Societies and Academies

LONDON

Royal Society, March 23. G. I. FINCH and A. G. QUARRELL: The structure of magnesium, zinc and aluminium films. An electron diffraction camera is described in which the specimen is swept by a diffuse beam of electrons, thereby reducing the risk of injury to the specimen. The beam is then focused electromagnetically. Oxide-free surfaces of magnesium, zinc, and aluminium on a platinum substrate, also vapours of these metals in transit between source and receiver, were obtained and examined by electron diffraction. The oxides of magnesium and zinc formed on the corresponding metal surfaces have also been examined. It is concluded from the results that (1) the abnormal crystal structures are caused by pseudomorphic strain effects whereby the substrate influences the positions taken up by the atoms of the metal or metal oxide layers formed thereon; (2) such pseudomorphic effects are no longer evident at the surface of sufficiently thick films; (3) for aluminium the pseudomorphic strain effects are confined to the two dimensions of the basal planes, because no such effect was to be observed in the third dimension; (4) magnesium, zinc and aluminium vapours are monatomic. E. C. POLLARD: Experiments on the protons produced in the artificial disintegration of the nitrogen nucleus. Experiments to determine the manner of entry of the α-particle into the nitrogen nucleus have been made; these indicate that entry is in general over the top of the barrier, and the height of this barrier is fixed as between $4{\cdot}1 \times 10^6$ and $4{\cdot}4 \times 10^6$ electron volts. Further investigation of the absorption curve of the protons confirms the work of Steudel on this element and gives an indication of a second group, which can be ascribed to resonance entry of an α-particle of $3{\cdot}5 \times 10^6$ electron volts energy.

Geological Society, Jan. 11. C. S. HITCHEN: The Skiddaw granite and its residual products. The Skiddaw granite occurs as three isolated, though neighbouring exposures of limited size in the fell country to the north-east of Keswick in the English Lake District. The most southerly exposure occurs at Sinen Gill. It is of the nature of a small apophysis and consists of a porphyritic oligoclase-biotite-granite corresponding to a sub-acid alkali-lime type. The granite of this exposure appears to represent a deep-seated term in the Skiddaw suite. The central and largest exposure occupies an area of about half a square mile and is situated in the valley of the River Caldew. It consists of an albite-muscovite-biotite-granite of a more normal alkali (soda-potash) type, the porphyritic character being less distinct than that of the Sinen Gill rock. The northern exposure at Grainsgill is approximately one-eighth of a square mile in area and appears to be a large apophysis. It consists partly of normal granite and partly of a quartz-mica rock or greisen. It is concluded that the greisen was not formed by the consolidation of mother-liquor extruded from the crystallising magma by crustal disturbances, as was formerly supposed, but that it represents normal granite which has undergone alteration by paulopost hydrothermal solutions. L. G. ANNISS: The Upper Devonian rocks of the Chudleigh area, South Devon. The Devonian rocks occur as a number of small, scattered inliers in a region mainly occupied by Lower Culm Measures. The outcrops of Massive Limestone are described, and the Upper Frasnian and the Famennian have been zoned by the cephalopod and other faunas. The Dunscombe beds represent the Manticoceras stage and the base of the Cheiloceras stage (zones 1α to 2α of Wedekind), the Lævigites Limestone and shales represent the Lævigites stage (zone 5), and the Entomis Shales are equivalent to the Gattendorfia stage (zone 6). The succession is not complete, there being a non-sequence between the base of the Cheiloceras stage and the Lævigites stage. The region has been subjected to three distinct earth-movements.

PARIS

Academy of Sciences, Feb. 13 (*C.R.*, 196, 449–512). J. COSTANTIN: Historical résumé concerning conceptions on the degenerescence of cultivated plants. E. MATHIAS: Contribution to the study of fulminating material. The evaluation of the constant ratio which exists between the final volume and the initial volume in the progressive decomposition at atmospheric pressure when the final temperature is identical with the initial temperature. W. SLEBODZINSKI: The complexes of geodesics in a variety V_3. ALFRED ROSENBLATT: The theorems of M. Picard in the theory of non-linear partial differential equations of the elliptic type. PAUL LÉVY: The absolute convergence of Fourier's series. E. KOGBETLIANTZ: The determination of the step $D(x_0)$ of $f(x)$. E. CRAUSSE and J. BAUBIAC: A modification of the chronophotographic method and some applications. Results obtained by the cinematographic method described were compared with those given by two other experimental methods, hot wire and stroboscopic, and also with the theoretical curve obtained by Szymanski. R. BOSSUET: The photographic sensibility of the lines of the alkaline metals in the oxyacetylene flame. Rods of magnesium pyrophosphate were impregnated with the solutions examined at increasing dilutions. Two forms of spectrograph were employed (Féry, Bourguel) and data are given for the limiting sensibilities with lithium, sodium, potassium, rubidium and cæsium. G. Déjardin and R. LATARJET: The spectral sensibility of photoelectric cathodes coated with a cæsium oxide film. Details of the method of preparing the coating and curves of emission as a function of the wave-length. MLLE. QUINTIN: Study of the electromotive force of the chain: copper, copper sulphate, mercurous sulphate, mercury, at 25° C. The experimental values, used to determine the normal potential E_0 by Lewis's method, do not give a satisfactory extrapolation. RENÉ AUDUBERT: The differentiation of the electronic effects and the photoelectric effects in photovoltaic elements. The study of the photovoltaic effects for several frequencies allows, by suitable choice of electrolytes, of distinguishing in the action of light on the electrodes the photoelectrochemical effect from a secondary internal electronic effect. H. MURAOUR and G. AUNIS: The laws of combustion of mixtures of (gun-cotton) powders. F. BOURION and MLLE. O. HUN: The cryoscopy of paraldehyde, acetone and ether in solutions of magnesium and ammonium sulphates. RENÉ DUFOUR: The initial electrolytic overvoltage in the disengagement of hydrogen on mercury. The study of the electrolytic overvoltage of mercury, placed under conditions of reversible equilibrium, appears to lead to the result that the initial overvoltage is nil. JEAN BOUCHARD: The quantitative

study of the inhibiting action of some ions on the fluorescent power of uranine. R. RAMBAUD: Trans γ-oxycrotonic acid. The trans form has been obtained by the complete saponification of ethyl acetoxycrotonate by warm aqueous potash solution. It is stable and does not give a lactone on dehydration. G. DARZENS and MAXENCE MEYER: A new general method for the synthesis of aldehydes. The halogen compound RX is treated with the sodium derivative of ethoxymalonic ester, the latter being readily prepared by the method of Wislicenus, followed by saponification, distillation in a vacuum giving the ester $RCH(OC_2H_5)(CO_2H)$. From the latter the aldehyde RCHO is readily obtained by the method already described by Darzens and Lévy. Examples of the generality of the proposed method are given. D. IVANOFF and I. ABDOULOFF: The velocity of disengagement of hydrocarbons produced by the action of indene on fatty organomagnesium derivatives. A method of measuring the strength of linkage of alkyl radicals with the magnesyl group. L. BERTHOIS: The study of contact metamorphism with the aid of heavy minerals. The method proposed has some advantages over the usual method of thin sections owing to the larger quantities used. P. FALLOT: The Xauen massif (Spanish Rif). L. JOLEAUD and J. LOMBARD: Quaternary mammals of Ounianga Kebir (South-eastern Tibesti). MARCEL CHOPIN: The influence of the medium on the baking value of bread. EMILE F. TERROINE, P. MEZINCESCO and MLLE. SIMONE VALLA: Utilisation of sulphur and nitrogen from cystine at the level of endogenous protein metabolism. The addition of cystine to the diet proves that there is no necessary parallelism, in all circumstances, between the metabolism of nitrogen and that of sulphur. The facts cited lend fresh support to the view according to which the protein needs of the organism should be divided into many fractions to a great extent independent. O. V. AMANN and MLLE. GILBERTE MOUROT: The comparative excretion of neutral sulphur in endogenous and exogenous nitrogen metabolisms and its signification. MME. ANDRÉE DRILHON: Glucose and shedding the shell of crustaceans. At the time the shell is being changed there is a marked increase in the proportion of glucose in the blood. J. LAIGRET: The sensibility of certain wild mice to the virus of yellow fever.

GENEVA

Society of Physics and Natural History, Feb. 2. W. SCHOPFER: Biometric researches on the spores of *Mucor*. The measurements carried out on thirteen pairs of strains of *Phycomyces blackesleanus* genetically related between themselves showed that the dimensional characters of the spores (length, coefficient of variability) are not connected with sex. E. FRIEDHEIM: The biological signification of melanogenesis. The biological signification of melanogenesis is not only in its final product, melanine, but also in an intermediate product, the 'red body', which is a reversible oxidation-reduction system in the thermodynamical sense and functions as a catalyst in cell respiration. P. ROSSIER: The influence of the absolute magnitude of a star on the width of the lines of stellar hydrogen. The relative widths of the lines are independent of the absolute magnitude, whilst the total width of the three lines H_γ, H_δ, and $H + H_\varepsilon$ increases with the absolute magnitude. G. TIERCY: Note on the respective phases of ionisation maxima and light maxima in a Cepheid. By the combination of the light curve and the curve of radial velocities (or that of pulsation) the present note tends to justify the view that the phase of maximum ionisation (youngest spectrum) precedes the maximum of light. WAKKER: Gold-bearing strata of the region of St.-Yrieix (Haute-Vienne). The author describes the deposits as well as the geology of the region and suggests an explanation of their genesis. He studies in detail the Fagassière deposits, those of Tournerie and Ladignac, which are constituted of mineralised quartz veins traversing a granite-gneiss complex.

ROME

Royal National Academy of the Lincei, Nov. 20. U. CISOTTI: Translo-circulatory plane current investing an indefinite rectilinear rod: dynamic actions. A. BEMPORAD: Proper motions and orbital motions resulting from the Astrographic Catalogue of Catania. E. ALMANSI: The deformations of elastic plates (1). GIUSEPPINA BIGGIOGERO: Geometric views on tensors. Certain questions of tensorial calculation are considered with the help of hyperspacial geometry. R. CACCIOPPOLI: A principle of inversion for functional correspondences and its applications to equations with partial derivatives (2). B. FINZI: Group velocity for waves associated with phenomena. M. KOURENSKY: Integration of equations to the partial derivatives of the second order with two functions of two independent variables. (2) Systems containing five derivatives of the second order. U. BARBIERI: Astronomical-geodetic station at the trigonometrical apex of the first order of Mount Crea in July 1930. Results are given of determinations of azimuth, longitude, etc. R. ZOJA: Distribution of the tensions in a solid with a rectilinear axis and a rectangular transverse section (4). A particular case is considered in the light of the solutions previously obtained. C. ANTONIANI: Investigations in the phytosterol group. (2) The sterols of rice husk. A laevo-rotatory sterol, $C_{27}H_{46}O$, melting at 143°, has been isolated from rice husk. The sterol fractions described by Anderson and Nebenhauer (1926) as phytosterol *B*, *C*, and *D* are not definite compounds, but mixtures of the sterol now described with the corresponding dihydro-derivative. A. BARONI: Protoselenosulphochloride. This compound, $SeSCl_2$, obtained by the action of selenium on sulphur monochloride, is a deep-red liquid, boiling at 60°–62° under 20 mm. pressure. It exerts a very rapid vulcanising action on rubber and with colza oil or with carbon disulphide and castor oil it causes instantaneous coagulation. Its action on piperidine results in the formation of monothiopiperidine and the separation of selenium; hence its formula is probably $Se:S:Cl_2$. NICOLETTA SABATUCCI: The toxic action and elimination of nicotine. (1) Toxic action of nicotine and oxynicotine. For a frog weighing 20 gm., the minimum toxic dose of nicotine capable of producing complete paralysis, followed by recovery after a few hours, is 1·2 mgm., and the minimal lethal dose 3 mgm. The lower toxity of oxynicotine, for which the minimal lethal dose is 15 mgm., shows that the toxic action of nicotine depends, at least partly, on the chemical function blocked by the oxygen. (2) Elimination and cutaneous absorption of nicotine and caffeine. If, after administration of nicotine by subcutaneous injection, a frog is immediately placed in 200 c.c. of water, the minimum lethal dose falls, from 3 mgm. with non-immersion, to 1·5 mgm. If,

however, the alkaloid is introduced into 200 c.c. of water, the minimum lethal dose is 3 mgm. Similar results are shown with caffeine. The frog evidently manifests a special affinity for the two alkaloids. M. MITOLO: Avitaminosis and intoxication. (2) Experimental scurvy and chemical intoxication by metals and metalloids. Ingestion, by a guinea-pig suffering from avitaminosis-C, of mixtures of salts of metals and metalloids in doses non-toxic to normal animals, enhances and accelerates the effect of the food-deficiency.

Forthcoming Events

Saturday, April 1

ROYAL INSTITUTION, at 3.—Developments in Cinematography: A Display of Films, (3) Films in Relation to Aeronautical Research.

Monday, April 3

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Rev. W. H. Murray Walton: "Among the Mountains and Head-Hunters of Formosa".

Tuesday, April 4

ROYAL AGRICULTURAL COLLEGE, CIRENCESTER.—Conference on: "The Breeding of Dairy Cattle".

Thursday, April 6

CHEMICAL SOCIETY, at 8.—Commemoration of the Bicentenary of Priestley. Papers by Prof. A. N. Meldrum, Sir Philip Hartog and Sir Harold Hartley.

Saturday, April 8

GILBERT WHITE FELLOWSHIP, at 2.30—(Annual General Meeting in the Hall of the Art-Worker's Guild, 6, Queen Square, W.C.1).—At 3, Sir John Russell: "Modern Trends in Agricultural Science".

INSTITUTION OF NAVAL ARCHITECTS, April 5–7.—(in the Lecture Hall of the Royal Society of Arts, John Street, Adelphi, W.C.2).—Annual Meeting.

Official Publications Received

GREAT BRITAIN AND IRELAND

The Science Masters' Association. Report for 1932, with List of Members (correct to January 1, 1933), Statement of Accounts and Report of Business Meeting. Pp. 96. (Eton College.)

Liverpool Observatory and Tidal Institute. Annual Report 1932. Pp. 15. (Liverpool.)

Linen Industry Research Association. Report of the Thirteenth Annual General Meeting, December 12, 1932. Pp. 14. (Lambeg.)

Department of Scientific and Industrial Research. Building Science Abstracts. Vol. 6 (New Series), No. 1, January. Abstracts Nos. 1–193. Pp. 36. (London: H.M. Stationery Office.) 1*s.* 6*d.* net.

London School of Hygiene and Tropical Medicine. Hand-List of Periodicals in the Library. Second edition. Pp. 44. (London.) 1*s.* 3*d.*

Proceedings of the Royal Society. Series A, Vol. 139, No. A839, March 3. Pp. 475–730. (London: Harrison and Sons, Ltd.) 12*s.*

The Journal of the Institution of Electrical Engineers. Edited by P. F. Rowell. Vol. 72, No. 435, March. Pp. 189–268+xvi. (London: E. and F. N. Spon, Ltd.) 10*s.* 6*d.*

University of Bristol. Annual Report of Council to Court, Session 1931–32. Pp. 45. (Bristol.)

The British Mycological Society. Transactions. Edited by J. Ramsbottom, B. F. Barnes and H. Wormald. Vol. 17, Part 4, 18 March. Pp. 237–371. (London: Cambridge University Press.) 7*s.* 6*d.*

Proceedings of the Society for Psychical Research. Part 129, Vol. 41, March. Pp. 121–138+8 plates. (London.) 3*s.*

Department of Scientific and Industrial Research. Report of the Water Pollution Research Board for the Year ended 30th June, 1932; with Report of the Director of Water Pollution Research. Pp. iii+55. (London: H.M. Stationery Office.) 1*s.* net.

Proceedings of the Royal Irish Academy. Vol. 41, Section B, No. 9: Colonization of a Disused Millpond at Hillsborough, Co. Down. By R. H. Common and H. Cairns. Pp. 146–154. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 1*s.*

Annotated Account of Fungi received at the Imperial Mycological Institute. List 2 (Fascicle 2.) By E. W. Mason. Pp. 67. (Kew.) 5*s.* net.

East African Agricultural Research Station, Amani. Fourth Annual Report, 1931–32. (Colonial No. 78.) Pp. 43. (London: H.M. Stationery Office.) 1*s.* net.

Journal of the Institution of Heating and Ventilating Engineers. Vol. 1, No. 1, March. Pp. 56+xxiv. (London.)

Imperial Agricultural Bureaux. Third Annual Report of the Executive Council, 1931–1932. Pp. 20. (London: H.M. Stationery Office.) 1*s.* net.

OTHER COUNTRIES

Bernice P. Bishop Museum. Bulletin 99: Ethnology of Manihiki and Rakahanga. By Te Rangi Hiroa (Peter H. Buck.) Pp. vi+238+11 plates. Bulletin 100: Archæology of the Marianas Islands. By Laura Maud Thompson. Pp. ii+82+11 plates. (Honolulu.)

Bernice P. Bishop Museum: Occasional Papers. Vol. 9, No. 20: Fishes obtained at Fiji in 1929. By Henry W. Fowler. Pp. 13. Vol. 9, No. 21: Check List of Tipulidæ of Oceania. By Charles P. Alexander. (Pacific Entomological Survey: Publication 2.) Pp. 12. Vol. 9, No. 22: Traces of Suffixed Pronouns in Polynesian Languages. By Spencer Churchward. Pp. 6. Vol. 9, No. 23: Check List of the Elateridæ of Oceania. By R. H. Van Zwaluwenburg. (Pacific Entomological Survey: Publication 3.) Pp. 28. Vol. 9, No. 24: A Giant Latreillopsis from Hawaii. By Charles Howard Edmondson. Pp. 9. Vol. 9, No. 25: Fresh-Water Fishes from the Marquesas and Society Islands. By Henry W. Fowler. (Pacific Entomological Survey: Publication 4.) Pp. 11. Vol. 10, No. 1: Echinodermata from Pearl and Hermes Reef. By Maximilian Holly. Pp. 9. (Honolulu.)

Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 84. African and Malagasy Blattidæ (Orthoptera), Part 2. By James A. G. Rehn. Pp. 405–511+plates 30–33. (Philadelphia.)

Proceedings of the United States National Museum. Vol. 82, Art. 11: Five New Species of North American Ichneumon-Flies. By Frank D. De Gant. (No. 2952.) Pp. 6. (Washington, D.C.: Government Printing Office.)

U.S. Department of Commerce: Bureau of Standards. Bureau of Standards Journal of Research. Vol. 10, No. 2, February, R.P. Nos. 522–530. Pp. 151–287. (Washington, D.C.: Government Printing Office.) 25 cents.

The Imperial College of Tropical Agriculture. The Principal's Report for the Year 1931–32 and the Accounts for the Year ended August 31, 1932. Pp. 32. (Trinidad and London.)

The Indian Forest Records. Vol. 15, Part 7: Provisional Volume Tables and Diameter Growth Curves for *Holoptelea integrifolia* Planch. (*kanju*) and *Trewia nudiflora* Linn. (*gutel*). By Ishwar Das Mahendru. Pp. iv+34+2 plates. (Calcutta: Government of India Central Publication Branch.) 12 annas; 1*s.* 6*d.*

Department of Agriculture: Straits Settlements and Federated Malay States. General Series, No. 12: Technical Reports for the Year 1931. Pp. iii+87. (Kuala Lumpur.) 50 cents.

Japanese Journal of Mathematics. Transactions and Abstracts, Vol. 9, No. 3, December. Pp. 161–230. (Tokyo: National Research Council of Japan.)

Records of the Geological Survey of India. Vol. 66, Part 2, 1932. Pp. 181–256+plates 3–10. 2.12 rupees; 5*s.* Vol. 66, Part 3, 1932. Pp. 257–404+plates 11–21. 2.12 rupees; 5*s.* (Calcutta: Government of India Central Publication Branch.)

Department of Science and Agriculture, Jamaica. Microbiological Bulletin No. 1: Panama Disease of Bananas in Jamaica. By F. E. V. Smith. Pp. ii+22. (Jamaica: Government Printing Office.)

U.S. Department of Agriculture. Technical Bulletin No. 344: Petrographic Methods for Soil Laboratories. By W. H. Fry. Pp. 96. 10 cents. Technical Bulletin No. 350: Effect of Lead Arsenate Insecticides on Orange Trees in Florida. By R. L. Miller, Ione P. Bassett and W. W. Yothers. Pp. 20. 5 cents. (Washington, D.C.: Government Printing Office.)

Report of the President of the Carnegie Institution of Washington for the Year ending October 31, 1932. Pp. 59. (Washington, D.C.: Carnegie Institution.)

Carnegie Institution of Washington. Annual Report of the Director of the Department of Terrestrial Magnetism. (Reprinted from Year Book No. 31, for the Year 1931–32.) Pp. 223–277. (Washington, D.C.)

Technical Conferences of the East African Dependencies. Proceedings of a Conference of East African Soil Chemists held at the Agricultural Research Station, Amani, Tanganyika Territory, May 21st to 26th, 1932. Pp. 25. (Nairobi: Government Printer.)

Indian Journal of Physics, Vol. 7, Part 5, and Proceedings of the Indian Association for the Cultivation of Science, Vol. 16, Part 5. Conducted by Sir C. V. Raman. Pp. 353–490. (Calcutta.) 3 rupees; 4*s.*

Smithsonian Miscellaneous Collections. Vol. 89, No. 2: The Latitude Shift of the Storm Track in the 11-Year Solar Period; Storm Frequency Maps of the United States, 1883–1930. By C. J. Kullmer. (Publication 3188.) Pp. 34. (Washington, D.C.: Smithsonian Institution.)

U.S. Department of Commerce: Bureau of Standards. Research Paper No. 509: Deflection of Cosmic Rays by a Magnetic Field. By L. F. Curtiss. Pp. 815–823. (Washington, D.C.: Government Printing Office.) 5 cents.

Proceedings of the American Academy of Arts and Sciences, Vol. 67, No. 13: Records of Meetings 1931–32; Biographical Notices; Officers and Committees for 1932–1933; List of the Fellows and Foreign Honorary Members; Statutes and Standing Votes; Rumford Premium; Index. Pp. 577–668. (Boston, Mass.) 1.45 dollars.

Transactions of the Geological Society of South Africa. Vol. 35, January to December 1932. Pp. iv+198+15 plates. 42*s.* Proceedings of the Geological Society of South Africa. To accompany Vol. 35 of the Transactions. Pp. liii. (Johannesburg.)

History of Agriculture in the Southern United States to 1860. By Lewis Cecil Gray, assisted by Esther Katherine Thompson. (Publication No. 430.) Vol. 1. Pp. xix+567. Vol. 2. Pp. ix+569–1086. (Washington, D.C.: Carnegie Institution.)