1903.

VICTORIA.

THIRTY-SEVENTH REPORT

OF THE

BOARD OF VISITORS

TO

THE OBSERVATORY;

TOGETHER WITH THE

REPORT OF THE GOVERNMENT ASTRONOMER

FOR THE PERIOD FROM THE 1ST APRIL, 1902, TO THE 31ST MARCH, 1903.

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

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THIRTY-SEVENTH 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 10th of June last, and received the Report of the Government Astronomer, which is appended.

From this Report, and from inquiries concerning the past year's work, the Board is satisfied that the special as well as routine duties of this establishment in all its departments have been efficiently carried out, and that the instruments and apparatus are in good condition and well cared for.

All but one of the new buildings authorized by the Government in 1901 have been erected, and promise to effectively relieve the congestion hitherto so troublesome at the Observatory; and it is to be hoped that the remaining building will be commenced at an early date.

The Melbourne portion of the work in connexion with the international scheme for the Photographic Survey of the Heavens is well advanced, and the measuring and tabulating of the stars on the Melbourne and Sydney plates, which is being done by the Measuring Bureau here, continues to make excellent progress.

During the past year a new department, viz., the Standardizing Bureau of Weights and Measures, has been transferred to the Observatory from the Customs Department, and the duties attached to it will in future be carried out by the Government Astronomer.

In our previous Report we drew your Excellency's attention to the fact that the post of Chief Assistant to the Government Astronomer had been vacant for some years, and that Mr. Baracchi was practically precluded from undertaking research on account of the great number and variety of routine duties he had to perform.

No appointment has yet been made to this post, and we would again urge that one be made at as early a date as possible.

The Board of Visitors also wishes to draw your Excellency's attention to a report which is appended, and which embodies its views on the question of Federalizing the Observatories of Australia. This report was prepared at the request of the Honorable the Premier of Victoria, and submitted to him during the past year.

THOMAS R. LYLE, Chairman.
ALFRED DEAKIN.
R. L. J. ELLERY.
THEODORE FINK.
W. C. KERNOT.
A. J. PEACOCK.
J. M. REED.
F. TICKELL.
H. J. WRIXON.

REPORT ON THE STATE OF THE MELBOURNE OBSERVATORY AND ON ITS WORK FOR THE PERIOD 1ST APRIL, 1902—31ST MARCH, 1903.

Buildings and Grounds.—The new lodge near the main gate was taken possession of by the caretaker last July, and the four rooms within the main building previously occupied by him and his family were altered and renovated, and are now available for Observatory purposes. These rooms will afford all the additional accommodation we require at present for the library, telegraph office, and storage of instruments. A new strong room, for the storage of original records, astronomical negatives, and primary standards of weights and measures, has been erected on a portion of the yard adjoining the old prime vertical room. It was completed early in January last, and will be utilized for its proper purposes as soon as every trace of dampness has disappeared. A new large room for the Astrophotographic Measuring Bureau has been built at the south-west end of the main building. It was ready for occupation by the end of last year, and the Bureau was installed in it on the 3rd of January. New closets have been built, but are not yet ready for use, as we are still awaiting for the sewerage connexion. The wooden building occupied by the messenger was removed on the eastern side of the main building to suit the new arrangements.

All the above works were recommended by the Board in 1901, and the Government authorized them towards the end of the same year.

A new room for testing air meters, chiefly for the service of the Mines Ventilation Board, was also recommended by the Board and authorized by the Government at the same time, but for reasons unknown to me this room has not yet been erected. I understand, however, that it will soon be commenced.

The grounds in the immediate vicinity of the main buildings have been altered a good deal to suit the new additions. Two new asphalted paths have been made, also new beds and shrubberies all round the southern half of the Observatory, and some new fencing, with a gate to serve as a back entrance.

Further necessary requirements are the general re-painting of fences, domes, and some parts of the old buildings ; repairs of the main road, and asphalting of minor paths, which I hope will be done during the current year.

Instruments.—All the instrumental equipment of the Observatory is in good condition. The meridian instruments and astrophotographic telescope, the clocks, the micrometric measuring machines, the seismograph, the magnetic and meteorological instruments, and all self-registering apparatus which have been in constant use, were periodically examined, adjusted, and maintained in good working order.

The two mirrors of the great telescope were re-cleaned last February. The gas-engine, lathes, and all tools in the workshop which had not been in use for some years were thoroughly overhauled.

The normal clock and sidereal control clock were taken down and re-cleaned. Various other repairs and alterations of minor importance were done to driving clocks, chronographs, and other apparatus. The second Repsold micrometer, for measuring the plates of the astrophotographic catalogue on the plan of Sir David Gill, reached the Observatory in September, 1902. This instrument is in every respect similar to the one which has been in use at this Observatory for the last two years, with the exception that the micrometric slides carry four (4) parallel wires instead of two, as in the first instrument. I have every reason to be satisfied with this new apparatus, which is very perfect in workmanship, and exceptionally suitable for the work.

The Superintendent of the Observatory Department of the National Physical Laboratory of London was good enough to procure for us the following new instruments, viz. :—

A new tide-guage, which I intend to erect at some suitable locality at Port Melbourne.
A pressure tube anemometer, with self-registering apparatus, which will be mounted at an elevation of 25 feet above the Observatory roof.
Two dipping needles.
A Gay Lussac barometer.
A hypsometer.
Fine thermometers for magnetic instruments.

Three Abbott's filters, connected with a 350-gallon tank, with accessory pipes, taps, &c., have been fitted in connexion with the photographic room, for the purpose of obtaining a sufficient amount of clean filtered water for the development of stellar negatives. Also a wooden chamber for drying these negatives under full protection from atmospheric dust. These precautions were found necessary owing to the difficulty, if not impossibility, of obtaining sufficiently clean negatives for our stellar chart plates by the ordinary methods.

Three Stevenson's screens and other sundry meteorological apparatus, battery material fittings, and a considerable number of tools and instruments, to complete the equipment of the workshop, were purchased in Melbourne.

The Permanent Staff.

I regret to have to report the death of Mr. N. Allen, which occurred on 2nd May, 1902. Mr. Allen was an officer of the 5th class in the clerical division, and rendered good services during his period of employment at the Observatory. He was temporarily succeeded by Mr. W. Roycraft, whose term of appointment expired on 30th June, 1902, and on 1st July last Mr. J. T. Curtain was permanently transferred from the Education Department to fill the vacant position. Mr. Curtain is an officer of the 5th class of the clerical division.

The permanent staff now consists :—

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. Ingamells.
Weather Telegraph Clerk	Mr. D. Hodge.
Clerk	Mr. J. T. Curtain.
Assistant Astronomical Computer	Miss C. E. Peel.
Caretaker, also acting as Clerk	Mr. J. J. Mannix.
Senior Messenger and Mechanical Attendant ..	Mr. J. Byrne.
Office Cleaner	Mr. A. E. Anniss.

The Temporary Staff.

Mr. J. O. Robson, one of the computers engaged in the reduction of magnetic records, left the Observatory on the 30th of April, 1902, having received a permanent appointment in the Government Printing Office, after passing the civil service examination. He was succeeded by Mr. E. A. Gorham on 2nd January, 1903.

The following changes took place in the Astrophotographic Measuring Bureau :—

Miss M. Suthmier resigned on 21st July, 1902, and was succeeded by Miss E. Sheldon on 17th September, 1902.

Miss L. E. Lewis obtained four (4) months' leave of absence on 6th September, 1902, and returned to duty on 12th January, 1903.

The term of appointment of the Misses E. Harker, E. Langley, M. Brenan, and M. A. Phillips expired on 31st March, 1903, and, owing to re-organization of the work of the Bureau, their re-appointment for a further term was not applied for.

Mrs. E. MacWilliam resigned on the 28th February, and Miss F. Sternberg resigned on 31st March of the current year.

Miss Le Lyons was appointed on 1st October, 1902, for a short period during Miss Lewis's absence, and her term of service ceased on 31st March last.

Miss Q. Sloman was also relieved of her duties on the expiration of her term of appointment on 31st March last.

A considerable part of the work in which the four (4) last-mentioned ladies were engaged having been nearly completed, their re-appointment for a further term was not required.

The temporary staff consists at present as follows :—

Miss L. E. Lewis Miss E. Sheldon Miss R. Rayson	Astrophotographic Measuring Bureau.
Mr. J. Moroney Mr. G. MacGowan Mr. E. A. Gorham Mr. A. Maguire	Engaged in reducing the 30 years' photographic records of terrestrial magnetism.

Mr. H. J. R. Lawrence is still occasionally employed in astronomical computations.

Mr. C. M. Otto has been continuously employed in keeping the Observatory equipment in good order, and in adjusting weights and measures.

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 796 honorary observers and rainfall recorders, under the control of the Observatory.

Work Done.

Meridian Observations.—These were made with the 8″ transit circle, and are as follows :—

Stars.	Observations in—	
	R.A.	P.N.D.
Azimuth stars	317	144
Clock stars	438	—
List stars	853	863
Cape stars	976	969
Miscellaneous	2	2
Total	2,586	1,978

Observations for	Collimation	98
	Level	92
	Nadir	89
	Runs	45
	Flexure	18

The list stars were, as in previous years, selected from the plates of the Astrophotographic Catalogue, to serve as fundamental stars for the reduction of these plates. The total number of this class of stars now completely observed three times or more is 4,202.

The Cape stars form a continuation of the series of Zodiacal stars selected by Sir David Gill, of the Cape Observatory, for heliometer comparison with the major planets at opposition in the years 1902, 1903, and 1904, the observations of which were commenced in January, 1902. The series will be completed by the end of the current year.

The annual catalogue for 1901 and the separate results for the year 1902 have been prepared.

The current reductions are well in hand.

ASTROPHOTOGRAPHIC OPERATIONS.

The table below shows the number of regions photographed :—

——	Passed as satisfactory.	Rejected.
Chart plates with triple exposure of 30^m each	135	13
Catalogue plates (duplicate series)	76	2
Test plates on South Polar region	49	—
Test plates on Oxford type regions	14	—
Plates for trails, adjustment of centre, &c. ..	30	—

The total number of regions photographed and passed as satisfactory up to 31st March, 1903, are as follows :—

Catalogue series, 1,149 plates completed.

Catalogue (duplicate series), 345 plates.

Chart series with single exposures of 60^m each, containing all regions in the Melbourne zone, with centres at even degrees of declination, 565 plates (completed).*

Chart series with triple exposure of 30^m each, with centres at odd degrees of declination, 284 plates.

The Measuring Bureau, which has been maintained at the joint expense of the Governments of New South Wales and Victoria, as in the previous year, has continued the measurement of the Sydney and Melbourne plates.

The work done during the period under consideration being as follows :—

Sydney plates, 19, containing 5,211 stars, completely measured.
Melbourne plates, 300, containing 84,895 stars, also completely measured.

The total numbers of complete measures are :—

Sydney plates, 224, containing 131,061 stars.
Melbourne plates, 362, containing 103,505 stars.

Time Service.—The time-ball at Williamstown Lighthouse was dropped on 301 days at 1$^h.$ 0$^m.$ 0$^s.$ Victorian statute time, corresponding to 3$^h.$ 0$^m.$ 0$^s.$ a.m. Greenwich time. It failed on nine (9) occasions, five (5) of which were due to absence of the attendant at Williamstown, and four (4) were traced to defects on the line, outside the Observatory. Time signals were supplied on week days as usual to the Melbourne Post Office and thence to all telegraph stations in Victoria ; also to railways and public buildings.

I mentioned in my report of last year that the site at Point Gellibrand had become unsuitable for time-ball purpose, and the Board delegated Captain Tickell to inquire into the matter. Captain Tickell suggested that I should send a circular letter to all the shipping companies and institutions interested in this question, soliciting advice as to a new site for the time-ball, which would be considered most suitable for the shipping interests generally. The suggestion was carried out, with the assistance of the Engineer for Ports and Harbors, and the opinion expressed by the shipping community, with very few exceptions, was in favour of having the time signal issued at Port Melbourne, near the torpedo shed, in preference to the site at Williamstown.

The next step will be to obtain money for removing the present apparatus from its present position, and erecting it on some suitable structure at Port Melbourne.

A small area of land on which the Williamstown time-ball tower stands belonged to, or was reserved for, the Observatory ; but recently it was transferred to the railway authorities at their request, on condition that if at any time they found it necessary to interfere with the tower for railway purposes they should erect another suitable structure at some other locality convenient for our purposes. Under the circumstances I propose to await a little time for probable events, which may enable me to gain my object without direct cost to the Observatory.

Weather Service.—This service has been practically continued under the same system as in previous years. On 1st November, 1902, the new postal regulations in regard to weather telegrams came into force. By these regulations all weather messages are allowed free of cost to the State, provided that they do not exceed twelve (12) words in messages sent by up-country stations to the Observatory, and twenty (20)

* NOTE.—On examining the contact prints on glass of the single exposure chart plates, many of these transparencies were found to be very disappointing, owing to a great number of false images, which rendered the transparencies almost valueless, especially in regard to plates containing rich fields. The cause was easily traced to impurity of the ordinary water used in development, and to insufficient protection of the plates from dust while drying. These troubles have been almost entirely remedied by the use of filtered water throughout the processes of developing and washing, and by drying the plates in a closed wooden chamber over a tray containing small blocks of chloride of calcium. Most of the defective negatives and prints of the single exposure chart plates will require to be taken again.

words in messages sent by the Observatory, and provided also that the aggregate amount of work thrown on the Postal Departments in the year by the weather service of all the States does not exceed that of the twelve months which ended on 31st October, 1902. These restrictions necessitated various changes in the preparation of code messages, in order to keep within the Federal allowance.

There have been 47 new rainfall stations and one barometric station established since April, 1902. The total number of recording stations is now as follows :—

2nd class stations, equipped with barometer, full set of thermometers, wind vane, and rain guage, making three observations daily ..	28
3rd class temperature stations	41
Simple rainfall stations	717
Simple wind and weather stations	22
Total	808

The work of re-arranging, classifying, and indexing rainfall returns from all up-country stations extending over a period of some 40 years, which was mentioned in my report of last year, has been completed.

The preparation of temperature statistics extending over the same period is in hand.

The reduction of cloud observations for the year 1896–7 in connexion with the programme of the International Meteorological Committee, and the results of meteorological observations for the year 1902 are ready for printing.

Terrestrial Magnetism.—The photographic registration of the three magnetic elements—declination, horizontal, and vertical components, has been continued as in previous years. Owing to the cutting off of the gas supply on various occasions when new gas-pipes were laid out for the new buildings, and some accidental failures of the driving clock, the records were temporarily interrupted, the total amount lost in twelve months being about 30 hours.

The programme for special meteorological and magnetic observations to extend from February, 1902, to February, 1903, as laid out by the Anglo-German Committee appointed by the International Geographical Congress of Berlin in 1899, in connexion with Antarctic exploration, in which the Melbourne Observatory was asked to undertake its share, was completely carried out. Some details of this work were briefly described in my last report.

Further progress has been made in the measurement of the magnetograph curves and reduction of all magnetic observations for the 30 years 1868–1898, and subsequent years. The number of day curves measured is as follows :—

Declination	2,110
Horizontal component	1,848
Vertical component	1,806
Total	5,764

The total number of curves measured up to 31st March, 1903, is 27,641.

The period already dealt with extends from 1868 to 1892 inclusive.

Tides.—The usual registration of tides has been continued as in past years by means of the self-registering tide-guage at Point Gellibrand. This locality has become somewhat unsatisfactory for a reliable investigation of the tides in Hobson's Bay, and I propose to supplement the present records by placing a new tide-guage at Port Melbourne. The daily records giving the height and time of high and low water at Point Lonsdale, Geelong, and South Channel Pile Light, since 1895, which were given over by Customs Department last year, as mentioned in my previous report, have been reduced and tabulated.

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 for testing air meters, which is still in the model room of the engineers, on the bank of the Yarra, has been frequently used in testing instruments for the Mines Department, in connexion with the Act on the ventilation of mines.

The Seismograph.—The Milne horizontal pendulum has been in continuous use with the exception of few short interruptions, due to accidental causes or re-adjustments of the instrument.

The Library.—During the period covered by the present report 317 books, 249 pamphlets, and 61 periodicals were presented to the Observatory ; 55 books and 17 periodicals were purchased ; 79 volumes were bound at the Government Printing Office.

In my last report I mentioned that the library was in a crowded and confused state, owing principally to want of room. The required accommodation is now available, and I hope to be authorized to obtain outside assistance for making an indexed catalogue, complete to date, and re-arranging the whole in a satisfactory state during the curent year.

Visitors.—Three hundred and seventy-two persons visited the Observatory on Wednesday afternoons, and 46 persons were admitted at night, by special appointment.

Weights and Measures.—On the 17th of last September I took delivery from the Customs Department of the State standards of weights and measures, together with a stock of weighing instruments and full sets of weights and measures, the whole being contained in an iron safe, and 86 other cases and packages. Also two (2) large cases for heavy scales, a sink with accessory steps for testing fluid measures, stamping blocks, &c., as per list appended ; and received instructions from the Under-Secretary to keep these standards and stock in my custody, and to carry on all technical operations in regard to standardizing copies for issue to municipalities, and periodical verification and adjustment of authorized copies of the

standards, in accordance with the Act on weights and measures. This work was commenced last December, but under considerable difficulties, as the existing scales for verifying weights were not up to modern requirements, and no apparatus of any kind was found in the stock received for comparing measures of length. Also, owing to want of space, the stock taken over had to be temporarily crowded without order as well as we could in almost every part of the Observatory.

A comparator and a large balance with 40″ beam are now being made here, and I have been authorized to procure two other balances for the smaller weights. This new department is to be permanently installed in the great telescope buildings, where two of the existing rooms are now being fitted for it, and the new testing room to be shortly erected at the south end of the same building will complete all the accommodation we require.

The following information, which I supplied to the Hon. the Premier on 1st June, 1902, for transmission to the Commonwealth Government, who asked for it as bearing on the question of federalizing the Australian Observatories, will be of interest to the Board.

Estimated cost of the Melbourne Observatory (including buildings, equipment, library, furniture, and all material in stock), £37,750.

Annual expenditure, including cost of the weather service, with nearly 800 observers, but exclusive of cost of weather telegrams, printing, and maintenance of buildings, £3,929.

The cost of weather telegrams, if they were to be paid at the ordinary public rates would be as follows :—

Telegrams within Victoria.—170 daily messages, containing in the aggregate 2,207 words. Cost per day, £10 7s. 5d.

Telegrams outside Victoria.—96 daily messages, containing in the aggregate 1,248 words, sent from Melbourne to the other States and New Zealand. Cost per day, £12 8s. 9d.

Telegrams outside Victoria.—102 messages, containing in the aggregate 1,149 words, received daily at Melbourne from the other States and New Zealand. Cost per day, £12 15s. 7d.

The total annual cost to this State for weather telegrams, if paid for at ordinary public rates, would be approximately £7,000.

At the same time I was also asked to express my personal views as to the desirability of transferring this Observatory to the Commonwealth, and I recommended—

> "That this Observatory be entirely relieved of all its present meteorological duties, and be retained by the State as a purely astronomical institution."

As the Board made a similar recommendation to the Government, I entertain the hope that this course, which will undoubtedly be viewed with favour by most astronomical authorities in other parts of the world, may eventually be adopted.

At the conference held in London in July and August, 1902, between the Secretary of State for the Colonies and the Prime Ministers of the self-governing colonies, the following resolution was passed, viz :—

> "That it is advisable to adopt the metric system of weights and measures for use within the Empire, and the Prime Ministers urge the Governments represented at this conference to give consideration to the question of its early adoption."

At the request of the Hon. the Premier of Victoria I furnished the following report on the subject in December, 1902 :—

"I can see no real difficulties in introducing the metric system into this State. Its adoption is highly desirable, and as the change from the old to the new system can only be effected gradually and, probably, slowly, it would be advisable, in my opinion, to proceed at once to take preliminary steps towards the object in view. The first step should be—To obtain from 'The Bureau International des Poids et Mesures,' which is the recognised authority, prototypes of the standard metre, the standard litre, and the standard kilogramme, with respective series of their multiples and sub-multiples, and, at least, one copy of them to serve as secondary standards.

The second step—To pass an Act legalizing the said standards, as primary and secondary standards for the State, and making it legal for the public to employ either the old or the new system of weights and measures for a limited period, say, five years.

The third step—To introduce the metric system into the Government departments immediately after the passing of the above Act.

This would give time and facilities to the people to become familiar with the new system, and at the end of, say, five years the old system might be abolished altogether.

Possibly the main difficulties may be encountered in dealing with cadastral matters, and other operations of the Offices of Lands and Surveys, but all such difficulties could be overcome within a reasonable time.

It is quite unlikely that the above preliminary steps would, in any way, clash or interfere with any scheme or law that may be adopted in future for the same purposes in any part of the Empire.

P. BARACCHI.

April, 1903.

Melbourne, 28th July, 1902.

To the Hon. the Chief Secretary.

SIR,—

The Board of Visitors of the Melbourne Observatory, having fully discussed the question referred to it in your letter of June 25th, begs to present the following statements and recommendations in regard thereto :—

The Melbourne Observatory has, in addition to its legitimate work of astronomical observations and research, time service, chronometer rating, tidal registration, and other public requirements allied to astronomy, carried on many other branches of scientific investigation, the principal of which are terrestrial magnetism, seismography, gravitation, and meteorology.

No serious objections can be urged against any of these additional undertakings, excepting meteorology.

Meteorology, which consists mainly in the weather service, is no part of the legitimate function of an Astronomical Observatory, and its association with astronomy interferes with the advancement of the latter. This fact is fully recognised in Europe, America, and in other countries where national weather services are conducted by separate organizations which are in no way connected with Astronomical Observatories. In them one central bureau receives the reports from all the stations, classifies and tabulates the observations, gives out weather forecasts for the whole country, and otherwise has complete control of the national meteorological work.

Hitherto the control of the Victorian weather service has been unavoidably enforced on the Melbourne Observatory by State reasons of expediency and economy. But, as the weather services of the various States could be carried on in a much more efficient manner if placed under the control of a Central Weather Bureau devoted entirely to the meteorological interests of the whole Commonwealth, the opportunity now offered of separating meteorology from astronomy should not be lost.

We therefore recommend—

1st. That all meteorological work at present conducted by the Astronomical Observatories of Australia be placed under a Federal Bureau, which should preferably be located in the Federal city, and controlled by a meteorologist of high standing.

On the other hand, when we consider the Observatories as purely astronomical institutions, devoted solely to astronomical observations and research and those demands of the State Government or the public that are germane to astronomy, we think that nothing would be gained either in efficiency or in economy by bringing them under one Federal control.

The standing in the astronomical world of the men who at present direct the leading Observatories of Australia is such, and that of their successors should be such, that they should have a perfectly free hand to conduct whatever investigation or research they may consider appropriate to their individual resources and ability in advancing astronomical knowledge.

We know of no Observatory of which the director has not complete control of the astronomical work.

Local considerations also impel us to strongly favour the continuance of the independence of the Melbourne Observatory.

It has gained a high reputation by means of the valuable work that has been carried on in it. It has been liberally supported by the Government of Victoria, and has grown into an institution peculiarly creditable to the State.

Its equipment is very valuable, and compares well with that of many European Observatories.

Its position in the Southern Hemisphere is unique, it being the most southern Observatory in the world.

In it have been kept for 40 years continuous records day and night of terrestrial magnetism, which are of immense scientific value.

Considering these things, we think it would be a matter of deep regret if our Melbourne Observatory were to be deprived of its individuality, and have the high reputation it has gained over a long period of years merged in some large organization or department comprising all the Observatories of Australia.

We therefore recommend—

2nd. That the Astronomical Observatories of Australia, relieved of all their present meteorological duties, remain independent State institutions.

We have the honour to be,
Sir,
Your obedient servants,

THOMAS R. LYLE.
R. L. J. ELLERY.
THEODORE FINK.
W. C. KERNOT.
A. J. PEACOCK.
J. M. REED.
F. TICKELL.
H. J. WRIXON.

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