Prof. Asaph Hall was elected vice-president; Prof. Ira Remsen, home secretary; and Prof. A. Graham Bell, treasurer. New members elected were Messrs. Wm. H. Dall (of Washington); Frank A. Gooch (of Yale); Chas. S. Minot (of Boston); and E. W. Morley (of Cleveland).

The autumn meeting of the Academy will be held at Boston on November 16 next.

CONTINUATION OF EXPERIMENTS ON ELECTRIC PROPERTIES OF URANIUM.[1]

IN a paper read before the Society on March 1, we had the honour to communicate some preliminary results on the electric properties of uranium. We propose now to give other results on the same subject, bearing on the conductance induced in air by uranium.

To measure the leakage in air at ordinary pressure at different voltages, we used in our first experiments the two-Leydens method described in a former paper. We found that the leakage was not proportional to the electro-motive force. It was not perceptibly increased when the uranium was heated, or when the sunlight fell on it.

We also observed the leakage in hydrogen, oxygen, and carbonic acid. The experimental arrangements necessary for this are described in a paper published by the Royal Society of Edinburgh. We found that the rate of leakage is greater in oxygen than in air. The ratio of the rates depends on the voltage chosen. The leakage in hydrogen is less than in air. In carbonic acid it is less for four volts per two cms., but greater for ninety volts per two cms. than it is in air; for the latter voltage the leakage in carbonic acid is greater even than the corresponding leakage for oxygen at ordinary pressure. We also made experiments with air, hydrogen, oxygen, and carbonic acid at different atmospheric pressures. We found that the leakage in air at pressures ranging from 760 mms. to 23 mms. was very nearly proportional to the atmospheric pressure. The rate of leakage for lower pressures was so slow as to make the results not very trustworthy. At pressures under 2 cms. no appreciable leakage with 4 or with 90 volts per two cms. was observed. With hydrogen, oxygen, and carbonic acid the rate of leakage at higher pressures was somewhat approximately proportional to the pressure, at lower ones to the square root of the pressure.

We found that at ordinary atmospheric pressure, sparking took place in air at 4800 volts, between a rough fragment of uranium and a metal tube around it, connected to the two electrodes of a vacuum-tube within which they were fixed. At 232 mms. pressure, the potential necessary to produce a spark fell to between 1500 and 2000 volts. At 127 mms. it had fallen to between 1100 and 1300 volts. At 54 mms. it was 700 volts; at 7 mms. 420 volts; at 2 mms. about 400 volts. At 1/1000 mm. the voltage necessary to produce sparking rose again to 2000 volts.

To measure the potential difference between two mutually insulated metals when the air between them is rendered conductive by the presence of uranium, we used two methods, which are described more particularly in the paper above referred to. The steady reading obtained when the quadrants of an electrometer were in metallic connection we shall call the metallic-zero. The deviation from the metallic-zero, when the quadrants were insulated, to a steady point—the uranium-conductance-zero, as we shall call it—depended on the volta difference between the two opposed surfaces of metals, more or less tarnished as they generally were. This deviation took place gradually in about half a minute with one arrangement of apparatus, and in about four minutes with a second arrangement. On the other hand, if the insulated metal had a charge given to it of such an amount as to cause the electrometer reading to deviate from the metallic zero beyond the uranium-conductance-zero, the reading quickly fell to this conductance-zero, and there remained steady.

The following table gives the potential differences between the electrometer wires, when one of them is connected with uranium, and the other with a plate of one or other of the named metals opposed to it:—

Metal.	Volt.
Polished aluminium (1) immediately after being polished	−1·13
Polished aluminium (1) next day	−0·90
Polished aluminium (2)	−1·00
Amalgamated zinc	−0·80
Polished zinc	−0·71
Unpolished zinc	−0·55
Polished lead...	−0·54
Tinfoil	−0·49
Unpolished aluminium (1)	−0·41
Polished copper	−0·17
Silver coin	+0·05
Unpolished copper	+0·07
Carbon	+0·20
Oxidised copper (*a*)	+0·42
Oxidised copper (*b*)	+0·90

It will be noticed that the difference of potential observed depends very much on the state of polish of the metal concerned. With a third specimen of oxidised copper a potential difference of +0·35 of a volt was obtained. This specimen was afterwards connected to sheaths; a piece of polished aluminium was placed opposite it, and connected to the insulated terminal of the electrometer. The uranium disc, insulated on paraffin, was then placed between them, and the deviation observed was equivalent to a potential difference of −1·53 volts; that is, we obtained an effect equivalent to the sum of the effects we had when the metals were separately insulated in air opposite to uranium.

We observed also the effect of various screens on the rate of reaching the conductance-zero. For example, when a sheet of lead about 2 mms. in thickness was used as screen, no deviation from the metallic-zero was obtained. In other words, lead 2 mms. thick is not transparent to the uranium influence. Glass 3 mms. thick did not entirely stop the deviation; it reduced the deviation in the first minute, however, to $\frac{1}{6}$ of the amount obtained with no screen. A copper screen, 0·24 mm. in thickness, reduced the rate to $\frac{1}{3}$; two copper screens, total thickness 0·48 mm., reduced it to $\frac{1}{12}$; three copper screens, 0·72 mm., reduced it to $\frac{1}{48}$. A mica screen did not reduce the rate at all. A zinc screen, 0·235 mm. thick, reduced it to $\frac{1}{2}$. Two zinc screens, total thickness 0·47 mm., reduced it to $\frac{1}{7}$. Paraffin, 3 mms. thick, when placed between the two mutually insulated metals, stopped the deviation from the metallic to the conductance-zero.

The final difference of potential observed between the electrometer wires connected to two mutually insulated metals, when the air between them was made conductive by uranium, was found to be independent of the distance between the metals through distances ranging from less than $\frac{1}{2}$ cm. to 8 cms.

The difference of potential observed when two mutually insulated metals were brought into electric connection with one another by a drop of water, was in the same direction as the uranium conductance-zero between the two surfaces when dry, and was smaller in magnitude. On the other hand, when the uranium surface was covered with water to the depth of about a millimetre, and an air space left above the water, between the submerged uranium surface and the opposed insulated metal, so that we had uranium-water-air-metal, the rate of deviation from the metallic-zero was reduced so much as to be scarcely observable.

We found that the uranium-conductance-zero between zinc and uranium was the same in air, hydrogen, and oxygen. And that the final steady reading did not depend on the atmospheric pressure, though the rate at which this steady reading was reached did largely depend on the atmospheric pressure.

[1] By Lord Kelvin, Dr. J. Carruthers Beattie, and Dr. M. S. de Smolan. Read before the Royal Society of Edinburgh, April 4.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. Nansen has made a contribution of £50 towards the teaching of Geography in the University.

The voting of the Senate on the resolutions respecting degrees for women will take place from 1 to 3 p.m. on Friday, May 21, in the Senate House.

The University of Madras is to be added to the list of Indian Universities which are affiliated to the University of Cambridge.

On account of the incidence of the Jubilee celebrations, the degree days at the end of this term are displaced to June 18 and 19.

THE Universities of Edinburgh and Glasgow each receive the sum of 5000*l.* by the will of the late Miss Brown, of Waterhaughs, Ayrshire. Miss C. Trow has left a bequest of 2000*l.* to found a scholarship, to be called the "Thomas Trow Scholarship," in St. Andrews University.

AT a recent meeting of the Governors of McGill University, it was resolved to institute forthwith a chair of Zoology in the University, the Chancellor, Sir Donald A. Smith, generously undertaking to defray the expenses of the foundation. With the sister department of Botany suitably equipped and provided for, it will be possible to make considerable advances along the lines of biological research and investigation.

THE *Lancet* states that at the statutory half-yearly meeting of the General Council of Edinburgh University, held last week, the draft ordinance issued by the Universities Commission instituting a "Professorship of Public Health and Sanitary Science (to be called the Bruce and John Usher chair of Public Health)" was approved. The professor of this new chair is to have a salary of not less than 600*l.* Mr. A. L. Bruce's bequest was "in acknowledgment of Pasteur's investigations."

THE March *Journal* of the South-Eastern Agricultural College, Wye, does credit to that young and vigorous institution, and to the County Councils of Kent and Surrey. Mr. F. V. Theobald contributes a number of instructive notes on injurious insects; and there are in the *Journal* several papers which should prove of great value to hop-growers, one, by Mr. John Percival, on the hourly temperatures of hops from the beginning to the completion of an oasting, being of special importance.

THE following are among recent appointments:—Dr. Beckenkamp to be professor of mineralogy at Würzburg; Prof. L. Claisen, of Aix, to be professor of chemistry at Kiel; Dr. Gaupp to be an assistant professor of anatomy in the University of Freiburg; Dr. E. H. Loomis, instructor of physics in Princeton University, to be assistant professor of physics in the same University; Dr. Friedrich Gräfe to be associate professor of mathematics in the Technical High School at Darmstadt; Dr. E. Fischer, associate professor of botany at Berne, to be professor and director of the botanical gardens in that place; Dr. P. Francotte to be professor of embryology at Brussels, and Dr. P. Stroobant to be professor of astronomy at the same place.

WE have received a copy of a memorandum drawn up by Dr. R. W. Stewart, principal of the Hartley Institution, Southampton, on behalf of the Hartley Council, and sent to the Chancellor of the Exchequer. The memorandum urges the claims of the Hartley Institution to a share of the increased grant which it is proposed to give to the University Colleges of Great Britain. That the Institution is doing valuable educational work must be acknowledged, but, judging from the memorandum, it attempts too much. We also venture to say that our University Colleges stand on a somewhat higher educational plane than the Hartley Institution, in spite of Dr. Stewart's reorganisation of the work, and the appointment of a "professional" staff. Certainly, if the application is considered, some of our best technical colleges will be justified in lodging a similar claim.

MR. J. PASSMORE EDWARDS' contributions to the streams which give life and strength to the physical and mental character of many sections of the community are so numerous, that they are almost past counting. We may be permitted to regret that but a minor rivulet having Mr. Passmore Edwards' generosity as a source flows through the field of scientific investigation, but at the same time we are glad that the growth and extension of education has been encouraged by a constant flow of gifts. How well Mr. Passmore Edwards has ministered to the general advancement of the people, may be seen from a recent publication containing illustrations of institutional buildings for educational and ameliorative purposes provided by him in response to public requests, and which will be completed or commenced during this year of the Jubilee. The buildings, twenty-five in all, constitute a most worthy contribution to the stream of individual and organised endeavour made during a notable year of a notable reign for the general good. Ten of the institutions illustrated are public libraries; two are public libraries and technical schools combined; and three will be devoted exclusively to artistic, scientific and industrial education; while all have been, or are being, built with funds provided by Mr. Passmore Edwards. When it is remembered that these do not include buildings of a similar character erected by the same donor before the commencement of the Diamond Jubilee year, a faint idea may be obtained of the valuable support he has given to educational agencies.

THE Report of the Council of the City and Guilds of London Institute upon the work of the Institute during 1896, may be taken as a complete reply to the few short-sighted people who, about this time last year, wished to see whether the results attained could be expressed in pounds, shillings and pence. In the Central College, and the Technical College, Finsbury, the Institute possesses establishments which show the way to improve technical education in this country. At the opening of the former College, the late Lord Selborne stated that "in the several laboratories with which this College is provided new and increased facilities will be afforded for the prosecution of original research, having for its object the more thorough training of the students, and the elucidation of the theory of industrial processes." As a supplement to the education which a student should receive at a college in the technical applications of science, Prof. W. E. Ayrton, the Dean of the College, points out that the experience which the student gains by carrying out a research is of great value in teaching him to think for himself, and acquire habits of self-reliance. Further, his having to adopt expedients for overcoming the experimental difficulties which are met with in all original researches trains his ingenuity, and this is necessarily of great value to one who is about to become an engineer, and who may, therefore, be brought face to face with totally new problems in practical life. The long list of investigations carried out in the various laboratories during the Sessions 1893-96, shows that this prosecution of original research has been carefully kept in view.—Dr. Sydney Williamson, who now holds the Salters' Company Research Fellowship at the College, has selected as his subject of investigation food stuffs generally, and more particularly some of the more definite albumenoids, with the ultimate object of ascertaining the influence of various manures on the growth of crops in so far as quality of produce is concerned. The subject is one of which we know practically nothing, and is obviously of great economic importance.

SCIENTIFIC SERIALS.

American Journal of Science, April.—Experimental investigation of the equilibrium of the forces acting in the flotation of discs and rings of metal; leading to measures of surface tension, by A. M. Mayer. The author describes a number of experiments on the flotation of clean ungreased wires on water. By observing the weight required to make them break through the water surface, a good value for the surface tension of water may be obtained. It is a mistake to suppose that a wire ring will not float unless it is greased. A ring of 1 mm. aluminium wire 5 cm. in diameter will make a depression of 5 mm. in a clean water surface, and requires 2·6 grams to make it break through. The value of the surface tension of water at 0° obtained by the author is 0·0809, which is 3½ per cent. higher than the mean of all determinations hitherto made.—Note on computing diffusion, by G. F. Becker. Introduces a simplified method of treating diffusion of substances in solvents and of heat in rocks, for the use of geologists, together with skeleton tables for the rapid computation of diffusions.—The application of iodic acid to the analysis of iodides, by F. A. Gooch and C. F. Walker. Iodic acid is easily and completely reduced by an excess of hydriodic acid with the liberation of iodine according to the equation: $HIO_3 + 5HI = 6I + 3H_2O$. The authors work out a method for the quantitative estimation of iodides, dependent upon the action of iodic acid or an iodate in the presence of free sulphuric acid, neutralisation of the solution by means of an acid carbonate, and titration of the free iodine by arsenious acid, five-sixths of the iodine thus found being credited to the iodide to be estimated. In the absence of large amounts of chlorides or bromides, the method is simple, rapid, and fairly accurate.—Difference in the climate of the Greenland and American sides of Davis and Baffin's Bay, by R. S. Tarr. The climate of