

THE Department of Agriculture and Technical Instruction for Ireland has now published particulars of the summer courses for teachers it has arranged to hold in July and August next. With few exceptions the courses will be held in Dublin. In July teachers will have the opportunity of selecting their study from a wide variety of subjects of experimental science and technology. In August, practical mathematics, rural science, and a number of domestic arts will be taught. These courses are open only to persons who are over twenty years of age, and, except in the case of the courses in rural science (including school gardening) and drawing and modelling, only to teachers who are engaged (a) by local committees of technical instruction; or (b) in schools receiving grants either directly from the department or under the provisions of an approved local scheme of technical instruction. Application to attend the courses must be made before April 15.

THE Education Committee of the West Riding County Council proposes to hold at the Training College, Bingley, in August next, a vacation course for teachers in secondary, technical, elementary, and other schools, beginning on August 5. The course will not be limited to West Riding teachers, but will be open to all on payment of the fees. The aim of the course is to stimulate teachers and to give them opportunities of studying new methods of teaching the various subjects rather than to give specific instruction in the subjects themselves. The subjects to be dealt with cover most branches of the curriculum, and include the following:—The teaching of practical arithmetic, Mr. J. R. Deeley; the teaching of hand-work, Miss K. Steel; the teaching of domestic subjects, Miss G. E. Irons; physiology, Miss F. E. Relf; the teaching of experimental science, Prof. Arthur Smithells, F.R.S., and Mr. H. Calam; and nature-study, Miss Mary Simpson.

In his report for the academic year ending June 30 last, a copy of which has reached us, President Ira Remsen, of Johns Hopkins University, refers to the inauguration of a school of technology in the University. The creation of a new department of the University has been made possible by an Act of the Legislature of Maryland, in its session of 1912. The sum of 120,000*l.* was granted for the construction and equipment of buildings for a school of advanced technology. A further continuing annual grant of 10,000*l.* was also provided for maintenance. The provisions of the Act include the granting of 129 free scholarships to residents of the State. These scholarships are apportioned to the various legislative districts, to seven colleges in the State, and six may be awarded at large. Among the numerous public lectures given in the University during the year, we notice a course of eight on solar and terrestrial physics, by Prof. A. Schuster, one by Prof. W. Paszkowski, of the University of Berlin, on the organisation and work of that institution, and four by Prof. W. L. Johansen, of the University of Copenhagen, on heredity and variation.

LORD HALDANE gave an address on the problem of national education at the conference of the National Union of Teachers on Tuesday, March 25. He stated that he could not describe the details of the scheme proposed by the Government, but he could give his own views. In the course of his remarks he said:—"If we do not keep abreast in the training of the national mind with those other countries which are organising their education systems, and which in many respects are our superiors, it is inevitable that in these days, when science and knowledge are the conditions of all success, industrial and generally,

we shall fall behind in the race. It is a question of national safety, and nothing else, with which we are dealing. I am sometimes very much concerned about our industries when I think of the backwardness of our educational system, but man does not live by bread alone, and we shall not get even a good technical education system unless we put it on a broad foundation of national education. The State has a deep and direct interest in seeing that its people are educated, just as it has in seeing that they are healthy. A national system must take cognisance of all the means by which education is provided in a country like this. The highest means, the lowest means, the university, the secondary and the elementary school—they must all be fitted into their place in one system. Ten years ago there were only six teaching universities, but since then five more have been established. Putting outside Oxford and Cambridge, the number of students working in the day time has doubled in the last ten years. The number of degrees obtained by students in England and Wales in 1911 is more than twice the number obtained in 1901. There are things which cannot be secured outside the atmosphere of the university. I can never admit that an external student is the same as an internal student. The internal student has matured his mind in the university atmosphere. The external student is working hard, but only for the external examination, and some people with much less aptitude than their neighbours in what is best in the realities of education have much greater aptitude in passing examinations. Therefore the external examination is not a real test of learning. The only real test of learning on which I should like to give a degree exclusively is the record of the student during his time at the university."

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, March 5.—Dr. Aubrey Strahan, F.R.S., president, in the chair.—S. S. Buckman: The "Kelloway Rock" of Scarborough. The author has studied the types of ammonites from the Kelloway Rock described by Leckenby, preserved in the Sedgwick Museum, Cambridge, and a series of Yorkshire Kelloway-Rock ammonites from the Museum of Practical Geology, London. He has grouped these ammonites according to their different matrices, and finds that they indicate several different zones. These zones he arranges in sequence, and suggests how they may be compared with the sections of Kelloway Rock of Scarborough given by Leckenby and by Fox-Strangways. The exact order of the zones is, in one or two cases, not considered to be proved, but the paper is offered with the idea of indicating where further work is required.—L. F. Spath: Jurassic ammonites from Jebel Zaghuane (Tunis). Jebel Zaghuane, the best-known and most conspicuous, though not the highest, mountain of the Tunisian Atlas, is built up largely of massive bluish-grey limestones of confused stratification which have been referred to the Middle Lias on the evidence of badly preserved belemnites and Terebratulæ, notably "*Pygope*" *aspasia*, *Columna* sp. Middle Liassic (Domerian) ammonites are now recorded for the first time. A new classification of the Domerian genera of the family Hildoceratidæ, to which the fossils from Jebel Zaghuane belong, is proposed. Moreover, the ammonites collected by the author afford sufficient evidence of the presence of the zone of *Reineckia anceps*, which occurs in Algeria, but had been supposed absent in Tunis, together with the other beds intervening between the Middle Lias and the Corallian.

CAMBRIDGE.

Philosophical Society, February 24.—Prof. Pope, vice-president, in the chair.—Prof. **Pope** and **J. Read**: The ten stereoisomeric tetrahydroquinaldinomethylene-camphors.—**J. E. Purvis** and **A. E. Rayner**: The chemical and bacterial condition of the Cam above and below the sewage effluent outfall. The river was investigated at various points extending from 100 ft. above the outfall and at 8 ft. from the outfall, and at $\frac{1}{2}$ of a mile, $\frac{1}{3}$ a mile, $\frac{2}{3}$ of a mile, $1\frac{1}{2}$ miles, 2 miles, $2\frac{1}{2}$ miles, 3 miles, and 4 miles below the outfall. Chemically, the river purifies itself moderately well from the contaminating effluent, for at about three-quarters of a mile below the effluent, the albuminoid ammonia and the oxygen absorbed figures were lower than at 100 ft. above the effluent outfall. Bacterially, the dangerous pollution, as indicated by *B. coli*, is well marked at between three and four miles below the outfall. The potential danger of such contamination is in the direction of cattle quenching their thirst, of bathers, and of watercress.—**F. E. E. Lamplough** and **Miss A. M. Hill**: Some experiments on the slow combustion of coal dust.—**F. R. Ennos**: The oxidation of ferrous salts. Air or oxygen was bubbled through ferrous salt solutions and the rate of oxidation measured by withdrawing portions at known intervals and titrating with KMnO_4 or $\text{K}_2\text{Cr}_2\text{O}_7$. For the chloride, sulphate, and acetate the rates are approximately as 1:10:100, the reaction in the case of the sulphate being proportional to the square of the ferrous salt concentration, and to the partial pressure of the oxygen. The oxidation seems to depend on the non-ionised part of the ferrous salt molecule.—**W. H. Mills** and **Miss A. M. Bain**: The optically active semicarbazone and benzoylphenylhydrazone of cyclohexanone-4-carboxylic acid.—**Dr. G. F. C. Searle**: Experiments illustrating "flare spots" in photography. When light from a point S falls on a simple thin lens of focal length f , most of it passes through the lens and forms an image of S. But some of the light suffers two reflexions within the lens, and this light gives rise to a second image of S of small intensity, the corresponding focal length being $(\mu-1)f/(3\mu-1)$, where μ is the refractive index. This image is called a "flare spot." When two lenses are used there are six flare-spot images of any object formed by twice reflected rays and with t lenses there are $t(2t-1)$ such images.—**J. G. M. Dunlop**: Effect of heating paraformaldehyde with a trace of sulphuric acid. The author finds that in the preparation of α -trioxymethylene (Pratesi, *Gaz.*, xiv., 139), by heating paraformaldehyde (trioxymethylene) with a trace of concentrated sulphuric acid in a sealed tube for some hours at 115°C ., a considerable amount of the formaldehyde is converted to methyl formate.

PARIS.

Academy of Sciences, March 10.—**M. P. Appell** in the chair.—The president announced the death of **M. Alfred Picard**.—**C. Guichard**: A particular class of Moutard's equations.—**Paul Sabatier** and **M. Murat**: The direct hydrogenation of the hydrocinnamic esters; preparation of β -cyclohexylpropionic acid. The reaction is effected with an active nickel at a temperature of 170° to 185° . Four esters have been prepared, and also β -cyclohexylpropionamide.—**R. Lépine** and **M. Boulud**: The secretion of the two kidneys compared. In the healthy dog one of the ureters generally furnishes less urine than the other; there are also differences in the composition of the urine.—**Henri Renan**: Results of the discussion of observations made by **MM. Delporte** and **Viennet**, to determine by wireless telegraphy the difference of longitude between the Royal Belgian Observatory and the Observatory of Paris. The ob-

servations extended from May 1 to August 2, 1912, and comprised twenty determinations by wireless telegraphy and nineteen by ordinary telegraphy. The mean error of a single observation was ± 0.0245 sec. by wireless and ± 0.0285 sec. by ordinary telegraphy.—**J. Clairin**: The invariants of the characteristics of partial differential equations of the second order with two independent variables.—**Vasilescu Karpen**: The flight of birds called hovering flight. A calculation showing that hovering flight is possible when the mean geometric acceleration of the wind reaches 30 cm. to 50 cm. per second.—**J. de Boissoudy**: The law of radiation of a black body and the quanta theory.—**Albert Turpain**: Extra-sensitive relays for wireless telegraphy. The relay described has a sensibility of the order 0.01 microampere.—**C. Tissot**: The reciprocal influence of two neighbouring antennae.—**F. Bodroux**: Some liquid mixtures particularly suitable for the observation of Christiansen's phenomenon. A suitable mixture is made by pouring 15 gr. of ethyl acetate and 10 gr. of water into 50 gr. of saturated sodium chloride solution.—**E. Rothé**: The reception of radio-telegrams by multiple antennae with or without contact with the soil.—**A. Guyau**: An interferential oscillograph. The apparatus figured was designed to register photographically oscillations of the magnitude of those of a telephone membrane.—**B. Szilard**: A spiral electrometer.—**Ch. Fabry** and **H. Buisson**: The absorption of ultra-violet light by ozone, and the extremity of the solar spectrum. The authors' results, taken with those of Cornu on absorption by the atmosphere, are in accord with the hypothesis of the absorption of the ultra-violet rays by ozone in the atmosphere.—**B. Bianu**: The secondary radiation produced by the α rays.—**Camille Matignon**: Chemical equilibrium in the action of hydrochloric acid gas on zinc sulphate.—**E. Rengade** and **N. Costescu**: The anhydrous monosulphides of the alkaline metals. The pure sulphides, Na_2S , K_2S , and Rb_2S , were obtained by allowing the vapour of sulphur to react upon the metal, with special precautions against the access of air. These sulphides are very easily oxidised; it is sufficient to touch one at a point with a hot glass rod for the mass to become incandescent and burn like tinder.—**E. E. Blaise**: The migration of chlorine in the chloroketones.—**A. Lassieur**: The catalytic hydrogenation of acetone. At temperatures between 200° and 300°C . hydrogen in presence of reduced nickel gives with acetone neither isopropyl alcohol nor pinacone, but methylisobutylketone in large quantities, smaller amounts of valerone and other higher condensation products.—**P. Lebeau** and **A. Damiens**: The composition of coal gas. An application of the general method of analysing complex mixtures involving the use of very low temperatures recently described by the authors. The presence of ethane, propane, and butane was proved with certainty.—**L. Ravaz** and **G. Verge**: The germination of the winter spores of *Plasmopara viticola*.—**L. Blaringhem**: The phenomena of xenia in wheat.—**C. L. Gatin** and **C. M. Bret**: The varieties of *Elais guineensis*, of the Ivory Coast, and their parthenocarpic fruits.—**Paul Bécquerel**: Vascular ontogeny of the plantule of the lupin and its consequences for certain theories of the classical anatomy.—**Anna Drzewina** and **George Bohn**: Anoxybiose and chemical polarity. An account of the effects of deprivation of oxygen on various species of invertebrates.—**E. Bataillon**: Demonstration of inoculation superposed on puncture in traumatic parthenogenesis.—**Mlle. Chevroton** and **M. Fauré-Fremiet**: A kinematographic study of the cytoplasmic phenomena of the division of the egg of *Ascaris*.—**G. J. Painvin**: The siphon of the *Spirulæ*.—**H. Vincent**: The action of polyvalent antityphoid vaccine in subjects in the incu-

bation stage of typhoid fever or infected in the course of immunisation. From experience gained in the typhoid epidemics cited it would appear that with this vaccine there is no negative phase, and there is no danger in vaccinating during epidemics.—**MM. Desgrez and Dorléans**: The influence of the amino group on the arterial pressure. A lowering of the blood pressure is produced by minimal doses of certain amino compounds, but an increase in the amount injected produces ultimately an increase in the arterial pressure.—**J. Houdas**: The presence of choline or allied bases in the saliva of the horse.—**Em. Bourquelot and M. Bridel**: The synthesis of the glucosides of alcohols with the aid of emulsin. β -Phenylethylglucoside and β -cinnamylglucoside.—**Ph. Négris**: The age of the cristalophyllian series of the Cyclades and the date of the foldings which have affected it.—**F. Dienert**: Study of the temperatures of subterranean water for public supply.—**V. Crémieu**: Seismographs giving directly the three components of an earthquake and slow variations from the vertical.

March 17.—**M. P. Appell** in the chair.—**E. H. Amagat**: Saturation curves and the law of corresponding states. The author concludes that the law of corresponding states is more rigorous than is usually admitted, and gives reasons for supposing that deviations from the law are probably due to experimental error.—**A. Müntz and E. Lainé**: The materials transported by the watercourses of the Alps and Pyrenees. The utilisation of mountain streams either for power or irrigation purposes requires an approximate knowledge of the amount of solid material brought down, as this material would tend to fill up more or less rapidly any storage reservoirs which might be constructed. A preliminary study has been made on eighteen rivers, and it has been found that the amounts of solid material brought down by alpine streams are so great that the construction of storage reservoirs will require very careful choice; the streams from the Pyrenees are much less troublesome in this respect.—**M. Gouy**: The theory of the gaseous photosphere.—**D. Eginitis**: The opacity of the sky and weakening of the solar radiation observed during the year 1912. The heliograph at Athens shows a progressive weakening in the solar radiation commencing April 7, 1912.—**M. Luizet and J. Guillaume**: Observation of the occultation of the Pleiades by the moon made on March 13, 1913, at the Observatory of Lyons.—**Léon Antonne**: Hypohermitian matrices.—**Ch. Muntz**: The solution of secular equations and integral equations.—**Georges Rémondos**: Families of algebroid functions.—**Farid Boulad Bey**: The disjunction of the variables in equations representable by nomograms.—**Th. De Donder**: Hilbert's theorem of independence.—**Carlo Bourlet**: Apparatus for measuring the vibrations of solid bodies in motion. A description of an instrument for measuring the vibration of the wing of an aeroplane, based on the use of two manometric capsules.—**Emile Jouguet**: The propagation of deflagrations in gaseous mixtures.—**Edouard Guillaume**: The extension of the mechanical equations of Appell to the physics of continuous media. Application to the theory of electrons.—**Kr. Birkeland**: Hertzian oscillations produced by intermittent discharges starting from isolated spots of a cathode in a Crookes's tube.—**Henri Bénard**: The prismatic cleavage due to cellular vortices (starch, basalts, &c.).—**Jean Bielecki and Victor Henri**: The quantitative study of the absorption of the ultra-violet rays by acetone. In alcoholic solution and in the liquid state acetone possesses a single band in the ultra-violet; the absorption curve can be exactly represented by the formula of Ketteler, Helmholtz, Reiff, and Drude.—**Mlle. E. Feytis**: The magnetic properties of some solid hydrates of

copper and chromium.—**Daniel Berthelot and Henry Gaudechon**: The decomposition of gaseous compounds by light. Hydrochloric acid is dissociated by the extreme ultra-violet, $\lambda < 0.2\mu$. Hydrobromic acid is more readily decomposed, and, in presence of mercury, the decomposition after eight hours is complete. Water vapour is decomposed by rays $\lambda < 0.2\mu$ to the extent of one-thousandth. Hydrogen sulphide and selenide are readily split up under the same conditions.—**Mme. N. Demassieux**: Study of the equilibrium between lead chloride and ammonium chloride in aqueous solution.—**René Dubrisay**: A new method of physico-chemical volumetric analysis.—**A. Wahl and P. Bagard**: Syntheses in the indigo series.—**A. Seyewetz**: The action of hydrochloric acid upon quinone sulphonic acid.—**G. Petit and R. Ancelin**: The influence of radio-activity upon germination. The experiments prove the stimulating influence of weak radio-activities on the plant cell.—**L. Moreau and E. Vinet**: The comparative effects of arsenic and lead in treatment of vines for the larvæ of *Cochylis*. Lead arsenate proved to be the most efficacious form of applying arsenic for the destruction of the larvæ of *Cochylis*.—**D. Keilin**: An intracellular fibrillary formation in the tunic of the salivary gland in the larva of *Syrphinae*.—**Raphael Dubois**: The treatment of tuberculosis by marine micro-organisms. Cultures of a *Micrococcus* obtained from the pearl sac of *Pinna nobilis* or *P. squammata* were used to inoculate tuberculous guinea-pigs; eleven out of twelve survived.—**Henri Stassano**: The mode of action of the anti-coagulating substance of the plasma of propeptone.—**Mlle. C. Robert**: The antitoxin behaviour of calcium in the case of some nutritive salts in the culture of the pea and lupin in liquid media.—**W. Kopaczewski**: The dialysis of maltase.—**M. Deprat**: The Triassic strata in the region of the middle Black River (Tonkin).

CALCUTTA.

Asiatic Society of Bengal, February 5.—**Dr. Malcolm Burr**: Indian Dermaptera collected by **Dr. A. D. Imms**. A number of new localities for known species of earwigs are put on record and one new species is described.—**Dr. W. A. K. Christie**: The composition of the water of the Lake of Tiberias. The water of the Sea of Galilee is shown to differ widely from that of almost all lakes with an outlet, and to approximate more in composition to that accumulated in closed basins. The difference is due to the peculiar nature of the soluble constituents of the rocks of the neighbourhood, as shown by analyses of spring waters near the town of Tiberias.—**Major J. Stephenson**: Aquatic Oligochaeta of the Lake of Tiberias. The collection obtained by **Dr. Annandale** from the edge of the Lake of Tiberias includes specimens of a number of species, representing several different families; but the majority are immature, and only two can be identified—a *Helodrilus* described as new, and *Criodrilus lacuum*, a common European species.

BOOKS RECEIVED.

Mysore Geological Department. Report of the Chief Inspector of Mines for the Year 1911-12, with Statistics for the Calendar Year 1911. Pp. 45+12 tables+81. (Bangalore: Government Press.) 2 rupees.

The Coleoptera of the British Islands. By **Dr. W. W. Fowler and H. H. J. Donisthorpe**. Vol. vi. (Supplement.) Pp. xiii+351+3 plates. (London: Lovell Reeve and Co., Ltd.) 18s. net.

Handbuch der Morphologie der wirbellosen Tiere. Edited by **A. Lang**. Band 3, Lief. 1. Band 4, Lief. 2. (Jena: G. Fischer.) 5 marks each Lief.