

from an examination of the work of London Polytechnics. In the first place, the funds at the disposal of the Institutes are usually not sufficient to permit the educational needs to be properly supplied. In order to supplement the sum arising from endowment, grant-earning classes have to be held, which means that subjects come to be considered for what they will bring to the Institute's exchequer rather than for what they are worth. The Technical Education Board of the London County Council have taken steps to remedy this evil by contributing maintenance grants, and capital grants for equipment, apparatus, &c., the former being allotted according to a scale calculated to promote educational efficiency, and regularity of attendance. The Department of Science and Art, and other Examining Bodies, should consider the advisability of treating Polytechnic Institutes in a similar manner, instead of regarding them as mere collections of classes. The less an institute of this kind depends upon payment by results, the more likely is it to develop in the proper direction.

Very little provision is made in the institutes for really advanced work or research, but this will probably come, for in London, technical education is only in its experimental stage. Many years of work will have to be done before any London institute will be able to find students for instruction of such an advanced character as that given in continental Polytechnics. Mr. L. Smith recommended, in his report to the London County Council, that a grant should be made "towards the maintenance of an advanced department of applied science, bearing on some local industry, under the control of a well-qualified instructor who gives all his time to the work of the institute." The Technical Education Board have promised a contribution for this purpose when a Polytechnic desiring it shall have drawn up a detailed scheme of work, and the Board is satisfied that the proposed class will be of value to the industries of the district.

As to the recreative side of the institutes, little need be said. The desire for physical exercise is so much stronger than that for mental development, that there is a possibility of recreation swamping education in one or two cases. Generally, however, the two sides are very well balanced, and admirably assist one another in the development of men of thought as well as men of muscle.

For the rest, Polytechnic Institutes have aroused the interest of the working class, and men now realise the necessity of a scientific grounding for every trade. To have done this in so short a time promises well. In a few years, perhaps, London Polytechnics will be able to compare favourably with those in other European capitals, and when that day arrives a generation of workmen will have sprung up which, for aptitude and efficiency, should be able to hold its own against the world.

R. A. GREGORY.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Mr. V. H. Velej and Mr. G. C. Bourne have been appointed Examiners for the Burdett-Coutts Scholarship.

The sixth annual report of the Curators of the Botanic Garden shows a deficit of nearly £200 on the close of the financial year. This is due principally to the decrease of income derived from rents and profits of estates. The Curators report that the existing endowment is inadequate to maintain the Garden, and that it will be necessary to call on the University at no distant date, to consider whether a moderate annual subvention should not be made to place the Garden on a satisfactory basis. The deficit would have been greater but that the Professor of Botany has made, *proprio motu*, a contribution of £50 towards the funds of the Garden. The new range of glass-houses, including the palm house and the succulent house, has been completed and proves satisfactory.

Elections to Scholarships in Natural Science will be held at the following Colleges:—Balliol College, examination to begin on November 20, a scholarship in Natural Science worth £80 a year, on the foundation of Miss Hannah Brakenbury. Balliol, Christ Church and Trinity College. At Balliol two Scholarships of the value of £80 a year and one Exhibition of the value of £40 a year. Christ Church, one Scholarship of the value of £80 a year and one Exhibition of the value of £85 a year. Trinity College, one Scholarship of the value of £80 a year. The examinations for these Scholarships will begin on Tuesday, November 20.

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CAMBRIDGE.—Dr. Bradbury, the Downing Professor of Medicine, has appointed as his assistant in Pharmacology Mr. C. R. Marshall, Research Fellow of Owens College, Manchester.

The Rede Lecture will be given in the Anatomy School by Mr. J. W. Clark, Registrar, on June 13 at noon. The subject is "Libraries during the Middle Ages and the Renaissance."

A considerable number of courses in scientific subjects, including Chemistry, Mineralogy, Geology, Anatomy, and Pathology are announced for the ensuing Long Vacation, which is more and more assuming the character of a regular term.

No less than twenty-three women are announced as having "deserved Mathematical Honours" in Part I. of the Mathematical Tripos.

By the election of Dr. Hickson to the Professorship of Zoology at Owens College, Manchester, a vacancy is created for a University Lecturer in Invertebrate Morphology.

#### SCIENTIFIC SERIALS.

*Wiedemann's Annalen der Physik und Chemie*, No. 5.—On the measurement of surface tension of water and mercury in capillary tubes, by G. Quincke. In accurate measurements of the surface tension of water by elevation in capillary tubes the marginal angle must be taken into account. It is different from zero, and generally increases with the age of the tubes. For the same kind of glass the surface tension of water at 18° is generally found to increase with the diameter of the capillary tube. For wide tubes of normal Jena glass or English flint glass the surface tension at 18° was 7.846 and 7.776 mgr.—On the magnetic deflection of cathode rays, by Philipp Lenard. The magnetic deflection is not affected by the medium in which the rays are observed, but remains the same for a given species of cathode rays, whatever may be the gas, the intensity, and the pressure. But at different pressures within the generating apparatus different cathode rays are produced, showing varying amounts of deflection.—On a sodium-nitrogen compound, by L. Zehnder. Sodium mirrors deposited electrolytically in vacuum tubes gave rise to strong absorption and rapid fall of pressure, accompanied by the formation of a brown mirror during the glow discharge. A detailed investigation showed that this action takes place as soon as metallic sodium has been transferred to the cathode. The compound formed, probably  $\text{NNa}_3$ , is not deposited on the cathode, but on the glass walls near the anode.—On the elliptic polarisation of reflected light, by K. E. F. Schmidt. In the case of glasses of equal refractive indices and different dispersive powers the glass with the higher dispersion shows the wider range of angle at which ellipticity is observed.—On the spectra of tin, lead, arsenic, antimony and bismuth, by H. Kayser and C. Runge. The authors have continued their efforts to find uniformities in the structure of the metallic line spectra through the periodic series of the elements. The above metals were taken as convenient representatives of the fourth and fifth rows. The spectrum of tin may be reconstructed by superimposing three equal spectra differing by a constant oscillation frequency. The same law applies to the spectra of lead and arsenic. In the case of antimony, six such spectra are superposed, and in bismuth four.—Line spectra, by J. R. Rydberg. This is a comparison of the spectra of calcium and strontium.

#### SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 10.—"Preliminary Report on the Results obtained with the Prismatic Camera during the Total Eclipse of the Sun, April 16, 1893." By J. Norman Lockyer, C.B., F.R.S.

During the total eclipse of 1871 observations were made by Respighi and the author with a spectroscope deprived of its collimator, and a series of rings was seen corresponding to the different rays emitted by the corona and prominences. A similar instrument, arranged for photography, was employed during several succeeding eclipses, but the photographs were on so small a scale that none of the results came up to the expectations raised by the observations of 1871. As the Solar Physics Committee is now in possession of a prismatic camera of 6 inches aperture, the prism having a refracting angle of 45°, it was determined to employ it during the eclipse of 1893. The instrument was placed at the disposal of the Eclipse