

## Societies and Academies.

LONDON.

**Association of Economic Biologists.**—The following were among the papers presented at the Edinburgh meeting on February 26 and 27:—

February 26.—F. A. E. Crew: Intersexuality in fowls and pigs. The condition in fowls is classified as (a) those in which a functional ovary occurs on the left and an active testis on the right; (b) ovotestis on left and active testis or no gonad on the right. The first condition is due to lack of inhibiting power in the ovary, so that the other gonad develops. It is always male. In the second class, there is ovarian disease or some other cause for the change of tissue.—W. G. Smith: The relation between hill pasture and sheep grazing. Work carried out at Boghall Farm, lately acquired by the Edinburgh and East of Scotland College of Agriculture, has shown a definite relationship between herbage and the quality of sheep produced. The value of the herbage varies with the nature of water supply. When the water is entirely aerial, the soil is impoverished and acid, and grazing is limited mainly to young growth in early summer. When the herbage is flushed by springs, the soil is less acid, and grazing is continuous. The most constant grazing of sheep is in moist places responsive to phosphates, as shown by the increase of white clover and pluff grass.—W. Robb: Hybridisation of oats. Experiments conducted with the view of improving the technique of hand-pollination in oats. Oats are generally self-fertilised and natural hybrids are rare. In a number of pure line cultures of known varieties grown side by side for years, only one hybrid was secured. Oats do indeed flower freely, but apparently *after* self-pollination has taken place. A wide range of artificial hybrids has been secured, but none between *Avena strigosa* and any of the cultivated oats. A difference in the chromosome numbers may explain this failure.—J. W. Gregor: Observations on the physiology of reproduction in some agricultural grasses. The work was carried out by the use of paper bags in greenhouses and specially designed pollen-proof boxes in the field. More than 90 per cent. of plants in both Italian and perennial rye grass were found to be self-sterile, and the self-fertile fraction are probably not self-pollinated. A proportion of this self-sterility is due to lack of pollen, only the female organs being developed.—J. M. F. Drummond and F. W. Sansome: The improvement of swedes and turnips by breeding. Yield and quality are of primary importance, but keeping quality and resistance to finger and toe disease are also important. Problems of testing yield in small field plots and feeding value by chemical analysis have yet to be solved. The value of the "dry matter" percentage as a criterion of feeding value is being reinvestigated. The policy of the Scottish Plant Breeding Station has been that of line selection (pure line method). In beginning work, 1922, strains approximately homozygous in respect of important characters were selected. A number of characters in swedes and turnips proved to be inherited, and enough evidence is at hand to show the possibilities of line selection for the improvement of these roots.—J. Ritchie: The control of mussels in sea water-pipes. The method used to prevent the blocking of the pipes at Portobello Electric Station with mussels and other marine growths was described. The problem was serious, for during the five months of maximum growth a layer 2-3.5 inches thick formed inside the 5-foot feed pipe. The water taken in was

used in the condensers, and it was found that by raising the temperature, in vacuo, of water that had just been used and returning it through the feed pipes, the growth could periodically be killed and prevented from assuming obstructive proportions.

February 27.—R. S. MacDougall: The ox warble flies and their control. Warble flies (*Hypoderma* spp.) are the cause of a great annual loss in Great Britain alone to farmers, butchers, and particularly hide and leather merchants. Great success has attended the attack on the larvæ in their last instar, when lying in a swelling on their victim's back. From 82 to 90 per cent. can then be killed by (1) tobacco powder and lime, (2) Derris, or (3) sulphate of nicotine, in various proportions.—P. H. Grimshaw: The occurrence in Britain of *Hydrellia griseola*. In Britain this fly does no damage though it is widespread, but round the Baltic it has been for a long time a serious pest of barley and oats.—Malcolm Wilson: (1) *Rhizosphæra Kalkhaffi* causing disease of spruce firs. The fungus is widespread in Central Europe and has lately been discovered frequently in Britain on the glaucous varieties of *Picea pungens*. Needles of the spruce become pale and purplish and fall off. Stem, etc., become blocked by spores. The disease also attacks Sitka spruce and (on the continent) the Norway spruce. It is spread by spores. (2) The occurrence of *Tuberculina maxima* in Scotland and its effect on the blister rust of the Weymouth pine. Blister rust is so serious a disease of the 5-needled pines in Britain that their planting has practically ceased. *T. maxima* is a parasite of the blister rust, and it has now been found for the first time in Britain. On the continent *T. maxima* does not apparently entirely kill out the rust, but there are indications that under the different weather conditions prevailing in Britain, the parasite may have greater value as a control.

**Institute of Metals.**—The following were among the papers presented at the annual general meeting held on March 11 and 12.

March 11.—H. T. Angus and P. F. Summers:—The effect of grain-size upon hardness and annealing temperature. Many heavily worked metals increase in hardness on annealing for a short time at relatively low temperatures, and this property depends, among other things, upon the grain-size that existed at the time of rolling. A coarse grain-size increases this rise in hardness and the range of temperature over which it extends, whereas with a fine grain-size, softening may commence at much lower temperatures. This effect was noted in both pure copper and bronze containing 4.5 per cent. of tin. The recrystallisation temperature of copper is higher in the coarse-grained metal than in the fine-grained. By calculating the area of grain boundary per cubic millimetre of metal from the grain-size, and plotting against hardness, a straight line was obtained, indicating that the hardness varies directly with the area of grain boundary per unit volume of metal.—S. L. Archbutt: A method of improving the properties of aluminium alloy castings. The process consists in allowing the molten alloy or metal to cool slowly in the crucible in the furnace until it has just completely solidified; it is then remelted, and may be carefully stirred, raised to the pouring temperature, and cast. Ingotting the metal is not satisfactory, as the ingots cool too quickly, and during remelting are too much exposed to the furnace gases. Passage of an inert gas through the melt during slow cooling and solidification improves still further the soundness of resulting sand-cast bars. The method eliminates a

considerable proportion of dissolved gas and thus reduces unsoundness, and to a considerable extent removes pin-holing.—Ulick R. Evans: Surface abrasion as a potential cause of localised corrosion. Previous work has indicated that most cases of serious corrosion are of an electrochemical character; it has been suggested that very severe corrosion may be occasioned by electric currents flowing between a bare abraded portion and the still encrusted area. An experimental investigation has been made regarding the existence of these currents. Sometimes they flow in such a direction as to localise corrosion on the small abraded portion, sometimes in the contrary direction. But they are generally transitors, dying away soon after abrasion ceases. Moreover, the abrasion required to produce them must, in most cases, be sufficient to damage the metal by mechanical erosion also. In the corrosion of zinc by hydrochloric acid, the wiping away of the black scum of residual impurities (lead, etc.) actually diminishes the rate of attack. Commercial (impure) zinc is attacked more slowly than some grades of much purer zinc. Probably "homophase" impurities (in solid solution) behave in the opposite mode to "heterophase" impurities (present as a separate phase).—J. Newton Friend and J. S. Tidmus: The influence of emulsoids upon the rate of dissolution of zinc in solutions of lead, nickel and copper salts. Emulsoids tend to retard the velocity of such reactions, whether chemical or physical, as involve a change of state from solid to liquid, or vice versa, in one or more of the components. This retardation is, in the main, due to adsorption; a thin layer of the emulsoid collects upon the surfaces of the solid reactants and impedes their chemical activity. The retarding action frequently falls off markedly with rise of temperature.—Denis Bunting: The influence of lead and tin on the brittle ranges of brass. The chief effect of lead is mechanical; the brittle range in itself is not affected, but masked owing to the embrittling effect at other temperatures of the lead which segregated as globules at the grain boundary. Tin in excess of the solubility limit produces extreme brittleness owing to the production of the brittle gamma or delta constituent. The effect of tin in solution appeared to be connected with an increase in crystal rigidity.

March 12.—G. L. Bailey and R. Genders: The density and constitution of the industrial brasses. A reduction of density, due to unsoundness accompanying constitutional change ( $\beta$  to  $\alpha$ ), occurs in the brasses over a considerable range of composition. The unsoundness is removable either by reversing the constitutional change (as by quenching) or by mechanical compression. Thus heat-treatments, involving quenching of the  $\alpha$   $\beta$  brasses and a small range of the  $\alpha$  brasses, may give rise to internal stresses of considerable magnitude. The cracking of heat-treated articles which sometimes occurs appears to be attributable to constitutional volume change rather than to the difference between the expansivities of the different constituents.—A. L. Norbury: Note on the effects of certain elements on the electrical resistivity of copper. Values for the increase in the electrical resistivity of copper due to the presence in solid solution of 1.0 atomic per cent. added element are calculated for each of the added elements. The "atomic effects" are small for elements like silver and gold—which are in the same group as copper in the Periodic Table—and are progressively larger as the added elements are farther away from copper in the Table.—Sir Thomas Kirke Rose: On the density of rhodium. One specimen

was forged up from sponge and annealed but not melted, and the other melted from sponge in the oxyhydrogen blowpipe and forged while hot. The rhodium sponge was chemically pure. The density of the melted specimen was 12.47 in vacuo at  $0^{\circ}/4^{\circ}$ , but the other specimen was evidently not free from internal cavities, as its density was only 12.22. Previous determinations have given 12.1-12.6.—Kotaro Honda and Ryonosuke Yamada: Some experiments on the abrasion of metals. In soft metals and carbon steels the amount of wear is proportional to the frictional horse-power, provided that the coefficient of friction is constant. Under a constant frictional horse-power the amount of wear increases with the coefficient of friction. The effect of the velocity of abrasion on the amount of wear is negligibly small in the range of velocity investigated.

## PARIS.

Academy of Sciences, March 23.—A. Haller and Salmon Legagneur: Diketones and mixed ketones derived from the  $\alpha$ -mono-nitrile of camphoric acid and of methyl cyanocampholate.—A. Desgrez and R. Vivario: The estimation of carbon in organic substances. The wet combustion method (sulphuric acid and potassium bichromate) with addition of a short length of red-hot copper oxide is employed. Tubes of potassium ferrocyanide and borax are used to remove chlorine and hydrochloric acid. Test analyses are given.—G. Claude: The rectification of the light in neon tubes. If the Geissler tube is made up of a series of wide and narrow sections, the wide portions show the mercury spectrum only and the narrow the neon spectrum.—G. Friedel: Ethyl anisal- $p$ -aminocinnamate.—Henry Scott was elected corresponding member for the section of botany.—Bertrand Gambier: Generalisation of the remainder theorem of Brill and Noether. Application to groups of superabundant points.—Alexandre Kovanko: The necessary and sufficient conditions for the summability of some functions.—V. Weniainoff: Some properties of the limit derivative.—P. Clerget: Reconstitution of the explosion motor of 1806 of the brothers Niepce. At the instance of the Service technique de l'Aéronautique, this early internal combustion motor has been reconstructed and found to work perfectly, using lycopodium powder as the combustible.—Rateau: Remarks on the preceding communication.—Barrillon: Resistance to the passage (through water) of cylinders of revolution turned in a sense perpendicular to their axis.—Lémeray: Spherical clusters. The theorem of level surfaces.—La Rosa: The relation between colour and amplitude of the variable stars and the ballistic theory. Reply to some criticisms by Ch. Nordmann and C. Le Morvan.—Le Roux: The determination of the viscosity coefficient of water in absolute value. The rotating cylinder method was adopted in preference to the capillary tube. Absolute viscosities are given for  $5^{\circ}\text{C}$ . intervals between  $0^{\circ}\text{C}$ . (0.0178) and  $50^{\circ}\text{C}$ . (0.057). The results are in good agreement with those of Thorpe and Rodger.—G. Reboul: Study, under reduced pressure, of the radiation emitted by highly resistant bodies traversed by an electric current.—G. Foëx: The various magnetic states of an ion. Two specimens of a pure salt (Mohr's salt), well defined from a chemical point of view and placed under identical conditions, may present very different magnetic properties, apparently corresponding to distinct structures of the paramagnetic ion.—E. Darmois: The action of boric acid on the rotatory power of malic acid and the malates. The existence of complex compounds of boric and malic acids is clearly

proved; some definite levorotary compounds of ammonium, sodium, and aniline have been isolated, but the complex dextrorotary compounds are less stable, and, at present, have not been isolated.—P. Lambert and D. Chalonge: A self-recording microphotometer with a photo-electric cell. The current from the photo-electric cell is amplified by a triode valve, under conditions securing stability and proportionality. As an example of its use, a negative of the ultra-violet spectrum of the sun is given.—A. Couder: The action of ammonia on cyanamide.—P. Job: The spectrographic study of the formation of complexes in solution and their stability.—L. Hackspill and R. Grandadam: The reduction of the metallic oxides by the alkaline cyanides. A repetition of Liebig's experiments (1842), using pure sodium cyanide (98.5 per cent.) and working in a vacuum. The oxides of lead, tin, copper, and iron give the metal, carbon, carbon monoxide, carbon dioxide, nitrogen, and metallic sodium, the weight of the sodium being practically equivalent to that of the reduced non-volatile metal. Strontium and barium are also reduced and combine with the metallic sodium to form a volatile alloy.—Mlle. Suzanne Veil: The decomposition of hydrogen peroxide in the presence of nickelous hydroxide. Nickel hydroxide decomposes hydrogen peroxide with evolution of oxygen, but no higher oxide of nickel is formed. The study of the changes in the coefficient of magnetisation shows that nickel hydroxide is not a true catalyst, if the latter be defined as a substance which remains unchanged throughout the reaction. Curves are given showing the changes in the magnetisation coefficient as a function of the time of exposure to the hydrogen peroxide solution.—Delbart: Contribution to the study of cold-drawn steels.—Ch. Jaquet: The constancy of the yield of the cold spring Velléda of the Royat thermal establishment. The hourly yield of this spring (10,210 litres) has not changed since 1886, and is independent of external meteorological conditions.—Emm. de Martonne and L. Aufrère: Extension of the oceanic drainage.—F. Löwinson-Lessing and V. Mitkewitch: The natural and artificial permanent magnetisation of rocks. A method is described capable of distinguishing between permanent magnetisation produced by lightning and that produced by the terrestrial magnetic field.—Henry Hubert: The quasi-permanence of the shape of the meteorological curves in Western Africa.—Pierre Lesne: The fauna of the peaty alluvium of the Seine valley to the south of Paris.—René Souèges: The embryogeny of the Hypericaceæ. The development of the embryo in *Hypericum perforatum*.—A. Guilliermond: New observations on the structure of the Cyanophyceæ.—J. Nageotte: The extreme contraction resulting from freezing striated muscle in the frog.—Ch. Champy and N. Kritch: Analogy of the hormone action of the male and female genital glands on the crest of the Gallinaceæ.—Marcel Avel: The vacuome and apparatus of Golgi in the vertebrates. The vacuoles, whether pre-existing or not, which take up neutral red and other stains are, at least in vertebrates, independent of the apparatus of Golgi.—René Jeannel: The morphology and origin of the claw of the tarsus of insects.—Jacques Risler and Paul Mondain: The limit of the antagonistic action of the spectrum and the application of radiations of great wave-length to the treatment of radiodermites and neoplasms.—René Fabre: A new method for the extraction of alkaloids or of various organic substances contained in the organs. The organ in a fine state of division is submitted to the digestive action of pancreatine for 12 hours at 50°-55° C. After filtration, the filtrate can be extracted with suitable

solvents. Substances such as strychnine, narcotine, veronal, sulphonal, atropine, cocaine, and morphine are stable towards the ferment, but the possibility of the pancreatine acting on the substances sought for must not be forgotten. Compared with the classical Stass-Otto method the process suggested gives higher yields in less time.—A. Goris and M. Métin: The presence of two alkaloids in *Aconitum Anthora*.—N. Bezssonoff: Some data on the nature of the anti-scorbutic principle known as vitamin C. A new process for extracting vitamin C from cabbage juice is described. The crystalline product obtained was analysed (carbon, 45.6 per cent.; oxygen, 48.2 per cent.; hydrogen, 6.2 per cent.). Daily doses of less than 2 mgrm. of this product prevented scurvy in guinea-pigs.—C. Gessard: Pyocyanoid bacilli of the melanogen variety.—Léon Blum, Maurice Delaville, and van Caulaert: The relations between the physico-chemical state of the body fluids and the phenomena of ossification and decalcification.

## ROME.

Royal Academy of the Lincei, February—G. Arturo Crocco: The degradation of wealth.—Secondo Franchi: Observations on the large overthrust Ausonio-Lepino.—Giulio Supino: Elastic systems in two dimensions and their relationships to spacial deformation.—Enrico Fermi: Intensity of multiple lines.—Francesco Rizzi: Rotatory power of fluorinated derivatives of benzene and its homologues as a function of the wave-length.—P. Bertolo: Action of iodine on desmotroposantonin; Artemisic acid.—Luigi Sanzo: Ova and larvæ of *Alalonga* (*Orcynus germo* Ltkn.).—Roberto Savelli: Transmission of mutations through interspecific hybridisations: Statistics of the first series of experiments.—Nazareno Strampelli: Acquisition of new characters in the glumes of blind and eared wheats (*Triticum folliculosum*).—S. Mandelbrojt: Generalisation of the calculus of variations.—F. Sbrana: An integral equation occurring in the statistical theory of the photo-electric effect.—A. Carrelli: Certain effects produced by rotatory motions.—Mentore Maggini: Aspect of the spots on Mars observed at Catania during 1924.—Francesco Vercelli: The results obtained during the cruise of the *Marsigli* in the Straits of Messina. The investigations on currents are described.—Washington Del Regno: Transformation of nickel in the neighbourhood of the Curie point. The temperature at which nickel begins to undergo transformation varies with the physical phenomenon considered. Apparently certain properties exhibit variation as soon as even a small part of the metal passes from one state to the other, whereas others vary only when an appreciable proportion of the material has suffered change.—Giuseppe Stefanini: First geological results of the mission of the Royal Italian Geographical Society to Somaliland, 1924.—G. Rodio: Pigments of the Floridææ.

## Diary of Societies.

SATURDAY, MAY 2.

ROYAL SOCIETY OF MEDICINE (Otolary Section) (Annual General Meeting), at 10.30.—A. Cheate: The Mastoid Emissary Vein and its Surgical Importance.

ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—W. P. Pycraft: Use and Disuse and their Effect on the Bodily Structure of Animals (II.).

MONDAY, MAY 4.

CAMBRIDGE PHILOSOPHICAL SOCIETY (in Cavendish Laboratory), at 4.30.—R. H. Fowler: A Theoretical Study of the Stopping Power of Hydrogen Atoms for  $\alpha$ -particles.—Dr. N. Bohr: On the Interaction of Atoms