of institutions outside the council. This committee has formulated a series of resolutions, which are now issued with the general approval of the members of the association, and among them the following may be noted:—

That the Government be asked to prevent any child leaving school before the end of the term in which the child attains its fourteenth birthday; that the State should make adequate grants for the maintenance of free scholars proceeding from primary schools to secondary and junior technical schools; that there shall be instituted compulsory attendance at continuation classes up to the age of eighteen years, such attendance to be made in the daytime, and the period of instruction to be not less than eight hours per week, such hours to be within the normal hours of employment; that the conditions for admission to universities should be reconsidered and rendered more uniform as between different universities, and less uniform as between different faculties and different honours schools in the same university, and that in the interest of candidates of mature age and of other candidates approaching the university otherwise than through the normal avenue of the secondary school, university entrance tests should be distinguished from secondary-school examinations; that it is desirable that there should be a large increase in the number of scholarships with adequate maintenance grants to enable candidates to proceed to day technical colleges; that teachers in technical departments of universities and technical colleges be encouraged to undertake research on behalf of, and in co-operation with, manufacturing firms: that in view of the national importance of technical education the State should bear a much larger proportion of its cost than is now the case; that Government grants in aid of technical research should be largely increased; that it is essential that the chief officials of the Technological Branch of the Board of Education should have had a scientific training; and that the examinations of the Civil Service and for other Government appointments, when not directly on the subjects of the service, should include such science subjects and syllabuses, and should be so marked as will give the student with a scientific training an equal chance with a student who has had a literary training.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LONDON.—The Senate has elected Sir Cooper Perry, physician at, and superintendent of, Guy's Hospital, to the office of Vice-Chancellor for the year 1917–18, in succession to Sir Alfred Pearce Gould.

The thanks of the Senate have been accorded to the Right Hon. Lord Reay, K.T., for the gift of a portion of his library to the University for the University College libraries, and to Mr. George Hare for the gift of 50*l.* to found a zoology prize at King's College, in memory of his son, a medical student, who was killed at the battle of Gaza.

The following doctorates have been conferred:—*D.Sc. in Physiology*, Mr. S. W. Patterson, an internal student, of University College, for a thesis entitled "The Action of Carbon Dioxide and Adrenalin on the Heart"; *D.Sc.* (*Economics*), Mr. J. E. Holloway, an internal student, of the London School of Economics, for a thesis entitled "The Prelude to the Great Trek"; *D.Sc. in Zoology*, Mr. Cyril Crossland, an external student, for a thesis entitled "Desert and Water Gardens of the Red Sea," and other papers.

OXFORD.—Sir Napier Shaw, Director of the Meteorological Office, has been appointed Halley lecturer for 1918.

The School of Geography has published its arrangements for the ensuing Michaelmas term. These include lectures, tutorial instruction, and field work. Among the subjects announced are:—"Maps: their Construction and Interpretation"; "The Alps and Northern Italy," Mr. Beckit; "The British Isles," Miss MacMunn; "Eastern Australia and New Zealand," Mr. Spicer; "Geology," Prof. Sollas; and "Historical Geography of Great Britain," Mr. Grant Robertson.

A list of lectures and other courses of instruction for the forthcoming term has also been issued by the Department of Anthropology. In physical anthropology lectures will be given by Prof. Thomson and by Miss Czaplicka, the latter on ethnology. The geographical distribution of man will be dealt with by Mr. Beckit. Mr. H. Balfour, Prof. Sollas, and Mr. Griffith will lecture respectively on prehistoric archæology, on stages of human culture, and on ancient Egypt. Various topics of social anthropology will be taken in hand by Dr. Marett, Sir P. Vinogradoff, Prof. Macdonell, Mr. V. A. Smith, and Mr. Blunt. Prof. Wright will lecture on philology, and Prof. J. A. Smith on primitive language in its relation to thought.

MR. T. H. BICKERTON has been appointed lecturer on ophthalmology in the University of Liverpool in succession to Mr. E. A. Browne, who has resigned the position.

THE title of Emeritus professor has been conferred upon Col. de Burgh Birch, until lately professor of physiology and histology, and dean of the faculty of medicine, in the University of Leeds.

THE proceedings at the annual general meeting (March 29) of the Council of Education, Witwatersrand, published in a report just received from Johannesburg, show that we were right in our article of August 10 last year when we said that apparent grievances and jealousies would end in a unanimous effort to establish a real university for Witwatersrand. We wish we could hope that the present entrance examination for the diploma of the School of Mines might be regarded as sufficient for matriculation in the new university, at all events for undergraduates proceeding to science degrees.

AMONG the many problems connected with engineering upon which experience gained during the war has shed fresh light is that of the workshop training of apprentices. An article which appears in *Engineering* for June 22, by Mr. Neil J. Maclean, gives an interesting account of the system which has been in operation for twelve years at the works of Messrs. Barr and Stroud, Ltd., Glasgow. The author lays down six axioms which should be borne in mind in instituting any apprenticeship system. (1) The apprentice must be always busy, thus necessitating the time and attention of a skilled man. (2) The apprentice must be always learning; he must be taught to do a certain thing properly, and must then be moved on to a different kind of work. (3) Engineering is an exact science, and the apprentice must develop the scientific mind; to obtain the desired result, the training must involve an intimate mingling of practical and theoretical work, of shop experience and study, of things seen and done, things noted and written down. (4) The apprentice's course of training must not be determined by the shop foreman or manager responsible for output; in our opinion, the author touches a fruitful source of grievance here. A lad does well at a certain job, and the foreman keeps him at it in order to maintain output, regardless of the loss of experience to the apprentice and the ultimate loss to the firm.

(5) There cannot be too many highly trained apprentices. (6) Special training must be given to those apprentices who show marked ability. The article is very interesting to all concerned in the training of apprentices, and throws light on one reason for the success of the well-known firm mentioned.

PROF. IGNAZIO GALLI has an article, "Sulla questione della lingua internazionale," in a recent number of the *Atti della Pontificia Accademia Romana dei Nuovi Lincei*. Among arguments in favour of a common international language he lays stress on its convenience at scientific congresses. Those who attend such meetings must have noticed that when each member uses his own language the discussion often shows that a speaker has imperfectly understood much that has been said in a language foreign to him. As regards the choice of the international language, Prof. Galli finds that Volapük is too complicated and difficult to pronounce. Esperanto is easy to pronounce, since it gives to each letter of the alphabet only one sound. Prof. Galli thinks that the belief that Esperanto would become a universal language is steadily losing ground, and that this is due to its too artificial simplicity, which renders this language meagre and rather vague. We are told that Ido has a more rational selection of words than Esperanto, while Simplo, a language invented by Mario Ferranti, has about 5800 words, which are formed from roots common to Latin, Italian, French, and English. Finding none of these artificial languages to be sufficiently flexible to express all the ideas of modern science and philosophy, Prof. Galli strongly urges that instead of wasting energy in the creation of a new language, Latin should be adopted as a common language for international intercourse. He proposes that Latin should be taught in schools, not as a dead, but as a living, language. Men of all nations would then converse freely when they met, as the learned could in the days of Roger Bacon. In connection with Prof. Galli's suggestion, it is worth while to mention that Latin and Greek are both taught as living languages at the Perse School, Cambridge, with very successful results. A letter on "Latin as a Universal Language," by the late Sir Lauder Brunton, appeared in NATURE of February 10, 1916 (vol. xcvi., p. 649).

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 14.—Sir J. J. Thomson, president, in the chair.—Prof. T. H. **Havelock**: Some cases of wave motion due to a submerged obstacle. In this paper Prof. Lamb's solution for a submerged circular cylinder is carried a stage further in the approximation, and the wave resistance is calculated directly from the resultant fluid pressure on the cylinder. Similar methods are then applied to a three-dimensional problem, the waves produced by a submerged sphere.—Prof. L. V. **King**: The propagation of sound in the free atmosphere and the acoustic efficiency of fog-signal machinery.—H. J. **Shannon**, F. F. **Renwick**, and B. V. **Storr**: The behaviour of scattering media in fully diffused light. The paper deals with the relationships between the rejectance (proportion of incident light rejected), the obstruction (ratio of incident light to transmitted light), light capacity (ratio of accepted light to transmitted light) when a sheet of diffusing medium is illuminated on one side by diffuse light, and also the relative obstruction, and relative density, when, as in various instruments, the source of light is a first sheet of diffusing medium in contact with the sheet being examined. The experimental part of the paper discusses the method of using the theoretical equations obtained for determining the constants of a specimen of diffusing medium, certain requirements of the instrument used, and precautions to be taken. Examples are given showing the close agreement between observed and calculated values up to seven thicknesses of opal for both air and oil contact.—J. W. T. **Walsh**: The theory of decay in radioactive luminous compounds. The theory of destruction of "active centres" put forward by Rutherford to account for the decay of luminosity of radio-active luminous compounds leads to a simple exponential relation in the special case of a compound of constant activity. It has been found for radium zinc sulphide compounds that this relation expresses the observed results to a sufficient accuracy over short periods of less than 200 days, but that it fails to do so over longer periods, such as 500 days, the rate of decay of luminosity becoming gradually slower and slower, so that the brightness tends to a limiting value which is not zero. The paper is an attempt to find a luminosity time relation which will allow of the prediction of the ultimate behaviour of compounds of varying composition, and it assumes the operation of some factor acting in a direction opposite to that of the destruction of the active centres.

Physical Society, June 8.—Prof. C. V. Boys, president, in the chair.—T. **Parnell**: An alternating-current bridge method of comparing two fixed inductances at commercial frequencies. The paper describes a method of avoiding the troublesome double adjustment required in Maxwell's method of comparing inductances. A current detector, the deflections of which depend on the component of the current in quadrature with the E.M.F., is employed, which makes it possible to arrange that the condition for no deflection depends chiefly on either the inductances or the resistances. In series with the bridge is placed either a non-inductive resistance or a capacity. In the first case the balance depends chiefly on the inductances, and in the second case on the resistances. A few alternate repetitions of the two adjustments suffice to balance the bridge, both for resistances and inductances. As detector a sensitive moving-coil galvanometer in conjunction with a commutator, or a Sumpner electrodynamometer, may be employed; the latter proved more satisfactory.—Balth. **Van der Pol**, jun.: The wave-lengths and radiation of loaded antennæ. The paper consists of a mathematical treatment of the subject, the following being some of the conclusions arrived at:—The radiation resistance of a loaded antenna, and also the radiation from the antenna, are dependent not only on the wave-length, but also on the current values at the top and bottom. The radiation cannot, therefore, be written $\Sigma = AT^2l^2/\lambda^2$, where A is constant and T is the R.M.S. current at the base, as is done in most text-books. Rudenberg's formula for flat-top or umbrella antennæ is valid only for very long wave-lengths, with a capacity at the top of the antenna very large compared with that of the vertical part, and Austin's table of radiation resistances up to ratios of $l/\lambda = 0{\cdot}4$ is based on an unjustifiable extrapolation of Rüdenberg's results. The paper also treats of the directions in which the energy is most strongly radiated under different conditions.—Dr. A. **Griffiths**: A method of preventing sparking at a rapid make-and-break, which incidentally produces colloidal platinum. The apparatus exhibited was described in the *Philosophical Magazine* for March, 1895, p. 232. The device consists of a series of electrolytic cells placed as a shunt across the spark-gap. The electrodes consist of platinum, and the electrolyte of strong sulphuric acid. The cells polarise, and on making the gap an E.M.F. is introduced opposed to the E.M.F. of the battery, so that the