.D. are well in hand.

The annual catalogue for 1900 has been completed, and that for 1901 is in course of preparation.

The third Melbourne general catalogue for the epoch 1890, has been ready for the printer since last December.

#### ASTROPHOTOGRAPHIC OPERATIONS.

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 <sup>m</sup> each ...	86	10
Catalogue plates (duplicate series) ...	117	6
Test plates on South Polar region ...	53	—
Test plates on Oxford type charts ...	13	—
Plates for trails, adjustment of centre, &c. ...	27	—
Plates for construction of magnitude scales ...	15	—
Plates for comet A 1901 ...	9	—
Total ...	320	16

Total number of plates passed as satisfactory up to 31st March, 1902.

Catalogue series, 1,149 plates completed.

Chart series with single exposures of 60<sup>m</sup> containing all regions in the Melbourne zone, with centres at even degrees of declination, 565 plates. Completed.

Catalogue duplicate series, 269 plates.

Chart series with triple exposures of 30<sup>m</sup> each, regions with centre at odd degrees of declination, 149 plates.

Total number of stars selected from the catalogue plates, and roughly reduced for observation with the Melbourne transit circle, to serve as standard stars for the reduction of all the Melbourne regions (10 stars at least in each region), 6,327. Of these, as previously stated, 3,944 have already been completely observed with the meridian circle three times or more.

Copies, consisting of contact prints on glass, of the complete series of chart plates with single exposures of one hour, have been made and carefully stored in grooved dry pine boxes, for preservation. Several plates, however, are not entirely satisfactory, and will be taken again.

The Measuring Bureau, which is still maintained at the joint expense of the Governments of New South Wales and Victoria, has made satisfactory progress, considering that only one quick measuring machine, the Repsold micrometer, was available, and that the slow rate of measuring with the other filar micrometers in use, is the unavoidable consequence of the nature of the machines themselves.

The measurements made are as follows:—

Catalogue plates completely measured in the direct and reverse positions during the period 1st April, 1901—31st March, 1902.

Sydney Regions, 147, containing 71,517 stars.

Melbourne Regions, 11, containing 4,939 stars.

Total numbers to March 31st, 1902.

Sydney Regions, 205, containing 125,850 stars.

Melbourne Regions, 62, containing 18,610 stars.

Further information on this work will be found in the joint report of Mr. Russell and myself, prepared for our respective Governments, attached.

No other systematic astronomical work was done, for reasons often expressed in previous reports, excepting observations and photographs of comet A 1901, with the astrophotographic telescope; and few miscellaneous observations with the other equatorials, which were also occasionally employed for the use of visitors.

#### TIME SERVICE.

The time-ball at the Williamstown light-house (Point Gellibrand) was dropped at 1h. 0m. 0s. Victorian statute time, corresponding to 3h. 0m. 0s. a.m. Greenwich time, on 298 days. It failed on twelve (12) occasions, generally traceable to causes beyond Observatory control, such as defects in the line.

Time signals were supplied on week days, as usual, to the Melbourne Post Office, and thence to all the telegraph stations in Victoria, also to the Railways and Public Buildings. The present site at Point Gellibrand, at which the time-ball is dropped, has now become unsuitable; and this service, which is intended almost exclusively for the shipping in Hobson's Bay, is now of comparatively little use, owing to the circumstance that the drop cannot be seen from many of the places at Port Melbourne, where the greater number of ships now have their berths.

It has been suggested by the Engineer-in-charge of Ports and Harbors that the most convenient site for the time-ball would be at Port Melbourne, near the torpedo sheds; but I am informed that there is not, in this locality, any existing structure available for the purpose, and it would be necessary to erect one, such, for instance, as a tubular iron beacon similar to that at Point Nepean, at a cost of some £600.

I have been informed that a time-ball signal or other kind of time signal at 1 p.m. is required for the service of the shipping at the wharfs on the Yarra. This could be done with little expense by utilizing one of the tall buildings in the city.

There will be no difficulty on the part of the Observatory to meet these public requirements, if the necessary funds are provided by the Government or private institutions or persons specially interested.

## WEATHER SERVICE.

This service has been carried on as in former years. There have been fifty-six new stations established since April, 1901. The total number of recording stations is now as follows :—

2nd class stations, equipped with barometer, full set of thermometers, wind vane, and rain gauge, making three observations daily	...	...	...	...	...	27
3rd class temperature stations	...	...	...	...	...	41
Simple rainfall stations	...	...	...	...	...	670
Simple wind and weather stations	...	...	...	...	...	22
Total	...	...	...	...	...	760

The rainfall returns furnished by country observers during the last 40 years had been for a long time put away in large parcels year by year, in a kind of order quite unsuitable for easy reference, and owing to the very frequent demands made to the Observatory for rainfall information by all classes of people, especially in connexion with water schemes and engineering works, I found it necessary to have the whole of the records completely re-arranged, registered, indexed, classified according to water-sheds, and filed in convenient form, size, and order to answer all practical purposes with the greatest possible facility.

This work has been done by some of the ladies of the temporary staff, and is now nearly completed.

The reductions of temperature readings and measures of thermograph curves registered in the magnet-house have been in hand for some time, and are well advanced.

In connexion with the scheme of the International Meteorological Committee for cloud observations mentioned in previous reports, the photographic operations carried on simultaneously at the station, on the roof of Parliament House, and at the Observatory, were brought to a close in June, 1901, as the series consisting of over 400 pairs of cloud negatives was considered sufficient for the purposes of the committee. The measurement of these plates is being carried on.

The visual cloud observations made by all the co-operating observers in the State, during the period May, 1896, to December, 1897, have been completely reduced, and the work in its totality will soon be ready for publication.

The half-yearly pamphlet containing results of meteorological and magnetic observations for the period January–June, 1901, was issued in March.

The half-yearly results for the period July–December, 1901, are now nearly ready for the printer.

## TERRESTRIAL MAGNETISM.

The photographic registration of the three magnetic elements, declination, horizontal, and vertical components, has been continued as in former years.

I regret to say, however, that serious interruptions occurred, mostly in the last winter months through various causes, the principal ones being corrosion and other defects in the gas pipes, which necessitated general repairs and renewal in some parts, other repairs to gas fittings, mounting of new burners with incandescent mantles, and alterations to the gear of the driving clock. The aggregate interruptions extended over  $11\frac{1}{4}$  days.

A scheme of co-operation in magnetic work was laid out by the Anglo-German Committee appointed by the International Geographical Congress of Berlin, in 1899, in connexion with antarctic expeditions, to extend over the years 1902 and 1903, in which the Melbourne Observatory was expected to take its share.

The programme of the work consists in making complete determinations of the value of the magnetic elements on certain specified days, namely, 1st and 15th of each month, and observing the variations of these elements during one specified hour on each term-day by readings taken at intervals of twenty seconds, or by ordinates measured at the same intervals on photographic traces.

Observations in accordance with this programme have been carried on here regularly since last December.

In order to obtain sufficiently minute detail of the variations during the hour-term, it was required to provide means in our magnetographs for increasing the speed of the revolving drums at the specified hours from one revolution per day, which is the ordinary movement, to one revolution in two hours.

This was done by introducing extra gear in the driving clock, by which we are now enabled to use the slow or quick motion when required without interruption in the records.

Incandescent mantles were also fixed to the gas burners, as above mentioned, in order to obtain sufficiently dark traces during the hour-term when the drums revolve at the quicker rate.

Good progress has been made in the measurement of the magnetograph curves and reduction of all magnetic observations of the past 30 years.

The number of day curves measured is as follows :—

Declination	...	...	...	...	2,811
Horizontal component	...	...	...	...	2,855
Vertical component	...	...	...	...	2,962
Total	...	...	...	...	8,628

The total number measured to 31st March, 1902, is 21,877, which covers the periods 1868–76 and 1881–91, the remainder being curves for days on which absolute observations were made between the years 1872 and 1900.

## TIDES.

The usual registration of tides has been continued as in past years by the self-registering tide-gauge at Point Gellibrand (Williamstown).

The daily records of high and low water, giving time and height, taken at Point Lonsdale, Geelong, and the South Channel Pile Light since 1895 have been given over to the Observatory by the Customs Department, and this valuable material is now being tabulated and arranged in suitable form for future reference and investigation of the behaviour of tides in Port Phillip Bay.

## RATING CHRONOMETERS AND TESTING METEOROLOGICAL, NAUTICAL, AND SURVEYING INSTRUMENTS FOR THE PUBLIC.

This part of the Observatory duties has been attended to as usual.

The whirling machine has been used very frequently for the testing of air meters, especially in connexion with the act on the ventilation of mines.

The new aneroid tester has been found very convenient and more expeditious than the one previously in use.

## THE SEISMOGRAPH AND EARTHQUAKE RETURNS FROM VICTORIAN OBSERVERS.

The Milne horizontal pendulum has been finally installed, and is working satisfactorily. Various small difficulties interfered with and delayed this work, and it was found necessary, after some experience, to provide for better ventilation and more protection from moisture and intrusion of insects. The continuous photographic registration of seismic disturbances by this instrument now forms part of the routine duties of the Observatory, and returns with copies of seismograms will, in future, be regularly supplied to the Seismological Committee of the British Association as requested.

Various reports of slight shocks of earthquakes were received from Victorian observers during the last twelve months, an account of which up to 31st December, 1901, with reduced and tabulated data, was included in the Report of the Seismological Committee of the Australasian Association for the Advancement of Science presented to the Association at the Hobart meeting in January last.

## THE LIBRARY.

The library is still in the same crowded and defective state as it was at the date of my last Report; but no attempt can be made to improve it until the new buildings will be completed. During the last twelve months 231 books, 42 periodicals, and 308 pamphlets and papers were presented, and 50 books and 18 periodicals were purchased; 115 volumes were bound at the Government Printer's office.

## VISITORS.

Two hundred and fifty-seven persons visited the Observatory on ordinary visiting afternoons, and 121 persons were admitted at night by special appointment.

## MISCELLANEOUS.

I stated in my last Report that a new set of half-second pendulums and apparatus for the determination of the force of gravity has been made here at the request of Professor Gregory, for the use of the British Antarctic Expedition in high southern latitudes.

I have now to report that these instruments were not required by the Expedition, probably on account of the new conditions which arose in consequence of Professor Gregory's resignation from the position of scientific leader of the Expedition.

A series of swings was undertaken last September in order to determine the constants of these instruments and to test their efficiency. The results were in every respect satisfactory.

Mr. Louis Bernacchi, one of the members of the British Antarctic Expedition, arrived in Melbourne at the end of last October on his way to New Zealand to join the *Discovery*. He had with him a set of three half-second invariable pendulums, with all necessary apparatus required for gravity observations, and a complete set of magnetic variation instruments of the Eschenhagen type, all forming part of the equipment of the Expedition, which he set up here at the Observatory, and kept them going for several days. All required assistance was given him to facilitate his task.

At the request of the Trustees of the Bendigo Gold Jubilee Exhibition, a number of astronomical and meteorological instruments, with other apparatus, and some twenty (20) pictures bearing on the subjects of astronomy and meteorology belonging to the Observatory were sent to the Bendigo Exhibition last November, where they were arranged in a court as suitably as circumstances permitted.

It has been decided by the authorities that the State standards of weights and measures, with the secondary standards, stock of copies for issue to applicants, and all equipment required for verification and adjustment of these standards, are to be transferred from the Customs Department to the Observatory as soon as the new testing room, to be erected at the south end of the great telescope house, is ready; and that in future the official verifications and adjustments demanded by the Act on weights and measures, and all other technical operations in connexion therewith, are to be performed by the Observatory.

As a considerable amount of delicate mechanical work will be required in carrying out these new duties, the authorities have consented, on my recommendation, to secure for the Observatory the continuous services of Mr. C. Otto, at a fixed salary of £3 15s. per week. The Board will remember that Mr. Otto is a skilful instrument-maker, who has done most of our mechanical work for a number of years, and who was at one time regularly employed in the Observatory workshop.

It will be observed that good progress has been made during the last twelve months in reducing the records of past years, but much remains yet to be done to clear up all arrears, and I would urge upon the Board the necessity of continuing the employment of the present temporary staff, the maintenance of which costs very little in comparison with the value of the services it renders to the Observatory.

P. BARACCHI.



## APPENDIX.

---

 MEASUREMENT OF THE SYDNEY AND MELBOURNE PLATES OF THE  
 ASTROPHOTOGRAPHIC CATALOGUE.

JOINT REPORT OF THE DIRECTORS OF THE SYDNEY AND MELBOURNE OBSERVATORIES ON THE WORK  
 OF THE MEASURING BUREAU FOR THE YEAR ENDING 31ST MARCH, 1902.

Since our last report, this work has been steadily carried on at the Melbourne Observatory under the same conditions, using the same measuring instruments, and following in every aspect the same methods, rules, and regulations, as in previous year.

We regret to report that the second measuring micrometer (Sir David Gill's type) which was ordered to the firm of Repsold and Söhne in 1900, has not yet reached Melbourne, and that the completion of the new measuring machine, devised by Mr. H. C. Russell, has unavoidably been further delayed. Consequently, four of the six measurers were obliged to use the Melbourne filar micrometers, which, though perfectly suitable in point of accuracy, cannot be expected to do more than one-third or one-fourth the amount of work that can be done in the same time with the Repsold micrometer. For this reason the number of measures completed during the year is relatively small.

The measurements made during the year ending 31st March, 1902, are as follow :—

One hundred and forty-seven Sydney plates, containing 71,517 stars, measured in the direct and reverse position.

Eleven Melbourne plates, containing 4,939 stars, also measured in the direct and reverse position.

The total work to date is as follows :—

Complete measures for 205 Sydney plates, containing 125,850 stars.

Complete measures for 62 Melbourne plates, containing 18,610 stars.

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

P. BARACCHI,  
 Government Astronomer of Victoria.

April, 1902.