

French Academy of Sciences, at which fifty-six representative astronomers from all parts of the world were present, a scheme has been approved for the formation of a photographic map of the heavens by the concerted action of a number of Observatories in both hemispheres. This scheme provides for two series of photographs, the one intended to contain all stars down to the fourteenth magnitude inclusive, and the other, taken with short exposure, specially designed to give accurate positions of brighter stars down to the eleventh magnitude, so that it may be possible to form an extensive Catalogue of reference-stars for the first series, and thus to give the means of accurately determining the position of any star on the photographic map down to the fourteenth magnitude. The instruments with which this work is to be jointly carried out are to be photographic refractors of 0.33m. (13 inches) aperture and 3.43m. (11 feet 3 inches) focal length, and the Directors of the following ten Observatories have already announced that they are prepared to take part in the enterprise: Algiers, Bordeaux, Paris, Toulouse, and Vienna in the northern hemisphere; La Plata, Melbourne, Rio de Janeiro, Santiago da Chile, and Sydney in the southern hemisphere. It seems fitting that Greenwich should take its share in a scheme which will in a few years so greatly extend our knowledge of the places of the fixed stars, and thus serve to carry out one of the principal objects for which the Astronomer-Royal was appointed.

"On a review of the work of the past twelve months, it will be found that the activity of the Observatory has increased in various directions. The number of meridian observations is much larger than usual; additions have been made to the work of the magnetical and meteorological branch; there have been continuous trials of chronometers and deck-watches (requiring special arrangements in each case), which have made large demands on my own time, as well as on that of Mr. Turner and of Mr. Lewis. Extraneous work in connexion with the Navy has also absorbed a good deal of time that would otherwise have been free for scientific investigations. Questions connected with gun-directors, mirrors for electric search-lights, and binoculars for the Navy, have continued to engage our attention, and since the date of the last Report 510 telescopes and 35 binoculars for the Navy have been sent to the Observatory for examination, whilst it is to be presumed that a further supply of 500 binoculars, now on order, will be forwarded here to be tested in due course.

"Whilst it seems desirable that such directly utilitarian work should be undertaken at the Observatory, as being the only existing Government establishment where it can be done efficiently, I feel it necessary to point out that the existing staff is inadequate for these extraneous duties in addition to the well-defined work for which the Observatory is primarily maintained. By great efforts, which can hardly be sustained for an indefinite period, the current reductions have been kept up, notwithstanding the large number of observations obtained in the last twelve months, but the ulterior discussions which are required to maintain the character of the Observatory as a scientific institution are falling further and further behind. Amongst other matters which I should wish to take up, if leisure could be found, I may mention the determination of proper motions of stars from the observations made at Greenwich since Sir G. B. Airy's appointment in 1835, an investigation which appears to come within the terms of the Royal Warrant directing the Astronomer-Royal 'to rectify the tables of the motions of the heavens and the places of the fixed stars.'

"The appointment of a clerk, which has presumably received the sanction of the Admiralty, will, when it is made, provide for the increase of office-work which has taken place of late years in regard to chronometers, accounts, stores, stationery, printing, &c., and if the maintenance of the telegraph-wire, batteries, &c., for communication of time-signals were undertaken by the Post Office Telegraphs as part of the distribution of time to the public, there would be some further relief. But to enable me to give time to extraneous questions referred to the Astronomer-Royal by the Government, it appears necessary that the Chief Assistant and I should be relieved of certain mechanical work which might be intrusted to computers, and that further responsibility should be delegated to the Assistants. Proceeding on the lines which have been laid down by my predecessor, I believe that the maximum of efficiency at the minimum of cost would be attained if an increase of work were met by an increase in the staff of computers, with due recognition of the position of two or three senior computers, and of the increased responsibility of the Assistants."

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—In Convocation on Tuesday, a grant of £4800, applied for by Prof. Clifton, for the extension of the Clarendon Laboratory by the erection of buildings for an Electrical Department, was refused by a large majority.

Twenty-seven men have entered for the final schools in Natural Science this year, of whom sixteen offer chemistry, four physiology, three animal morphology and physics, and one botany.

A course of medical teaching, including clinical demonstrations and elementary surgery, is to be given at the Radcliffe Infirmary during the first half of the Long Vacation.

Besides the lectures which were announced at the beginning of term, Mr. Arthur Evans, the Keeper of the Ashmolean Museum, is giving a course of lectures on "The Early Iron Age."

CAMBRIDGE.—The twenty-first Annual Report of the Museums and Lecture Rooms Syndicate states that during the year 1886 considerable progress has been made in arranging the various collections, but additional accommodation in the form of cases and cabinets is required in various departments, especially for botany and ornithology. Additional accommodation is urgently demanded for the teaching of physiology, pathology, and botany. It is also desirable that permanent arrangements for human anatomy and medicine should be taken into consideration without further delay, and that the work should be commenced as soon as possible after the present chemical laboratory is vacated.

Mr. J. W. L. Glaisher, F.R.S., and Mr. J. S. Nicholson, Professor of Political Economy in the University of Edinburgh, have been approved for the degree of Doctor in Science.

The University having been applied to by the Association for the Improvement of Geometrical Teaching to take some steps to give improved methods of teaching geometry fair play in their examinations, and the Association having sent a deputation to Cambridge to confer with the Board of Mathematical Studies, the latter Board have recommended that other proofs than Euclid's be accepted in the Previous Examination, no proof of any proposition occurring in Euclid being admitted in which use is made of any proposition which in Euclid's order occurs subsequently. They do not at present propose modifications in the syllabus of geometry for the Mathematical Tripos, because they are about to revise the schedule of Part I. as a whole.

The recent report on the local lectures scheme shows that a fair share of attention has been devoted to natural science—namely, thirty-five out of one hundred courses of lectures. The courses on "Work and Energy" by Mr. A. Berry, delivered at five centres in the Northumberland mining district, were very successful. There is distinct progress in the systematization of work, and the development of local centres; but there are many difficulties owing to lack of endowments. Attempts are being made to connect practical courses of instruction with the scientific lectures, but here again the lack of apparatus and laboratories is a serious disadvantage. An endowment fund of £1136 has been contributed, of which more than half is given by the Local Lectures and Examinations Syndicate. The chief purpose contemplated is the retention of the services of practised lecturers.

The class list of the Natural Sciences Tripos, Part I., just issued, contains the following names in Class I.: Anderson, Cai.; Barber, Chr.; Colbeck, Cai.; D'Albuquerque, Joh.; Dufton, S. F., Trin.; Dufton, A., non-collegiate; Elliott, Chr.; Francis, King's; Fry, King's; Grabham, Joh.; Groom, Joh.; Richardson, King's; Tennant, Cai.; Turner, F. M., Trin.; Waggett, Pemb.; Wagstaff, Sid.; Williams, Cai.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Physical Society**, May 28.—Prof. W. E. Ayrton, Vice-President, in the chair.—Dr. S. P. Thompson read a note on transformers for electric distribution. In the simple algebraic treatment of the dynamo several assumptions approximately true for well-made machines are made use of. The author finds that a similar set of assumptions for transformers greatly simplifies the algebraic theory:—(1) The iron, copper, and insulation are assumed good. (2) The reaction of the secondary on the primary (other than that desired) is small; thus, if the primary be