

dent in the substantial æther. Here a speck and there a speck, but, for the great bulk of it, empty space!

"Impalpable" is not the right word, for matter is essentially palpable. It is because it appeals so directly to our senses that we attend to it so vividly. It forces itself on our attention, while the æther eludes us. And why? Clearly because our bodies are composed—our sense organs are composed—of this very matter. On the material side we are part of, and thoroughly at home in, the material universe. Whereas the æther is elusive—we know nothing of it directly—and though our eyes are instruments for receiving æthereal tremors excited by agitated electrons, we only know that fact, or half know it, by rather recondite inference. Light really tells us nothing about its own nature, but only about the superficial aspect of that gross and palpable matter which has interfered with and scattered it before it enters our eye.

Nevertheless, the atoms of this solid-seeming flesh and matter as we know it, when analysed into constituents, are turning out to be composed each of a definite grouping of ultra-minute particles, the positive and negative electrons, which themselves scarcely occupy any space (save as soldiers occupy a country), and which appear to be of two kinds only: the ultimate indivisible units of positive and negative electricity.

(To be continued.)

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MANCHESTER.—The following appointments are announced:—Mr. A. G. Ogilvie, reader in geography; Mr. J. Macmurray, lecturer in philosophy; Messrs. A. Gardner and R. L. Newell, demonstrators in anatomy. Mr. E. N. Ramsbottom has been elected to a research fellowship in public health.

DR. J. GRAHAM has been appointed professor of anatomy in the Anderson College of Medicine, Glasgow, in succession to the late Dr. A. M. Buchanan.

THE sum of 700,000*l.* has been given by Mr. G. Eastman, head of the Eastman Kodak Co., for the establishment of a school of music in connection with the University of Rochester, New York.

DR. G. SPENCER MELVIN, lecturer on experimental physiology in the University of Aberdeen, has been appointed professor of physiology in Queen's University, Kingston, Ontario.

THE PRINCE OF WALES, in acknowledging the degree of LL.D. conferred upon him on August 26 by the University of Toronto, said that the anti-toxin establishment with which the University is equipped had rendered invaluable service during the war for the forces of the British Empire and the Allies.

PROF. C. GOLGI has retired from the chair of general pathology and histology in the University of Pavia, but he remains in charge of the institute connected with it. A gold medal and souvenir album were recently presented to him, and a scholarship founded in his honour is to be given to the orphan of some physician killed during the late war.

DR. F. J. WILSON has been appointed professor of inorganic and analytical chemistry, and Dr. I. M. Heilbron professor of organic chemistry, at the Glasgow Technical College. Mr. W. Kerr has been appointed research assistant in the department of mechanical engineering at the same institution. The new development fund of the college has now reached

the total of 35,000*l.*, the following donations having recently been received:—From Mr. W. J. Chrystal, 1000*l.*; Mr. and Mrs. George Morton, 500*l.*; Messrs. W. Teacher and Sons, 500*l.*; Messrs. Alexander Stephen and Sons, Ltd., 500*l.*; the Anchor Line (Henderson Bros.), Ltd., 250*l.*; Messrs. Macfarlane, Lang, and Co., Ltd., 250*l.*; and Mr. James Reid, 250*l.*

THE Civil Service Commissioners announce that an examination will begin on October 28 for the purpose of filling vacancies as assistant examiners in the Patent Office. The examination will be confined in the main to candidates who have served in his Majesty's Forces, and will consist of a qualifying examination followed by interview by a selection board. The subjects of the qualifying examination are English composition, *précis*-writing, general knowledge, and one of the following:—General chemistry, electricity and magnetism, or mechanics and mechanism. The limits of age are 20–30. Initial salary 150*l.* a year, together with a war bonus. Copies of the regulations and forms of application may be obtained from the Secretary, Civil Service Commission, Burlington Gardens, London, W.1. The last day for making application is September 18.

THE United States General Education Board has granted 16,000 dollars to the National Committee on Mathematical Requirements, appointed by the National Mathematical Association of America, for the purpose of undertaking a study looking to improvements in the mathematical curriculum of the secondary schools of the country. Mathematicians, as well as educators in general, have in recent years criticised the prevailing high-school work in mathematics on the ground that much of the material is of little practical value, and on the further ground that the high-school curriculum in mathematics takes too little account of modern developments in this science. The American Mathematical Association is made up of the leading professors and teachers of mathematics in American colleges and universities. It has appointed to conduct the inquiry a committee composed of four university professors of mathematics and four secondary-school teachers of mathematics. Having no funds, this body applied to the General Education Board for assistance. The board itself will not take any part in the study or make recommendations. Prof. Young, of Dartmouth College, and Prof. Fobert, Technical High School, Chicago, will devote their entire time to the work for a year or more.

#### SOCIETIES AND ACADEMIES.

##### PARIS.

Academy of Sciences, August 18.—M. Léon Guignard in the chair.—G. Humbert: The particular representations of an integer by positive forms of Hermite in an imaginary quadratic body.—H. Andoyer: The development of a general function of the radius vector of the eccentric anomaly in elliptic movement.—E. L. Bouvier and d'E. de Charmoy. Mutation of a *Caridina* into an *Ordnannia*, and general observations on the evolutive mutations of fresh-water shrimps of the family of the *Atyidæ*.—E. Kogbetliantz: Ultraspherical series.—R. Garnier: Vectorial fields with indeterminate asymptotic directions.—E. Jouguet: A problem of generalised hydraulics. Flow of a burning gaseous mixture.—A. Veronnet: Ellipsoidal figures of equilibrium of a liquid in rotation; variation of the major axis.—G. Fayet and A. Schau Masse: The next return of the periodic comet 1911 VII. (Schaumasse). Taking into account the perturbations

in the orbit caused by the proximity of the comet to Jupiter in 1913, new elements have been worked out. It should be sought for in the beginning of September.—**R. Baillaud**: An impersonal photographic astrolabe.—**P. Nicolardot**: The action of reagents upon glass-powder. Eight kinds of glass were studied, and the amounts dissolved by pure water and decinormal hydrochloric acid determined for three grades of powder, fine, medium, and coarse.—**S. Posternak**: The saturated sodium salt of inosite hexaphosphate. A collection of data given in an earlier paper.—**Ch. Boulin** and **L. J. Simon**: The evolution of a mixture of methyl sulphate and chlorosulphonic acid.—**J. Bougault** and **P. Robin**: The oxidation of benzaldehyde. This oxime, on treatment with iodine and sodium carbonate, gives benzoic acid, benzaldehyde peroxide, benzoyl-benzaldehyde, and dibenzoyl-oxoazo-oxime.

## SYDNEY.

**Linnean Society of New South Wales**, June 25.—**Mr. J. J. Fletcher**, president, in the chair.—**Dr. A. J. Turner**: Revision of Australian Lepidoptera. Part vi. (continued). Thirty-two genera and ninety-five species of the subfamily Boarmiinae are recorded or described, five genera and forty species being described as new.—**Dr. R. Greig-Smith**: The germicidal activity of the eucalyptus oils. Part ii. Eucalyptus oils are irregular in their action upon *B. coli communis*, and duplicate experiments may show a considerable amount of variation. Cineol begins to act in about a minute and a half; phenol acts instantly. The curves of cineol and phenol cross in 5 minutes with a dilution of 1:75 at 20°. The phenol coefficient of cineol in 15 minutes at 20° is 3.1; it rises to 3.4 in 30 minutes, and then slowly declines to 2.8 in 4 hours. Aromadendral is the most active of the constituents of the oils. The phenol coefficient is 21.1 in 30 minutes. The next most active is piperitone (4.1), and possibly phellandrene. Pinene and sesquiterpene are low (0.8 to 0.5). The rectified oils of *E. cinerea* and *E. Smithii* are more efficient than the crude oils. In the case of the oil of *E. cinerea*, this appears to be due to the hydrolysis of the esters and the subsequent oxidation of the alcohols to aldehydes. Treatment with alkali did not reduce the efficiency of the acid-rectified oil. The addition of acetic acid to the crude oil doubled the germicidal power in the course of 3½ months. The germicidal activity of the rectified and crude oils of *E. cinerea* is proportional to the starch-iodide reaction, and not to the acidity, but this does not hold for the oils as a class. The rectified oil of *E. polybractea* is less efficient than the crude oil. This may be due to the elimination of aromadendral during rectification. The oil of the Braidwood variety of *E. australiana* is the best and cheapest disinfecting oil (phenol coefficient=5.8 in 30 minutes). The oil of *E. cinerifolia* was the second best crude oil tested (phenol coefficient=4.8 in 30 minutes); its activity is probably due to its aromadendral content. As in the case of phenol, the addition of acid to the water used in emulsifying the oils greatly increases the germicidal activity.—**T. Steel**: Water from the roots of the red mallee. A chemical investigation of water from the roots of this plant from Fowler's Bay, South Australia.—**Prof. E. D. Merrill**: The identity of *Polypodium spinulosum*, Burm. f. The author, by comparing Burman's figure with Australian material, concludes that the plant described as *P. spinulosum* from Java represents the W. Australian plant, *Synalpheia polymorpha*, R. Br., and that the locality record is an error.

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## BOOKS RECEIVED.

Physiology and Biochemistry in Modern Medicine. By Prof. J. J. R. Macleod. Assisted by Dr. Roy D. Pearce and by others. Pp. xxxii+903. (London: Henry Kimpton, 1919.) 36s. net.

The Conditions that Govern Staleness in Bread: Changes of Moisture and Soluble Extract with Age. Investigations and Researches made in the British Army Bakeries in France, 1917-18. By Capt. R. Whymper. (Reprinted from the *British Baker*.) Pp. 72. (London: Maclaren and Sons, Ltd., 1919.) 1s.

Board of Agriculture and Fisheries. Fishery Investigations. Series iii. Hydrography. Vol. i. The English Channel. Part i.: Start Point to the Channel Islands. Review of the physical and chemical properties of the surface waters, and the variations of these properties during the thirteen years from 1904 to 1917 inclusive. (London: H.M.S.O., 1919.) 10s. net.

Some Questions of Phonetic Theory. By Wilfrid Perrett. Chap. v.: The Perception of Sound. Pp. 39. (Cambridge: W. Heffer and Sons, Ltd., 1919.) 2s. net.

The Silk Industry and Trade: A Study in the Economic Organisation of the Export Trade of Kashmir and Indian Silks, with special reference to their Utilisation in the British and French Markets. By Ratan C. Rawley. Pp. xvi+172. (London: P. S. King and Son, Ltd., 1919.) 10s. 6d. net.

We Must Discover. Pp. viii+176. (London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd., 1919.) 3s. 6d. net.

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