

the engineering curriculum at the University of Bristol cover eminently suitable ground, and appear to be well designed successfully to achieve the purposes mentioned above.

ON Thursday, July 31, the King received at Buckingham Palace three deputations from public bodies, viz. the London County Council, the Body of English Presbyterian Ministers in London and the neighbourhood, and the General Body of Protestant Dissenting Ministers, who each presented an address of congratulation on the signing of peace after the terrible four years' struggle in which the nations of the world have been engaged, expressing the hope that we may now embark upon measures having for their object the continuous improvement of social conditions and the raising of higher ideals of life. In his replies to the several addresses the King expressed his strong conviction that nothing is more essential to national prosperity and happiness than education, and that the potentialities, physical, mental, and spiritual, of every member of the community should be developed to the fullest extent. If this were done, the life of the nation would be transformed within a generation. His Majesty alluded in terms of keen sympathy to the necessity for the care of the weak and helpless, for the protection of our infant life, and for the guardianship and training of the physically and mentally defective. New powers are being bestowed upon the public authorities, and the responsibility for their effective use rests with them. It is essential to raise the ideals of life throughout all classes. This implies due nurture and care of infant life, so that when the child comes of school-age it shall enter upon its formal education healthy in mind and body. To achieve this, better housing and more ample surroundings for light and air and healthy outdoor enjoyment are essential. If these conditions are established there will no longer be, as Sir George Newman recently reported, a million children out of six millions on the rolls of the elementary schools totally unfit, by reason of physical or mental defects, to make effective use of their educational opportunities. The King's sympathy and encouragement, so earnestly expressed to these deputations, ought to stimulate the zeal and the efforts of the local authorities to provide the facilities so necessary to the national well-being.

#### SOCIETIES AND ACADEMIES.

##### LONDON.

**Faraday Society**, July 14.—Prof. A. W. Porter, vice-president, in the chair.—L. A. Wild: A method of measuring the magnetic hardness of ferrous metals and its utility for carrying out research work on thermal treatment. The coercive force forms a very convenient criterion for judging the physical condition of steel, as a small change in the heat-treatment conditions or composition of the steel results in the production of a much larger change in the coercive force. The method has been used for the investigation of many problems relating to the properties of steel.—F. H. Jeffery: The electrolysis of solutions of sodium nitrate, using a silver anode.—W. E. Forsythe: The disappearing-filament type of optical pyrometer. The paper discusses fully the principles that determine the accuracy and use of this type of pyrometer. The instrument is practically a telescope with a lamp filament at the focus of the objective, in series with a battery resistance and ammeter. The instrument is lighted in the hot body in such a manner that the image of the filament crosses that of the body. The current is then adjusted until the filament is just as bright as the body sighted. A red glass in the eye-

piece eliminates difficulties due to colour differences.—E. A. Ashcroft: Some chemically reactive alloys. An alloy of 15 per cent. of pure magnesium with 85 per cent. of pure lead has the remarkable property that upon exposure to moist air oxidation of both the magnesium and the lead proceeds so rapidly that a lump of alloy so exposed swells up and falls to a black powder in a single night, or in some instances even in an hour or two. The experiment suggests a ready means of producing nitrogen or nitrogen and hydrogen mixtures from these alloys, or of removing remainders of oxygen from various mixtures in the cold.—Prof. H. Honda and H. Takagi: A theory of invar.—Prof. A. W. Porter: The equation for the chemical equilibrium of homogeneous mixtures. Part i.: Equilibrium at constant temperature. The general equation for chemical equilibrium is obtained in a way which is so much less abstract than the method depending upon the thermodynamic potential that no dubiety need exist of the meaning of the result and the conditions under which any particular form of it applies. The result is expressed in terms of the pressures of the constituents when isolated and in osmotic equilibrium with the mixture through membranes each permeable to one alone of the constituents.—Irving Langmuir: The mechanism of the surface phenomena of flotation. The paper directs attention to a theory of adsorption and surface tension which greatly aids in understanding the phenomena of flotation. The necessity for further researches is urged.

##### PARIS.

**Academy of Sciences**, July 15.—M. Léon Guignard in the chair.—G. Bigourdan: The pupils and temporary observers of the Observatoire de la Marine.—E. Kogbetliantz: The summation of ultra-spherical series.—J. Guillaume: Observations of the sun made at the Lyons Observatory during the first quarter of 1919. Observations were possible on seventy-two days, and the results are given in tables showing the number of spots, their distribution in latitude, and the distribution of the faculae in latitude.—A. Muguet: A fluorometer. This instrument is based on the use of a number of superposed absorbent screens, and comparisons are made with a luminescent standard containing 1 mg. of elementary radium per square centimetre of surface, acting upon a barium platino-cyanide screen.—H. Abraham, E. Bloch, and L. Bloch: Sensitive apparatus for the measurement of alternating currents.—F. Taboury and M. Godchot: A new method for the preparation of bicyclic ketones. Calcium hydride is used as the condensing agent, and it is noteworthy that the ketones resulting from the reaction are unsaturated, as the hydrogen from the calcium hydride is not taken up.—MM. Vavon and Faillebin: The hydrogenation of piperonal ketone and dipiperonal ketone.—E. Léger: Contribution to the study of cinchonidine.—G. Chavanne and L. J. Simon: The use of the critical solution temperature ("T.C.D.") in aniline for the rapid analysis of petrol. The method proposed gives the percentages of aromatic and naphthenic hydrocarbons.—A. Duffour: The hexahydrated potassium magnesium double chromate.—C. Dauzère: The formation of basaltic columns.—L. Dunoyer and G. Reboul: The prediction of barometric variations. A reply to M. Gabriel Guilbert.—Ch. Maurain: The velocity of the wind in the upper atmosphere in bright weather.—J. Rouch: The ascensional velocity of pilot balloons. From 168 measurements of velocity of pilot balloons it is concluded that the velocity of ascent is practically constant, and this holds for heights up to 10,000 metres. For balloons weighing between 50 and



91 grams the velocity can be expressed by the formula

$$V = \frac{42F}{(F + P)^{3/2}}$$

where  $V$  is velocity in metres per minute,  $P$  is the weight of the balloon, and  $F$  the initial ascensional force.—**R. Régnier**: The bacterial nodule of the poplar (*Micrococcus populi*)—Observations on the development of the disease on the tree, and suggested means of preventing its spread.—**P. Carnot** and **P. Gérard**: Mechanism of the toxic action of urease. The injection of urease into the blood causes death by ammonia poisoning; the urea in the blood completely disappears and is replaced by ammonia.—**R. Fosse**: The formation of cyanic acid by the oxidation of organic substances. Its identification based on quantitative analysis. Aqueous solutions of glucose, glycerin, or glycol, oxidised by potassium permanganate in presence of ammonia, give cyanic acid as one of the oxidation products. This was identified by precipitating as the silver salt. The silver in this salt was determined by addition of ammonium chloride, and the urea formed from the ammonium cyanate separately estimated.—**P. Woog**: The variable persistence of luminous impressions on the various regions of the retina. Reply to an objection.—**P. Girard**: Relation between the electrical state of the cell-wall and its permeability to a given ion.—**R. de la Vaulx**: Intersexuality in *Daphne atkinsoni*.—**J. Pellegrin**: The Eleotris of the fresh-waters of Madagascar.—**M. Lienhart**: The possibility of chicken-breeders obtaining at pleasure male or female chickens. For a given strain of bird, the heavier eggs produce a higher proportion of males.—**J. Danysz**: The life of a micro-organism, individual and species.—**P. Delbet**: Researches on the toxicity of crushed muscles from the point of view of the pathology of shock.

#### CAPE TOWN.

**Royal Society of South Africa**, May 21.—**Dr. J. D. F. Gilchrist**, president, in the chair.—**B. de St. J. v. d. Riet**: Note on coloration produced in clay by injured roots of *Pinus pinea*. Instances were described in which vapours from injured roots of the stone pine produced, in warm sunshine, blue, green, and occasionally purple stains on soil and subsoil on occasions when excavations were made close to the tree. The author ascribed the phenomenon to (1) oxidation of volatile matter given off by roots of *Pinus pinea*; (2) the resulting oxidation products, or product, under favourable conditions reacting with iron salts in the clay (the well-known reaction between many phenolic carbon compounds and ferric salts); and (3) the production of a kind of lake with aluminium compounds in the clay.—**Dr. J. D. F. Gilchrist**: Note on the shells of *Schizoderma spengleri*. Shells of the bivalve *Schizoderma* are found in abundance on the Muizenberg sands, and present the peculiarity that they are either whole or broken up into small fragments. This seems to be due to the fact that, when the living animal is cast up on the beach, it is seized by the gull (*Larus dominicanus*) and dropped from a height of 20–30 ft. on the wet sand. This has the effect of causing both shells to open without injury, or one shell only is broken, rarely both. It was shown by experiment that this depends on how the shells fall.—**Dr. Dru-Drury**: An extreme case of microcephaly. The author describes the skull of a Basuto woman aged thirty-two which is preserved in the Port Alfred Mental Hospital. The type of skull is long-headed and narrow, with ape-like protrusion of the jaws (thick-lipped in life). The nose was of medium breadth and the orbits were unusually high. The cranial capacity is 340 c.c., which is much smaller than an average case of microcephaly.

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#### BOOKS RECEIVED.

- The British Freshwater Rhizopoda and Heliozoa. By J. Cash and G. H. Wailes, assisted by J. Hopkinson. Vol. iv.: Supplement to the Rhizopoda. By G. H. Wailes. Bibliography by John Hopkinson. Pp. xii+130+plates lviii.–lxiii. (London: The Ray Society, 1919.)
- Camping Out for All. A Complete Handbook for All who Love the Out-of-Doors. By J. Gibson. Pp. x+81. (London: Gale and Polden, Ltd., 1919.) 2s. net.
- Training for Young England. By F. G. Cooke. Pp. xiv+98. (London: Gale and Polden, Ltd., 1919.) 2s. net.
- The Boys' Own Book of Great Inventions. By Floyd L. Darrow. Pp. ix+385. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1918.) 12s. 6d. net.
- Education for the Needs of Life: A Text-book in the Principles of Education. By Dr. I. E. Miller. Pp. vii+353. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1919.) 7s. net.
- The Sugar-Beet in America. By Prof. F. S. Harris. (The Rural Science Series.) Pp. xviii+342+xxxii. plates. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1919.) 2.25 dollars.
- British Science Guild: British Scientific Products Exhibition, Central Hall, Westminster, July 3 to August 5, 1919. Descriptive Catalogue. Edited by Sir Richard Gregory. Pp. xxiii+358. (London: British Science Guild, 1919.) 2s. 6d.

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