

June 23, 1859.—Lieut.-Col. A. W. ALCOCK, C.I.E., F.R.S., I.M.S. (retired), formerly professor of medical zoology in the University of London.

Since my retirement from the London School of Tropical Medicine under the statutory age-limit, my efforts have been confined to supporting, under the auspices of the Tropical Diseases Bureau, what I hope may never be neglected, namely, the old and fruitful connexion between natural science and scientific medicine. Authors of papers treating of animals specifically hurtful to the human frame, and zoological papers throwing light on causes, or suggesting means of control and prevention, of specific diseases of mankind, provide most of the material of this useful though non-spectacular work.

As a medico-zoological subject for extremely promising study, I would direct attention to the wolf-reared children—one of whom I have seen—that occasionally come to light in northern India. There is evidence that such children, having in infancy been carried off by wolves, have survived, have lived among the wolves, and (if by after-chance rescued by capture) behave as wild animals. But to what extent the germs of their human and intellectual endowment have been annulled or aborted in their aberrant wolfish environment is a subject that has never been precisely investigated. It is plain that such exact investigation by a company of medical mentalists and biologists might be enormously instructive, in many directions, where confusion and fallacy now are somewhat prevalent.

June 25, 1859.—Prof. SYDNEY J. HICKSON, F.R.S., emeritus professor of zoology in the University of Manchester, honorary fellow of Downing College, Cambridge.

During the last three years the subject of my investigation has been the species-problem in certain groups of Cœlenterata. With this in view, I have completed a study of the Gorgonacea from the Panama region and of the Xenidæ from the Barrier Reef. In some genera there are apparently clearly defined discontinuous groups probably of the character of Linnean species, in others there seems to be complete continuity between the so-called 'species'. Satisfactory results as regards continuity can only be obtained when considerable numbers of specimens of a genus from one locality, or of species from several localities, are submitted to detailed investigation.

The main object of this research is to throw light on the origin of species in a group of radially symmetrical and sedentary animals.

June 26, 1894.—Prof. P. KAPITZA, F.R.S., fellow of Trinity College, Cambridge, and assistant director of magnetic research in the Cavendish Laboratory.

The general line of our research is the study of the influence of strong magnetic fields on solid substances. It is possible to trace the influence of the magnetic field on nearly all the known physical properties of substances. We devote our attention mainly to studying the magnetisation of the substance itself, to the influence of the magnetic field on the binding forces between the atoms (magnetostriction) and to the disturbing effect of the field on the motion of free electrons in the crystal lattice (galvanomagnetic phenomena).

It appears that all these phenomena are strongly influenced by the physical state of the substance, and are much simplified if they are studied in undisturbed crystals. The presence of foreign atoms, plastic deformation, and temperature agitation all seem to disturb the symmetry of the crystal lattice and hinder

the appearance of the more simple laws which govern the phenomena in a perfect crystal lattice. Should these laws be established they would probably have a more simple theoretical interpretation, since the crystal lattice is the most regular and symmetrical of all aggregates of atoms known in Nature.

Societies and Academies.

LONDON.

Royal Society, June 11.—M. L. E. Oliphant: Electron emission from Langmuir probes and from the cathode of the glow discharge through gases. It is found that for potentials above about 600 volts the rate of increase of current to the probe is greater than that predicted by the original theory of Langmuir and Mott-Smith, and this is ascribed to electron emission from the electrode, which increases with the energy of impact of the positive ions. The energy delivered to the probes as heat has been measured by a compensation method which eliminates all corrections. From this energy and the potential of the probe relative to the surrounding space the positive ion current i_p can be obtained. It is found that the ratio of electron to positive ion current is independent of the energy of the positive ions up to that corresponding to a potential of 600 volts, and thereafter increases. The results are then discussed from the point of view of the angle of impact of the positive ions on the electrode surface, and it is pointed out that there must be an emission of electrons produced by agencies other than the impact of positive ions.—H. E. Watson, G. Gundu Rao, and K. L. Ramaswamy: The dielectric coefficients of gases, I. The dielectric coefficients of the five inactive gases and hydrogen have been measured at 25° and at -190° or -78° and compared with that of carbon dioxide. None of these gases except argon has an electric moment detectable by the method of measurement employed, 0.05×10^{-18} being an upper limit for krypton and xenon. For argon the figure appears to be 0.03×10^{-18} , but this is probably a spurious result. For the remaining gases it is not more than 0.015×10^{-18} . Further investigations of possible sources of error have been made, and an approximate method of determining condenser distortion with pressure is described.—G. D. Bengough, A. R. Lee, and F. Wormell: The theory of metallic corrosion, IV. The effect on the corrosion of zinc of faster and slower rates of oxygen supply than those used for previous papers has been studied, and some comparisons made with the corrosion of mild steel. Complete curves are given showing the effect of concentration of potassium chloride and of potassium sulphate on the corrosion rates of zinc in tranquil conditions. The influence of depth of immersion between limits of 0.35 mm. and 100 mm. has been ascertained. An explanation has been found for the departure from linear corrosion rates after prolonged immersion in potassium chloride solution. A micrographic study of the form and distribution of corroded areas has shown that very highly purified zinc yielded characteristic etch pits, but no preferential crystal boundary attack; less highly purified zinc rarely showed etch pits of definite shape, but marked preferential attack on the crystal boundaries.

Geological Society, May 20.—A. A. Fitch: The geology of the country between Ivybridge and Buckfastleigh, Devon. The area described consists of a strip of the granite margin, the metamorphic aureole, and some rocks beyond the influence of the granite. The physical geology is discussed and the presence of a relic of the 700-500-foot platform demonstrated by

planimetric measurements. The rocks are described stratigraphically. The petrology and petrogenesis of the resulting rocks are discussed in detail, and some aspects of two-way migration considered. The mineral assemblage of the aureole is not of much diagnostic value for the provenance of the sediments of the South of England. Superficial deposits do not afford matter of great interest. Economic aspects of the geology are dealt with.

DUBLIN.

Royal Irish Academy, May 11.—J. J. Nolan and P. J. Nolan : Observations on atmospheric ionisation at Glenree, Co. Wicklow. The equilibrium of atmospheric ionisation was examined under conditions of wide variability of concentrations of condensation nuclei. Certain diurnal variations of the concentrations of ions and nuclei were found. The relation between ions and nuclei cannot be represented by a recombination equation of the ordinary type. An empirical equation formerly proposed, involving the square root of the nucleus concentration, appears to fit the results better. Both the ratio of positive to negative ions and the rate of production of ions appear to have a diurnal variation corresponding to that of the earth's field.—T. McHugh : A pair of circular cubics generated by two rigid quadrangles. When one plane moves upon another in such a way that a fixed quadrangle in the first plane is always in perspective with a fixed quadrangle in the second plane, the centre of perspective describes a circular cubic in each plane. The relations and properties of these cubics are discussed and degenerate cases are examined.

EDINBURGH.

Royal Society, May 19.—A. D. Peacock and R. A. R. Gresson : Male haploidy and female diploidy in *Sirex Cyaneus*, F. (Hymen). The work of Peacock and Sanderson on the more generalised Hymenoptera, the Tenthredinidae, in which cells of connective tissue, blastoderm, embryo, and gonad have been examined, shows that the parthenogenetically-produced male is haploid (8) and the bi-sexually-produced female is diploid (16). Further work, by Peacock and Gresson, on the wood-wasp *Sirex cyaneus* F., supports the same view, for the spermatogonia and second spermatocytes are haploid (8), there is an abortive first maturation division, and the oogenia are diploid (16). Shortage of material has precluded study of the somatic cells. Fuelgen's 'nuclealreaktion' is negative when applied to the large chromoid body and the cytoplasmic granules seen so prominently in spermatogenesis by the iron hæmatoxylin technique; their nature remains to be discovered.—Jessie A. R. Wilson : Some new facts about the structure of the cuticles in the Russian paper-coal, and their bearing on the systematic position of some fossil Lycopodiales. With a note on the absence of eligulate heterosporous Lycopodiales in the fossil-record by J. Walton : A reinvestigation of the plant-cuticles extracted from the 'paper-coal' from the Lower Carboniferous of the Moscow Basin has confirmed that the plants from which these cuticles have been derived were in possession of a ligule and must be classed amongst the ligulate lycopods. Since there is no evidence of leaf-cushions having been present on the older stems the cuticles are to be referred to the genus *Bothrodendron*. A critical consideration of the known facts about the living and extinct Lycopodiales makes it clear that there are no known examples of eligulate heterosporous types.—A. H. R. Goldie : The electric field in terrestrial magnetic storms. Magnetically disturbed days magnify a peculiarity that is present in the diurnal variation of magnetic force even on

quiet days, the magnification increasing with proximity to the auroral zone. Using mainly the data of Lerwick, Eskdalemuir, and Abinger observatories, computations are made of the position, direction, and strength of electric currents capable of producing the displacements recorded during storms. The heights found in individual cases range from less than 100 km. to above 500 km.; strengths are of the order of 500,000 amperes. Midwinter and quiet years are characterised by currents low in strength and in altitude and considerably inclined to the W.-E. direction; summer and equinoctial seasons and disturbed years by the opposite features. A chart is given of the electric current system in northern latitudes. This system is derivable from currents generated mainly in the illuminated regions of the globe.—T. M. MacRobert : Fourier integrals. This paper gives proofs, by the method of contour integration, of Fourier's double integral and of the Fourier-Bessel integral. Two new Fourier-Bessel integrals are then established, and also a Fourier-Legendre integral.

PARIS.

Academy of Sciences, April 27.—Gabriel Bertrand and V. Ciurea : Lead in the organs of animals. In a previous communication regarding the occurrence and distribution of tin in animals it was mentioned that the sulphide precipitate contained other metals besides tin. One of these is lead, and figures are now given for the amounts of lead found in various organs of the ox, horse, and sheep. Generally, the distribution of lead and tin in the organs of these animals is similar, except in the case of the brain, which, in proportion, contains more lead.—L. Cayeux : The core-in-core structure in schists. Of the two hypotheses suggested for the explanation of the core-in-core structure, crystallisation and a pressure effect, the latter is found to accord best with the results obtained by the author from his examination of the Ordovician schists of Cabrières.—Ch. Achard and M. Piettre : The proteins of the articular effusion.—Paul Helbronner : A text of the third circular letter of Pascal relating to the cycloid (Dec. 7 and 9, 1658).—S. Winogradsky : New researches on the micro-organisms of nitrification : a description of a modified silica gel culture method, in which the gel is coated with a layer of an insoluble carbonate of an alkaline earth; the production of nitrate is accompanied by solution of the carbonate and consequent formation of translucent spots which can be counted.—A. Buhl : The curvilinear propagation of invariant integrals. The case of double integrals. Corpuscular propagation.—D. Wolkowitsch : The utilisation of Culmann's ellipsoid of inertia for the representation of an empirical law by an approximate formula with several parameters.—André Fouillade : A general theorem of iteration.—Arnaud Denjoy : Co-ordinated ensembles.—Paul Montel : Pairs of polynomials the zeros of which are inter-related.—Edgar Baticle : The equilibrium curves of wires the elements of which are submitted to central forces.—P. Dupin and Teissié-Solier : The alternate vortices of Bénard-Karman and Reynolds's law of dynamical similitude.—S. Choubine : The possible anomalies of resistance at low temperatures.—L. Goldstein : The quantum mechanics of atomic shocks.—Drzewiecki : The application of Bernoulli's formula to the expansion of gases.—R. Perrin and V. Sorrel : An induction furnace with a ferromagnetic muffle and self-regulating temperature. The muffle is made of ferrocobalt (30 per cent cobalt) and is surrounded by a closed conducting envelope (nickel) not magnetic at the working temperature. With currents varying from 40 amp. to 120 amp. the temperatures varied only from 946° C. to 972° C. The range of

special steels now available permits self-regulating furnaces of this type to be made to work at any temperature between 150° C. and 1100° C.—A. Sesmat: The hypothesis of the curve of pursuit and Michelson's experiment.—A. Kastler: The structure of the Raman bands in liquids. In the passage from the gaseous to the liquid state, the Raman bands are displaced in the direction of lower frequencies.—Ch. Féry and Reynaud-Bonin: A non-sulphating accumulator with high output. A modification of the arrangement suggested in 1924, in which the access of oxygen to the negative plate is prevented. The results of comparative tests on the commercial scale with ordinary and modified accumulators are given, and show clearly the advantages possessed by the latter.—P. Brenans and K. Yeu: Symmetrical halogenated phenols.—M. G. Filipesco: The siliceous rocks of organic and chemical origin from the Oligocene of the Carpathian mountains.—Albert Michel-Lévy: The conditions of deposit of the Perrier conglomerates (Puy-de-Dôme).—C. Arambourg: The longevity, in northern Africa, of the genus *Rhinoceros* during the Quaternary period. Evidence from various sources tends to prove that the rhinoceros survived in North Africa up to a relatively recent date.—Maurice Villaret, L. Justin-Besançon, and Jean Camus: The application of perfusion methods to researches of experimental hydrology concerning vaso-motricity.—Albert Nodon: Observations on atmospheric detonations preceding solar and terrestrial disturbances.—Ernest Esclangon: Remarks on the preceding communication.—Mlle. V. Bossuyt and G. Chaudron: Contribution to the study of the structure of textile fibres.—Pr. Merklen, Mlle. E. Le Breton, and A. Adnot: The influences of the lipoids of serum on the precipitation and estimation of the serum globulins. The lipoprotein complexes of the serum exercise a hindering action on the precipitation of the globulins either by carbon dioxide or by neutral salts.—G. Tanret: The trehalose of yeast. Trehalose is found in high fermentation yeast to the extent of 2 per cent, but is not present in low fermentation yeast.—M. A. Machebœuf and R. Wahl: Biochemical researches on the serum of patients suffering from lipid nephrosis.—Marcel Labbé and F. Nepveux: The sulphydric compounds of human blood in the normal and in pathological states.

ROME.

Royal National Academy of the Lincei, Nov. 16.—Maria Pastori: General expression for isotropic tensors.—V. Hlavatý: Geodetic co-ordinates. Various considerations concerning Fermi's theorem on the geodetic co-ordinates along a curve in n -dimensional space are discussed.—G. Krall: Critical velocities of heavy masses on a binary.—N. Sakellariou: A class of central movements.—A. Masotti: The electrical condenser formed by a rectilinear wire between two parallel planes. The general case, in which the wire is not equidistant from the two planes, is discussed.—R. Brunetti and Z. Ollano: The Raman effect in pure water and in certain solutions.—V. Puntoni: Morphological differentiation of certain species of Actinomycetes confused under the name *Actinomyces bovis*. By a study of the process of formation of aerial mycelia, and of the sporification, differential characters have been established between *A. sulphureus*, *A. albus*, *A. chromogenus*, *A. albido-flavus*, and *A. carneus*.—M. Mitolo: The material metabolism of the central nervous system (3): The elimination of the cholesterol. The complete elimination of cholesterol by surviving central nervous tissue is a phenomenon which may be established experimentally and is intimately connected with the metabolic processes of the tissue.

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Official Publications Received.

BRITISH.

- Forestry Commission. Bulletin No. 12: Forest Gardens. Pp. 116+25 plates. (London: H.M. Stationery Office.) 2s. 6d. net.
- The Journal of the Royal Agricultural Society of England. Vol. 91. Pp. 8+342+clxxv+12+xvii. (London: John Murray.) 15s.
- Territory of Papua. The Species of Tobacco grown in New Guinea. By J. S. L. Gilmour. (Anthropology, Report No. 11.) Pp. v+10+7 plates. (Port Moresby: Government Printer.)
- The Journal of the Institution of Electrical Engineers. Edited by P. F. Rowell. Vol. 69, No. 413, May. Pp. 557-672+xxviii. (London: E. and F. N. Spon, Ltd.) 10s. 6d.
- Records of the Botanical Survey of India. Vol. 13, No. 1: A Census of Indian Mosses, with Analytical Keys to the Genera referred to in the Census as well as all the Genera dealt with in the second edition of Prof. Brothier's Account of the Musci Veri in Engler and Prantl's "Pflanzenfamilien". By P. Brühl. Pp. 185. (Calcutta: Government of India Central Publication Branch.) 2.6 rupees; 4s. 8d.
- Proceedings of the Society for Psychical Research. Part 119, Vol. 39, May. Pp. 419-447. (London.) 2s. 6d.
- The Scientific Proceedings of the Royal Dublin Society. Vol. 20 (N.S.), No. 5: Observations on the Photo-electric Measurement of the Radiation from Mercury Vapour Lamps and from the Sun, and on the Effects of such Radiation upon the Skin. By Dr. W. R. G. Atkins. Pp. 49-65. 1s. 6d. Vol. 20 (N.S.), No. 6: Some Experiments on the Accuracy obtainable with Gas-filled Photo-electric Cells. By Dr. W. R. G. Atkins. Pp. 67-73. 6d. Vol. 20 (N.S.), No. 7: A Method of distinguishing certain Strains of New Zealand Perennial Ryegrass (*Lolium perenne*, L.) by examination of Seedlings under Screened Ultraviolet Light. By P. A. Linehan and S. P. Mercer. Pp. 75-83+1 plate. 1s. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.)
- Board of Trade. Report of the Departmental Committee on the Patents and Designs Acts and Practice of the Patent Office. (Cmd. 3829.) Pp. 104. (London: H.M. Stationery Office.) 1s. 6d. net.
- Imperial Institute. Annual Report, 1930, by the Director, Lieut.-General Sir William Furse, to the Board of Governors. Pp. 55. (London.) 2s.
- Horticultural Education Association. Reports on some Aspects of Horticultural Education. Pp. 27. (Lewes.) 6d.
- The Linen Industry Research Association. Report of the Council, 1930. Pp. 26. (Lambeg.)
- British Honduras. Report of the Forest Trust, 1929. Pp. 15. (Belize: Conservator of Forests.)
- Empire Cotton Growing Corporation. Report of the Administrative Council of the Corporation submitted to the Tenth Annual General Meeting on May 20th, 1931. Pp. ii+94. (London.)
- Union of South Africa: Department of Mines and Industries: Geological Survey. The Geology of the Country surrounding Nkandhla, Natal: an Explanation of Sheet No. 109. By Dr. Alex. L. Du Toit. Pp. 111+3 plates. (Pretoria: Government Printing Office.) 5s. (including Map.)
- The Committee for Legalising Eugenic Sterilization. Psychiatric Indications for Sterilization. By Dr. Ernst Rüdin. (Abridged translation.) Pp. 10. (London: The Eugenic Society.) 6d.
- Report of the Director of the Royal Observatory, Hong Kong, for the Year 1930. Pp. 19. (Hong Kong.)
- Survey of India. Map Publication and Office Work, 1929 to 1930, from 1st April 1929 to 31st March 1930. Pp. vii+19+5 maps. (Calcutta.) 1 rupee; 1s. 9d.
- Proceedings of the Royal Society of Victoria. Vol. 43 (New Series), Part 2. Pp. 101-262. (Melbourne.)
- Canada: Department of Mines: Mines Branch. Investigations of Mineral Resources and the Mining Industry, 1929. (No. 719.) Pp. ii+69+5 plates. (Ottawa: F. A. Acland.)
- Proceedings of the Royal Society of Edinburgh, Session 1930-1931. Vol. 51, Part 1, No. 6: The Genus *Lyginorachis* Kidston. By Dr. R. Crookall. Pp. 27-34+3 plates. 1s. 6d. Vol. 51, Part 1, No. 7: On Charlier's New Form of the Frequency Function. By A. C. Aitken and A. Oppenheim. Pp. 35-41. 9d. Vol. 51, Part 1, No. 8: Some Note-worthy Examples of Parallel Evolution in the Molluscan Faunas of Southeastern Asia and South America. By Dr. B. Prashad. Pp. 42-53. 1s. Vol. 51, Part 1, No. 9: The Classification and Development of Carbonaceous Minerals. By Prof. Henry Briggs. Pp. 54-63. 1s. Vol. 51, Part 1, No. 10: On the Identity of *Sacculina triangularis* and *Sacculina inflata*. By Dr. H. Boschma. Pp. 64-70. 9d. Vol. 51, Part 1, No. 11: Electromagnetic Phenomena in a Uniform Gravitational Field. By Dr. D. Meksyn. Pp. 71-79. 1s. Vol. 51, Part 1, No. 12: Further Numerical Studies in Algebraic Equations and Matrices. By A. C. Aitken. Pp. 80-90. 1s. Vol. 51, Part 1, No. 13: On the Operational Solution of the Homogeneous Linear Equation of Finite Differences by Generalised Continued Fractions. By L. M. Milne-Thomson. Pp. 91-96. 6d. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.)

FOREIGN.

- University of Washington Publications in Anthropology. Vol. 4, No. 2: A Sketch of Northern Sahaptin Grammar. By Melville Jacobs. Pp. 85-291. (Seattle, Wash.: University of Washington Press.) 2 dollars.
- Journal of the Faculty of Agriculture, Hokkaido Imperial University. Vol. 30, Part 2: On the Change of Barley Protein in Storage and Germination. By Eiji Takahashi and Kihoshi Shirahama. Pp. 119-161. (Tokyo: Maruzen Co. Ltd.)
- Scientific Papers of the Institute of Physical and Chemical Research. No. 297: Propagation of Wireless-Waves. By Hantaro Nagaoka. Pp. 169-188. 30 sen. No. 298: Experimental Studies on Form and Structure of Sparks, Part 8. By Torahiko Terada, Ukutirō Nakaya and Ryūzō Yamamoto. Pp. 189-217+plates 10-22. 90 sen. Nos. 299-301: X-Ray Diffraction by Incandescent Carbon, by Morisō Hirata; Über die Bandenspektren des Zinkhydrids, von Mitsuharu Fukuda; An Apparatus for Detecting Defective Insulators, by Takeshi Nishi. Pp. 219-250+plates 23-24. 50 sen. (Tokyo: Iwanami Shoten.)