conduct the Lampadephoria of the inspiration of humanity, and to guard and develop the most precious and enduring aspects of the most comprehensive of all the arts—the art of Life itself."

THE new building of the Department of Applied Statistics and Eugenics (including the Galton and Biometric Laboratories) at University College, London, will be opened by Dr. Addison, Minister of Health, on Friday, June 4. The Vice-Chancellor of the University will preside.

TWO lectures on Factors in the Froth-flotation of Minerals will be given at the Sir John Cass Technical Institute, Aldgate, E.C. 3, by Mr. H. Livingstone Sulman, on Wednesdays, June 2 and 9, at 5.30 p.m. The chair at the opening lecture will be taken by Mr. F. Merricks, president of the Institution of Mining and Metallurgy.

THE Glasgow Technical College is preparing for its entrance hall a monument in bronze and marble to the 612 students and members of its staff who gave their lives in the war. To show the quality and quantity of the war work of the 3218 members, students, and past students of the college who served in the Army or Navy, or on special national duty, the college has issued, in a volume of 211 pages, a list of their names and services. The preface, by Sir George Beilby and Mr. Stockdale, the director, summarises the contributions of the college to research on fuels and explosives, the testing of war materials, and the training of munition workers. The normal classes had to be maintained for the thousands of evening students as well as for the many foreigners and refugees, for whom most of the day classes had to be continued in spite of the reduction in the staff. The successes enumerated include three awards of the Victoria Cross and 336 orders and crosses. Amongst the ranks attained, one student became colonel, fifteen were lieutenant-colonels, and seventy-seven majors. The letters quoted from the Government Departments express high appreciation of the research work conducted at the college. Of its contributions, both of men and mind, to the national strength, the college and science may well be proud.

THE recently issued report on the war work of the College of Technology, Manchester (faculty of technology in Manchester University), gives an interesting account of the services rendered by members of the college in his Majesty's Forces—particularly in connection with the Royal Engineers and the technical branches of the Royal Navy—and in the many fields of scientific research opened up by the war. The greater part of the report is concerned with college war work other than that of supplying men. It appears that before the war was over the college was by no means large enough to undertake all the work which the military authorities—including the Air Board as well as the Admiralty and the War Office—were anxious to entrust to it. The mechanical and electrical engineering departments of the college were intimately concerned with the work of the Lancashire Anti-Submarine Committee, which had its headquarters in the college, and produced and developed several instruments, including, in particular, a deep-sea hydrophone for detecting and combating enemy submarines. The same departments helped to solve certain problems relating to the fitting of wireless apparatus to aeroplanes; for instance, a high frequency alternator, designed and manufactured in the college, was largely adopted for both naval and military 'planes. A new type of gas furnace designed in the college led to important improvements in the heat treatment of machine tools, involving an increase of 30 per cent. in the speed of the machining of shells and other munitions. The same research enabled the college to supply the Admiralty with special blades for cutting mine mooring cables, and when the demand for these blades was greater than the college could supply, the Admiralty required its manufacturers to employ the method of heat treatment devised in the College of Technology. An improved cast iron of high tensile strength, produced under the direction of the metallurgical department of the college, was usefully employed in the manufacture of gas shells. The college departments of applied chemistry and textiles carried out a number of investigations upon fabrics used in aircraft manufacture. A thorough investigation of the structure and scouring of airship fabrics led to the development of a process which was afterwards applied to all R.N.A.S. fabrics. The giant airships R33 and R34 were treated with a special dope produced at the college before starting on their long-distance flights. The chemical laboratories were also engaged during the war in investigating processes for the manufacture of explosives, pharmaceutical products, dyestuffs, rubber derivatives, and foodstuffs.

Societies and Academies.

LONDON.

Royal Society, May 13.—Sir J. J. Thomson, president, in the chair.—Dr. A. D. **Waller**: Demonstration of the apparent "growth" of plants (and of inanimate materials) and of their apparent "contractility." In Sir J. C. Bose's original demonstration an amputated leaf was fixed up in connection with a crescograph, at a magnification stated to be $\times 10^7$, and the indicator was shown to be moving in a direction and at a speed that were stated as representing the growth of the petiole. Alternating currents were now sent through the leaf, causing a sudden reversal of the movement of the indicator, *e.g.* in the demonstration that the present author witnessed at the Royal Society of Medicine the indicator (a spot of reflected light) moved to the right at what he judged to be something like 1 metre per sec. in the direction of elongation (by growth?), and flew off scale in the opposite direction, at least ten times as fast, as soon as the buzz of the exciting coil was heard ("degrowth"). The demonstration was, in Dr. Waller's opinion, illusory. The movement to the right (indicating an elongation of petiole=0·1 m. per sec.) was indeed consistent with "growth," although its rate was surprisingly high under the conditions of experiment. The elongation might, however, have been due to, or modified by, many accidental variations of conditions—heat, moisture, handling of plant during preparation, etc.—and was precisely similar to the gradual elongation that takes place in a damp fiddle-string under similar conditions. The second part of the experiment, when the "excited" plant shortened and caused the indicator to fly off to the left, is held to afford conclusive proof of fallacy. The fact belonged to the familiar phenomena of heat contraction aroused by electrical currents in all kinds of (doubly refracting) moist conductors, whether living or dead, to the study of which attention was directed by Engelmann in his Croonian Lecture of 1895. These are demonstrable with a low-power crescograph ($\times 10^3$), and play a part in masking or simulating physiological changes when a high power ($\times 10^7$) is employed.—W. N. F. **Woodland**: The "renal portal" system (renal venous meshwork) and kidney excretion in vertebrata. The first three parts of this memoir contain, in the first place, proof that the assumption, commonly made in physiological literature, that the venous blood "supplied" to the kidneys of lower vertebrata mixes with

the arterial blood and traverses the system of channels known in mammals as the intertubular plexus, is erroneous—the renal afferent vein-blood does not supply the kidney tubules. The renal artery-blood traverses the intertubular plexus proper, and the renal afferent vein-blood a system of wide sinusoids (renal venous meshwork), which has no connection with the intertubular plexus, save that the latter opens into the former where the venous blood flows into the renal efferent veins. In the second place, much experimental and otherevidence is provided to prove that the "renal portal" system is devoid of function so far as kidney secretion is concerned. Evidence is also adduced to show that the urine is solely secreted by the renal tubules, the glomeruli taking no part. The glomeruli (as will be explained in the forthcoming Part iv.) are solely to be regarded as retia mirabilia and function as such. This is the tubule-cum-rete theory of kidney secretion.

Zoological Society, May 11.—Prof. J. P. Hill, vice-president, in the chair.—Dr. W. J. **Dakin**: Fauna of Western Australia. III. Further contributions to the study of the Onychophora.—C. **Forster-Cooper**: Chalicotheroidea from Baluchistan.

PARIS.

Academy of Sciences, May 3.—M. Henri Deslandres in the chair.—C. **Moureu** and J. C. **Bongrand**: New researches on carbon sub-nitride. The action of the halogens, haloid acids, and alcohols. Numerous attempts to prepare the compound CN—C≡C—CN in quantity proved unsuccessful, and hence experiments on this substance had to be confined to those requiring little material. The sub-nitride combines with bromine. Hydrobromic acid gives bromobutene dinitrile, CN—CH=CBr—CN, and hydriodic acid furnishes the corresponding iodine compound. Hydrochloric acid acts differently, addition and partial hydrolysis taking place simultaneously, giving chlorobutene nitrile amide,

$$CN—CH=CCl—CONH_2.$$

Ethyl alcohol forms an addition product, probably ethoxybutene-dinitrile.—J. **Constantin**: The fossil chalk Siphoneæ of Munier-Chalmas.—A. **Blondel**: Best conditions to be fulfilled by long-distance electric cables for energy transmission. Practical solutions.—A. de **Gramont**: The spectrographic detection of metals, especially zinc, in animal organisms. Details of the application of the spectrograph to the detection of zinc in the ash from snake poison.—G. **Julia**: Families of functions of several variables.—B. **Jekhowsky**: Differential equations of the second order verified by Bessel's functions of several variables.—J. Kampe de **Fériet**: The use of generalised differentials for the formation and integration of certain linear differential equations.—MM. **Descolas** and **Prétet**: The macrographic study of the propagation of cooling in the interior of a steel ingot starting from its solidification. The method is based on the appearance of the specimen after etching with dilute sulphuric acid (17 in 5).—D. **Hondros**: The integration of the Laplace equation between two non-concentric spheres.—M. de **Broglie**: The properties of reinforcing screens with respect to X-ray spectra and on a splitting of the β line of the K spectrum of tungsten.—G. **Chaudron**: Reversible reactions of water on tungsten and the oxides of tungsten. The constant $K=\frac{p(H_2O)}{pH_2}$ has been studied at temperatures between 600° C. and 1000° C. The results are given in both numerical and graphical forms.—C. **Zenghelis** and B. **Papaconstantinou**: Colloidal rhodium. Sodium rhodiochloride was reduced in presence of sodium protalbinate by various reducing agents, hydrazine sulphate, hydrogen gas, and formaldehyde, the last of which gave the best preparation. After dialysis and drying in a vacuum, brilliant scales are obtained which are very stable. Solutions have remained unchanged for two years. The crystals contain 33 per cent. of rhodium. Colloidal rhodium absorbs about 2700 times its volume of hydrogen, and from 300 to 1800 times its volume of carbon monoxide, according to the conditions.—O. **Bailly**: The action of neutral methyl and ethyl sulphates on alkaline phosphates in aqueous solution.—J. B. **Senderens** and J. **Aboulenc**: The catalytic decomposition of the fatty acids by carbon. The vapours of the fatty acids, from acetic to isovaleric, give no gas at 460° C. in the absence of a catalyst; but in presence of purified animal charcoal decomposition takes place at 360° to 380° C. The products of the reaction include carbon monoxide and dioxide, unsaturated hydrocarbons, hydrogen and methane, a liquid containing water, and traces of ketones and aldehydes. Sugar carbon is less active as a catalyst, and a much higher temperature is required to effect the decomposition.—P. **Guérin** and A. **Goris**: A new plant containing coumarin, *Melettis melissophyllum*. The presence of coumarin in this labiate has been proved: it probably occurs as a glucoside hydrolysable by emulsin.—Ad. Davy de **Virville**: Note on the comparative geographical distribution of *Primula officinalis*, *P. grandiflora*, and *P. elatior* in the west of France. *P. grandiflora* grows best in damp, shady spots, whilst *P. officinalis* prefers dry soil and positions exposed to sun; hence, although hybrids of these two species are readily formed, they rarely occur in Nature. In railway cuttings the conditions favourable to each species may occur in close proximity, and hence the hybrid is particularly abundant along railway lines. It is suggested that *P. elatior* may have originated as a hybrid between the two species above-mentioned.—H. **Coupin**: Seedlings which turn green in the dark. The green colouring matter of pine seedlings grown in the absence of light is not identical with that of pine seedlings grown in daylight. The differences are marked in *Pinus sylvestris*, less marked in *P. pinea*, and slight in *P. maritima*.—A. **Mayer**: The mode of action of the poison gases utilised during the war.—I. **Nageotte**: Formation and structure of blood-clots.—H. **Violle**: Milk and hæmolysis. Normal milk does not produce hæmolysis of red blood corpuscles, not even when mixed with 30 per cent. of its volume of water. Any milk producing hæmolysis after this addition of water is abnormal.—M. **Marage**: The limits of debility and pretuberculosis.—P. **Wintrebert**: Medullary conduction in *Scyllorhinus canicula*, and the supposed function of the transitory dorsal giant cells of Rohon-Beard.—M. **Lécaillon**: Eggs intermediate between the summer and winter eggs produced in the cocoon of the silkworm.—L. **Hudelo**, A. **Sartory**, and H. **Montlour**: Eczematoid epidemiomycosis due to a parasite of the genus Endomyces.—F. **Diénert**, F. **Wandenbulke**, and Mlle. M. **Launey**: The action of activated sludges.

Books Received.

The Social Diseases: Tuberculosis, Syphilis, Alcoholism, Sterility. By Dr. J. Héricourt. Translated, with a final chapter, by B. Miall. Pp. x+246. (London: George Routledge and Sons, Ltd.) 7*s*. 6*d*. net.

Animal and Vegetable Oils, Fats, and Waxes: Their Manufacture Refining, and Analysis, including the Manufacture of Candles, Margarine, and Butter. By Dr. G. Martin. Pp. x+218. (London: Crosby Lockwood and Son.) 12*s*. 6*d*. net.