

dent of Denison University, Ohio. From 1901 to 1908 Dr. Chamberlain occupied the chair of physics in that institution. Since the latter date he has held the professorship of that subject in Vassar College.

DR. B. T. GALLOWAY has resigned his position as assistant secretary of the U.S. Department of Agriculture in order to accept the post of dean of the Agricultural College of Cornell University.

THE London County Council Education Committee has had under review the scheme for the reorganisation of the council's evening school system which was adopted last winter. The object of the reorganisation was to remedy certain serious defects of enrolment, attendance, and organisation, and to infuse freshness and attractiveness into the system. Among other arrangements made was a relief from fees as an award for good attendance, important changes in the *personnel* and duties of the inspectorate, and changes of a far-reaching character in the staffing, so as ultimately to obtain a separate staff for evening schools. Public attention was at the beginning of the session directed to the classes in many ways. Though a decrease of 30,000 pupils was anticipated in the total attendance, happily this was not realised. The committee is of opinion that in the main no change in the fundamental principles of the organisation appears to be advisable. Extension of the main features of the organisation are recommended, and some modifications of detail are suggested. It is proposed in a few instances to convert free schools into fee-paying under the ordinary conditions. The most important proposal, however, is to charge a registration fee of sixpence at all "free" institutes. It is felt that the immediate outlay of sixpence on joining an institute will be some guarantee that the student is serious, while it will not really interfere with the "free" character of the schools. The committee proposes to make provision for 120,000 students in these classes next year.

SOCIETIES AND ACADEMIES.

LONDON.

Zoological Society, May 19.—Mr. R. H. Burne, vice-president, in the chair.—Dr. C. H. O'Donoghue: The venous system of the dogfish. The general disposition of the main trunks in Scyllium is similar to that described in other Elasmobranchs, but the details differ considerably.—B. F. Cummings: Scent-organs in Trichoptera. An account of the remarkable development of the palpi of the first maxilla in a male caddis-fly, *Sericostoma personatum*. Instead of being 5-segmented, the palpus consists of a single swollen segment carrying an enormous tuft of long, silky hairs, at the bases of which unicellular scent-glands are situated.—H. A. Baylis: A new species of Cestode collected from an albatross (*Diomedea irrorata*) by Dr. H. O. Forbes in Peru.—D. M. S. Watson: The Deinocephalia, an order of mammal-like reptiles. The skull of a Tapinocephaloid is almost completely described. The fact that whilst in the skull Deinocephalia agree with the American Pelycosaurids, but in the post-cranial skeleton they resemble South African Therapsids, shows that the American forms must be included in the same great group, super-order, as the South African mammal-like reptiles.—Dr. R. C. L. Perkins: Species of the genus *Paralastor* and some other Hymenoptera of the family Eumenidæ. All the described species are enumerated therein, together with the descriptions of many new forms.—G. Jennison: Notes on colour-development in

the Indian wood-stork (*Pseudotantalus leucocephalus*).—Dr. Ph. Lehrs: A new lizard from the Canary Islands, recently discovered by Dr. Cæsar Boettger on Hierro.

Physical Society, May 22.—Dr. A. Russell, vice-president, in the chair.—T. Barratt and A. B. Wood: Volatility of thorium active deposit. On heating thorium active deposit to accurately measured temperatures up to about 1250° C. it is found that B and C each commence to volatilise at 750° C., but the volatilisation is not complete until 1200° C. is reached. The C curve is peculiar, being similar to two of the B curves placed end to end, the inflexion occurring between 750° C. and 900° C., where about 35 per cent. of the α activity is removed. When measured by β radiation, C is not volatile until a temperature of 900° C. is reached. D commences to volatilise at 500° C. It is assumed that the part of C which produces β rays, viz., C_β , is a separate product, which is not so readily volatile as C_α .—H. P. Walmsley and Dr. W. Makower: The passage of α particles through photographic films. Kinoshita has shown that when an α particle strikes a grain of silver halide, that grain is subsequently capable of photographic development. It seemed probable that the path of an α particle projected tangentially to a photographic film should, after development, be visible under a microscope. This was shown to be the case, and photomicrographs showing the tracks of α particles through a photographic plate have been obtained.—S. Butterworth: A null method of testing vibration galvanometers. By extending the theory of the vibration galvanometer it is shown how the constants may be determined by methods which involve only the measurements of one deflection. The remaining measurements are carried out on an alternating-current bridge. The principle of the method depends on the fact that a vibration galvanometer behaves as a parallel combination of a conductance, a capacity and an inductance, in series with a resistance.—C. W. S. Crawley and Dr. S. W. J. Smith: Experiments with an incandescent lamp. The first experiment was due to Mr. Addenbrooke who, using a 100-volt lamp filled with paraffin oil as a high resistance in a 200-volt circuit, noticed that some of the bubbles forming on the filament behaved in a curious way. Instead of rising at once to the surface they ran down the legs of the filament, against gravity, and escaped at the leading-in wires. Dr. Smith, repeating the experiment, discovered another striking phenomenon. Placing the 100-volt lamp in a 100-volt circuit in series with a variable resistance it was found possible to obtain a single bubble upon the wire. Instead of escaping at either terminal, the bubble travels backwards and forwards between the two, "looping the loops" of the filament during every journey. A rapid fall of temperature from the wire through the liquid, in the region through which the bubble moves, is an essential condition of the phenomenon.

DUBLIN.

Royal Dublin Society, May 26.—Prof. W. Brown in the chair.—Prof. G. H. Carpenter: Injurious insects and other animals observed in Ireland during the year 1913. The more noteworthy records are larvæ of Bibionidæ feeding in potato tubers, and the presence of all three species of apple Aphis—*A. pomi*, *A. sorbi*, and *A. fitchi*—in Ireland. Observations and experiments by T. R. Hewitt on the infestation of narcissus bulbs by eelworms (*Tylenchus*) and their migration through the soil are described. Copper sulphate in weak solution (5–7½ per cent.) is safe and effective for soaking the bulbs. A mature larva of *Hypoderma* extracted from the back of a mare may be confidently

referred to the common *H. bovis*.—T. R. Hewitt: The larva and puparium of the frit-fly. The author describes the external features of this destructive larva in greater detail than has yet been attempted, directing attention to sensory organs in the head region, the mouth hooks, and the spiracles.—Prof. J. Wilson: Polygamous Mendelian factors. In papers on the colours of horses published in 1910 (Roy. Dublin Soc. Proc., vol. xii., p. 331) and 1912 (*ibid.*, vol. xiii., p. 184) it was observed that each of the colours was the result of a single factor which was polygamous. That is to say, the factor for one colour can mate with the factor for any of the others, one at a time. When the observation was made, however, it was not realised to be unusual or extraordinary, but was assumed to be a phenomenon which might occur frequently; consequently stress was not laid upon the observation. It was eventually seen, however, that the phenomenon is very unusual, and with the data collected, together with additional data to be found in Dr. Walther's "Beiträge zur Kenntniss der Vererbung der Pferdefarben," the phenomenon is now demonstrated. It would be inferred from Dr. Walther's data if the "absences" which his analysis requires were eliminated, and the conditions which they stand for substituted in their stead.

PARIS.

Academy of Sciences, May 18.—M. P. Appell in the chair.—Armand Gautier and P. Clausmann: Fluorine in freshwater. An application of the method previously described for determining traces of fluorine to the examination of water from rivers, glaciers, and springs. No potable waters examined contain more than 0.6 milligram of fluorine per litre. In Paris water the amount of fluorine taken a day per individual is about 0.12 mgr., or less than a quarter the amount daily excreted.—Charles Moureu and Georges Mignonac: A new class of nitrogen compounds, the ketisoketamines. This name is applied to substances of the type $R.CR':N.CR:CH.R''$, obtained by the action of heat upon the ketamines.—L. Maquenne and E. Demoussy: The mobility of potash in plant tissues.—J. Delauney: The times of revolution of the satellites of a given system presenting certain relations between themselves.—W. Goloubeff: Functions with discontinuous singularities.—Marcel Moulin: The position of the centre of gravity of spiral springs furnished with theoretical terminal curves.—Albert Turpain: A photographic self-recording microammeter and the measurement which it furnishes. The apparatus described has given good records of messages from the Eiffel Tower at Poitiers, 300 km. distant. The instrument is of use in geodesic operations.—G. Gouré de Villemontée: The propagation of electricity through paraffin oil.—Léon and Eugène Bloch: The spark spectra of some elements in the extreme ultra-violet. Wave-lengths are given of the lines for arsenic, antimony, tin, bismuth, aluminium, and cadmium for the range 2134 to 1855.—R. Marcelin: The evaporation of slightly superheated liquids and solids. Results are given for nitrobenzene, naphthalene, and iodine.—Léo Vignon: The solvents of coal. Coals of different origin were extracted with alcohol, ether, benzene, toluene, aniline, nitrobenzene, pyridine, and quinoline. The soluble and insoluble portions of the coals were analysed. Bituminous coals gave a high aniline extract.—J. Bougault: The process of saponification of esters and of amides by strong sulphuric acid.—Georges Tanret: The constitution of galegine. This alkaloid was extracted from the seeds of *Galega officinalis*, and has the composition $C_6H_{13}N_3$. Its most important reaction is the formation of methyl-3-pyrrolidine and

urea by hydrolysis with baryta water.—E. Carrière: The equilibrium at the ordinary temperature of the enol and aldehyde forms of ethyl formylsuccinate and ethyl formylethylsuccinate.—R. Fosse: The chemical activity of xanthidrol and its application to the estimation of urea.—Robert Douin: The development of the fruit-bearing apparatus of Marchantia.—M. Marage: The sensibility of the physiological ear for certain musical sounds.—A. Montier: The interdependence of peripheral arterial hypotension and visceral arterial hypertension.—A. Trillat and M. Fouassier: The action of cooling on microbial droplets.—J. Nageotte: Some peculiarities of the nerve fibre of batrachians and on the so-called alterations of the myeline sheath, considered as causing changes of excitability of the nerves.—M. Vasticar: The nuclear formations of the internal auditive cell.—Mme. Marie Phisalix: Poisonous properties of the parotidian saliva of *Coronella austriaca*.—L. Germain and L. Joubin: The Chetognaths of the cruises of the Prince of Monaco.—Gabriel Bertrand and M. Rosenblatt: The thermo-regeneration of sucrase. A study of the changes in the hydrolysing power of sucrase from yeast produced by exposure to varying temperatures.—F. Kerforne: The presence of *Calymmene blumenbachi* in the Gothlandian of Brittany.—N. Arabu: The Trias of Ismid.—Léon Bertrand and Antonin Lanquine: New observations on the tectonic of the south-west slopes of the Maritime Alps.—E. A. Martel: The chasms of the Tertiary formations in the neighbourhood of Vertus (Marne).—Alphonse Berget: A piezometric sounder. Use is made of the compressibility of water contained in a tube silvered internally. The water is in contact with mercury, and the contraction of the water is measured by the amount of the silver removed as amalgam. The sensibility is practically constant at increasing depths, and gives an accuracy of 10 metres at a depth of about 6000 metres.—Ernest Esclançon: An instrument for recording the intensity of rainfalls.—Gabriel Guilbert: Weather prediction.

May 25.—M. P. Appell in the chair.—Fred. Wallerant: Contribution to the study of polymorphism. Experimental details concerning the polymorphism of malonic acid, monochlorocamphor, benzyl cinnamate, benzaldoxim, paratolylphenylketone and trinitrometa-cresol.—S. A. S. Albert, Prince of Monaco: The third campaign of *Hirondelle II*. (twenty-sixth of the complete series). In the course of bathypelagic work it has been found that certain organisms, more especially fishes, are only found during the daytime at a depth not less than 1000 metres, but are commonly obtained during the night at a depth of 200 metres. This corresponds to a change of pressure of 100 atmospheres.—M. Jacques Loeb was elected a correspondant for the section of anatomy and zoology in the place of the late Lord Avebury.—A. Schaumasse: Observations of the Zlatinsky comet (1914b) made with the equatorial at the Nice Observatory. Data given for May 18, 19, 20, 21, 22, 23. Changed from 6th magnitude on May 18 to 8.7 magnitude four days later.—Louis Fabry: The problem of the minor planets.—P. Chofardet: Observations of the new comet 1914b (Zlatinsky) made at the Observatory of Besançon. Four positions given for May 19–22. Was estimated to be of the 5th magnitude on May 19.—L. Ballif: The surfaces developed in two different manners by the motion of an indeformable curve.—W. de Tannenberg: A functional equation and curves of constant torsion.—T. H. Gronwall: Laplace's series.—R. W. Wood and L. Dunoyer: The optical resonance of sodium vapour under the stimulation of one only of the D lines. It has been proved that the resonance radiation excited by the line D_2 alone contains that radia-

tion only.—A. **Blanc**: A radiation accompanying the oxidation of phosphorus. The oxidation of phosphorus is accompanied by the production of an ionising radiation of very slight penetrating power, and resembling the γ rays of radio-active substances.—M. de **Broglie**: The spectroscopy of the secondary rays emitted outside Röntgen tubes and the absorption spectra.—L. **Bouchet**: A manometric arrangement for studying very small deformations of india-rubber.—Ch. **Fabry** and H. **Buisson**: The experimental verification of the Doppler-Fizeau principle.—R. **Swyngedauw**: The control of the insulation of a triphase network.—Ernest **Berger**: The oxidation of copper: the influence of temperature and pressure. The oxidation of copper by dry oxygen can be traced down to a temperature of 15° C. The velocity of oxidation is tripled for each 10° rise of temperature.—Jules **Roux**: Study of the limit of some reactions by means of the hydrostatic balance. Examples of the application of a quartz float to determine small changes of density.—Victor **Henri** and Venceslas **Moycho**: The action of monochromatic ultra-violet rays on the tissues. Measurement of the energy of radiation corresponding to sunstroke.—G. **Courtois**: Some organic uranium salts of the monoacids of the fatty series.—P. **Lebeau** and M. **Picon**: The hydrogenation of the cyclic hydrocarbons by sodammonium. The preparation of naphthalene tetrahydride. Naphthalene and powdered sodium are treated with liquid ammonia, naphthalene tetrahydride, and sodium amide are produced.—G. **André**: The development of the bud in a living plant (chestnut).—W. **Kopaczewski**: Researches on the composition of *Scilla maritima*. A toxic glucoside, not containing nitrogen, has been isolated from the scilla.—Raoul **Bayeux** and Paul **Chevallier**: Comparative researches on the concentration of the arterial blood and venous blood at Paris, Chamonix, and Mt. Blanc, by the refractometric study of the serum.—J. **Tissot**: Destruction of serum activity by heat.—Robert **Dollfus**: *Trochicola enterica*, a parasitic Eucepode of the intestine of the Trochidæ.—M. **Herlant**: The existence of a periodic rhythm in the determination of the first phenomena of experimental parthenogenetic development in the sea-urchin (*Paracentrotus lividus*).—Ch. A. **Rolland**: Contribution to the study of the constitution of bovine vesicular bile and of its lipid portion.—Maurice **Gignoux** and Paul **Combay**: The history of the last rhodanian glaciations in the Belley basin.—L. **Cayeux**: The existence of numerous traces of perforating algæ in French oolitic iron minerals.—H. **Fonzes-Diacon** and M. **Fabre**: The detection of boron in mineral waters.—Albert **Baldit**: A case of globular lightning.

BOOKS RECEIVED.

Western Australia. Geological Survey. Bulletin No. 44. A Geological Reconnaissance of a Portion of the South-West Division of Western Australia. By E. C. Saint-Smith. Pp. 80. Bulletin No. 49. Geology and Mineral Resources of the Yilgarn Goldfield. Part 1. Southern Cross. By E. C. Saint-Smith and R. A. Farquharson. Pp. 193+plates. (Perth, W.A.)
The Teaching of Mathematics in Australia. By Prof. H. S. Carslaw. Pp. 79. (Sydney: Angus and Robertson, Ltd.; London: Oxford University Press.)
The Call of the Stars. By Dr. J. R. Kippax. Pp. xviii+431+xlili plates. (New York and London: G. P. Putnam's Sons.) 10s. 6d. net.
Die Süßwasser-Flora Deutschlands, Oesterreichs und der Schweiz. Edited by Prof. A. Pascher. Heft 6. Chlorophyceæ, III. By W. Heering. Pp. iv+250. (Jena: G. Fischer.) 6 marks.

NO. 2327, VOL. 93]

Chimie Physique Élémentaire. By E. Ariès. Tome Premier. Pp. xxx+212. (Paris: A. Hermann et Fils.) 4 francs.

Der Bau des Weltalls. By Prof. J. Scheiner. Vierte Auflage. Pp. iv+132. (Leipzig: B. G. Teubner.) 1.25 marks.

Vegetationsbilder. Edited by Drs. G. Karsten and H. Schenck. Zwölfte Reihe. Heft 2 and 3. Pp. iv+Tafel 7-18. (Jena: G. Fischer.) 8 marks.

I.K. Therapy, with Special Reference to Tuberculosis. By Dr. W. E. M. Armstrong. Pp. x+83. (London: H. K. Lewis.) 5s. net.

A Contribution to the Flora and Plant Formations of Mount Kinabalu and the Highlands of British North Borneo. By L. S. Gibbs. Pp. 240+plates 1-8. (London: Linnean Society.)

The Carnegie Foundation for the Advancement of Teaching. Eighth Annual Report of the President and of the Treasurer. Pp. vi+158. (New York City.)

Annual Report of the Meteorological Observatory of the Government General of Korea for the year 1912. Pp. iv+120+20. (Chemulpo.)

Manks Antiquities. By P. M. C. Kermode and Prof. W. A. Herdman. Second edition. Pp. 150. (Liverpool University Press.) 3s. net.

Memorabilia Mathematica, or the Philomath's Quotation-Book. By Prof. R. E. Moritz. Pp. x+410. (London: Macmillan and Co., Ltd.) 12s. 6d. net.

Twenty-sixth Annual Report of the Purdue University Agricultural Experiment Station, Lafayette, Indiana, for the Year Ending June 30, 1913. Pp. 88. (Lafayette, Ind.)

Aeronautics. Technical Report of the Advisory Committee for Aeronautics for the Year 1912-13 (with Appendices). Pp. 416. (London: H.M.S.O.; Wyman and Sons, Ltd.) 10s.

Spectrum Analysis Applied to Biology and Medicine. By the late Dr. C. A. MacMunn. Pp. xiv+112. (London: Longmans and Co.) 5s. net.

Problems of Science. By F. Enriques. Translated by K. Royce. Pp. xvi+392. (Chicago and London: Open Court Publishing Co.) 10s. net.

The Country Month by Month. By J. A. Owen and Prof. G. S. Boulger. New edition. Pp. x+492+plates. (London: Duckworth and Co.) 6s. net.

The Latest Light on Bible Lands. By P. S. P. Handcock. Second edition. Pp. xii+371. (London: S.P.C.K.) 6s. net.

Royal Society of London. Catalogue of Scientific Papers, 1800-1900. Subject Index. Vol. iii. Physics. Part ii. Electricity and Magnetism. Pp. xv+551-927+vii. (Cambridge University Press.) 15s. net.

Amulets Illustrated by the Egyptian Collection in University College, London. By Prof. W. M. Flinders Petrie. Pp. x+58+liv plates. (London: Constable and Co., Ltd.) 21s. net.

A Practical Treatise on Sub-Aqueous Foundations. By C. E. Fowler. Third edition. Pp. xliii+814. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd.) 31s. 6d. net.

The Science of Knitting. By E. Tompkins. Pp. xiii+330. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd.) 12s. 6d. net.

Chemical Examination of the Blood and its Technique. By Prof. A. Pappenheim. Translated by R. Donaldson. Pp. ix+87+ii plates. (Bristol: J. Wright and Sons.) 3s. 6d. net.