

University and Educational Intelligence

At the beginning of November, Loughborough College will inaugurate a series of intensive management courses under the direction of Mr. E. T. Elbourne. Each of the eleven courses will last ten days. Lectures will follow in the main the sectional syllabuses of the Institute of Industrial Administration's diploma, and subscribers to any course may, on completion, sit for the Institute's examination accordingly. The tuition fee for any ten-day course is five guineas, including the loan of books and demonstration materials. Further information can be obtained from the Registrar, Loughborough College, Loughborough, Leics.

A NEW high-voltage laboratory at East London College enables that institution to offer greatly improved facilities for study and research in a branch of electrical engineering, the practical importance of which at the present time is obvious. Towards the cost of its erection and equipment the Court of the University made a grant of £12,000 and the Drapers' Company gave £5,000 and lent another £5,000 to enable the College to proceed at once with this and other enterprises. The calendar for the present session announces that the equipment will include a 500,000-volt testing transformer, a surge generator with a maximum capacity of a million volts, a direct-current generator of 200,000 volts capacity, a cathode ray oscillograph recording surge voltages up to a million volts, Schering bridge for measurement of dielectric losses, and transformers of 30,000–250,000 volts capacity for experiments. A course in high-voltage technology for degree students is being introduced under the direction of Prof. J. T. MacGregor-Morris.

A REVIEW of the school year 1933–34 in the United States is published in the June issue of *School Life*. Dr. G. F. Zook, who assumed the office of Commissioner in June 1933, has now relinquished it to become director of the American Council on Education and has been succeeded by Mr. J. W. Studebaker, who for the past twenty years has been superintendent of public schools in Des Moines, Iowa. The year is characterised in an editorial as one of sensational progress in the following respects: the Federal Government did more for schools than in any year since 1787; State support for public education came into being in many States; adult education classes attracted more than a million students; nursery schools increased from 300 to 2,500; practical camp schools were set up for 300,000 boys in "civilian conservation camps"; and industrial child labour was ruled out. As regards the last point, the retiring Commissioner points out that the prohibition (by two thirds of the codes) of the employment of 'under-sixteens' means that millions of young people have little or no opportunity of regular employment. Either the industries must co-operate, he says, in setting up extensive apprenticeship programmes including part-time instruction, or the Government will have to adapt the civilian conservation camps to enable them to reach a larger proportion of the adolescent population, or the school system must provide types of training that will appeal to all who do not go on to a university. It may be noted that, on June 27, President Roosevelt made the Secretary of Labour an educational dictator for industry.

Science News a Century Ago

Faraday's Experiments on Self-Induction

In 1834, a young man, Mr. William Jenkin, brought to Faraday's notice a new effect of electro-magnetic induction. The shock obtained on breaking contact with a voltaic battery was greatly enhanced if a coil instead of a straight wire was used as the conducting circuit. On October 15, 1834, Faraday began experiments on this action of the 'extra current', as he called it, and traced it to induction between the neighbouring turns of the coil at the moment of disjunction. "These effects," he wrote in his Diary a month later, "show that every part of an electric current is acting by induction on the neighbouring parts of the same current, even in the *same wire* and the *same part* of the wire."

The Ninth Series of the Experimental Researches in Electricity contains a description of these experiments on self-induction. The action had interesting consequences, as for example, if a wire was doubled and formed into a coil, the induction in one half neutralised that in the other, and a non-inductive coil resulted.

It is of this occasion that Faraday said, years afterwards: "The number of suggestions, hints for discovery, and propositions of various kind offered to me very freely, and with perfect goodwill and simplicity on the part of the proposers for my exclusive investigation and final honour, is remarkably great, and it is no less remarkable that but for one exception—that of Mr. Jenkin—they have all been worthless".

Sturgeon's Electro-Magnetical Experiments

On October 15, 1834, William Sturgeon sent to the editors of the *Philosophical Magazine*, then conducted by Sir David Brewster, Richard Taylor and Richard Phillips, an "Account of some Electro-magnetical Experiments made with the Large Magnet at the Exhibition Room, Adelaide Street". The experiments, he said, were made by the permission of the proprietors of the Exhibition Room, and he acknowledged the obligations he was under to Mr. Payne, who procured the use of the magnet, and to Mr. Maugham, the chemical lecturer, for his assistance. Among the results of his experiments, Sturgeon mentioned the decomposition of "hydriodate of potassa" in solution and the decomposition of sulphate of copper and of water. "The experiments were made by changing the connexions and reversing the current, and the results were exhibited with as much promptitude as they would have been by the employment of a voltaic battery. . . . I have also made a great variety of electro-magnetic rotations, and some other rather novel motions, with electric currents by magnetic excitation, which I intend to publish as soon as opportunity offers."

The Gresham Chair of Physic

The death of Dr. Christopher Stanger in September 1834 had left vacant the professorship of physic in Gresham College. In connexion with this, the *Times* on October 18, 1834, said: "We understand that the place of Lecturer in Physic in the Gresham Institution is now vacant and that it is shortly to be filled up. Contrary to the intentions of the enlightened founder, the lectureships in this institution have been for a lengthened period mere sinecures. We hope, however,

that advantage will be taken of the present opportunity to pave the way for a better system, by the appointment of at least one competent and efficient teacher. All favouritism ought in a case of this sort to be, as we have no doubt it will be, entirely laid aside, and the situation should be given to the candidate who produces the least unequivocal proofs of industry learning and talent".

Iron Shipbuilding

Among the pioneers of iron shipbuilding was Sir William Fairbairn (1789-1874) who, in 1835, opened a shipbuilding yard at Millwall on the Thames. Prior to this, however, he constructed several iron vessels at Manchester. These were built in sections, taken to pieces and reconstructed at the ports. On October 18, 1834, the *Mechanics' Magazine* said that an iron steamer of 96 tons of Fairbairn's was launched at Selby. As she was for Swiss owners, the vessel was to be navigated up the Rhine as far as possible, taken to pieces again, carried overland a distance of forty miles and ultimately launched at Zurich, "and after all this will be considerably cheaper and better than if built on the continent".

Societies and Academies

PARIS

Academy of Sciences, August 27 (*C.R.*, 199, 501-544).
 LOUIS BLARINGHEM: The temperature of flowers. From the results of about 3,000 observations, the author concludes that most plants, at certain stages of growth and especially in the course of the development of the flowers, show a regular excess of temperature of the internal tissues and of the floral organs over the temperature of the surrounding air. This excess is usually 1°-6° but in one case amounted to 9°. EMILE MATHIAS: Blue globular lightning.
 HANS SCHWERDTFEGER: The characteristic roots of the matrices of linear forms. Y. WHY F'SCHEN: Remark concerning the solution of the mixed problem relating to the equation $\Delta u - 1/\omega^2 u = 0$ for $\omega \rightarrow \infty$. ROLF NEVANLINNA: The harmonic measurement of ensembles of points. EDGAR ODELL LOVETT: Bertrand's problem for certain curves which generalise conics. CHARLES PLATRIER: The most general infinitely small isothermal transformation of the homogeneous material medium. MIROSLAV NENADOVITCH: Contribution to the theory of supporting wings. PIERRE LEJAY: Gravity anomalies in the south of Indo-China. A map is given showing the anomalies. ALBERT PÉRARD and MIROSLAV ROMANOWSKI: New comparisons of national standards of electrical resistance. Comparison of the standard ohms of Germany, United States, France, Great Britain, Japan and Russia, showing secular changes between December 1932 and November 1933. PAUL JANET: Remarks on the preceding note. It is pointed out that this is the first work done by the Bureau international des Poids et Mesures in the field of electrical units. ARCADIUS PIEKARA: The magnetic anisotropy of the fatty acids. PIERRE BRICOUT and ROBERT SALOMON: The use of the cathode ray oscillograph for the study of the magnetisation of ferromagnetic substances. The apparatus described showed differences between specimens of identical composition when the annealing temperatures differed by only 10° C. It has proved capable of showing when the

time of annealing has been sufficient to bring about the steady magnetic state. CHARLES COURTOT and ABBAS MOTAMED: Introduction to the study of the chemistry of diphenylene selenide. PAUL SELTZER: The vertical distribution of temperature in a forest. JACQUES EMILE ABELOUS and RENÉ ARGAUD: The formation of adrenaline in the suprarenal capsule. The rôle of lipids and lipoids in adrenalogenesis. MARC ANDRÉ: An American crayfish multiplying near Paris. MAURICE DOLADILHE: Researches on the complementary power of blood sera. Mlle. MATHILDE ZIRNHELT: A new culture medium specially favourable to the development and maintenance of the virulence of *B. typhi murium*. Sterilised rye, impregnated with ordinary peptone broth, forms an excellent medium for the culture of this organism. The virulence is increased and the rye can be directly used for the destruction of rats.

CAPE TOWN

Royal Society of South Africa, May 16. J. L. B. SMITH: The South African species of the triglid genera: *Lepidotrigla* and *Peristedion*. The paper revises the South African species of *Lepidotrigla*. *L. Faurei* and *L. Natalensis* are maintained as distinct species, and one new species is described. A new species of *Peristedion* is also described.

GENEVA

Society of Physics and Natural History, June 7. LÉON W. COLLET and ED. PAREJAS: The presence of the Upper Cretaceous in an alpine nappe of Elba. The authors describe grey limestones occurring at the Colle Reciso containing *Coccolithus pelagicus* and *C. leptoporus* with several species of *Actiniscus Ehrenbergeri*. It is the first time that Upper Cretaceous has been discovered above Biancone in Elba. LÉON W. COLLET: On a nummulitic breccia, with Wildflysch facies, from Elba. The elements of the breccia are made up of ophites. The cement is calcareous and contains *Nummulites lucasani* of the Lower Lutetian. The formation of these breccias shows that movements occurred in the Lower Lutetian, in one of the alpine nappes of the island. LÉON W. COLLET and J. BUFFLE: The transportation of alluvial matter in suspension in the waters of the River Arve at Geneva, in 1933. The run off of the River Arve in 1933 was low. The total amount of alluvial matter transported in suspension in its waters was 1,506,000 tons. During 1915 the run off of the river was much larger and the alluvial matter transported amounted to 3,644,000 tons. ED. PAREJAS: Some species of *Actiniscus* of the Upper Cretaceous of Brasses (Préalps médianes) and of the island of Elba. The author describes a fauna of *Actiniscus* observed in the red layers (Upper Cretaceous) of Brasses (Haute Savoie) and in a limestone of the Colle Reciso (Elba). The species *Actiniscus quinarius* and *A. Stella* have been found. The following species and varieties are new: *A. cruciatus*, *quinarius* var., *Stella Ehrenb.* var., *Colleti* var., *Chaïci*, *ilvensis*, *decapetalus* and *Verandi*. G. TIERCY: (1) The function introduced in the calculation of the distribution of the temperatures in the interior of a star. The numerical variation of this function has been given in a preceding note; it is now given as an algebraical function of the radius. An empirical solution, numerically satisfactory, has been found. (2) Remarks on a particular model of the