1895.

VICTORIA.

TWENTY-NINTH REPORT

OF THE

BOARD OF VISITORS

TO

THE OBSERVATORY;

TOGETHER WITH THE

REPORT OF THE GOVERNMENT ASTRONOMER

FOR THE PERIOD FROM 1ST JULY, 1893, TO 30TH MAY, 1895;

TO WHICH IS APPENDED THE

TWENTY-EIGHTH REPORT OF THE BOARD OF VISITORS TO THE OBSERVATORY,

WHICH WAS NOT PREVIOUSLY PRINTED.

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

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

No. 58.—[9d.]—5461.

APPROXIMATE COST OF REPORT.

	£	s.	d.
Preparation—Not given.			
Printing (1,010 copies)	7	10	0

TWENTY-NINTH REPORT OF THE BOARD OF VISITORS TO THE OBSERVATORY.

To His Excellency Sir John Madden, LL.D., *the Officer Administering the Government of the Colony of Victoria.*

We beg leave to report to Your Excellency that on the 17th June we made a visitation of the Observatory which covers two years of its operations.

The Government Astronomer, Mr. Ellery, presented his Report, and informed us that he would retire from the public service on the 30th inst. We append a copy of the resolutions passed by the Board upon this intimation, in which we express the high estimation in which we hold Mr. Ellery's long and most efficient services.

We believe that in Mr. Baracchi the Observatory will have a very capable director, who will maintain the high position the Observatory has attained, and fulfil the important duties intrusted to him.

It gives us much satisfaction to know that Mr. Ellery has been appointed a member of the Board of Visitors, and that in this capacity he will retain his connexion with the Observatory, which we think a geat advantage.

We are also glad to find that it has been arranged that Mr. Ellery shall remain for a time in the Astronomer's quarters, where he can still afford such aid and advice as the Acting Government Astronomer may require.

We found the buildings, instruments, and records in the usual good order, and we are glad to be able to say, although some of the work of the Observatory has been necessarily restricted by the reduction of the establishment recently made, that all its most important functions have been fulfilled, although with some difficulty.

We beg to refer Your Excellency to the Report of the Government Astronomer, hereto appended, for a detailed account of the work of the Observatory during the past two years.

GEORGE VERDON, Chairman.
M. H. IRVING.
W. C. KERNOT.
THOMAS R. LYLE.
ALFRED DEAKIN.
ALEXANDER BLACK.
G. V. SMITH, Hon. Secretary.

Melbourne, 29th June, 1895.

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

The Report, which I have now the honour to submit to the Board of Visitors, refers to the two years commencing 1st July, 1893, and ending 30th May, 1895, and gives the state of the institution on the latter date. The last visitation of the Board was made on 25th August, 1893, and the Board's Report, covering mine for the previous year, was presented to Parliament on 31st October, 1893, but has not yet been printed.

Since my last Report further considerable reductions in the Staff and expenditure of the Observatory have been made. In accordance with the general scheme of retrenchment carried out in the public service, G. Swanson, mechanic, retired in September, and Mr. F. Ingamells, junior assistant, at the end of April last. The vote for contingent expenses has also been reduced very considerably. The amount voted for the Observatory (salaries and contingencies) in 1890–91 was £5,382, and £3,112 in 1894–5.

The personal staff on 31st May, 1895, was as follows :—

Government Astronomer	Mr. ELLERY.
Chief Assistant	Mr. BARACCHI.
Assistant	Mr. SWAN.
"	Mr. QUAYLE.
Photographic Assistant	Mr. KEMP.
Junior Assistant	Mr. WALLACE.
Weather Telegraph Clerk	Mr. HODGE.
Mechanical Attendant	J. BYRNE.
Junior Messenger	J. MANNIX.

THE BUILDINGS.

Some renovations and outside painting were carried out by the Public Works Department in the spring of last year, and the buildings generally are now in good repair. The grounds have been kept in fair order, and the shrubberies are now well grown, and afford a considerable protection in strong winds and dust storms.

INSTRUMENTS.

The only notable addition made to our instrumental equipment since the date of my last Report is a set of half-seconds pendulums (for the determination of differences of gravity), which were constructed in the Observatory workshops early in 1894, concerning which I have to speak later on.

All the instruments except the great telescope are in excellent order ; but this had to be placed under repair at the beginning of May, on account of injury to the large mirror by heavy dews, and the necessity of partly repolishing it. The telescope has been under repair on several occasions during the two years under review, and in July, August, and September last year both small mirrors were repolished, and a new small mirror (glass silvered) was constructed to take the place of either of the two metal mirrors that may get tarnished.

The New Transit Circle was taken from its bearings and reversed on 10th March of this year. The level error having become rather large from a very slow subsidence of the eastern pier, the opportunity was taken to reduce it by lowering the western bearings.

The Old Transit Circle has been used only occasionally, but is in working order.

The Photo-astrographic Telescope continues to give every satisfaction, and has required only the slightest attention to its mechanism and adjustments since it was first erected.

The Photoheliograph, the smaller equatorials, the self-recording meteorological and magnetic instruments, clocks, chronographs, seismograph, and other minor apparatus which are either in constant use or are stored away, may all be reported in working order.

THE LIBRARY.

The library has been increased since the date of the last visitation by donations and exchanges 543 volumes, by purchase 18 volumes, making a total addition of 561 volumes.

THE WORK OF THE OBSERVATORY.

In my last Report I stated that, notwithstanding the severe retrenchments in the Staff and grants for the Observatory which it had suffered in common with every other Department, I had by re-organization been able to carry on most of the important and more essential work.

Further retrenchment at the beginning of the present financial year and the loss of another member of the Staff has made it somewhat difficult to fully carry out my intentions, and I have found it absolutely necessary to again curtail our operations in intercolonial meteorology, in the supply of meteorological information to the public, in the matter of receiving evening visitors to the great telescope, and in some of the observational work.

The meridian observations, the photographic charting, the magnetic observations, including the record of the magnetographs, and the monthly absolute determinations, daily photographs of the sun, and the general meteorological work have been carried on as heretofore.

The following is a summary of the meridian observations made during the two years under review:—

1st July, 1893, to 1st July, 1894.

R.A. Observations	2,792
N.P.D. „	1,376
Observations for Instrumental Errors—	
Runs	44
Flexure	13
Level	204
Collimation	130
Nadir	144

1st July, 1894, to 1st June, 1895.

R. A. Observations	2,385
N.P.D. „	1,346
Runs	43
Flexure	11
Level	154
Collimation	122
Nadir	110

Star Charting.

In my last Report in 1893, I gave the number of plates secured up till 30th June, 1893, as 422 catalogue series, since then we have obtained 476 catalogue and 40 chart plates, besides 142 plates for trails, tests, &c., making a total of 1,080 plates up to 1st June, 1895. The weather has been remarkably unpropitious for this work, and absolutely clear nights which are essential especially for the chart plates have been exceptional.

The question of measurement of the plates is still an undecided one. Several Observatories have made a commencement; but, excepting at Paris, I do not think this part of the work has been systematically entered upon. We have made preliminary measures of 238 plates for obtaining the positions of five stars on each plate where possible to be used for the determination of the constants of the plates.

Extra meridian observations have been necessarily limited to special cases or requirements, and have been very few.

Positions of comet gale were obtained with the 8-in. equatorial on seven nights in April and its orbit computed therefrom.

In accordance with a request received from Harvard College Observatory, Boston, U.S.A., physical features of Mars were observed with the great telescope, and drawings made at its opposition last year in the mornings from 22nd May to 8th June.

From the date of my last Report to the end of May last the great telescope was used on 75 nights for visitors, of whom 572 were received. During the same period our visitors' book shows that 509 visitors were admitted in the day-time to be shown over the Observatory.

We have continued obtaining sun pictures daily whenever the weather permitted; but, in consequence of the necessity for limiting our expenditure as far as possible during the last year, I arranged that no sun photographs should be taken unless there were signs of solar disturbance, consequently the number of pictures obtained in 1893–4 was 134, and in 1894–5, 70.

The intercolonial weather telegraph system has been carried on as usual, there has been no increase of the service during the past two years.

A somewhat important change in our time distribution was made in February last by the introduction of zone or standard time in all the Australian colonies. By the zone system Eastern Australian time which covers Queensland, New South Wales, Victoria, and Tasmania will conform to that of the 150th meridian; Melbourne time therefore is 20 minutes, or more accurately 20 minutes 6 seconds, in advance of local mean time—this makes Melbourne exactly 10 hours in advance of Greenwich time, instead of 9 hours 39 minutes 54 seconds, which is the true difference of longitude. The change was made from 1st February, and gave rise, I believe, to no inconvenience whatever, the advantage of zone time over varying local times are already being experienced, and will have the effect of avoiding many difficulties commercially and otherwise which frequently arose under the old method. With this exception our system of time distribution has remained the same, and has worked satisfactorily.

The Hobson's Bay self-recording tide gauge has been continued at work, but had to be stopped for one or two days for repairs in August, 1893.

The number of instruments, &c., tested or rated during the past two years, are as follows:—

Marine chronometers	143
Watches	6
Thermometers	9
Aneroid barometers	49
Sextants	2

The publication of the results of meteorological and magnetic observations is completed to the end of 1894. Until July, 1892, these results were published and issued monthly, when, in order to save work and cost of printing, they were somewhat condensed and issued in a quarterly pamphlet which meets all requirements, and is, I believe, an improvement, as the data and information most required by science and the public are for the most part already deduced from the large mass of detailed observations.

As regards publication of our astronomical work nothing has been done since Vol. VII. was published in 1888, as, for reasons of economy already spoken of, it was desirable to limit our demands on the Government Printer as much as possible.

It has been our custom to publish an annual volume of our meridianal observations with an annual catalogue deduced therefrom, and in 1870 and 1880 a ten-year star catalogue was issued.

The Annual Catalogue for the years 1884 to 1893 are ready for the printer, and that for 1894 nearly complete; but, under existing circuumstances, I think it will be the best course not to continue the yearly volumes and catalogue, but to combine the whole into one general catalogue, in which case it would probably be best to delay a little longer, and bring it up to the epoch 1900.

Pendulum Observations.

I have already referred to the construction of a set of half-seconds pendulums made at the workshop of the Observatory early in 1894 (which are described in the proceedings of the Royal Society of Victoria), and in my last Report I spoke of the Katers pendulums of the Royal Society, London, having been received here, and of a series of observations which were being made by Messrs. Baracchi and E. J. F. Love, of the Melbourne University.

Subsequently, in the end of 1893, a complete series of swings were observed by both these gentlemen and the pendulums were taken to Sydney, in January, 1894, by Mr. Love, where he obtained another series of swings in the basement of the Observatory, in the precise position that the same pendulums were used by Messrs. Professors Smith and Pritchett, of the United States Coast Survey, in the year 1882. The results of these observations by Messrs. Baracchi and Love were communicated by them in a paper to the Royal Society of Victoria, in October, 1893, and March, 1894.

The half-seconds pendulums made at the Observatory were completed in June, 1894, and the determination of their constants were made by the same observers in July and August, 1894. In September, Mr. Love visited England on a holiday, and took these small pendulums with him, and obtained successful series of swings at Kew, Greenwich, and Cambridge. The two former places are the bases with which all our pendulum results will be finally compared to obtain the differences of the value of "g."

These half-seconds pendulums have been brought back to Melbourne by Mr. Love, who, with Mr. Baracchi, will shortly undertake a further determination of their constants, and a closing series of observations of their vibration periods.

The members of the Board are doubtless aware that I retire from my post as Government Astronomer on the 30th of this month, after 42 years' service. I have, therefore, taken upon myself the responsibility of asking you to meet earlier than has hitherto been our custom, in order that I might report to you the state of the establishment and the work under my charge, before I relinquish my duties as director.

My chief assistant, Mr. Pietro Baracchi, is to succeed me as Acting Government Astronomer, and I believe the Government will do me the honour of appointing me a member of the Board of Visitors, so that I shall probably not entirely sever my connexion with the Observatory.

It goes without saying that I shall retire from my position with keen regret, for it has been my privilege and pleasure to initiate and build up our Observatory from its very small beginning in 1853 to its present recognised position among the national Observatories of the world. But I am now some years past the age fixed by our law for retirement from the public service, and have arrived at a time of life when I must look forward to a natural lessening of the energy the position demands. For these reasons, in February last I asked the Chief Secretary to allow me to retire on my pension, and the request was at once granted.

I shall relinquish my post with the less regret that I feel great confidence in my successor, and assured that the work of the establishment will be carried out faithfully and well, and that the reputation won for the Melbourne Observatory in the past will be thoroughly maintained. Mr. Baracchi's attainments in all branches of science involved in Observatory work are of the highest order, while his practical knowledge of the official management of the establishment has been well proved by the fact that, during the last year, he has made himself thoroughly and practically acquainted with every detail, from the highest and most scientific duties down to the simplest account keeping and clerical work, and during the last few months has practically managed the institution.

R. L. J. ELLERY,
Government Astronomer.

17th June, 1895.

TWENTY-EIGHTH REPORT OF THE BOARD OF VISITORS TO THE OBSERVATORY.

To His Excellency the Right Honorable John Adrian Louis, *Earl of Hopetoun, Viscount Aithrie and Baron Hope in the Peerage of Scotland; Baron Hopetoun of Hopetoun and Baron Niddry of Niddry Castle in the Peerage of the United Kingdom; Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George; Governor and Commander-in-Chief in and over the Colony of Victoria and its Dependencies, &c., &c., &c.*

We have the honour to report to Your Excellency that, on the 25th of August, we made our annual visitation of the Melbourne Observatory, and received and considered the Astronomer's Report.

We inspected the buildings, instruments, and records, and found everything in perfect order.

Since our last visitation, the Honorable Sir Henry Wrixon and the Honorable Alfred Deakin have been appointed Trustees of the Observatory Site and Grounds, in the place of the late Mr. Justice Stephen and Dr. Bromby. The appointment of Mr. Deakin as a member of the Board has been notified, and we beg leave to express the hope that Sir Henry Wrixon will also be added to our number.

The Chairman, who was the only surviving Trustee of the Observatory Reserves, until the appointments now reported were made, informed the Board that the Minister for Public Works had applied to him on a proposal to let the quarters recently occupied by Signor Baracchi by public tender, and that he had considered it his duty to say that, as the Reserve had been made permanent to preserve the land and buildings for the exclusive use of the Observatory, it would be, in his opinion, undesirable to alienate any portion for more than a year. This opinion was formed partly on the general consideration that it was inexpedient that encroachments of any kind should be made upon this Reserve, and partly because it might be found necessary at any time to resume the occupation of the quarters for Observatory purposes.

The Board unanimously approved of the course taken by the Chairman.

It has given us great satisfaction to find that the large reductions in the cost of the Department recently made have been so ordered by the Government Astronomer as to preserve all the essential functions of the Observatory, without any serious detriment to its general public usefulness. We think that Mr. Ellery has earned the thanks of the Government, as well as of ourselves, for the able way in which he has carried out a complete re-organization of the establishment under his direction.

We are so sensible of the great value of his services in the office of Astronomer, and in many other ways in which his knowledge and skill have been employed in the public service for the last 40 years, that we venture to express our earnest hope that, if hereafter, any change in the office of Government Astronomer be contemplated, we may be afforded an opportunity of considering and advising by what means the entire loss of his services may be averted or at least postponed.

We beg to refer Your Excellency to the Report of the Government Astronomer, hereto appended, for a detailed account of the work of the Observatory during the past year.

GEORGE VERDON, Chairman.
W. C. KERNOT.
THOMAS R. LYLE.
GEORGE ANDERSON.
F. STANLEY DOBSON.
MARTIN H. IRVING.
A. BLACK.
G. V. SMITH.
ALFRED DEAKIN.

Melbourne, 5th September, 1893.

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

Since the last visitation of the Board, on 2nd September, 1892, the reductions in the Staff and re-organization of the work of the Observatory then referred to have been carried into effect.

The Staff.

Messrs. White and Moerlin retired upon their pensions on the 30th of September last, but it was arranged that Mr. White should be allowed to retain his quarters for a time, in consideration of his giving certain services towards the completion in the reduction of a large amount of meridian work, which had been carried out under his supervision in the year prior to his retirement.

Mr. Baracchi takes Mr. White's position as chief assistant, but without any increase of salary at present. As mentioned in my last Report, Mr. G. Swanson, mechanic, was transferred on probation to another Department in September last; but not being fitted for the duties he was called upon to perform, he returned in December and is again on the Observatory Staff, which is now as follows :—

Government Astronomer	Mr. Ellery.
Chief Assistant	Mr. Baracchi.
Assistant	Mr. Swan.
„	Mr. Quayle.
Photographic Assistant	Mr. Kemp.
Junior Assistant	Mr. Ingamells.
„ „	Mr. Wallace.
Weather Telegraph Clerk	Mr. Hodge.
Mechanic	G. Swanson.
Mechanical Attendant	J. Byrne.
Junior Messenger	J. Mannix.

Mr. Baracchi takes charge of the meridian observations, assisted by Messrs. Swan and Quayle, and of the magnetic and part of the meteorological work, assisted by Messrs. Kemp and Ingamells.

Mr. Wallace, assisted by Mr. Kemp as photographer, carries out the astrographic work. He also has charge of the chronometers and assists generally in much of the physical work of the Observatory, testing of thermometers and barometers, &c.

Buildings and Grounds.

The buildings generally are in good order. There have been no additions since the last visitation.

The grounds are also in a satisfactory condition, and the work therein has been limited to seasonal requirements.

Instruments.

The chief instruments of the Observatory, viz., the great telescope, the new and old transit circles, and the 8-in. and 4-in. equatorials are all in use and in good condition; no additions or alterations worthy of note have been made during the year.

The polish of the mirror now in use in the great telescope keeps up fairly well, but the mischief done to it on damp nights has made it necessary, under present circumstances, to keep it out of use during the months of July, August, and September.

The astrograph is in excellent order and continues to give complete satisfaction.

The photoheliograph has been in continued use throughout the year

As regards the autographic magnetic and meteorological apparatus, the photographic thermographs and barograph have been put out of use during the year, a Richards thermograph being substituted for the former, while the latter is amply represented by the King's large scale barograph.

The clocks, chronographs, and minor apparatus remain the same as at the last visitation, except that the Seth Thomas clock has been removed from the old prime vertical room to the basement or bar room, where it has the advantage of a very equable temperature.

The Library.

The library has been increased during the year by donations and exchanges 286, by purchase 9—a total of 295 volumes.

The Work of the Year.

In my last Report I pointed out that, in view of the reduction in the Staff, it would be necessary to limit the scope of work very considerably, but that, if possible, the more important functions of the establishment would be carried on without alteration.

I am glad to report that, in the re-organization of the duties, it has not been found necessary to stop or shorten any of the essential or important operations except the regular work with the great telescope and minor details of routine work, which have been otherwise provided for, or could be stopped without much harm. The meridian circle observations, the astrographic operations, the record and observations of terrestrial magnetism, as well as the meteorological work, both local and intercolonial, have therefore gone on as usual, except that several time-saving changes have been made.

The meridian observations of the year, besides the ordinary observations for clock and instrumental errors, have been almost entirely limited to obtaining the places of guide stars for the photographic charting of the heavens. This work done may be summarized as follows :—

R.A. observations	3,456
N.P.D. „	1,963

Observations for Instrumental Errors :—

Collimation	152
Level	172
Nadir	153
Runs	47
Flexure	13

The Great Telescope.—The only observations made with the great telescope during the year were for a revision of the nebula argus for comparison with the last drawings made of that object. It has, however, been used for several nights each month for visitors, on which occasions Mr. Ingamells has taken charge.

Photoheliograph.—One hundred and forty-one pictures of the sun have been obtained during the year.

Terrestrial Magnetism.—Monthly observations for the determination of absolute force have been regularly made, and the continuous photographic record of variations has been carried on uninterruptedly.

Meteorology and Intercolonial Weather Service.—No change of importance has been made in these branches of the work, nor have there been many additions to the Australasian chain of reporting stations, except in Western Australia and Queensland. Two new stations have been established in each of these colonies, viz., Wyndham and Southern Cross in Western Australia, and Georgetown and Camooweal in Queensland.

The rainfall stations now reporting in Victoria number 514.

Daily weather charts and forecasts for 24 hours have been regularly issued.

The time distribution and time-ball service has been carried out as in previous years. Out of 299 days on which signals were sent for dropping the Williamstown time-ball, five failures occurred, four of which were caused by faults on the telegraph line, and one by an error in the Observatory.

The Hobson's Bay self-recording tide gauge, which is in charge of the Observatory, has furnished continuous tide curves for the year.

The instruments, &c., tested or rated for the public departments and the general public during the year, are as follows :—

Marine chronometers	92
Thermometers	4
Aneroid barometers	14
Surveyors' chains	16

In reviewing the year's proceedings, it is satisfactory to find that none of the most essential work of the establishment has gone behiud. The observing has gone on steadily while the reductions and computations are well up to date, and although no Observatory publications have been issued, all the work up to the 31st March is already in the printer's hands. In view, however, of the large retrenchments now necessary in the State service, it is probable that not only will our publications be delayed, but it will also be necessary to limit our demands on the Government Printer to the smallest amount, and it is likely some time will elapse before the work now ready will be published.

The photographic chart operations are progressing steadily but not rapidly of late, owing to the unusually cloudy weather that has prevailed. We have secured 422 plates out of the 1,400 necessary to cover the Melbourne share of the heavens for the star catalogue series. The second series for the chart has not yet been commenced.

The question of the measurement of the star plates is a much larger one than that of obtaining the photographs, as it involves considerably more labour. At first it was thought desirable by the Astrographic Congress in Paris to establish a central bureau in Europe for the systematic measurement of all the plates obtained at the various Observatories which have taken part in the work, but, at its more recent meetings, it was considered best that each Observatory should carry out the measurement of its own plates. Although the final completion of the undertaking will be thus greatly delayed, there is much to be said in its favour. In view of this decision the whole question of plate measurement has been under consideration during the past year, a special micrometric apparatus has been constructed for the purpose, and a good deal of experimental measuring has been made, which gives a pretty clear idea of the task before us. The difficulty now presents itself of how to get through it within a reasonable period. The work, when a suitable micrometer is provided, is simple but tedious. In European Observatories it has been found that young women of ordinary intelligence can be quickly trained in the use of the micrometer, and do the measurements quickly and well. Before we can make any great progress in this part of the undertaking, I think it will be necessary to obtain special assistance.

During the year several small comets have made their appearance, the first news of their discovery being communicated to us by telegrams through the Central Astronomical Bureau at Kiel, of which this Observatory is a branch. In every case copies of the information received are sent to the Observatories of the other colonies both public and private, and although we endeavour always to verify the telegraphic information by observation, we have not of late been able to spare the time to carry on systematic cometic observations.

Observations of all these bodies that come within reach of Australian telescopes are, however, always secured at either Sydney, Windsor, or Adelaide.

I had hoped to largely condense the routine work, more especially in the meteorological branch but public requirements are growing instead of diminishing in this direction, and it has been found impossible to lessen it to any appreciable extent. The preparation of the daily weather chart, and the issue of forecasts from it, takes up a considerable part of the time of two officers, while dealing with statistics from over 500 stations supplying the growing demand for climatic and meteorological information, more especially in connexion with rainfall, involves a great amount of clerical labour. It therefore seems impossible to cut down this part of the work without seriously lessening the immediate value of the Observatory to the public.

Pendulum Observations for the Determination of Gravity at Melbourne.

In November last year the Katers pendulums and apparatus with which observations for the value of "g" have been made in England and other parts of Europe and America during the present century by the late Sir Edward Sabine, the late Sir George Airy, and more recently used for the same purpose in the Indian Survey, were received at the Observatory, having been lent to this Observatory by the Royal Society of London, at my request, for the purposes of a gravity survey of Australia, to be undertaken at the instance of the Royal Society of Melbourne, which had appointed a committee from its scientific members to carry out the necessary observations. This apparatus has been set up in the bar room in the basement, which is admirably adapted for the purpose, and several series of observations have already been made by Mr. Love, of the Melbourne University, and Mr. Baracchi, my Chief Assistant. Last month Lieutenant Elblein, of the Austrian man-of-war *Saida*, made a series of similar observations in the same room, with a set of half-seconds pendulums (of the form devised by Col. von Sterneck), which he had brought from Vienna, and the results were very satisfactory. From the computations of the results of these observations up to the present time, the value of "g" at the Melbourne Observatory appears to be about 980·02 centimetres, or 32·1527 feet.

R. L. J. ELLERY,
Government Astronomer.

25th August, 1893.

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