## Societies and Academies.

LONDON.

**Royal Society**, Mar. 31.—Sir Robert **Hadfield**: Alloys of iron and manganese of low carbon content. The range of alloys covers 0·06 per cent. to 38·90 per cent. manganese, also one additional alloy containing 83·50 per cent. manganese. With 4·00 per cent. to 10·00 per cent. manganese the alloys have a comparatively high Brinell hardness, in the region of 400, and are brittle; from 15·00 per cent. to 39·00 per cent. manganese, characteristics are observed similar to those of manganese steel, though only to a limited extent—that is, a comparatively low Brinell hardness, in the neighbourhood of 200, with considerable tenacity and ductility and fair capacity for work-hardening. The alloy containing 83·50 per cent. manganese is hard, brittle, and unforgeable. With 16·00 per cent. or more of manganese the alloys are non-magnetic, whereas in the presence of 1 per cent. of carbon not more than about 7 per cent. manganese is required to take away or suppress the magnetic qualities of the iron. The electrical resistance, while increasing with manganese percentage up to 87·2 microhms per cubic centimetre for the 38·90 per cent. alloy, does so in a fairly continuous manner and without any changes of a critical character such as those observed for the specific magnetism. In their corrodibility the alloys show under some conditions a somewhat improved resistance as compared with ordinary steel, but not such as to make them of any practical value in this connexion. In their microstructure the alloys with increasing manganese percentage pass at 4 per cent. from a pearlitic structure to a martensitic, which at about 16 per cent., that is, the point where almost completely non-magnetic qualities appear, changes into the austenitic type.

E. **Griffiths**: The thermal and electrical conductivity of a single crystal of aluminium. A method is described for the determination of the thermal conductivity which does not necessitate any machining of the crystal. Tests were made at various temperatures, the value of the thermal conductivity at 100° C. being 0·55 C.G.S. units. The specific electrical resistivity is $2{\cdot}89 \times 10^{-6}$ ohms per centimetre cube at 18° C.

W. L. **Webster**: The transverse magneto-resistance effect in single crystals of iron. The change of resistance of single crystals of iron produced by a transverse magnetic field has been investigated. Measurements were made with the current along a {100}, {110} or {111} crystal axis, and with the field in a series of positions in the plane normal to these directions. The phenomenon is of a double nature. There is in all cases a gradual decrease in resistance approximately proportional to the field, and probably due to the action of the field on the conducting electrons. Superimposed on this effect there is a sudden change in resistance between 5000 gauss and 12,000 gauss, the sign depending on the direction of the current and the magnitude on the direction of the field. This second effect is probably caused by the change of orientation of the atoms accompanying magnetisation.

W. A. **Bone**, R. P. **Fraser**, and F. **Witt**: The initial stages of gaseous explosions. Part iii. The behaviour of an equimolecular methane-oxygen mixture when fired with sparks of varying intensities. Sparks of varying intensities were passed between electrodes fixed half-way along a horizontal glass tube (35-50 cm. long by 2-2·5 cm. diameter), both ends of which were *closed* in one series of experiments but *open* in another. The new evidence, which mainly lies in the photographs taken, shows (*a*) the occurrence, under ordinary sparking conditions, of what seems to be a definite 'induction period' as a preliminary to the actual combustion; (*b*) initial propagation through the medium of a 'ghost-like flame' condition involving only a very partial combination of the gases; and (*c*) the main combustion, following later as the result of the superposing of a compression wave, or the like, upon a system which during the phase (*b*) has already become highly sensitive to chemical changes.

F. T. **Meehan**: The expansion of charcoal on sorption of carbon dioxide. Wood charcoal expands when it sorbs carbon dioxide, and the process is reversible. The relations between expansion, pressure and temperature are similar to those connecting quantity of gas sorbed with pressure and temperature. Thus at constant temperature the expansion is related logarithmically to the gas pressure; at constant pressure the expansion is inversely proportional to the temperature. The same relations hold above and below the critical temperature of carbon dioxide. As the expansion is uniform in the three original grain directions, it appears that carbonisation destroys the structure of wood, leaving an isotropic product.

J. E. **Lennard-Jones** and W. R. **Cook**: The equation of state of a gaseous mixture. A theoretical formula is given for the equation of state of a gaseous mixture, and from it is deduced a generalisation of Dalton's partial pressure law. The forces between the unlike molecules of a mixture can be deduced.

**Aristotelian Society**, Feb. 21.—A. **Wolf**: Some aspects of the philosophy of Spinoza. The paper dealt with some common misinterpretations of Spinozism. The chief of these are (1) the quasi-Kantian interpretation of the Attributes as subjective ways of regarding Nature, instead of as objective characters of Nature; (2) the mistranslation of *infinite* attributes by *innumerable* attributes, instead of simply "all the Attributes," which may not exceed the two known to man, namely, extension and thought; and (3) the logico-mathematical, instead of the dynamic, interpretation of the attributes in relation to finite objects. The last was specially emphasised, as it obscures the relation of Spinoza to the science of his time and of ours. Reality for Spinoza was essentially activity, energy. Spinoza criticised Descartes' conception of matter as mere extension, saying that from such inert matter the world of physical phenomena could not be derived. For Spinoza matter was essentially energy occupying space. The inert idea of matter had eventually to be abandoned, and, in spite of Newton's protest, matter came to be regarded as kinetic of its own nature, so as not to need an external mover. Similarly with Spinoza's conception of thought; ideas, he insisted, are not dumb pictures on a tablet, but active assertions. While European psychology was for many generations obsessed with the conception of mind as a passive tablet on which sense stimuli make impressions, Spinoza already anticipated present-day dynamic conceptions in psychology, as he anticipated the general kinetic conceptions of physics.

**Geological Society**, Feb. 23.—W. D. **Lang** and S. **Smith**: A critical revision of the rugose corals described by W. Lonsdale in Murchison's "Silurian System." These forms include some of the earliest-described British Silurian forms. A detailed examination has been made of their external characters and the internal structure with the object of putting the nomenclature upon a sound footing.—L. G. **Anniss**: The geology of the Saltern Cove area (Torbay). The series here termed Red Shale Group (Upper Frasnian and Lower Fammenian) are overthrust on the north

by the Staddon Grits and Shales (Upper Coblentzian), and on the south by the 'Massive Limestone' (probably Lower Frasnian). The 'Massive Limestone' forms the high ground on the south and also the summit of Sugar Loaf Hill, between which denudation has cut a deep valley exposing the Upper Devonian as a 'window.' The latter is a series of Red Shales, thin limestones, and tuffs. From these beds goniatites have been collected, which fix the fossiliferous horizon on Zone 1γ of Wedekind. Associated with the Upper Devonian is a decomposed albitedolerite; this rock has no connexion with the intrusions of the Torquay and Dartmouth areas, but is comparable with those of the Ashprington and Totnes areas.

**Association of Economic Biologists**, Feb. 25.—F. **Tattersfield** and C. T. **Gimingham**: During laboratory and field experiments on contact insecticides, an apparatus and technique have been devised for the quantitative study of the toxicity of contact insecticides, both to adult insects and to insect eggs, and some relationships between chemical constitution and toxicity in certain groups of synthetic organic compounds have been worked out. The results of the laboratory work have led to experiments in the field with certain compounds, highly toxic to insect eggs, which may prove to have practical value for winter spraying. The toxic properties of extracts of some tropical plants have also been studied.

**Society of Public Analysts**, Mar. 2.—E. Richards **Bolton** (Presidential address). The new preservatives regulations were welcomed. The adulteration of food is steadily decreasing, partly owing to the activity of the authorities, and partly to the efficiency of public analysts. Manufacturers should avail themselves of the services of a chemist to maintain the purity of their products and advise them in order to enable them to avoid any contravention of the law. The food of Great Britain was never in a purer state than it is at the present time.—A. W. **Knapp**, J. E. **Moss**, and A. **Melley**: Cacao butter substitutes and their detection. The most useful single test is the determination of the 'titre' of the fatty acids, and in the absence of certain other fats (*e.g.* coconut oil) this test enables the amount of Borneo tallow in admixture with cacao butter to be approximately determined after reference to a curve. A new method of determination has been based on the fact that the green colour of Borneo tallow is not bleached by ultra-violet light, whereas the yellow colour of cacao butter is readily bleached.—H. W. **Bywaters**, F. T. **Maggs**, and C. J. **Pool**: The determination of illipé butter in chocolate. Melted illipe butter becomes turbid at a much higher temperature than cacao butter, and the turbidity temperature determined under definite conditions is practically constant for different specimens of the two fats. If a third fat (*e.g.* milk fat) is also present, the percentage of illipé butter may still be found by reference to a curve, provided that the amount of the third fat can be ascertained.—A. F. **Lerrigo** and A. L. **Williams**: A study of the determination of saccharin, colorimetrically and by the ammonia process (work done under the Analytical Investigation Scheme). None of five colour reactions of saccharin studied under variable conditions gives quantitative results. The ammonia process (in which saccharin is converted into the ammonium salt of sulphobenzoic acid, the ammonia in which is determined by distillation) has been adapted to the determination of small quantities of saccharin.

**Linnean Society**, Mar. 3.—A. J. **Wilmott**: The Irish Spiranthes called *S. Romanzoffiana* Cham. Specimens from County Cork and Lough Neagh are distinct; the southern one is *S. gemmipara* Lindl., and the northern one *S. stricta* Rydberg.—J. **Davidson**: On the occurrence of intermediates in *Amphis rumicis* L. and their relation to the alate and apterous viviparous females. In *Aphis rumicis* L. (Hemiptera, fam. Aphididæ) both alate and apterous viviparous females (virginoparæ) develop in the parthenogenetic generations. The alate forms tend to produce apterous forms, and the apterous virginoparæ produce only apterous forms or a mixed progeny of apterous and a variable percentage of alate forms. From time to time intermediate individuals develop. Compared with their immediate alate and apterous relations in the same generation, these intermediate forms behaved as apterous forms.

EDINBURGH.

**Royal Physical Society**, Feb. 21.—Isobel **Deans**: The genus Hicksonia: an account of a new species. A new species, *Hicksonia köllikai*, is described. Attention is directed to the occurrence of telestid-like spicules which suggest the derivation of telestids from clavularids.—D. **Chalmers**: Worm parasites of common marine fishes. The results of an examination of specimens of sixteen species of North Sea fishes. Thirty-one species of parasitic worms are described, including three new, or hitherto unrecorded in the present host.—C. **Cumming**: Re-investigation of the eye of the mole. Embryonic development and histological structure of the eye of the mole are described. The whole of the eye shows a simplification. The lens is degenerate, the retina partly so; normal image perception is impossible.

PARIS.

**Academy of Sciences**, Feb. 28.—S. **Winogradsky**: Researches on the degradation of cellulose in the soil. Hutchinson and Clayton, in 1919, isolated the first typical representative of the group of aerobic bacteria attacking cellulose, and the author has followed the same general method. A dozen forms have been isolated falling in two groups, Cytophaga, the type discovered by Hutchinson and Clayton, and vibrions. In the latter group, the fibrolytic action is much less marked than with the Cytophaga, but they spread over paper with great rapidity.—A. **Weinstein**: A problem at the limit in an indefinite band.—Paul **Lévy**: The iteration of the exponential function.—G. **Pòlya**: The singularities of the lacunar series.—D. V. **Jonesco**: A class of functional equations.—C. **Cerf**: The integration of systems in involution of partial differential equations.—**Mandelbrojt**: A complement to the theorem of M. Fatou.—G. **Sugot**: The integration of the differential equations of the gyroscopic movement of a projectile.—**Kolossoff**: A transformation of the equations of elasticity.—J. **Vorobeitchik**: The horizontal flight of an aeroplane with great radius of action.—J. **Thovert**: The propagation of aerial waves in large subterranean cylindrical mains. The proved lack of uniformity of temperature in large underground mains will tend to give low values for the velocity of sound in such tubes. It would appear to be impossible to apply a suitable correction.—**Belin** and **Holweck**: Television. First results in the transmission of moving images.—J. **Cabannes** and P. **Daure**: The absolute measurement of the intensity of the light diffused by benzene in the liquid state. On the basis of measurements on the light diffused by benzene and other liquids, the authors conclude that it is not at present possible to deduce the Avogadro number from measurements of the diffusion of light by liquids.—Pierre **Jolibois**, Henri **Lefebvre**, and Pierre **Montagne**: The chemical yield in the decomposition

of carbon dioxide under small pressure by the condensed spark. The experimental results cited agree with the theoretical conclusions deduced from the study of the thermal dissociation of carbon dioxide. The energy of the electrical discharge is only partially utilised in the form of chemical energy, and the figures expressing the yield are notably lower than those calculated on the supposition that the spark produces in the gas uniquely a heat development absorbed quantitatively by the gas.—Albert **Kirrmann**: A method of synthesis of α-bromoaldehydes. The general method proposed is the action of phosphorus chlorobromide, $PCl_3Br_2$ on the acetals $R . CH_2 . CH(OR)_2$. This reaction gives the α-bromaldehyde $R . CHBr . CHO$ together with RBr, HBr, phosphorus trichloride and oxychloride. The method is practicable starting from $C_4$, and gives good yields above $C_5$. The physical properties of five bromoaldehydes prepared by this method are given.—Paul **Gaubert**: The formation in the insoluble state of two hydrates of magnesium platinocyanide.—Ch. **Gorceix**: The variation of longitudes can be attributed to another cause than the drift of the continents.—C. E. **Brazier**: The periodicity of the magnetic disturbances observed at Parc Saint-Maur and at Val-Joyeux. The results of a statistical analysis of 36 years' observations tend to show that the days on which there are magnetic disturbances succeed each other at intervals of which the approximate duration will be equal to one of the numbers obtained by multiplying the period of synodic rotation of the sunspots by a simple fractional factor, between 0·5 and 3.—R. **Combes**: The nitrogen in a ligneous plant in the course of a year's growth.—**Volmar** and **Samdahl**: The constitution of α-kirondrine. Owing to the small quantity available for study the constitution of α-kirondrine could not be completely determined. It is a bitter toxic principle which is neither an alkaloid nor a glucoside but a lactone containing one or more aldehyde groups.—A. **Demolon** and G. **Barbier**: Study of the mechanism of the exchanges of ions in the clay-lime complex.—A. **Rochon-Duvigneaud** and M. L. **Verrier**: The existence of serous pockets in the orbit and in the eye of the teleosteans.—**Béhague, Garsaux**, and Charles **Richet, jun.**: The rhythm and respiratory frequency of animals submitted to a barometric depression.—Pièrre **Lesne**: The subfossil Gyrinus of Belle-Isle-en-Mer.—Armand **Dehorne**: The annual reproductive cycle of *Dodecaceria concharum* at Le Portel.—Louis **Bounoure**: The primary gonocytes in the embryos of toads from eggs submitted to uterine super-maturation.—A. **Fernbach, M. Schoen**, and Motohichi **Mori**: Some observations on the so-called elective fermentation. It has been held that the differences in the velocity of disappearance of various sugars in a mixture was due to differences in the resistance that the cell-wall of the living yeast offered to the passage of the various sugars. It is now shown that these differences do not depend on the presence of the living yeast, but are also shown by zymines prepared according to the technique of Albert, Buchner, and Rapp. The causes of this selection still remain obscure.—A. **Marxer**: The proteolytic ferment of *Bacillus subtilis*.—Maurice **Letulle** and Louis **Vinay**: Experimental cancer of the lung.

VIENNA.

**Academy of Sciences**, Jan. 27.—F. **Hölzl**: The alkylisation of ferrocyanic acid.—R. **Frisch**: The action of slow cathode rays on rock-salt.—H. **Küpper**: Elucidation of morphogenesis and tectonics at the edge of the Vienna basin.—A. **Smekal**: The coloration of rock-salt crystals by radium radiation.

## Official Publications Received.

BRITISH.

The Preservation of Ancient Cottages. An Appeal by the Rt. Hon. Stanley Baldwin; with a Note by Thomas Hardy. Pp. 16+8 plates. (London: Royal Society of Arts.)

Transactions of the Royal Society of Edinburgh. Vol. 55, Part 1, No. 10: On the Feeding Mechanism of a Mysid Crustacean, Hemimysis Lamornæ. By Dr. H. Graham Cannon and Miss S. M. Manton. Pp. 219-253+4 plates. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.) 6*s*.

British Museum (Natural History). Picture Postcards. Set E43: Exotic Butterflies, Series No. 7. 5 cards in colour. 1*s*. Set E44: Exotic Butterflies, Series No. 8. 5 cards in colour. 1*s*. (London.)

Shirley Institute Memoirs. Vol. 5, 1926. Pp. viii+349+iv. (Manchester: Shirley Institute.)

Reports of the Progress of Applied Chemistry. Vol. 11, 1926. Pp. 742. (London: Society of Chemical Industry.)

Transactions and Proceedings of the Perthshire Society of Natural Science. Vol. 8, Part 3, 1925-26. Pp. 119-157+xxix-xxxviii. (Perth: Perth Natural History Museum.) 3*s*. 6*d*.

Uganda Protectorate: Geological Survey Department. Occasional Paper No. 2: The Geology and Palæontology of the Kaiso Bone-Beds. Part i: Geology, by E. J. Wayland; Part ii: Palæontology, by Members of the British Museum (Natural History) Staff—Mammalia, by Arthur T. Hopwood; Reptilia, by W. E. Swinton; Pisces, by Erol Ivor White; Mollusca, by L. R. Cox. Pp. 71+9 plates+2 maps. (Entebbe.) 6*s*. 6*d*.

The Physical Society. Proceedings, Vol. 39, Part 2, February 15. Pp. 99-170. (London: Fleetway Press, Ltd.) 6*s*. net.

Nigeria. Fifth Annual Bulletin of the Agricultural Department, 1st August, 1926. Pp. 209. 5*s*. Annual Report on the Agricultural Department for the Year 1925. Pp. 15. (Lagos: Government Printer.)

Department of Agriculture, Ceylon. Bulletin No. 77 (Bulletin No. 43, Rubber Research Scheme, Ceylon): The Inter-Relationship of Yield and the Various Vegetative Characters in Hevea Brasiliensis. By R. A. Taylor. Pp. 67. 40 cents. Bulletin No. 78: Manuring in relation to the Control of the Shot-Hole Borer of Tea (*Xyleborus fornicatus*, Eichh.). Part i by F. P. Jepson; Part ii by Dr. C. H. Gadd. Pp. 49. 40 cents. Bulletin No. 79 (Bulletin No. 44, Rubber Research Scheme, Ceylon): The Construction of Smoke Houses for Small Rubber Estates. By T. E. H. O'Brien. Pp. 7+4 plates. 40 cents. (Peradeniya.)

The Zoological Society of Scotland. An Appeal for Funds for the Scottish Zoological Park. Pp. 40. (Edinburgh.)

Department of Commercial Intelligence and Statistics, India. Agricultural Statistics of India, 1924-25 Vol. 1: Area, Classification of Area, Area under Irrigation, Area under Crops, Live-Stock, Land Revenue Assessment and Harvest Prices in British India. Pp. ii+ix+81. (Calcutta: Government of India Central Publication Branch.) 1.5 rupees; 2*s*. 3*d*.

Aeronautical Research Committee: Reports and Memoranda. No. 1046 (Ae. 232): The Effects of Body Interference on Airscrew Performance. By W. G. Jennings. (A.3.d. Airscrews, 94.—T. 2293.) Pp. 8+3 plates. (London: H.M. Stationery Office.) 6*d*. net.

The Journal of the Institution of Electrical Engineers. Vol. 65, No. 363, March. Pp. 297-388+xxx. (London: E. and F. N. Spon, Ltd., 10*s*. 6*d*.

The Journal of the Quekett Microscopical Club. Edited by W. S. Warton. Ser. 2, Vol. 15, No. 92, February. Pp. x+211-288. (London: Williams and Norgate, Ltd.) 3*s*. 6*d*. net.

Report of the Committee of the Privy Council for Scientific and Industrial Research for the Year 1925-26. (Cmd. 2782.) Pp. iv.+178. (London: H.M. Stationery Office.) 3*s*. net.

Ministry of Health. Reports on Public Health and Medical Subjects, No. 37: A Report on the Occurrence of Glass Fragments in Foods packed in Glass Containers. By George C. Hancock Pp. iv+36 (15 plates). (London: H.M. Stationery Office.) 1*s*. net.

British Research Association for the Woollen and Worsted Industries. Annual Report, 1926. Pp. 23. (Headingley, Leeds.)

Memoirs of the Geological Survey of India. Palæontologia Indica. New Series, Vol. 7, Memoir No. 3: A Review of the Genus Gisortia, with Descriptions of several Species. By E. Vredenburg. Pp. iv+124+32 plates. (Calcutta: Government of India Central Publication Branch.)

Report of the Department of Industries, Madras, for the Year ended 31st March 1926. Pp. iv+98+ii. (Madras: Government Press.) 12 annas.

Forest Bulletin No. 69: The Mechanical and Physical Properties of Himalayan Spruce and Silver Fir. By L. N. Seaman; assisted by C. R. Ranganathan. Pp. iii+26+5 plates. (Calcutta: Government of India Central Publication Branch.) 1.1 rupees; 1*s*. 9*d*.

Canada. Department of Mines: Geological Survey. Summary Report, 1925, Part A. (No. 2113.) Pp. 248. Summary Report, 1925, Part B. (No. 2114.) Pp. 46. Economic Geology Series No. 3: The Iron Ores of Canada. Vol. 1: British Columbia and Yukon. By G. A. Young and W. L. Uglow. (No. 2093.) Pp. ii+253. 40 cents. (Ottawa: F. A. Acland.)

Canada. Department of Mines: Victoria Memorial Museum. Museum Bulletin No. 43, Biological Series No. 11: List of Mushrooms and other Fleshy Fungi of the Ottawa District. By W. S. Odell. (No. 2089.) Pp. iii+15. (Ottawa: F. A. Acland.) 10 cents.

University of Reading: The National Institute for Research in Dairying. Annual Report, for the Year ending 31st July 1926. Pp. 62. (Reading.)

Report on the Health of the Army for the Year 1925. (Vol. 61.) Pp. iv+152. (London: H.M. Stationery Office.) 3*s*. 6*d*. net.

The Institution of Professional Civil Servants. Annual Report of Council for the Year 1926. Pp. 44. (London.)

Report of the Marlborough College Natural History Society for the Year ending Christmas, 1926. (No. 75.) Pp. 91. (Marlborough.) 5*s*.

Torquay Natural History Society. Transactions and Proceedings for the Year 1925-6. Edited by the Rev. James H. Balleine and H. L. Earl. Vol. 4, Part 4. Pp. 289-386. (Torquay.)

Report of the Rugby School Natural History Society for the Year 1926. Pp. 54. (Rugby.)