

results to an extent incommensurable with the extra labour involved.

The 200 areas would include 400 square degrees of the sky, and this full scheme would entail the following labours:—The determination of the rough positions and sharply defined photographic magnitudes of some 200,000 stars; visual magnitudes for the same 200,000; the determination of the accurate proper motions, to within $0^{\circ}01$ in each coordinate, of some twenty thousand of these objects. For the same twenty thousand, parallaxes are necessary, and for as many of them as is possible the class of spectrum and the radial velocities must be determined. Finally, the determination of the total amount of light received from different parts of the sky would complete a set of homogeneous data from which undreamt-of additions to our knowledge of the sidereal universe might accrue.

In addition to this "systematic plan," Prof. Kapteyn, after much correspondence and discussion with a number of eminent astronomers, has decided on a scheme for the elucidation of "special areas." This scheme includes forty-six areas, such as those in the Milky Way which show intense variations of star-density, the rifts and branches of the Milky Way, and extra-galactic areas where nebulae or strong contrasts in star-density are preponderant.

Many interesting devices to further the plan are discussed by Prof. Kapteyn, e.g. the determination of colour, and hence the probable spectrum class, from the comparison of the photographic and visual magnitudes in the cases where the stars are so faint that these features cannot be determined by the usual methods; again, the determination of proper motions and parallaxes from plates exposed a second time after an interval of some years. Possibly Prof. Wolf's stereo-comparator method of determining proper motions would materially curtail the interval necessary between the two exposures.

Considering a few details, it is seen that the scheme includes:—(1) 9710 exposures on 2620 plates, in addition to the plates for the determination of the radial velocities of three or four standards in each area. (It is intended that the bulk of the radial velocities shall, if possible, be determined by one of the wholesale prismatic-camera methods such as those proposed by Herr Orbinsky, Prof. E. C. Pickering, and Prof. Comstock.) (2) Visual observations of 3024 standard magnitudes, the determination of the magnitudes and positions of 200,000 stars, and the meridian observations of some 2600 stars for proper-motion standards. (3) The measuring of nearly $1\frac{1}{2}$ million images.

Prof. Kapteyn, with all his experience, is quite ready, should the essential funds be forthcoming, to undertake a greater part of the measuring work, and could, at present, undertake to perform half his proposed share. A number of other well-known astronomers, as may be seen from the letters which he publishes at the end of his brochure, are definitely and enthusiastically in favour of the project, and are willing to grant what aid is in their power, so that the scheme cannot be looked upon as immature or as entailing insuperable difficulties.

Accepting for the moment that the plan, in its entirety, is feasible, the possibilities attached to the discussion of the results are obviously infinite. In some fifty or a hundred years, the "Carte du Ciel," if repeated, will probably afford a series of definitive proper motions which can then be discussed from the sidereal structure standpoint, but of the spectral layers in the visible universe it would leave us in almost total ignorance. On the other hand, the results from Prof. Kapteyn's plan would probably afford all the information attainable by human effort of the sidereal strata, or groups, or drifts, or a thousand and one other features.

As an earnest of what might accrue from such a discussion, one may cite the remarkable result recently derived by Mr. Eddington from the analysis of the relatively meagre data of the Greenwich-Groombridge proper motions (see NATURE, No. 1938, p. 182, December 20, 1906), a result first derived, in a qualitative form, by Prof. Kapteyn himself from a discussion of the Bradley proper motions.

W. E. ROLSTON.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—At a meeting of members of convocation in Magdalen College on February 23, which had been summoned by the Vice-Chancellor to consider the election of a Chancellor of the University, there seemed to be a majority in favour of the nomination of Lord Curzon.

The published accounts of the common university fund for 1906 show that the income for that year was 6937*l.*, and the expenditure 6395*l.*, of which sum 3577*l.* was devoted to scientific objects.

CAMBRIDGE.—The Smith's prizes have been awarded for the following essays:—"Fluorescence," G. R. Blanco-White; "The Systematic Motions of the Stars," A. S. Eddington; "The Bending of Waves Round a Large Opaque Sphere and some Associated Problems," J. W. Nicholson; "The Variation of the Absorption Bands in the Spectrum of a Crystal under the Action of a Magnetic Field," W. M. Page. The names are arranged in alphabetical order. The essay on "Some Problems on the Diffraction of Electric Waves," by H. J. Priestley, is awarded honourable mention.

H. R. Hassè has been elected to the Isaac Newton studentship, tenable from April 15, 1907, to April 15, 1910. The student will carry on a course of research in physical optics.

W. Spens has been elected fellow at Corpus Christi College, and has also been appointed director of natural science studies in the college.

Zoology, the superintendent of the Museum of Zoology, announces the receipt of a cast of a skeleton of *Diprotodon australis*, presented by Dr. E. C. Stirling, F.R.S., director of the South Australian Museum at Adelaide. Dr. Harmer also records the gift of a valuable consignment of some nine skeletons and forty skulls and skins of mammals, mostly antelopes, from tropical Africa, presented by Mr. C. B. C. Storey, of Clare College.

The Cavendish Laboratory Extension Syndicate has proposed plans for the new laboratory running along Free School Lane, which will cost between 7000*l.* and 8300*l.* Towards defraying the cost of this building there is available Lord Rayleigh's gift of 5000*l.* out of the Nobel prize, and Prof. Thomson is able to find 2000*l.* from the laboratory funds.

The recommendation of the general board of studies that a university lecturer in pathology be appointed, in connection with the special board for medicine, with an annual stipend of 100*l.* payable out of the common university fund, will be brought before the Senate on March 9.

It is proposed to nominate Prof. A. Thomson to be a member of the board of electors to the professorship of anatomy; Sir E. C. Perry, a member of the board of electors to the Downing professorship of medicine; Prof. Graham Kerr, an elector to the professorship of zoology; Dr. Anderson, an elector to the chair of physiology; Prof. Middleton, an elector to the Drapers' professorship of agriculture; and Prof. Langley, to that of botany.

The local examinations and lectures syndicate has appointed E. A. Parkyn and D. H. S. Cranage as delegates at the International Congress on School Hygiene to be held in London in August.

Mr. J. J. Lister has been appointed a manager of the Balfour fund until June, 1909, in succession to the late Sir Michael Foster.

Mr. F. A. Potts has been nominated to occupy the University table at the laboratory of the Marine Biological Association at Plymouth for one month during the ensuing Easter vacation.

THE Mercers' Company has made a donation of fifty guineas, and the Grocers' Company one of ten guineas, to the South-Eastern Agricultural College.

At the South-Western Polytechnic on March 15 the Lord Alverstone, G.C.M.G., Lord Chief Justice of England, will present prizes and certificates to students of evening classes and of the day college.

THE Goldsmiths' Company has undertaken to provide the 8000*l.* required for the completion of the new wing of Goldsmiths' College at New Cross. The site and buildings were presented by the company to the University of London for educational purposes in 1904.

THE treasurer of Guy's Hospital has received a bequest of 1000*l.* under the will of the late Dr. C. J. Oldham, of Brighton, for the purpose of endowing an annual prize in ophthalmology at the medical school. A further anonymous donation of 200*l.* has also been received for the fund of the endowment of medical education and research.

MR. HAROLD HILTON has been appointed lecturer in mathematics at the Bedford College for Women (University of London). Mr. Hilton is a former fellow of Magdalen College, Oxford, and has for the past five years been on the teaching staff of the University College of North Wales. He is the author of a treatise on the mathematical theory of crystallography, and of numerous papers published in the Proceedings of the London Mathematical Society and elsewhere.

SINCE the disastrous fire which partially destroyed the main building of the Merchant Venturers' Technical College, Bristol, in October last, various sites for the re-erection of the college have been suggested and carefully discussed. A report advising the retention of the present site was adopted by the Society of Merchant Venturers on Friday last, and steps will, therefore, be taken at once to replace the various laboratories, workshops, lecture theatres, &c., with all possible speed. In framing plans for re-building, the Merchant Venturers will bear in mind the possibility that at some future period the college may be called upon to take its proper part in the formation of the proposed University of Bristol.

THE Board of Education has issued a return showing the extent to which, and the manner in which, local authorities in England and Wales have applied funds to the purposes of technical instruction and other forms of education other than elementary during the year 1904-5. The total number of authorities having powers in respect of education other than elementary was, for the year under consideration, 1203; of these, sixty-three were county councils, seventy-one county borough councils, and the remainder councils of non-county boroughs or urban districts. All the county councils and county borough councils, and 431 of the councils of non-county boroughs or urban districts, incurred expenditure for higher education. Particulars are provided as to money spent upon secondary schools, including pupil-teacher centres; evening schools and institutions for higher and technical education; exhibitions, including payment of fees; salaries for administrative officers, legal expenses, and general administration; and in respect of loans. The total expenditure in England and Wales on higher education, understood as including the work of institutions mentioned, was, in 1904-5, 2,889,871*l.* The amounts under the more important headings were:—secondary schools, 736,966*l.*; evening schools and institutions for higher and technical education, 1,382,162*l.*; exhibitions, 248,007*l.*; training of teachers, 48,835*l.*; administrative and legal expenses, 152,605*l.* The detailed information provided in the tables should prove of great value to members of education committees desiring to compare the expenditure in their own districts with that in other areas.

MR. MCKENNA, President of the Board of Education, addressed a letter on February 19 to Sir Francis Mowatt, the first chairman of the departmental committee on the Royal College of Science, concerning the proposed Imperial College of Applied Science at South Kensington, to the delay in the inauguration of which we referred last week. Mr. McKenna says that the time which has elapsed since the appearance of the committee's report has not been wholly wasted, because the problem has become clearer and the institutions concerned have become more nearly agreed as to the necessities of the case. After reviewing the alternative courses pressed upon the consideration of the Board of Education, the president expresses the opinion, maintained in these columns, that the point of determinative importance in the whole situation now is that there should be no further avoidable delay in bringing

about the establishment of the new institution. The gratifying announcement is then made that the King is to be petitioned for a Charter for the new institution on the lines unanimously recommended by the departmental committee in January, 1906, and set forth in the draft proposals circulated by the Board of Education last July. The special governing body suggested by the departmental committee is to be appointed forthwith, and the institution to be developed as soon as possible. Mr. McKenna concludes his letter by requesting Sir Francis Mowatt to intimate to the Senate of the University of London that after an interval of time sufficient to permit of the full development of the governing body for the new institution, he will be prepared to advise the appointment of a Royal Commission to consider whether the amalgamation of the new institution with the University of London is desirable and feasible.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 13, 1906.—“Further Observations on the Effects produced on Rats by the Trypanosomata of Gambia Fever and of Sleeping Sickness.” By H. G. **Plimmer**. Communicated by Dr. C. J. Martin, F.R.S.

From the results of 211 experiments, extending over a period of nearly three years, it appears that the tentative deductions which the author made in his preliminary note (Roy. Soc. Proc., vol. lxxiv.) from the few experiments therein recorded, that Gambia fever and sleeping sickness are two distinct diseases, cannot be maintained.

This extended series of experiments and observations goes to show that each of these two strains of Trypanosomata has produced two different effects in the same class of animals, under conditions of which we at present know nothing; that these effects are alike for the two organisms; and that the Trypanosomata found in these two types of disease are one and the same organism, modified by passage from man through monkeys to rats, and perhaps in the strains used by the author, by transplantation into animals of, and in, another country.

Faraday Society, January 29.—Prof. H. E. **Armstrong**, F.R.S., in the chair.—Discussion on osmotic pressure, opened by the **Earl of Berkeley**, who exhibited and described his apparatus for the direct measurement of osmotic pressure. The ordinary direct method of measuring osmotic pressures is to obtain equilibrium on the two sides of the semi-permeable membrane by means of the pressure of a head of liquid. The method devised by the author and Mr. E. G. J. Hartley substitutes mechanical pressure, which is put straight on to the solution, and equilibrium thus obtained. A vapour-pressure method for measuring osmotic pressure was also described.—Indirect methods of measuring osmotic pressure: W. C. **Dampier Whetham**. The speaker agreed as to the importance of the vapour-pressure method. He discussed the formula used by Berkeley and Hartley, and explained the difference between it and the van 't Hoff formula obtained from thermodynamic considerations, the expressions being identical where there is no change of volume of the solvent as it enters the solution.—Osmotic pressure from the standpoint of the kinetic theory: Dr. T. M. **Lowry**. The application of the equation $PV=RT$ to the osmotic pressure of gases could be predicted on general theoretical grounds, but there was no *a priori* reason for supposing that it would be applicable to the case of liquids. In the early years of the osmotic discussion it had been assumed by van 't Hoff and others that since osmotic pressures and gas pressures could be calculated by means of the same formula the conditions must be identical in the two cases, and it was definitely stated that in dilute sugar solutions the osmotic pressure was wholly due to the bombardment of the membrane by the molecules of the sugar, the effects produced by the water molecules being substantially identical on either side of the membrane. The alternative view, that osmotic pressure represented a diminution in the activity or “active mass” of the solvent, was suggested by Poynting in 1896, and had sub-