

Birthdays and Research Centres.

Mar. 8, 1855.—Prof. K. E. VON GOEBEL, For.Mem.R.S., professor of botany in the University and Director of the Botanical Gardens, Munich.

At present I am engaged on the preparation of a work on "The Flowering Shoot" (anthocladia and inflorescences) to be published this year as the second supplement to the "Organographie den Pflanzen", third edition. My main interest is the biology and taxonomy of leptosporangiate ferns.

A critical revision of phylogeny, especially a comparison of the results of the phyto-palaeontological discoveries with the modern views on the relationships in the larger natural groups of plants, for example, in ferns, is a problem deserving of the closest study.

Mar. 9, 1862.—Sir SIDNEY F. HARMER, K.B.E., F.R.S., formerly Director of the Natural History Departments of the British Museum.

My principal work, at present, is the preparation of Part 3 of my *Report on the Polyzoa* collected by the *Siboga* in the Malay Archipelago.

I continue to keep in touch with recent developments of the subantarctic whaling industry. Whaling operations have increased in magnitude to an alarming extent, particularly since the season 1926–27, and principally as the result of the increased use of pelagic 'floating factories' which operate on the high seas. These ships, which have already reached a size exceeding 20,000 tons, are capable of performing all manufacturing operations on board. They are under no effective control, and there is reason to believe that in some cases a regrettable waste of valuable material is taking place. The production of oil, in these localities, has risen from less than 800,000 barrels in 1925–26 to more than 1,600,000 barrels in 1928–29, and more than 2,500,000 barrels in 1929–30 (6 barrels = 1 ton). Naturalists acquainted with the results of earlier hunting in other areas are convinced that the whale population of subantarctic seas, the last refuge of the great whales, will be gravely reduced, in the near future, unless it is found possible to secure international agreement to the regulation of the industry, on satisfactory lines.

Mar. 13, 1873.—Dr. CHARLES S. MYERS, C.B.E., F.R.S., Director of the National Institute of Industrial Psychology.

Much of the research work on which my staff and I have been engaged during the past ten years at the National Institute of Industrial Psychology has been fundamentally concerned with the mental differences between individuals. Undoubtedly it suggests a problem of vast magnitude for future solution, namely, what are the *physiological* differences with which these *mental* differences are associated? What, for example, is the physiological significance of the discovery that, during the menstrual period, the mental efficiency of some women is distinctly greater, in others less, while in many it is not appreciably changed, compared with other times? What, again, is the physiological significance of similarly wide individual differences in efficiency which appear to result from ultra-violet radiation? And what is the physiological significance of the striking differences in various mental characteristics revealed by mental tests?

Clearly, conjoint physiological and psychological research is essential to ascertain what *bodily* differences, say in metabolism, blood composition, or endocrine activity, are responsible for the *mental* differences disclosed by the Institute's research work.

Societies and Academies.

LONDON.

Royal Society, Feb. 26.—J. C. Eccles and Sir Charles Sherrington: Studies on the flexor reflex. (1) Latent period. A method for measuring the latent period of the flexor reflex is described. The values obtained for the central reflex time range from 2.7σ to 4.35σ , and are in general agreement with the values calculated by Jolly and by Forbes and Gregg. The central reflex time is shortened when the stimulus applied to the afferent nerve is strengthened. The temporal dispersion of many reflex discharges is shown to be due, not to the discharge of more than one impulse from motoneurons, but to variations in the latent periods of the single responses of different motoneurons. The latent period of the response to a centripetal volley is greatly shortened if another volley precedes it by certain intervals. This shortening occurs at the expense of the central reflex time. It is concluded that all the time is saved in the reduction of the normal 'synaptic' delay by facilitation. If that is so, the actual conduction time through the spinal cord must be less than 0.5σ . On the assumption that the normal 'synaptic' delay is due to time taken for a succession of excitatory impulses (owing to their temporal dispersion) to build up a c.e.s. of threshold intensity, all the observations are satisfactorily explained. The experiments support the conclusions that in the flexor reflex, centripetal impulses are not transmitted straight through the spinal cord, but at certain points ('synapses') they are transformed into an enduring excitatory condition, c.e.s., which may in turn set up fresh nerve impulses—the reflex discharge.—(2) The reflex response evoked by two centripetal volleys. When the interval between two centripetal volleys is short, the reflex contraction evoked by the second volley is due largely to the discharge of motoneurons which fail to respond to either volley alone. The response of these motoneurons is due to summation of the subliminal excitatory effects of each volley. In addition to this facilitation at short intervals, a centripetal volley gives rise to a period of unresponsiveness of motoneurons. Three types of unresponsiveness have been met with: (a) Recovery complete in less than 16σ . (b) Recovery complete in less than 50σ . (c) Recovery not complete for more than 80σ . From theoretical considerations, the duration of the relatively refractory period following an antidromic volley (10.5σ) is likely to be identical with the duration of the relatively refractory period of the reflex arc.—J. C. Eccles: Studies on the flexor reflex. (3) The central effects produced by an antidromic volley. When a single stimulus is applied to an intact motor nerve, a volley of impulses (called an antidromic volley) passes into the spinal cord through the ventral roots. A single centripetal volley gives rise to c.e.s. during a considerable period. Persistence of the c.e.s. set up by such a volley is due partly to the temporal dispersion of the incident excitatory impulses and partly to the c.e.s. produced by any particular impulse itself enduring for some time. In any motoneuron an antidromic impulse removes preformed c.e.s.—J. C. Eccles and Sir Charles Sherrington: (4) After-discharge. A period of quiescence follows an antidromic volley set up during the after-discharge of a reflex either by a single centripetal volley or by a repetitive series of centripetal volleys (confirming Denny-Brown). It is concluded that preformed c.e.s. of a motoneuron is removed by a reflex discharge, and has to be built up again by delayed excitatory impulses before another discharge can occur.—J. C. Eccles and Sir Charles Sherrington: (5) General

conclusions. A brief statement with discussion of various views of the nature of central excitation in reflex activity.—A. V. Hill and J. L. Parkinson: Heat and osmotic change in muscular contraction without lactic acid formation. Frogs' muscles poisoned with iodo-acetic acid, in which no lactic acid is formed, when stimulated to exhaustion in nitrogen gave total heat 0.367 cal. per 1 gm. and showed a rise of osmotic pressure. This change of osmotic pressure cannot be explained in full without assuming either (a) that some chemical reaction, hitherto unrecognised, occurs in such poisoned muscles when stimulated, or (b) that phosphagen (and perhaps adenyl-pyrophosphoric acid) exist not as simple molecules in the resting muscle but in some combined form.

Society of Public Analysts, Feb. 4.—L. H. Lampitt and J. H. Bushill: The solubility of milk powder—the moisture factor. The authors stress the complicated nature of the changes which take place when spray-dried milk powder absorbs moisture. The freezing of the fat, whereby it is made available for solution in organic fat solvents, is one indication of the changes taking place above the 'critical moisture content', a figure dependent upon the solids not fat.—S. Marks and R. S. Morrell: (1) The determination of the hydroxyl content of organic compounds: estimation of castor oil. Peterson and West's modification of the method of Verley and Bolsing, in which the hydroxyl content is determined by treatment with acetic anhydride and pyridine, was found the most satisfactory method, and is particularly suitable for the estimation of castor oil.—(2) The determination of the carboxyl and aldehyde content of organic compounds: estimation of phenylhydrazine. The most suitable method was found to be that of Ellis, in which the substance is treated with excess of phenylhydrazine, and the nitrogen evolved on treating the excess with Fehling's solution is collected and measured in a simple form of apparatus, an allowance being made for the benzene vapour.—A. Van Raalte and J. Straub: Food control in Holland. Food control in Holland is based on legal standards arrived at usually by agreement between the directors of the control service and the large manufacturers. Not only foods, but also other commercial products such as toilet articles, wallpaper, insecticides, etc., are subject to control. There is a right of inspection of premises where food is manufactured or sold, and this, coupled with intensive sampling, has reduced to 6.7 per cent, the percentage of samples falling below the standard.—H. R. Ambler: The determination of small quantities of methane. The hydrogen and carbon monoxide are oxidised by means of cupric oxide at about 500° C., the resulting carbon dioxide removed, and the methane determined by burning with oxygen in the presence of platinum wire at bright yellow heat, and measuring the carbon dioxide produced and the residual oxygen.—R. Bhattacharya and T. P. Hilditch: The fatty acids and component glycerides of Indian ghee. Cow ghee gives figures falling within the limits previously recorded for English and New Zealand butter fats, but buffalo ghee showed rather higher Reichert-Meissl and Kirschner values. It also contained more butyric and stearic acids than cows' butter.

Geological Society, Feb. 11.—W. J. Arkell: The Upper Great Oolite, Bradford Beds, and Forest Marble of South Oxfordshire, and the succession of gastropod faunas in the Great Oolite. In the first part of the paper the principal exposures in South Oxfordshire of the uppermost beds of the Great Oolite and the Forest Marbles are described, with especial reference to the palæontological horizons, and for the first time

the fauna of the highest portion (or Block I.) of the Great Oolite is enumerated and discussed. It is shown that this fauna is essentially a Great Oolite one. Secondly, it is demonstrated that the renowned fossil bed of Islip contains nearly the whole of the highly characteristic assemblage of the Bradford Clay, of which it is held to be a true representative. In the second part of the paper the gastropod beds of the Great Oolite are studied, and an attempt is made to disentangle the various species and genera.—A. Heard and J. F. Jones: A new plant (*Thalassia*), showing structure, from the Downtonian Rocks of Llandovery, Carmarthenshire. The structures of the peculiar fossil were revealed by mechanical and chemical methods of treatment. Horizon: Lower Downtonian, probably a few yards above the Upper Ludlow—Downtonian junction. Locality: Long. west 3° 41', lat. north 51° 58' 35".

PARIS.

Academy of Sciences, Jan. 5.—Auguste Lumière and Mme. A. Dubois: The distribution of Koch's bacilli, contained in milk, after separating the butter and casein. Known amounts of tubercle bacillus were added to milk, the cream separated, and the casein separated from the butter-milk in the usual way. The resulting whey and the cream were free from bacilli, which appear to be concentrated in the casein. It is concluded that starting with tuberculous milk the maximum danger is in the cheese.—J. Herbrand: The units of an algebraical body.—J. Rey Pastor: A characteristic property of the varieties of Jordan.—H. F. Bohnenblust and E. Hille: The absolute convergence of Dirichlet's series.—L. Tchakaloff: The theorem of finite increments.—Georges Bouligand: Cavities arising in a heavy liquid.—G. Ribaud and P. Mohr: The determination of the melting point of platinum. The method adopted was optical extrapolation, starting with the melting point of gold. The melting point found was 1762° ± 2° C.—Mlle. M. Chenot: A new appearance of the high frequency discharge.—G. Ferrié: Remarks on the preceding communication.—Armand de Gramont: Transmitted light in the case of so-called total reflection. If a light pencil is reflected from the long side of a right-angle prism, under an angle of incidence greater than the limiting angle, some light diffuses through the back of the prism and shows a maximum in a definite direction. The intensity of this maximum depends on the polish of the reflecting surface.—Jean Loiseleur and Léon Velluz: The preparation of cellulose membranes containing proteins. The solubility of some proteins (gelatine, casein, egg albumen) in anhydrous organic acids allows the preparation of true solutions of mixtures of proteins and cellulose derivatives, and from these, by evaporation, membranes of varying permeability can be prepared.—P. Pingault: The iron carbide and iron oxygen equilibrium.—L. Hackspill, A. P. Rollet, and L. Andrès: The action of boric acid upon the alkaline chlorides and nitrates. In the presence of steam, boric acid easily displaces the acid of alkaline chlorides and nitrates.—M. Lemarchands and C. Tranchat: The purification of disodium phosphate.—A. Travers and Avenet: The determination of thiocyanates in coke oven effluents. The thiocyanate is precipitated as cuprous thiocyanate, this dissolved in ammonia, oxidised to cupric salt, and titrated with potassium permanganate.—Mme. Ramart-Lucas and J. Hoch: The absorption spectra of dibenzyl and its derivatives. A band attributed by previous workers to dibenzyl has been found to be due to the presence of a trace of stilbene as impurity.—A. Marin and P. Fallot: The distribution of the facies in the Spanish Rif and their special character.—Pierre Dangeard: A parasitic *Ectocarpus* causing tumours in *Laminaria flexicaulis*

(*Ectocarpus deformans*).—Robert Weill: The genus *Pteroclava*, the systematic interpretation of the Pteronemidæ and the taxonomic value of the cnidome.—Georges Fontès and Lucien Thivolle: Tryptophane and histidine are anabolites. The simultaneous injection of tryptophane and histidine into dogs, in equilibrium with a fixed food ration, results in rapid gains in weight, and these gains are maintained for some time.—L. Septilici: The diagnosis of syphilis by spectro-reaction.—C. Levaditi and P. Lépine: The preventive action of liposoluble bismuth in experimental syphilis of the chimpanzee.

Jan. 12.—A. Guldberg: The problem of the scheme of urns.—David Wolkowitsch: The geometrical properties of ellipses of inertia of a plane system.—J. A. Lappo-Danilevski: The analytical coefficient of the singularities of integrals of systems of linear differential equations with arbitrary rational coefficients.—N. Mouskhelichvili: New method of reduction of the fundamental biharmonic problem to an equation of Fredholm.—J. Dieudonné: The radius of univalence of polynomials.—O. Nikodym: Linear and continued functionals.—J. Dufay and R. Gindre: The variable star *d*-Cygni. The variations of luminosity suggest the mutual eclipses of two stars moving in circular orbits and give a curve of the type of β -Lyrae. A detailed spectroscopic study is required to elucidate the physical nature of the system of *d*-Cygni.—Jean Ullmo: The application of classical statistical conceptions to wave mechanics.—H. Muraour and G. Aunis: The variation of $sp. dt$ with density of the charge for different types of (explosive) powders.—Charles Marie and N. Marinisco: The phenomena of adsorption and protection in complex colloidal media.—Augustin Boutaric and Jean Bouchard: The acceleration produced by light in the flocculation of colloidal solutions in fluorescent media. Suspensions of gamboge and resin (in presence of eosin and fluorescein) and of arsenic sulphide sols (in presence of eosin, fluorescein, and erythrosin) were used. It was generally found that flocculation is accelerated by light: in the absence of the fluorescent substance the flocculation was not accelerated.—G. Chaudron and A. Girard: The formation of a ferromagnetic iron sesquioxide by the decomposition of van Bemmelen's hydrated sesquioxide.—V. Agafonoff: The influence of impurities on some physical and crystallographic properties of hemimellitic acid. Some anomalies in crystal form and optical properties were traced to the presence of impurities, one being calcium hemimellate.—V. Gouzien: The geological structure of the peninsula of Crozen (Finistère).—M. Gignoux and E. Raguin: The stratigraphy of the Trias of the Briançonnais zone.—Ch. Poisson and J. Delpeut: Magnetic observations at Tananarive.—L. Mercier: The hypopleural bristles of *Oryzma luctuosa* and the principle of the connexion of the organs.—Mme. Lucie Randoïn and Mlle. Andrée Michaux: Variations in the proportions of chlorine and of water in striated muscle, liver, and kidneys in the course of acute experimental scurvy. At the time of appearance of the characteristic symptoms of scurvy, the proportion of chlorine in the muscles shows marked increase, from 0.5 per thousand to twice or even three times this amount, and this is due essentially to the deficiency in vitamin C.—Raymond-Hamet: The cardiac antagonism of pilocarpine and tropine.—Jean Régnier and Guillaume Valette: The influence of the concentration of hydrogen ions on the fixation of cocaine by adsorption on the nerve fibres. The experiments described lend support to the hypothesis according to which increasing alkalinity increases the anæsthetic action of cocaine hydrochloride, not only by modifying the physico-chemical properties of the anæsthetic solution in a sense favour-

ing fixation, but also by reinforcing the power of fixation of the nerve cell itself.—P. Delanoë: The sensibility of the fox to the Moroccan spirochæte, *Sp. hispanicum* var. *maroccanum*. Young foxes are frequently infected, but as adult foxes can show a very complete acquired immunity, the fox, like the porcupine, must be regarded as a reservoir of the virus.

Official Publications Received.

BRITISH.

- The British Electrical and Allied Industries Research Association (Incorporated). Tenth Annual Report, October 1, 1929, to September 30, 1930. Pp. 86. (London.)
- The Journal of Physiology. Subject Index to Volumes 1 to 60. Pp. iv+201. (London: Cambridge University Press.) 15s. net.
- Navy (Health). Statistical Report of the Health of the Navy for the Year 1929. Pp. 158. (London: H.M. Stationery Office.) 2s. 6d. net.
- War Office. Report on the Health of the Army for the Year 1929. (Vol. 65.) Pp. iv+172. (London: H.M. Stationery Office.) 3s. net.
- Canada. Department of Mines: Mines Branch. The Salt Industry of Canada. By L. Heber Cole. (No. 716.) Pp. viii+116+15 plates. (Ottawa: F. A. Acland.) 20 cents.
- The Engineer Directory and Buyers Guide, 1931. Pp. 260. (London.)
- Proceedings of the Cambridge Philosophical Society. Vol. 27, Part 1, January. Pp. 162. (Cambridge: At the University Press.) 7s. 6d. net.
- The Journal of the National Institute of Agricultural Botany. Vol. 2, No. 4. Pp. 309-412. (Cambridge: W. Heffer and Sons, Ltd.) 2s. 6d.
- Proceedings of the Royal Irish Academy. Vol. 39, Section B, No. 28: A Statistical Analysis of the Laws governing the Urea Excretion in Man. By Dr. E. J. Conway. Pp. 574-594. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 6d.
- C.B.C. Bulletin No. 2: Coital Interlocking, a Physiological Discovery. By Dr. Marie Carmichael Stopes. Pp. 6. (London: Mothers' Clinic for Constructive Birth Control.)
- Nigerian Forestry Department. Bulletin No. 1: Record of Forest Research in 1928. Pp. 42. (Lagos: C.M.S. Bookshop; London: The Crown Agents for the Colonies.) 5s.
- Journal of the Chemical Society. January. Pp. iii+223+x. (London.)
- Some Notes on the Cinchona Industry. (Streatfeild Memorial Lecture, 1930.) By Bernard F. Howard. Pp. 22+4 plates. (London: Institute of Chemistry.)
- Journal and Proceedings of the Asiatic Society of Bengal. New Series, Vol. 25, 1929, No. 2: Numismatic Supplement for 1929. Pp. 78+5 plates. (Calcutta.)
- The Journal of the Botanical Society of South Africa. Edited by R. H. Compton. Part 16. Pp. 30+3 plates. (Kirstenbosch.)
- Quarterly Journal of the Royal Meteorological Society. Vol. 57, No. 238, January. Pp. 116. (London: Edward Stanford, Ltd.) 7s. 6d.
- Transactions of the Institute of Marine Engineers, Incorporated. Session 1930. Vol. 42, January. Pp. 959-1044+xl. (London.)
- Memoirs of the Indian Meteorological Department. Vol. 25, Part 6: The Wind at Agra and its Structure. By Barkat Ali. Pp. 191-251+6 plates. 2.14 rupees; 5s. Scientific Notes. Vol. 2, No. 17: Tables of Monthly Average Frequencies of Surface and Upper Winds up to 3 Km. in India, Part A. Pp. 64-127. 1.6 rupees; 2s. 3d. Vol. 2, No. 17: Tables of Monthly Average Frequencies of Surface and Upper Winds up to 3 Km. in India, Part B. Pp. 129-192. 1.6 rupees; 2s. 3d. Vol. 3, No. 18: The Structure of the Madras Storm of January 1929. By Dr. K. R. Ramanathan and A. A. Narayana Iyer. Pp. 12+11 plates. 1.10 rupees; 2s. 6d. Vol. 3, No. 19: Distribution of Air Density at M.S.L. over India. By U. N. Ghosh. Pp. 13-14+20 plates. 1.4 rupees; 2s. (Calcutta: Government of India Central Publication Branch.)

FOREIGN.

- Scientific Survey of Porto Rico and the Virgin Islands. Vol. 6, Part 4: Botany of Porto Rico and the Virgin Islands. Supplement to Descriptive Flora, Spermatophyta, Bibliography, Spermatophyta and Pteridophyta, Index to Volumes 5 and 6. By N. L. Britton and Percy Wilson. Pp. 521-668. 2 dollars. Vol. 10, Part 4: The Ascidiaria of Porto Rico and the Virgin Islands. By Willard G. Van Name. Pp. 401-535. 2 dollars. Vol. 12, Part 1: Insects of Porto Rico and the Virgin Islands. Heterocera or Moths (excepting the Noctuidæ, Geometridæ and Pyralididæ). By W. T. M. Forbes. Pp. 174. 2 dollars. (New York: New York Academy of Sciences.)
- Meddelelser fra Kommissionen for Havundersøgelser. Serie Hydrograaf, Bind 2, No. 10: Contributions to the Hydrography of the Waters round Greenland in the Year 1925. By Baggsgaard-Rasmussen and J. P. Jacobsen. Pp. 24. (København: C. A. Reitzels Forlag.)
- Koninklijk Nederlandsch Meteorologisch Instituut, No. 102. Mededeelingen en Verhandelingen, 29c: Klimatologie van den Indischen Oceaan. v. Neerslag; vi. Frequentie van Luchtdrukkingen en Stormachtige Winden; vii. Tropische Cyclonen. Door P. H. Gallé. Pp. 31. (Amsterdam: Seyffardt's Boekhandel.) 0.45 f.
- Proceedings of the Imperial Academy. Vol. 6, No. 9, November. Pp. xxvii-xxviii+357-384. (Tokyo.)
- Science Reports of the Tokyo Bunrika Daigaku. Section B, Nos. 2-5. No. 2: On Vector Quantity, 1: A Method of Vector Analysis with an Idea of Higher Complex Numbers, by Suminosuke Ono; No. 3: On the Expression of the Transition Probability, by Uzumi Doi; No. 4: Large Displacements in the Spectra of Ionized Nitrogen, by Kwan-ichi Asagoe; No. 5: Some Peculiar Types of the Lichtenberg Figures, by Kwai Umeda and Mitsuo Shoyama. Pp. 15-66+4 plates. (Tokyo: Maruzen Co., Ltd.) 75 sen.