

Societies and Academies.

LONDON.

British Mycological Society, Mar. 19.—W. R. I. Cook: Influence of environment on *Ligniera Juncei*. Examination of natural habitats shows that slightly acid water with excess of iron favours growth of the fungus. Laboratory experiments show that light is a more important factor in determining infection, as when exposed to light, roots are not infected and any existing infection disappears.—Miss M. P. Hall: Zonation in cultures of *Monilia fructigena*. Cultures show concentric bands of sterile mycelium with bands of conidia, which are controlled by the medium. The initial reaction should be acid unless growth induces acidity, and the concentration should not cause staling. Conidia are produced in light but not in darkness. Zonation can also be produced by temperature variation.—K. R. Mohendra: Variation in *Sphaeropsis Malorum*. Spores from a single pycnidium of a strain of *S. Malorum* gave two kinds of cultures, black and white. The ratio between the two was not constant, the whites increasing from three to one until the blacks had almost gone. Spores from a single white pycnidium gave white individuals only: spores from single black pycnidium gave mainly black but also a few white. The percentage of white colonies could be increased by repeated culture, but one strain gave only black individuals. White strains show a considerable amount of variation in spore formation.—E. Wyllie Fenton: Seed mixtures and incidence of fungal diseases. Plots grazed and mown for hay were sown with different seed mixtures. One of the grazed plots and all the hay plots were yellow with *Uromyces Dactylidis*. Absence of a reasonable amount of clover deprived the grasses of a sufficient supply of nitrogen.—E. H. Ellis: Fungi in Japanese carvings. An account of the fungi conventionalised in Japanese netsukes.

Physical Society, Mar. 25.—E. Mallett: Acoustical experiments with a mechanical vibrator. Preliminary experiments are described with a mechanical device vibrating a piston at one end of a tube so that a sound wave is emitted at the other. The particle velocities in the sound wave are measured by a Rayleigh disc, and resonance curves are drawn. The energy in the sound wave can be calculated from the results. The experiments are directed towards obtaining a standard source of sound, and the results are encouraging.—E. T. Paris: On the stationary-wave method of measuring sound-absorption at normal incidence. The apparatus differs from that used by earlier workers in the use of (1) a small tuned hot-wire microphone for determining relative pressure-amplitudes in the sound-waves; (2) the employment of a steady valve-driven source of sound with arrangements for maintaining the strength at a constant value; (3) the screening of source and experimental pipe from disturbances due to the movements of the observer. The relation between the response of the microphone and the amplitude of the pressure-variation in the sound-wave is eliminated.—J. H. Awbery and Ezer Griffiths: A ball and tube flowmeter suitable for pressure circuits. This robust form of the Ewing ball and tube flowmeter is suitable for the metering of gases or liquids under pressure, as for example the ammonia in a refrigerating plant. The necessary pressure-tight joints for connecting the conical tube to the circuit are described, and also a device for cutting off the flow should the tube fail.

Optical Society, April 7.—C. V. Raman: Huyghens' principle and the phenomena of total reflection. The

phenomena of total reflection are considered *de novo* from the viewpoint of the principle of Huyghens, which enables us to evaluate the disturbance appearing in the second medium when light is incident on the boundary between two media and is totally reflected into the first medium. The disturbance takes the form of a superficial wave moving parallel to the boundary and involves an acceleration of the reflected wave with reference to the incident wave, which is zero at critical incidence. The intensity of the superficial wave at critical incidence is greater for the component having the magnetic vector parallel to the surface, but diminishes more rapidly with increasing incidence than for the component having the electric vector parallel to the surface. The phase angle between the two components is an acute angle, in agreement with the classical treatment based on the Fresnel formulae, but in disagreement with the conclusions of Lord Kelvin and Schuster.—H. W. Lee: The Hartmann formula for the dispersion of glass. The Hartmann formula is accurate within the limits of the Pulfrich refractometer. Optical glasses can be divided into three well-marked classes by their Hartmann constants, with linear relations between the constants in each class.

CAMBRIDGE.

Philosophical Society, Mar. 14.—G. I. Taylor: An experiment on the stability of superposed streams of fluid. Experiment to illustrate the stabilising effect of a density distribution similar to that which occurs in the air near the ground on a cold clear night. A stream of water flows over a coloured solution of salt. Instability sets in when the upper stream attains a certain velocity.—C. D. Ellis and W. A. Wooster: The absolute intensities of the γ -rays of radium-B and radium-C. The measured intensities of the groups in the β -ray spectra of these bodies, due to the internal conversion of the γ -rays in the atom that emits them, are used. The magnitude and rate of variation with frequency of the internal conversion coefficient is determined by considering the total energy and total number of the emitted γ -rays, both of which have been measured. To account for the measurements the internal conversion coefficient must vary approximately as the inverse 2.65th power of the frequency and have a value of 0.12 at a frequency corresponding to 3.54×10^5 volts. This result strengthens the evidence for physical reality of internal conversion. Using this co-efficient the intensities of the γ -rays are obtained directly from the intensities of the β -ray lines. One striking result is the amount of energy concentrated in the high frequencies.—P. M. S. Blackett: The limits of classical scattering. The condition given by de Broglie for the validity of geometrical optics is applied to the waves associated with a material particle; in particular to find the limits of classical scattering of α -particles by nuclei.—J. A. Gaunt: The stopping power of hydrogen atoms for α -particles according to the new mechanics. The classical theory of the stopping of α -particles agrees well with experiment, when account is taken of the transfer of energy to atoms at a considerable distance from the track. The limitations imposed by the stationary states of the old quantum theory seriously diminish the effect of the less close encounters. The new mechanics avoids this starvation of the more distant atoms. The deflexion of the α -particle is neglected. The excitation and ionisation of atoms at distances from the track, which are large in comparison with atomic dimensions, are calculated approximately by perturbation theory. The transfer of energy is nearly the same as on the classical theory.

DUBLIN.

Royal Dublin Society, Mar. 22.—L. B. Smyth: The index fossil of the Cleistopora zone. New material from Hook Head, Co. Wexford, together with a re-examination of the S.-W. Province specimens, shows that this is not a Cleistopora. It has a compact, fibrous cenenchyma, and a system of ring canals, and is therefore placed in *Vaughania* Garwood. M'Coy's *Astreopora antiqua* is considered, and the specific name rejected. The name *Vaughania vetus* is proposed. A portion of its ontogeny is worked out.—Dorothy Beckett: The influence of separation and pasteurisation on the size and distribution of fat globules in milk and cream. By direct measurement and counting on photographs at magnifications of 250 and 500 of samples of milk, in which the average diameter of globule was 3.7μ , and those larger than 6μ contained 9 per cent. of the fat, it was found that the distribution of the smaller globules was unchanged by the creamery process, but in the final cream 36 per cent. of fat was contained in globules ranging from 6μ to 24μ .—H. H. Poole: A convenient method of charging electroscopes. A well-insulated variable air condenser of capacity about $0.001\mu F.$, as used in radio reception, is set to its maximum capacity and charged from a battery or D.C. mains. It is then connected to the gold leaf, and by reducing the capacity the potential is raised to any desired voltage within the limit imposed by internal sparking. Initial voltages of either 80 or 220 were found to work well with the electroscope used, which, having a relatively heavy gold leaf, requires a large charging potential. Lower initial potentials could probably be used with many electroscopes, especially if a 'square law' condenser were used.

Royal Irish Academy, April 11.—J. L. Synge: Mathematical investigation of the thrust experienced by a cylinder of any section in a current of inviscid liquid, the motion being periodic and a regular train of vortices being formed. The formula obtained differs from that of Kármán, which only contains the first term. (2) Time measurement in an isotropic space-frame. The transitivity of simultaneity (if *A* is simultaneous to *B* and *B* is simultaneous to *C*, then *A* is simultaneous to *C*) is here proved on the simple assumption that the space-frame is isotropic with respect to light propagation.

PARIS.

Academy of Sciences, Mar. 21.—C. Matignon and Mlle. G. Marchal. The reducing properties of beryllium. The isolation of barium, magnesium, potassium, and aluminium. At a temperature of 1200° – 1300° C., *in vacuo*, beryllium gives no appreciable amount of vapour, and this, with its high heat of combustion in oxygen, renders this metal a valuable reducing agent. Details are given of the reduction of baryta to barium, magnesia to magnesium, potash to potassium, and alumina to aluminium. Lime is converted under the same conditions into calcium suboxide.—Pierre Termier: The tectonic problem of Vanoise and Mont-Pourri (Savoy Alps).—André Blondel: Rotating radiophares. A method for supplementing or replacing lighthouses by radio signal stations.—Léon Guillet and Albert Roux: The gases contained in brass, aluminium, and its alloys. Brass gives from 0.4 to 0.55 of its volume of gases (carbon dioxide and monoxide, hydrogen and nitrogen). Aluminium gave 0.14 of its volume of gas (carbon dioxide and monoxide and hydrogen).—Beniamino Segre: The cubic indicator of the linear projective

element of a surface.—Pierre Humbert: Differential equations which generalise Lamé's equation.—Octave Onicescu: The representation of a function by an ensemble of functions and the integral equations which result.—W. Margoulis: New experimental researches on the helices of helicopters.—P. Dejean: Hardening by traction, hardening by compression.—R. Wavre: The stratification of the planets in surfaces of equal density.—H. André: The electrical properties of some metallic compounds. Silver sulphide is capable of absorbing a certain quantity of sulphur at a low temperature. This mixture has an electrical conductivity which diminishes with rise of temperature, and is susceptible of numerous industrial applications.—Vautot: The constants of a passive quadripole.—Léon and Eugène Bloch: The fluorescence of chlorine and bromine.—E. Doumer: The electrolysis of aqueous solutions of pure oxalic acid. A mixture of carbon dioxide and oxygen is evolved at the anode, the proportion varying with the current density.—H. Colin and Mlle. A. Chaudin: Mutarotation and the alkalinity of the medium. The action of soda and of ammonia on the change in rotation of glucose are parallel down to a concentration of $N/5500$.—W. Ipatief and Orloff: The hydrogenation of dibenzalacetone and of dibenzylacetone.—Roger Lyon, G. Fron, and M. Fournier: The characterisation of old wood as compared with green wood. Old stored wood has a different composition from new wood of the same species. This difference can be detected by microscopical observation or by measuring the hydrogen ion concentration of the water soluble extract.—Const. A. Ktéas: Discovery of the lower marine Pliocene in the island of Nikaria (Egean Sea).—P. Martens: Vital observation of karyokinesis.—Henri Coupin: The influence of calcium on *Penicillium glaucum*. It is inexact to say that calcium is useless to *P. glaucum*, since its presence is necessary to the good formation of the conidia.—E. Miège: Sudden appearance of a barley with smooth beard.—Robert Lami: The liberation, following traumatism, of fungoid symbiosis of the young plants of *Cattleyæ*.—J. Dumont: The weight ratios of the reacting bodies in colloidal flocculations.—D. Bach: The nitrogen nutrition in the *Mucorinæ*. The assimilation of ammoniacal salts.—L. Ambard and F. Schmid: The excitability of the nerve centres as a function of their charge of hydrochloric acid.—Ch. Achard, Léon Binet, and A. Leblanc: Death in a superoxygenated atmosphere. An excess of oxygen over the normal atmospheric proportion causes death in animals. It is concluded that inhalations of pure oxygen used in therapeutics should not be too prolonged.—Charles Richet: Observations on the preceding communication. The author's observations made in 1904 confirm the conclusions given in the preceding paper. The composition of the atmosphere is an optimum for living beings and any change in either direction is disadvantageous.—Raymond-Hamet: The antagonism of hydrastinine and adrenaline.—J. Chevalier and Ripert: The pharmacodynamic action and physiological titration of preparations of flowers of pyrethrum.—E. Grynfeldt and H. J. Guibert: The genesis of the fibroid web of cicatricial tissue in experimental suppurations of the subcutaneous conjunctive.—Alfred Maubert: The influence of thorium-X on laccase. In doses between 1 and 5 micrograms, thorium-X causes an activation of laccase: in quantities of more than 10 micrograms, complete inactivation of the ferment is produced.—G. Levaditi: The sterilising action of bismuth in syphilis.—E. Ducloux and Mlle. G. Cordier: A method of immunisation by slow resorption of virulent antigens.

VIENNA.

Academy of Sciences, Feb. 24.—J. Hertzka: Relations between the fundamental chemical numbers.—D. Balarew: The equilibria between the hydrates of calcium sulphate.—T. Radakovic: The interpolation of functions of several variables.—F. Emich: The observation of 'streaks' (*Schlieren*) in chemical experiments. Toepler showed that the observation of flaws was one of the most sensitive methods in optics. This method is applied to testing with the microscope the purity and identity of small quantities of fluid distillates.—F. Trauth: Geology of the northern Radstädter Tauern and of their foot-hills.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, Vol. 13, No. 1, January).—George B. Kistiakowsky: The activation of gases by adsorption. Measurements were made in a glass vacuum calorimeter of the heats of adsorption of hydrogen on a copper catalyst, before and after poisoning by oxygen, and of carbon monoxide on the active catalyst. Some of the adsorbed gas appears to be activated by the fields of force surrounding unsaturated surface atoms; oxygen oxidises preferentially the most unsaturated surface atoms.—D. H. Kabakjian: Luminescence due to radioactivity. Three types of such luminescence exist. The first, shown by synthetic zinc sulphide under the action of α -rays after an equilibrium condition is reached, may be due to the destruction and re-formation of active centres in the substance. The second is shown by pure radium or radium bromide; the substance shows luminescence after heating. Certain stable molecular configurations are formed at high temperature and persist on cooling until attacked by an α -particle. The third type, thermo-luminescence, is shown by fluorite crystal. Energy is furnished by α -, β - or γ -rays and set free by molecular agitation in the crystal. The lower the temperature the more energy is absorbed, and heating the crystal afterwards intensifies the luminescence.—J. C. Slater: Radiation and absorption on Schrödinger's theory.—Carl R. Doering: The death rate from diphtheria in Massachusetts for 51 years, 1875–1925. In 1875 the death rate was nearly 200 per 100,000 of population; since then there has been a steady rate of decline of about 5.5 per cent. per annum. Figures for New York show a similar decline. The highest rates of decline (1892–1908) occur when the use of antitoxin and bacteriological diagnosis were spreading, but the figures are only doubtfully significant statistically.—Edward L. Thorndike: A fundamental theorem in modifiability. If a certain situation promotes one of a number of responses, the frequency of the use of one 'connexion' causing a certain response does not increase its strength at the expense of other 'connexions' causing different responses. Facilitation and inhibition among the 'connexions' from a situation cannot be explained by 'a drainage theory' towards the stronger 'connexion'.—N. D. M. Hirsch: A summary of some of the results from an experimental study of the East Kentucky mountaineers.—George H. Shull: Crossing over in the third linkage group of *Oenothera*. The gene for double flowers (*mut. supplena*) in *O. Lamarckiana* is closely linked with that for old-gold colour (*mut. vetaurea*); the crossing-over observed is considered to consist in the exchange of factors between the two chromosomes of the same pair.—G. A. Miller: Groups generated by two operators of order three whose product is of order three.

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Official Publications Received.

BRITISH.

- Papers and Proceedings of the Royal Society of Tasmania for the Year 1926. Pp. iv+196+11 plates. (Hobart: Tasmanian Museum.) 10s.
- Union of South Africa: Department of Agriculture. Science Bulletin No. 52: Cost of Production of Maize; Report on the Investigation for the Season 1923–24. By D. W. McKellar. Pp. 28, 3d. Science Bulletin No. 58: The Manufacture of Loaf and Blended Varieties of Cheese. By Prof. H. B. Davel and D. J. Retief. Pp. 20, 3d. (Pretoria: Government Printing and Stationery Office.)
- Aeronautical Research Committee: Reports and Memoranda. No. 1060 (Ae. 243): Flying Positions of Control Surfaces of Bristol Fighter. By Capt. G. T. R. Hill. (A.2.b. Stability, Full Scale Expts., 40.—T. 2265.) Pp. 6+6 plates. 6d. net. No. 1068 (Ae. 250): The Full Scale Determination of the Lateral Resistance Derivatives of a Bristol Fighter Aeroplane. Part ii: The Determination of the Rate of Turn Derivatives. By H. M. Garner. (A.2.b. Stability, Full Scale Expts., 43.—T. 2340.) Pp. 4, 3d. net. (London: H.M. Stationery Office.)
- Empire Cotton Growing Corporation. Report on the Characteristics of Several Crops that may be suitable as Rotation Crops with Cotton in East Africa and the Possibilities of Marketing Them in this Country. By H. C. Sampson. Pp. 23. (London: Empire Cotton Growing Corporation.) 1s.
- The Journal of the Institution of Electrical Engineers. Edited by P. F. Rowell. Vol. 65, No. 364, April. Pp. 889+468+xxx. (London: E. and F. N. Spon, Ltd.) 10s. 6d.
- The Carnegie United Kingdom Trust. Thirteenth Annual Report (for the Year ending 31st December 1926) submitted by the Executive Committee to the Trustees on Friday, 11th March 1927. Pp. ii+110. (Dunfermline.)
- The South African Journal of Science. Vol. 23: Being the Report of the Twenty-fourth Annual Meeting of the South African Association for the Advancement of Science, Pretoria, 1926, July 5–10. Pp. xiv+1150. (Johannesburg.) 35s. net.
- Board of Education. Vacation Courses in England and Wales, 1927. Pp. 21. (London: H.M. Stationery Office.) 6d. net.
- Journal of the Society of Glass Technology. Vol. 11, No. 41, March. Pp. x+11+97+124+xxxii. (Sheffield: The University.) 10s. 6d.
- Royal Botanic Gardens, Kew. Bulletin of Miscellaneous Information, 1926. Pp. iv+496+90+11 plates. (London: H.M. Stationery Office.) 15s. net.
- Aeronautical Research Committee: Reports and Memoranda. No. 1057: On the Calculation of Stresses in the Hulls of Rigid Airships. By R. V. Southwell. (R. 33 Memorial Prize Essay, 1926.) Pp. 49. (London: H.M. Stationery Office.) 1s. 9d.
- Leeds University: Department of Pathology and Bacteriology. Annual Report, 1926, by Prof. Matthew J. Stewart and Prof. J. W. McLeod. Pp. 12. (Leeds.)

FOREIGN.

- Proceedings of the United States National Museum. Vol. 69, Art. 16: A Revision of the Parasitic Wasps of the Subfamily Braconinae occurring in America north of Mexico. By C. F. W. Muesebeck. (No. 2842.) Pp. 73+2 plates. Vol. 70, Art. 13: Contribution to the Anatomy of the Chinese Finless Porpoise, *Neomeris phocaenoides*. By A. Brazier Howell. (No. 2892.) Pp. 43+1 plate. Vol. 70, Art. 16: Foraminifera of the Genus *Ehrenbergina* and its Species. By Joseph A. Cushman. (No. 2865.) Pp. 8+2 plates. Vol. 70, Art. 20: The Occurrence and Properties of Chlorophoenicite, a new Arsenate from Franklin, New Jersey. By William F. Foshag, Harry M. Berman and Robert B. Gage. (No. 2669.) Pp. 6. Vol. 71, Art. 2: The Beetles of the Family Cleridae collected on the Mulford Biological Exploration of the Amazon Basin 1921–1922. By Edward A. Chaptin. (No. 2674.) Pp. 10. (Washington, D.C.: Government Printing Office.)
- Publications of the Kapteyn Astronomical Laboratory at Groningen. Edited by Prof. Dr. P. J. van Rhijn. No. 41: The Proper Motion and the Distance of the Praesepe Cluster. By Dr. W. J. Klein Wassink. Pp. 43. (Groningen: Hoitsema Bros.)
- Journal of the College of Agriculture, Hokkaido Imperial University, Sapporo, Japan. Vol. 18, Part 4: The Ticks Parasitic on Cattle and Horses in Hokkaido, Japan. By Kisejiro Ogura and Koji Takada. Pp. 199+206+ plates 11–15. (Sapporo.)
- Contributions to Embryology. Vol. 18, Nos. 90–97. No. 90: Cultivation of Embryonic Heart Muscle, by Warren H. Lewis; No. 91: Correlation of External Genitalia and Sex-Glands in the Human Embryo, by Karl M. Wilson; No. 92: The "Miller" Ovum—the Youngest Normal Human Embryo thus far Known, by George L. Streeter; No. 93: Detailed Form of the Wolffian Body in Human Embryos of the First Eight Weeks, by Jujiro Shikunami; No. 94: Lens Ectoderm and Optic Vesicles in Allantois Grafts, by Vera Danchakoff; No. 95: Menstrual Records and Vaginal Smears in a Selected Group of Normal Women, by Jessie L. King; No. 96: Transformation of Mononuclear Blood-Cells into Macrophages, Epithelioid Cells and Giant Cells in Hanging-Drop Blood-Cultures from Lower Vertebrates; by Margaret R. Lewis and Warren H. Lewis; No. 97: Origin of Thrombocytes and of the Different Types of Blood-Cells as seen in the Living Chick Blastoderm, by S. Sugiyama. (Publication No. 363.) Pp. iii+147+39 plates. (Washington, D.C.: Carnegie Institution.) 5.75 dollars.
- Anatomical Texts of the Earlier Middle Ages. A Study in the Transmission of Culture. By Prof. George W. Corner. With a revised Latin Text of *Anatomia Cophonis* and Translations of Four Texts. (Publication No. 364.) Pp. 112+3 plates. (Washington, D.C.: Carnegie Institution.)
- Environment of Tetrapod Life in the late Paleozoic of Regions other than North America. By E. C. Casa. (Publication No. 375.) Pp. iii+211. (Washington, D.C.: Carnegie Institution.) 2.50 dollars.
- Bulletin of the Geological Institution of the University of Upsala. Founded by H. J. Sjögren. Vol. 20. Pp. 286+6 plates. (Upsala: Almqvist & Wiksells Boktryckeri A.-B.)