

figure; since damp grain suffers loss by heating in stacks or bins, or it may go mouldy. The water-content depends very largely on the weather at harvest. In the wet years of 1922 and 1924, for example, the early-threshed British wheat carried 18-20 per cent of water, a degree of moisture which renders the grain liable to the above losses and is rather too high for milling purposes. The harvest of 1933 will have been secured under extraordinarily good conditions. We may expect the moisture content of the wheat grain of the early deliveries to approach that obtained in 1921, when the early threshings were sending in grain containing only about 13 per cent of water. This is a degree of dryness approaching that of some of the United States wheat, but still much moister than Australian or Indian samples. Such wheat stores without loss and needs the addition of a certain amount of water to bring it up to the optimum moisture-content for grinding.

## Societies and Academies

### LONDON

Geological Society, June 28. G. DELÉPINE: Upper Devonian goniatites from Mount Pierre, Kimberley District, Western Australia. The dominant type is a *Sporadoceras* belonging to the group of *S. contiguum* (Münster). There are also other new species—a *Pseudoclymenia* near *Ps. applanata*, Schindewolf, a *Dimeroceras* near *Goniatites mammiliferus*, Sandberger, and a *Tornoceras*. The presence of such species relegates the red goniatite limestones of the Devonian rocks of Mount Pierre to the Middle Famennian (zone 3 of Wedekind) horizon. W. B. R. KING and W. H. WILCOCKSON: The Lower Palaeozoic rocks of Austwick and Ribblesdale. The Lower Palaeozoic rocks outcrop in the valleys beneath the almost horizontal Carboniferous Limestone in the neighbourhood of the Craven faults. They are arranged in a synclorium, pitching in a direction about 70° east of south and striking more or less parallel to the North Craven fault, thus making an angle of about 25° with the strike of the Ingletonian rocks of Chapel le Dale. It is maintained that the Ingletonian rocks are faulted against the Lower Palaeozoic strata. The oldest fossiliferous horizon appears to be referable to the higher beds of the Caradocian series.

### DUBLIN

Royal Irish Academy, June 12. J. J. HARTLEY: The geology of north-east Tyrone and the adjacent parts of Co. Londonderry. The relation between (1) the Ordovician rocks of Pomeroy, (2) the Igneous complex of north-east Tyrone, and (3) the Dalradian schists which are in contact with the complex, are discussed. It is considered that the above order gives the correct succession in time, series (1) being the newest, while two considerable time-intervals separate the three groups from each other. J. A. ADAMSON and G. F. WILSON: The petrography of the Lower Carboniferous rocks of north-east Ireland. Detailed examination of these rocks suggests that they were derived from a land of acid igneous and metamorphic rocks lying to the north with important contributions from the igneous complex of Co. Tyrone, the Dalradian rocks of Donegal and the inlier of north-east Antrim and the Ordovician rocks of Co. Down.

### PARIS

Academy of Sciences, July 10 (*C.R.*, 197, pp. 101-204). ARMAND DE GRAMONT: The different vibratory regimes of a quartz parallelepiped. G. FRIEDEL: A new type of macles. A discussion of the Zinnwald macle of quartz discovered by Drugman and the macle of alum recently described by M. Schaskolsky and A. Schubnikow. H. DEVAUX: The wetting of insoluble substances and the remarkable powers of attraction existing at the interface of non-miscible liquids. Various elements, about twenty in number, in a fine state of division are not perfectly moistened by water. Many insoluble compounds behave similarly. Q. BORŮVKA: An extension of the formulæ of Frenet in complex space and their real image. HANS LEWY: A new formula in linear elliptic equations and an application to Cauchy's problem. RAPHAËL SALEM: A property of Fourier's series of functions with summable square. JEAN LERAY and JULES SCHAUDER: Topology and functional equations. CH. FOUSIANIS: Some properties of increasing functions. JEAN LOUIS DESTOUCHES: The principles of a general mechanics. Y. ROCARD: Hydrodynamics and the kinetic theory of gases: the theory of surface tension. CAÏUS JACOB: Some problems concerning the flow of perfectly compressible fluids. EMILE BELOT: The age of the universe and the age of the earth. J. COMAS SOLA: The observation of a shooting star. HENRI MARCELET: A capillarity phenomenon observed with marine animal oils. F. PRUNIER: A new expression of the radiant vector of Poynting. LÉON and EUGÈNE BLOCH: Extension of the spark spectrum of copper between 400 and 240 Å. R. SIKSNA: Fluorescence with atomic lines of antimony vapour. PROT. and MLLÉ. N. GOLDOVSKY: New methods for the examination of metals from the point of view of their heterogeneity and their resistance to corrosion. The alloy is placed in a solution of an electrolyte with an indicator with a pH range between 4 and 12. This method has been successfully applied to the control of thermal treatment, riveting and welds. An alternative method uses very thin test pieces (0.1 mm.) and is specially useful in detecting liability to pitting. G. KRAVTZOFF: The electrolysis of copper salts of organic acids. The presence of cuprous oxides in the copper deposited has been proved. PRIVAULT: Study of the *M* level of magnetised iron. WENLI YEH: The radioactivity of some of the rare earth elements. Contrary to the results of Libby-Latimer, lanthanum was found to be inactive. Erbium shows a strong activity, but the purity of the preparation has not yet been proved. Neodymium shows a weak radioactivity. M. VALADARES: The spectrography by crystal diffraction, of the  $\gamma$ - and X-rays of the radium family. PIERRE GIRARD and P. ABADIE: The composition of the electric moments in the polyalcohols. The moments of associated dipoles. R. ÉTIENNE: Displacements of equilibrium by variation of mass. PICON: The chemical properties of the zirconium sulphides. The three zirconium sulphides described in an earlier paper have been treated with various chemical reagents and the results are given. Generally the activity of the reagents on these sulphides diminishes as the proportion of sulphur in the compound is smaller. The physical and chemical properties of the three sulphides are so distinct that they may be regarded as three distinct compounds. PENG CHUNG-MING: The action of boric acid on the chlorides and

nitrate of the alkaline earths. This reaction gives tetraborates of the type  $4B_2O_3.MO$ . MME. GUAISNET-PILAUD: The stereo-isomeric phenylmethyl ethyl and phenylmethylpropyl betaines. G. DUPONT and E. URION: The true nature of the supposed dihydro-pyrocatechol. Mlle. DENISE SONTAG: The direct halogenation of the arylaliphatic alcohols. CHARLES DUFRAISSE, ROGER VIEILLEFOSSE and JEAN LE BRAZ: Some applications of the antioxygen effect to fighting fire. The extinction of flames. Study of the proportions of various halogen compounds necessary for extinguishing a coal gas flame burning under defined conditions. L. GLANGEAUD and BOUTIRON: The chemical and mineralogical modifications of the Miocene marls from the Génie spring (Algeria) in contact with a granite laccolite. V. AGAFONOFF and ST. PAVLOVITCH: The so-called thermal analysis applied to the study of the soil. F. DAGUIN and J. LACOSTE: The extension of the Cretaceous in the southern Prerif and other new observations concerning these regions. JACQUES BONDON and LOUIS NELNER: The Cambrian series of the plateaux of Draa (South Morocco) and the presence of the Georgian in this series. L. BAUD: The clay-limestone conglomerate in the region of Kayes and Bafoulabé (Western Sudan) and its stratigraphical position. ED. SAURIN: The anthracolithic and the 'red earth' of the neighbourhood of Yunnanfou (Yunnan). M. and MME. H. LABROUSTE: The analysis of Rayleigh waves. J. GAUZIT: The study of atmospheric ozone by a rapid method of visual photometry. The method described has been used at Montpellier for six months and results are given. The values are higher than those obtained for the same months at the same place by Duninowski. PAUL CORSIN: The discovery of a flora in the lower Devonian of the Pas-de-Calais. A. GUILLIERMOND: The structure of the Cyanophyceæ. PH. JOYET-LAVERGNE: Contribution to the study of the oxidising power of the chondriome. E. MIÈGE: The reappearance, by spontaneous hybridation, of a species of *Hordeum* (*H. intermedium*). E. BLANCHARD and J. CHAUSSIN: Wheat, a plant with silica. Wheat is richer in silica than other cultivated plants. The silica content is fairly constant and is of the same order as the amount of phosphoric acid. MARC DE LARAMBERGUE: The development of the genital apparatus in the two forms (*A* and *B*) of *Bullimus contortus*. PAUL CHABANAUD: The atrophy of the nadiral nasal organ in certain heterosome fishes. A. PACAUD: The action of lecithine and of magnesium chloride on the life and reproduction of *Cladoceros*. O. BINDER: The absence of  $\alpha$ -cellulose in the tubercle bacillus. The author concludes that  $\alpha$ -cellulose is not present in the tubercle bacillus. LUCIEN SEMICHON and MICHEL FLANZY: The organic acids of grape juice. P. NOËL BERNARD and JEAN GUILLERM: The transmissible lysis of the cholera vibriion. G. MOURIQUAND and Mlle. J. SCHËN: The protective influence of gestation on vitamin C deficiency.

## ROME

Royal National Academy of the Lincei, March 19. FRANCESCO SEVERI: The theory of the series of equivalence on an algebraic surface: invariance of the fundamental conception (1). E. ALMANZI: Deformations of elastic strips (5). S. AMANTE: The reduction to canonical form of a special class of matrices (2). R. L. GOMES: Simultaneous canonical transformation of several matrices neither Hermitian

nor unitary. MARIA PASTORI: The general expression of isotropic tensors. A. ROSENBLATT: The equations to the partial non-linear derivatives of the second order, of elliptic type. In a recent study of the equation to the partial derivatives,  $\Delta u = F(x, y, u, p, q)$ , Lipschitz's condition was replaced by a more general condition. Further simplification of this condition is now considered. N. SPAMPINATO: Compound algebras endowed with moduli by means of their normal semi-algebra. T. BOGGIO: The equations of the dynamics of systems. Movement in a linked system, composed of  $\nu$  points and mobile under the action of given applied forces, is determined by Lagrange's dynamic equations, from which Hamilton's canonical equations, etc., are derived. By the introduction of a euclidean space  $S_{3\nu}$  of  $3\nu$  dimensions, a point  $Q$  may be defined as the image of the system. The motion of  $Q$  is defined by an equation of the same form as that governing the motion of a point on a line or surface of ordinary space. From such a very simple equation, Lagrange's dynamic equations, etc., may be rapidly deduced. B. FINZI: Movements of surfaces, lines, and points associated with groups of waves. E. FROLA: The dynamics of free transversal vibrations of beams, and the dynamics of the points representing the elastic lines in spaces of infinite dimensions. A. CASTIGLIONI: Quinoline and lignin. Tests made with a large number of different woods show that lignin may be detected by means of either a 1 per cent solution of quinoline in alcohol, followed by concentrated hydrochloric acid, or an aqueous 10 per cent solution of quinoline hydrochloride or sulphate, an intense wine-red colour being obtained. Contrary to statements in the literature,  $\gamma$ -methylquinoline gives only a faint pink coloration. A. FERRARI and C. COLLA: The importance of the crystalline form in the formation of solid solutions (10): thermal analysis of the anhydrous systems,  $CoCl_2-PbCl_2$  and  $FeCl_2-PbCl_2$ . These systems form eutectics at  $424^\circ$  and  $421^\circ$ , corresponding with 76.5 and 71.5 per cent respectively of  $PbCl_2$ . The curves representing the primary crystallisation approximate closely to branches of hyperbolæ. F. P. MAZZA and G. STOLFI: The dehydrogenase of the higher fatty acids contained in the liver. The existence in liver extracts of an enzyme capable of mobilising the hydrogen of higher fatty acids has been definitely proved, the point of attack of this dehydrogenase being the ionised carboxyl of the acid. The enzyme differs from succino-dehydrogenase and is not found in the muscles, kidneys, or pancreas. C. ARTOM: Abortive ovogenesis and aberrant spermatogenesis in prosobranch molluscs of the genus *Valvata*. V. ZAGAMI and V. FAMIANI: The nutritive value of the proteins of leguminous seeds. The protein constituents of beans, peas, and lentils act as efficiently as casein in correcting the protein deficiency of cereals in the diet of rats.

## WASHINGTON, D.C.

National Academy of Sciences, (*Proc.*, 19, 277-348, March 15). FREEMAN DEVOLD MILLER: The space motions of stars in the Orion and Scorpio-Centaurus clusters. An investigation of stars of classes  $B0-B9$  leads to the view that *B* stars in each region form a single homogeneous cluster. No evidence is obtained of two star streams in the space motions; their apparent existence is due to the presence of the two large moving clusters. WILLARD J. FISHER: The penetration of iron meteorites into the ground.

The work of Piobert, Morin and Didion (1839-40) on the penetration of targets by round shot, applied to the case of small meteors the ultimate velocity of which is little affected by their extra-terrestrial velocity, leads to an equation for penetration which accords well with the rough data available. Penetration even of large meteorites is small but unless they fall among rocky uplands, they are not likely to be found by the prospector. CHARLES A. KRAUS and FRANK E. TOONDER: (1) Trimethyl gallium, trimethyl gallium etherate and trimethyl gallium ammine. Preparation and properties of these compounds. The starting point is the reaction of gallium trichloride with dimethyl zinc. (2) Chlorination products of trimethyl gallium. L. O. BROCKWAY: The three-electron bond in chlorine dioxide. Electron diffraction photographs lead to the probable value of  $1.58 \pm 0.03$  Å. for the chlorine-oxygen separation. This is in good accord with the value predicted if the molecule contains a three-electron bond. No definite conclusion regarding the bond angle is obtained. WILLIAM DRAPER HARKINS: The neutron, atom building and a nuclear exclusion principle. (See NATURE, Jan. 7, 1933, p. 23.) A full statement is given in particular of the view put forward in the last paragraph of that communication. CARL V. WELLER: Biological significance of protective mechanisms inherent in the myocardium. The pattern of the myocardial arterial blood system increases in complexity with age; in cases of congenital syphilis and in human trichinosis, the myocardium is relatively little affected; these are examples of some protective mechanism of a vital organ which is of considerable biological significance. LEONARD G. WORLEY: (1) Metachronism in ciliated epithelium. Metachronism—ability to beat in sequence—involves two activities, one of which relates the beating of cilia of different cells, while the other concerns the beating of cilia of an individual cell. (2) The intracellular fibre systems of *Paramecium*. By microdissection, the ectoplasm has been stripped off specimens and examined fresh. On the dorsal side longitudinal fibres occur; in the vicinity of the cytostome, there are cross fibres in addition to the longitudinal ones. No evidence was obtained of the 'fibres of Rees'. F. A. BROWN, JR.: The controlling mechanism of chromatophores in *Palæmonetes*. The common prawn has four pigments, red and yellow (in one type of chromatophore), white and blue. Two substances, not hormones, carried in the blood seem to be necessary, one to contract the red chromatophores, the other the white ones. The blue pigment is not discussed. J. M. OBTORNE: Degeneration of melanophores in *Fundulus*. Melanophores of *Fundulus* in white surroundings contract and degenerate, slowly and progressively, the pigment granules aggregating at the edges of the scales and being lost later at the surface of the body. This is not due to inanition. G. A. MILLER: Groups in which either all the operators or all the subgroups of the same order are conjugate. DINSMORE ALTER: An extremely simple method of periodogram analysis. The method is stated to be as powerful as the correlation periodogram and to take one third the time; all calculations are made on an ordinary adding machine. GEORGE D. BIRKHOFF: Some remarks concerning Schrödinger's wave equation. It is claimed that by the method used, the position of the wave equation is fixed mathematically. GUSTAV A. HEDLUND: On the measure of the non-special geodesics on a surface of constant negative curva-

ture. *Symposium on climatic cycles*. JOHN C. MERRIAM: Introductory remarks. A. E. DOUGLASS: Evidences of cycles in tree ring records. C. G. ABBOT and Mrs. A. M. BOND: Periodicity in solar variation. W. S. ADAMS and S. B. NICHOLSON: The nature of the solar cycle. ISALAH BOWMAN: Correlation of sedimentary and climatic records. (See NATURE, Aug. 5, p. 193.)

## Official Publications Received

### GREAT BRITAIN AND IRELAND

Department of Scientific and Industrial Research. Report of the Food Investigation Board for the Year 1932. Pp. x+304+10 plates. (London: H.M. Stationery Office, 1933.) 5s. net.  
Air Ministry: Aeronautical Research Committee: Reports and Memoranda. No. 1451 (T.3126): Wind Tunnel Interference on Streamline Bodies. By C. N. H. Lock and F. C. Johansen. Pp. 21+8 plates. 1s. 3d. net. No. 1505 (T.3316): Statistical Method of Investigating Relations between Elastic Stiffnesses of Acroplane Wings and Wing-Aileron Flutter. By H. Roxbee Cox. Pp. 30+9 plates. 1s. 6d. net. No. 1513 (I.C.E. 896, 897, 897a): Heats of Formation of Nitrous Oxide and Carbon Dioxide. Part 1, by J. H. Awbery and Dr. Ezer Griffiths; Part 2, by R. W. Fenning and F. T. Cotton. Pp. 43+12 plates. 2s. 6d. net. No. 1533 (Strut. 93, 116): Loads in a Fuselage under Combined Bending and Torsion. By G. W. Mullett. Pp. 30+2 plates. 1s. 6d. net. (London: H.M. Stationery Office.)  
Clifton College Scientific Society. Report for the Years 1930-1933. Pp. 16. (Bristol.)  
Department of Scientific and Industrial Research. Building Science Abstracts. Vol. 6 (New Series), No. 6, June. Abstracts Nos. 963-1109. Pp. 185-210. (London: H.M. Stationery Office.) 1s. 6d. net.  
Scottish Society for Research in Plant Breeding. Report by the Director of Research to the Annual General Meeting, 13th July 1933. Pp. 32. (Edinburgh.)

### OTHER COUNTRIES

U.S. Department of Agriculture. Technical Bulletin No. 365: Biology of *Brachymeria Fonscolombi* (Dufour), a Hymenopterous Parasite of Blowfly Larvae. By Raiford A. Roberts. Pp. 22. (Washington, D.C.: Government Printing Office.) 5 cents.  
Proceedings of the Imperial Academy. Vol. 9, No. 6, June. Pp. xvii-xviii+227-283. (Tokyo.)  
Advisory Department of the Imperial College of Tropical Agriculture. Report on the Agricultural Department, St. Vincent, for the Year 1932. Pp. v+39. (Kingstown: Government Printing Office.) 6d.  
Proceedings of the United States National Museum. Vol. 82, Art. 18: Synopsis of the Calanoid Crustaceans, exclusive of the Diaptomidae, found in Fresh and Brackish Waters, chiefly of North America. By C. Dwight Marsh. (No. 2959.) Pp. 58+24 plates. (Washington, D.C.: Government Printing Office.)  
Journal of the Faculty of Agriculture, Hokkaido Imperial University. Vol. 32, Part 4: Untersuchungen über die Hefekatalase. Von Mosuke Matsuyama. Pp. 109-199. (Tokyo: Maruzen Co., Ltd.)  
Proceedings of the Rhodesia Scientific Association. Vol. 32, 1932 33. Pp. 118+8 plates. (Salisbury.) 5s.  
Borough of Durban: Durban Museum and Art Gallery. Annual Report for Municipal Year 1931-1932. Pp. 8+4 plates. (Durban.)  
Union of South Africa: Department of Agriculture. Science Bulletin No. 119: The Cryoscopy of South African Milk. By Dr. L. Denis-Nathan. (Division of Chemistry Series, No. 128.) Pp. 24. (Pretoria: Government Printer.) 3d.  
Instytut Geofizyki i Meteorologii Uniwersytetu Jana Kazimierza we Lwowie. Komunikaty, Tom 6. Nr. 67 do 79 wyników prac Henryka Arctowskiego, i jego współpracowników PP. K. Deisenberga, I. Gottlieba, A. Kochańskiego, H. Orkiszka, E. Stenza, J. Tešli, Z. Wierzbickiego i W. Wiszniewskiego. Pp. viii+312. (Lwow.)  
The Indian Forest Records. Vol. 17, Part 10: Entomological Investigations on the Spike Disease of Sandal. (3) Membracidae (Homopt.) By W. D. Funkhouser. Pp. iii+10+1 plate. 6 annas; 8d. Vol. 18, Part 1: Entomological Investigations on the Spike Disease of Sandal. (4) Cercopidae (Homopt.) By Dr. V. Lallemand. Pp. iii+4. 2 annas; 3d. Vol. 18, Part 2: Entomological Investigations on the Spike Disease of Sandal. (5) Brentidae and Lycidae (Col.) By R. Kleine. Pp. iii+4. 2 annas; 3d. Vol. 18, Part 3: Entomological Investigations on the Spike Disease of Sandal. (6) Anthribidae (Col.) By Dr. Karl Jordan. Pp. iii+8. 3 annas; 4d. Vol. 18, Part 4: Entomological Investigations on the Spike Disease of Sandal. (7) The Genus *Exocentrus*, Cerambycidae (Col.) By W. S. Fisher. Pp. iii+5. 2 annas; 3d. Vol. 18, Part 6: Entomological Investigations on the Spike Disease of Sandal. (9) Neuroptera. By Dr. Nathan Banks. Pp. iii+4. 2 annas; 3d. (Delhi: Manager of Publications.)

### CATALOGUES

The Protexray Shock-Free Tube. Pp. 8. (London: Cuthbert Andrews.)  
Naturwissenschaften und Reisen. (Verzeichnis 50.) Pp. xvi+118+8 plates. (Berlin: Martin Breslauer.)  
B.D.H. Preparations of Liver for use in the Treatment of Anæmia—Pernicious and various forms of Secondary Anæmia. Pp. 6. (London: The British Drug Houses, Ltd.)  
Zeiss Nachrichten. Heft 4, Juli. Pp. 40. (Jena: Carl Zeiss.)