

ON THE PROPOSED LEAKE SCHOOL OF
PRACTICAL ASTRONOMY.

BY H. C. RUSSELL, F.R.S., C.M.G., GOVERNMENT
ASTRONOMER OF NEW SOUTH WALES,

Corresponding Member, Royal Society of Tasmania.

During my visit to Hobart in January last I was struck with the brightness and translucency of the atmosphere, and it was evident to me that the weather of the fortnight I was in Hobart would have enabled me to do as much as I had done in Sydney during the preceding two months. And, in conversation with some friends, I expressed regret that such fine skies for the Astronomer should not be taken advantage of, and an Astronomical Photographic Observatory established. I was told that Tasmania, like other parts of the world, was passing through a period of commercial depression, and the Government did not seem to be disposed to add to expenditure by starting an Observatory, but that the late Mr. Leake had left a sum of £10,000 for the foundation of a School of Astronomy, and it was hoped that an Observatory would be established very soon.

And it seems to me most fitting that the colony in which this noble bequest was made should be the first to take it up and benefit by its provisions; and the establishment of a Tasmanian University will, with the co-operation of the Senate, enable the trustees to carry out in a most satisfactory manner the wishes of the testator, who indeed seems to have contemplated such a natural combination as that now proposed between his trustees and the Senate of the University for the establishment of a School of Astronomy.

Such an addition as this to the functions of the University would be an immense advantage. In the first place, it will add to the curriculum another subject which students may take up, either as technical education or as a most valuable mental training in a general course of study. Next, it will induce some students to come to the University in order to attend the lectures on Astronomy, and if provision is made for non-matriculated students to attend the teaching in practical Astronomy on payment of fees, there can be no doubt that many will enrol their names.

The desire to contribute in some way towards the consummation of the proposed Observatory scheme, which seems to me so desirable, and so easy of attainment with the means at command, has induced me to make the following suggestions;

but before going on to these, I may point out that Hobart, in addition to its clear atmosphere, possesses in its high southern latitude a great advantage over any other available place for the new Observatory in the Southern Hemisphere. It is true that a slightly higher latitude is available in New Zealand, but the climate is less favourable, and the means to build an Observatory are apparently not forthcoming, and if one were erected in New Zealand it would no doubt be at Wellington. So that, practically, Hobart not only possesses the means, but also the best available site in the Southern Hemisphere for the Leake Observatory.

The extreme south part of the Milky Way is for the Astronomer an almost unexplored mine of wealth, and he will be in the best position to acquire the gems which it contains who has the greatest southern latitude for his instruments, because these parts of the heavens will come nearest to his zenith, and therefore suffer least by the Astronomer's greatest enemy, the impurity of the atmosphere. Admitting, then, the advantage of position, about which there can be no doubt, it may be pointed out that the time is opportune, and to establish the Observatory now would be gratifying to Astronomers generally, because the complete scheme for carrying out the work arranged by the Astronomical Conference in Paris, in 1887, according to which 18 Observatories agreed to divide the work of making a photographic chart of the whole heavens, has been to some extent marred by the political troubles in South America, owing to which three Observatories there have been unable to take up their part of the work. And the question is pressing upon the general committee in Paris,—How shall that portion of the photographic work which South America undertook be provided for? Under these circumstances the establishment of an Observatory to take up even a part of the work, would, by that fact alone, be brought into immediate prominence and earn the good wishes of all Astronomers.

But, in addition to the honour which would come in this way to Tasmania, if the work is undertaken by the University in co-operation with the Leake trustees, as I understand is proposed, the University of Tasmania will be the only one in Australasia having a complete School of Astronomy; that is, one in which the theory and *practice* of the science are taught, and it is natural to expect that students who want to take up the study, either as a mental culture, or with the object of making use of it practically in surveying or in a private Observatory, will naturally go to the most complete school. And if the teaching in such a school is thrown open to the public, so that on payment of fees non-matriculated students can attend, I am sure that a number of persons will

be found ready to take advantage of it, and thus get initiated into the study of the grand science which entices so many to the private study of it. But the teaching must include the use of instruments as well as lectures upon the theory and practice. Indeed, an Observatory is just as essential to the teaching of Astronomy as the dissecting room is to surgery, the laboratory to physics, or the workshop to engineering.

In the present day Astronomy covers such a wide range of subjects, and requires the use of so many expensive instruments, that no Observatory, even the great National Observatories of Europe, attempts to take up all of them, and it is usual for Observatories to take up some *special subject*, and in this way the whole study is carried on by a number of independent Observatories. I think, therefore, the idea of having an Observatory covering all branches of Astronomy in Tasmania may be dismissed, and our attention confined to the requirements of one which will fulfil the testator's intention, and at the same time take up *one special branch* of the subject, and place Tasmania at once amongst those countries in which the Observatories are taking an effective part in promoting the progress of Astronomy; and, without doubt, the best way is to make its special feature *astronomical photography*. Such an Observatory, as I have already pointed out, is badly wanted in the Southern Hemisphere, and Hobart has special advantages of climate and position for the work.

We may then, I think, begin with these conditions, viz., that the Tasmanian Observatory should provide:—

- (1.) All that is necessary for practical teaching in the School of Astronomy established within the University under the Leake bequest.
- (2.) That its special work shall be Astronomical Photography.
- (3.) That its name shall be the "Leake Observatory."
- (4.) That its control and management shall vest in the Council of the University.

(a.) I have assumed that the Leake trustees are prepared to hand over to the University the Leake bequest of £10,000 for the establishment of a school for the practical teaching of Astronomy, provided that the Senate make such provision for it as will carry out the testator's wish as laid down in his will.

(b.) I have also assumed that the Government or the Senate of the University would provide a *site*, a piece of ground about 60 feet square, for the Observatory to stand upon.

(c.) Further, that the Government would keep public time as they do at present, and give time to the Leake Observatory, and permit the Leake Lecturer in Astronomy to use their

transit instrument from time to time for teaching students in Astronomy.

If the arrangement assumed in (c) could not be made, there would still be sufficient funds out of the £3,000 for *instruments* for the purchase of a transit instrument. (See appendix A.)

The necessary equipment for an Observatory consists of a transit instrument, an equatorial with attached star camera, a good clock, photographic outfit, furniture, etc.

If it were proposed to devote the Observatory to the making of star catalogues, the greater part of the money would have to be spent upon the transit instrument; but since this is not proposed, a transit instrument of moderate cost will serve every purpose, and the greater part of the expenditure may properly be made upon a really fine equatorial with star camera attached,—such an instrument, in fact, as is used by all the 15 observatories taking part in the great work of photographing the heavens. This is, in the first place, an equatorial telescope of 10 inches aperture, and mounted on a stand of the most perfect kind that modern instrument makers can make, and so constructed that it carries with the telescope a star camera, with an object glass of 13 inches diameter. Such an instrument would be fit for any extra meridian work in addition to its use with the star camera. In fact, this instrument would be an exact counterpart of the instruments used in Greenwich, Paris, and other first-class Observatories for similar work, and would place the “Leake” Observatory in a position to do *first class work*, with the advantage of position over all other southern Observatories.

The only building required would be a round one, 26 feet in diameter, with revolving roof, and having cellar space sufficient for photographic work.

One first class regulator clock, together with some photographic and electrical apparatus and furniture, would complete the outfit, the cost of which I have estimated in appendix A.

I have been careful to add to the actual cost of the smaller items from 25 to 40 per cent. in each case, well knowing that contingencies arise which increase the cost.

The great item, the equatorial, I have set down at the price paid by Greenwich, the Cape, and Melbourne. In providing for the staff of the Observatory, I have ventured to suggest the appointment of a Demonstrator in Physics, in addition to the Lecturer, or rather to help the Lecturer in Mathematics, Physics, and Astronomy, because experience here shows that the professor or teacher in these subjects must have some help of the sort. If the expenditure is deemed too great, it could be reduced to, say, £100; for which salary I have no

doubt an educated youth, or perhaps one of the students, would undertake the duty. The sum proposed, £250, would find an able Demonstrator, whose services in teaching science would materially add to the success of the school. If, however, it be decided not to have him at all, it would be better to increase the salary of the Photographer to £200, and get a man with wider experience, who should then be called *Observatory Assistant*. It will be observed that such a change, *i.e.*, omitting the Demonstrator and increasing the salary for the Observatory Assistant, will not alter the charges for salaries.

The sum of £50 a year set down for photographic plates, chemicals, etc., would, I have no doubt, cover the incidental expenses.

It would be a legitimate although perhaps small increase to the Observatory funds to hand over to it for current expenditure the fees paid by non-matriculated students of Astronomy.

It would be an easy matter to suggest various other instruments for the Observatory.

TO RECAPITULATE.

It is proposed that the Leake bequest of £10,000 be handed over to the University.

That the University establish a School of Astronomy and an Observatory, to be called the Leake Observatory.

That the Lecturer in Mathematics and Physics should also teach Astronomy, and have, under the governing body of the University, general control and direction of the Observatory, for which he should be paid from the Leake fund £100 per annum in addition to his salary from the University.

That an Observatory Assistant be appointed with salary of £200 per annum from the Leake fund.

That, if possible, the University should obtain permission from the Government to use their transit instrument for teaching purposes. If not, that a transit instrument be purchased at a cost of £110.

That a site for the Observatory be provided by the Government or the University.

That one round Observatory with revolving roof be built.

That a large equatorial, with star camera attached, be purchased at a cost not exceeding £1,800, together with necessary apparatus. (See page 4 and appendix A.)

That the Observatory work should be Photographic Astronomy, in connection with the photographic star chart now being made.

APPENDIX A.

SALARY.

Office.	University.	Leake Bequest	Total.	Remarks.
A Lecturer in Mathematics, Physics, and Astronomy.	£500	£100	£600	To give fifty lectures on Astronomy each year, and have general oversight and direction of the Observatory.
B Demonstrator in Physics and Astronomy.	*£200	£50	£250	To demonstrate in Physics and Astronomy and have general charge of the instruments.
C Photographer ...	*—	£150	£150	To do all photographic work and any other that may be necessary.
D Photographic Plates and Chemicals ...	—	£50	—	—

COST OF INSTRUMENTS, ETC.

	£	s.	d.
E Equatorial telescope and star camera combined	1,800	0	0
F Freight and charges	...	...	...
G Observatory building	...	...	...
H Clock ...	...	...	...
I Batteries, furniture, etc.	...	...	...
J To cover unforeseen expenses	...	...	...
Total cost	...	...	...
K Reserve fund	...	...	...
E to K Leake bequest for instruments	...	...	...

Annual expenditure under A B C & D, amounting to £350, the interest on £7,000 from Leake Estate ; in reference to B see page 30.