

LONDON.—Mr. R. O. Kapp has been appointed as from March 1 to the Pender chair of electrical engineering tenable at University College.

THE Board of Education is prepared, as in recent years, to consider applications for full-time studentships from teachers in England and Wales with at least five years teaching experience who desire financial assistance to follow courses of advanced study at universities or other institutions at home or abroad. Particulars of the awards and application forms are obtainable from the Board of Education, Whitehall, S.W.1.

APPLICATIONS, which must be received not later than April 15, are invited for the following scholarships awarded by the Council of the Institution of Electrical Engineers. Further particulars can be obtained from the Secretary of the Institution, Savoy Place, London, W.C.2. Duddell Scholarship, valued at £150 a year and tenable for three years, open to British subjects under nineteen years of age on July 1, 1935, who wish to take up a whole-time day course in electrical engineering; Ferranti Scholarship, valued at £250 a year and tenable for two years, open to British subjects under twenty-six years of age on July 1, who desire to carry out whole-time research or post-graduate work in electrical engineering. Swan Memorial Scholarship, valued at £120, and for one year, open to British subjects under twenty-seven years of age on July 1, who desire to carry out whole-time research or post-graduate work in electrical engineering. Silvanus Thompson Scholarship, valued at £100 a year and tuition fees, tenable for two years, for works employees, open to British subjects under twenty-two years of age on July 1; the successful candidate will be required to take up a whole-time day course in electrical engineering at an approved university or technical college.

FROM Heriot-Watt College, Edinburgh, we have received a brochure signalling the completion and opening, in January, of the first section of an important extension of the College buildings, planned, in conjunction with the Town Council, in 1928. The second section, to be completed, it is hoped, in 1936, has already been begun, and the governors propose to make now an appeal for the sum of £100,000 to finance the construction and equipment of the final section. The appeal will be associated with the celebration of the fiftieth anniversary of the assumption by the College of its present name and functions. Prior to 1886, the institution was concerned mainly with evening classes for young persons employed during the day in earning their living, and without any other means of advancing beyond the standards of education of the elementary schools. The pamphlet gives, in addition to full particulars of the extension scheme, a very interesting account of the stages through which the 'School of Arts', founded in 1821 by Leonard Horner (afterwards first principal of University College, London), gradually reached its present status—that of an affiliated college of the University of Edinburgh, preparing students for careers in mechanical, electrical, mining and oil engineering, applied chemistry, brewing, pharmacy, building and printing and conducting evening classes in commerce. Special prominence is given to the amplitude, due in large measure to the exertions of the late Edward Clark, of the equipment of the printing school for the teaching of all phases of book production.

Science News a Century Ago

Chemistry of the Sea

The chemical composition of sea and mineral waters has been actively investigated by Dr. Daubeny in the years 1835–37. In his manuscript "Note-book of Experiments" he records, "March 25th. Having brought from Naples a bottle containing the residuum of 2 gallons of the sea-water taken off the Island of Ischia evaporated till there remained only 6 ounces, I tested it for Bromine . . . I obtained 5.1 grains of silver precipitate—chiefly bromide." From previous analyses it appeared that there is an almost exact correspondence between the quantity of bromine present in the sea-water off Southampton and off Naples.

Temperature of Fishes

Dr. John Davy (1790–1868), the brother of Sir Humphry Davy, became an army surgeon and rose to the rank of inspector-general of army hospitals. He was eminent as a chemist, geologist and physiologist, and in 1834 was elected a fellow of the Royal Society. On March 26, 1835, he read a paper to the Royal Society "On the Temperature of some Fishes of the Genus *Thunnus*". He said that many years before he had observed that the bonito had a temperature of 99° F. when the surrounding medium was 80.5° F. and that it, therefore, constituted an exception to the general rule that fishes are universally cold-blooded. Having found that the gills of the common tunny of the Mediterranean were supplied with nerves of unusual magnitude, that the heart of this fish was very powerful and that its muscles were of a dark red colour, he was led to conjecture that it might, like the bonito, be also warm-blooded, and this opinion was corroborated by the testimony of several intelligent fishermen. In the course of his paper he endeavoured to extend the analogy to other species of the same family which, according to the reports of the fishermen of whom he made inquiries, have a high temperature and in the internal structure of which he noticed the same peculiarities as in the tunny, namely, very large branchial nerves, furnished with ganglia of considerable size.

Faraday on the Manufacture of Pens

On March 27, 1835, Faraday lectured at the Royal Institution on the manufacture of pens. A report of the lecture was given in the *Records of General Science* of May 1835. Quills, Faraday said, appear to have been employed at least as early as the seventh century. England was supplied with the article from Russia and Poland, where immense flocks of geese were kept for the sake of their quills. Twenty million quills were imported into England from those countries in 1834. A wing of a goose produced about five good quills, and by proper management, a goose might afford twenty quills during the year. The preparation of quills was a nice process of which, up to seventy years previously, the Dutch had had a monopoly. A pen cutter would cut about 1,200 quills a day. A house in Shoe Lane cut annually about six million. Steel pens for writing were first made by Mr. Wise in 1803, and were fashioned like goose pens. A patent was taken out in 1812 for pens with flat cheeks, and in this way all metallic pens were made for some time, as the rhodium pen of Dr. Wollaston and the iridium pens of others. About twelve years

previously, Mr. Perry began to make pens, and about six years after that they were manufactured in Birmingham. Faraday described the processes employed in the making of steel pens and said that, from information given him, the total quantity of steel used in Great Britain for pen-making was 120 tons. When first introduced, steel pens were 8s. a gross, but recently they had been manufactured at 4d. a gross. It appeared that the only interest that had suffered by the employment of steel pens was that of the pen-knife makers.

Samuel Clegg and the Gas Industry

In the *Mechanics' Magazine* of March 28, 1835, is a contribution from "L. L." on "Materials for a Memoir of Mr. Samuel Clegg, and Authentic History of the Art of Gas Lighting". Samuel Clegg, the elder, was born in 1781 and died in 1861, and "L. L." described himself as one of his earliest and oldest friends. Clegg learnt the art of gas-making from Murdoch at the works of Boulton and Watt. In 1805 he set up a small gas plant at his mother's house in Manchester, and in the following year installed gas lighting in some of the Lancashire factories. He was the first chief engineer of the Gas Light and Coke Company and he was the first to invent a gas meter. In the course of his article "L. L." said: "In 1814 Mr. Clegg superintended the fitting up of the pagoda in St. James's Park. This splendid display of the power of gas illumination was exhibited to the Royal family on the evening previous to the night when it was burned down by the fireworks. The pagoda was an octagonal figure, 80 feet high from the bridge. At each angle there was a pipe running the whole height, with a small hole drilled every two inches, through which gas issued, and opposite each of the lowest holes in the perpendicular pipes was placed an oil lamp, concealed by a piece of sheet iron, so that when the gas was turned on, the first flame was ignited by the oil lamp, and each gas flame lighted the one immediately above it all the way to the top. This gave the whole the appearance, when first lighted, of so many rockets ascending into the air. There certainly never was anything so beautiful before, and it is likely that there never may be again."

the case of lithium, which involves the masses of particles measured in terms of helium, a number of nuclear reactions in beryllium and other elements show large discrepancies on the accepted mass scale. These reactions, as well as those in lithium, can be brought into line by assuming a small error in the helium oxygen ratio. H. J. TAYLOR: The tracks of α -particles and protons in photographic emulsions. α -particles and protons give tracks in photographic emulsions, which are visible, after development, as rows of grains in straight lines. These tracks have been studied, using special emulsions more suitable for such work than those commercially obtainable. Exposure of a plate to a neutron source gives rise to well-defined tracks, which are due to the protons ejected by the neutrons in their passage through the gelatine of the emulsion. The method is, however, unsuitable for quantitative study of neutron energies.

PARIS

Academy of Sciences, February 4 (*C.R.*, 200, 429-500). The president announced the deaths of Charles Flahault, non-resident member, and of Theobald Smith, *Correspondant* for the Section of Rural Economy. B. HAVELKA: The curves in Euclidian space of n dimensions the curvatures of which are connected by linear relations with constant coefficients. JEAN LOUIS DESTOUCHES: Conditions to be imposed on a physical space and the generalisation of Poincaré's definition of the number of dimensions. HENRI ROURE: The calculation of a periodic solution in the perturbation of Pluto by Neptune. F. TESSON: A liquid microcathetometer. The distance between two vertical points is measured by running water from a microburette into a circular trough containing water covered with a layer of oil. Contact with the point can be determined to 0.001 mm. and, by arranging a suitable area for the section of the trough, this corresponds to the addition of 0.02 c.c. of water. AMÉDÉE GUILLET: The measurement of the moment of a couple by the use of the chronometric motor. Application to the study of viscosity. MARCEL CHRÉTIEN: A new apparatus for the restitution of aerial photographs. LÉONARD SOSNOWSKI: The radioactivity excited by neutrons in platinum. The neutrons in the experiment described were obtained from irradiated beryllium. Platinum, after 15 hours exposure, gave a radiation which from its rate of decay and absorption on passing through aluminium, would appear to be due to β -particles. PIERRE AUGER and A. ROSENBERG: The secondary effects of the cosmic rays. FRANCIS PERRIN and WALTER M. ELSASSER: The theory of the selective capture of slow neutrons by certain nuclei. PIERRE MONTAGNE: The calculation and graphical representation of the elementary displacements in the reactions of homogeneous chemical equilibrium. Variation of the concentrations. Reactions at constant volume. RAYMOND LAUTIÉ: The molecular weight of a pure liquid at its normal boiling point. PAUL LAFFITTE and PIERRE GRANDADAM: The oxides of platinum. The authors have previously described the preparation of a mixture of the two oxides PtO and PtO₂ by the direct action of oxygen at high pressure and at a high temperature on platinum. The dioxide was isolated from this mixture and in the present communication the isolation of PtO is described. Hydrogen reduced PtO instantaneously at the ordinary temperature. The mixed oxides act as a very active catalyst in the hydrogenation of certain organic

Societies and Academies

LONDON

Royal Society, March 14. M. L. E. OLIPHANT, A. E. KEMPTON and LORD RUTHERFORD: The accurate determination of the energy released in certain nuclear transformations. If changes of mass are taken into account, the law of conservation of energy holds closely for the transformations of the isotopes of lithium when bombarded by ions of ordinary and of heavy hydrogen. The masses of Li⁶ and Li⁷ are found to be 6.0143 ± 0.0002 and 7.0148 ± 0.0002 respectively, in good agreement with the mass spectroscopic values 6.0145 ± 0.0003 and 7.0146 ± 0.0006 found by Bainbridge. By application of the laws of conservation of momentum and energy, the mass of the hydrogen isotope of mass 3 is found to be 3.0152 ± 0.0002 . Attention is directed to the factors involved in determining the mean ranges of expelled particles and to the difficulties of interpretation when more than two particles are emitted in a single transformation. While there is good agreement in