

Forbes and Vernon Harcourt

During the meeting Forbes entertained Whewell, Peacock and Vernon Harcourt in his house at Greenhill. Of the last he said in a letter: "I learn every year to look with more admiration and affection on that remarkable man; nor shall I ever cease to look back with peculiar satisfaction on that meeting at York which brought me first into connection with him. . . ." Forbes had every reason to be satisfied with the success of the meeting, for the treasurer, Taylor, was able to announce that whereas the membership at York had been 350, at Oxford 700, and at Cambridge 1,400, the membership at Edinburgh had risen to 2,200.

Exposure of Raingauges

Among the activities initiated by the British Association was the measurement of the quantities of rain falling at different heights above the ground. The observations were carefully made on a pole above the top of York Minster at a height of 212.9 ft., on the top of the Yorkshire Museum at a height of 43.7 ft., and on the ground near by; the second report on the subject was communicated at Edinburgh. It was clearly established that the recorded amounts decreased with height above the ground, the decrease being greater in winter than in summer. The cause, however, was completely misunderstood, the increased catch near the ground being attributed to the increase in size of the drops as they fell through the lowermost layers of air or, by Luke Howard, to the actual formation of new drops near the ground. The circumstance that the vertical decrease is greater in winter than in summer was attributed to a direct effect of temperature. It is now known that the true cause of the decrease of the catch of rain as the gauge is raised above the ground is the increase of wind velocity with height, the wind forming eddies which sweep the drops past the opening of the gauge. The effect is greater in winter than in summer because the average wind velocity is greater in winter.

Early Gold Mining in South America

In the course of his excursion in Chile in August and September 1834, Darwin visited both copper and gold mines. On September 13 he says: "we slept at the gold mines of Yaquil, which are worked by Mr. Nixon, an American gentleman to whose kindness I was much indebted during the four days I stayed at his house. . . . When we arrived at the mine, I was struck by the pale appearance of many of the men, and inquired from Mr. Nixon respecting their condition. The mine is 450 feet deep, and each man brings up about 200 pounds weight of stone. With this load they have to climb up the alternate notches cut in the trunks of trees, placed in a zigzag line up the shaft. Even beardless young men, eighteen and twenty years old, with little muscular development of their bodies (they are quite naked excepting drawers), ascend with this great load from nearly the same depth. A strong man, who is not accustomed to this labour perspires most profusely, with merely carrying his own body. With this very severe labour, they live entirely on boiled beans and bread. They would prefer having bread alone; but their masters, finding that they cannot work so hard upon this, treat them like horses and make them eat the beans. . . ."

Societies and Academies

PARIS

Academy of Sciences, July 16 (*C.R.*, 199, 173-248).
J. VINOGRADOV: Some new results in the analytical theory of numbers. **EMILE OSTENC**: The ergodic principle in Markoff chains with variable elements. **SERGE FINIKOFF**: Projective deformation of a couple of congruences. **M. MURSI**: The values of the modulus of $\sigma(z)$ at infinity. **ANDRÉ WEIL**: A characteristic property of finite groups of substitutions. **AUGUSTE LAFAY**: The modifications of the Magnus phenomenon determined by the structure of the wind. Study of the effects of an air current on a polished rotating cylinder, with special reference to the existence of eddies in the air current. **MME. EDMÉE CHANDON**, **EDOUARD BOUTY** and **ANDRÉ GOUGENHEIM**: Time determinations obtained with the aid of an equal altitude instrument, with prism and impersonal micrometer. Results obtained using a Baillaud self-recording optical micrometer. Comparison of three instruments. **VENCESLAS POSEJPAL**: The formation of hydrogen in a vacuum. In a previous communication (*C.R.*, 198, 59) the author shows that certain hypotheses concerning the ether lead to the prediction of the formation of hydrogen in a vacuum. Further experiments are now described giving the effect of any hydrogen pre-existing in the tube. These show that any hydrogen pre-existing in the vacuum tube will not invalidate the interpretation given in the earlier note. **MARCEL PAUTHENIER** and **MME. MARGUERITE MOREAU-HANOT**: The study of an electrified space containing material particles. **EDMOND GUILLERMET**: The electrolysis of the chlorides of zinc and cadmium in methyl alcohol. **JEAN SWYNGEDAUW**: Study of the anodic depression in the electrolysis of gelatine. **PIERRE FLEURY**: An addition method for the exact study of the current given by a photoelectric cell as a function of the incident light flux. **PIERRE SOUTY**: The influence of circularly polarised light on the velocity of mutarotation of some sugars. A solution of a sugar giving mutarotation is divided between two polarimeter tubes and exposed to beams of dextrorotatory and levorotatory polarised light. It is shown that the photochemical effect is asymmetrical. **HORIA HULUBEI**: Intense sources of protons applicable to transmutations. The use of palladium charged with hydrogen for the production of the protons necessary for certain transformations markedly simplifies the working method, and gives yields equalling or surpassing other methods. The new technique can be extended to the production of deuterons. **JEAN AMIEL**: The preparation and explosion temperature of some complex compounds of copper nitrate, perchlorate and chlorate with ethylenediamine. The chlorates explode with great violence on heating and might prove useful as primers. **HENRI PARISELLE** and **F. CHIRVANI**: The emetic of saccharic acid. **JAMES BASSET**: The synthesis of ammonia under very high pressures, above 1,000 kgm./cm.². The apparatus described and figured can work for long periods at permanent pressures between atmospheric pressure and 5,000 kgm./cm.². At pressures of 2,000 kgm./cm.² and higher, the velocity of the reaction is increased to such an extent that the presence of a special catalyst is unnecessary. The presence of impurities in the gas mixture is less material; thus coal gas may be used as the source of the hydrogen. **J. PRAT**: The thermal decomposition of the

aryltrihydroxyarsonium chlorides. LÉON DENIVELLE: The neutral aryl sulphates. PAUL GAUBERT: Spherulites with helicoidal windings of the allantoin and their artificial coloration. F. DUPRÉ LA TOUR and Mlle. A. RIEDBERGER: The effect of temperature on the crystalline network of certain normal dicarboxylic acids. ANTONIN LANQUINE: The structure of the Provençal chains to the north-west and to the south of the grand canyon of Verdon. AURÉLIAN VLADESCO: Cultural experiments with ferns: the formation of an aposporous prothallus. AUGUSTE and RENÉ SARTORY, JACQUES MEYER and HANS BÄUMLI: The experimental reproduction of the cryptogamic diseases of paper. CH. CHABROLIN: The germination of the seeds of *Thesium humile* requires the intervention of saprophytic fungi. G. BARBIER: Negative absorption in soil, clay and humus. LOUIS GALLIEN: The determinism of the duality of evolution of the larvæ in *Polystomum integerrimum*. ARMAND DEHOENE: The active phagocytosis of the sarcocytes of the longitudinal muscles after the evacuation of the ovules in *Nereis diversicolor*. Mlle. ANDRÉE MICHAUX: The amounts of calcium in the lungs and kidneys of guinea pigs, normal and starved, suffering from acute or chronic scurvy. Observation of certain bladder troubles due to diet deficiencies. MME. MARIE PHISALIX and FÉLIX PASTEUR: The action of short waves on asp poison. KOHN-ABREST: Rapid toxicological examination for the alkyl halides (chloroform, carbon tetrachloride, etc.). Application to the detection of these products in the air. Mlle. LISE EMERIQUE: Vitaminosis A and the chemical composition of the animal. ALEX-ANDRE SALIMBENI and GEORGES LOISEAU: Concentration of the diphtheria toxin and anatoxin by means of freezing. FRED VLÈS, ANDRÉ DE COULON and ANDRÉ UGO: The statistics of survival in tar cancers of mice after removal of the tumour. Study of the toxic rôle of the latter.

CAPE TOWN

Royal Society of South Africa, April 18. P. W. LAIDLER: The archaeology of the prehistoric settlements in the Heilbron area. W. E. ISAAC: Researches on chlorosis in deciduous fruit trees. The experiments were divided into the following five groups: experiments with lime; experiments with sulphur; experiments with manganese sulphate; experiments with manganese sulphate and mineral fertilisers; experiments with copper sulphate. In about 10 per cent of cases chlorosis tends to pass away. Copper added as copper sulphate solution in a concentration of about 20 p.p.m., seems to cure the chlorotic conditions. There are beneficial effects with lower concentrations. Additions of potash bring about an improvement in the trees. Additions of lime do not exert a beneficial influence, and thus the trouble would not seem to be due to excess of available manganese, aluminium or iron. The trees are not in any way suffering from a deficiency of manganese, and evidence is presented indicating that chlorosis is not due to a deficiency of magnesium. J. GORDON CRAMB: Smithfield implements from a Natal coast site. A. GALLOWAY and L. H. WELLS: (1) Report on human skeletal remains from the Karridene site. (2) A further note on human skeletal remains from the Natal coast.

SYDNEY

Linnean Society of New South Wales, April 18. H. M. R. RUPP: Notes on Australian orchids: a review of the genus *Cymbidium* in Australia. The

variation in the number of recognised Australian species, from R. Brown's time to the present, is discussed, and causes for existing difficulties in determining certain species are suggested. A review is given of the variable species *C. canaliculatum*, R. Br., which is divided into five distinct forms in which colour-scheme and colour play the principal part. T. H. JOHNSTON: (1) Remarks on some Australian Cestodaria. Notes are given on the Cestodaria which are known to occur in Australia, namely, *Austrampphilina elongata*, Johnston, *Gyrocotyle urna*, Gr. and Wag., and *G. rugosa*, Dies. (2) Notes on some monocoelid trematodes. An amended description of *Monocotyle robusta*, Johnston and Tiegs, is given. The parasite, together with the two species *M. dasybatis* and *M. minima*, is assigned to a new genus. *Monocotyle selachii*, MacCallum, is also placed in a new Merizocotyline genus. A. N. COLEFAX: A preliminary investigation of the natural history of the tiger flathead (*Neoplatycephalus macrodon*) on the south-eastern Australian coast. This is the principal food fish of this coast. Data were collected during a series of cruises, made in 1930 on privately owned trawlers operating from Sydney as a base; and the records of the trawlers previously controlled by the State in 1918-22 were consulted. A comparison of the years 1918-22 with hauls made in 1930 shows a considerable decrease in the amount of fish taken per hour's trawling. The evidence so far obtained is insufficient to indicate whether this is due to over-fishing, to a migration of the flathead to less disturbed surroundings, or to a natural fluctuation.

ROME

Royal National Academy of the Lincei, March 18. T. LEVI-CIVITA: Stationary solutions of Pfaffian systems: the more significant case (2). G. ABETTI: Height of the chromosphere in 1933 and course of the solar cycle. Observations on 89 days during 1933 at Arcetri gave the mean height of the solar chromosphere as 10·68", an increase over the 1932 results of 0·45". At Madrid (31 days), the mean value 9·84" was found, this being less by 0·01" than the mean for 1932. The difference is probably due to the marked difference between the numbers of observations at the two stations. As in 1932, the height is greatest at the poles and least at low latitudes. The view that the new solar cycle has commenced, mentioned last year, is confirmed. U. BROGGI: An application of Borel's method of summation. F. CONFORTO: Construction of automorphic functions by means of infinite products (2). G. BARBA: Observations on the nuclei of Andreoli and of Evans. G. LAMPARIELLO: A noteworthy class of non-linear differential equations of the second order. (2) Analytical behaviour—resolutive development. R. EINAUDI: Waves of discontinuity combined with superficial elastic vibrations. F. TRICOMI: An intuitive interpretation of the rotor and of the condition of irrotationality. L. SONA: Dynamic actions of a transloculatory current investing a bilateral lamina (2). M. RENATA FABBRI: A particular solution of the equations of the motion of a heavy solid round a fixed point. A. ROSSI and A. IANDELLI: Crystalline structure of the compounds LaMg₃, CeMg₃ and PrMg₃. These compounds crystallise in the cubic system, the unit cell containing four molecules. B. L. VANZETTI: Structure of olivil and its derivatives. The structures of olivil and of the isomeric iso-olivil are discussed. M. CURZI: A species of *Aspergillus* with stellate ascospores. *Aspergillus stellatus*, isolated

from fermenting sansa, is described. V. PUNTONI: Development of *Anopheles* larvæ in the waters of sewers. Contrary to current opinion, these larvæ grow well in sewage, the organic suspensions of which furnish them with suitable nutriment. V. RIVERA: Further considerations on the biological action of metals at a distance. This action cannot be regarded as due to either the vapour pressure of the metals, or the very slight reduction of the penetrating radiation inside metallic containers, or the radioactivity of the metals. It is assumed that the effects observed are determined by secondary phenomena, including ionisation of the air, produced by the penetrating radiation. G. LUCHETTI: Contributions to the knowledge of the causes of 'intoxication' of soil. This is a true 'intoxication', caused by bacterial, fungal and plant metabolism.

VIENNA

Academy of Sciences, June 14. MARIETTA BLAU and HERTHA WAMBACHER: Physical and chemical investigations on the photographic detection of H-rays. Experiments with pinakryptol-yellow show that the desensitising power of a dye depends on the nature of the solvent in which it is used. It varies also with the oxygen content of the surroundings, the dye apparently acting as a catalyst of the oxidation, by atmospheric oxygen, of the silver formed photochemically. HANS PETTERSSON: Ultra-violet spectrum of radium emanation. By means of a special experimental arrangement, a number of new lines in this spectrum have been mapped. FRIEDRICH BÖCK, GUNTHER LOCK and KARL SCHMIDT: Perkin's synthesis of cinnamic acid. The effects of the temperature and time of the reaction, of the proportions between the three reagents, and of various substituent groups on the yield of product obtained by this synthesis, are studied. The view that benzylidene diacetate is an intermediate product in the reaction is shown to be erroneous. WILHELM SCHMIDT and ERNST BREZINA: Experiments on the action of air-suction arrangements in works. The results of small-scale tests bring out various important points, for example, the inadequacy—in almost all cases—of a hood over an open vessel when the vapour emitted is somewhat heavier or cooler than the air. The necessity of testing the air at a number of points in the room is emphasised. K. W. F. KOHLRAUSCH and A. PONGRATZ: Studies on the Raman effect (33). The Raman spectrum of organic compounds—poly-substituted benzenes (34). Benzoyl, α -toluyl and cinnamoyl compounds. The effect of a benzene nucleus on the extent and intensity of the carbonyl frequency and on the frequency of the nitrile group is similar to that of a conjugated C:C double linking. The order of the substituents of the CO group according to their constitutive influence on the CO-frequency is the same as that of the dipole moments. O. PAULSEN: Raman observations on dichloroethylene. Results are given which indicate that it is scarcely justifiable to speak of dichloroethylene as a definite equilibrium mixture. ROBERT WILLHELM: Carbohydrate metabolism of carcinoma. The co-ferment peculiar to the malignant tumours or a substrate accompanying it causes the characteristic anomalies of the carbohydrate metabolism, and presumably the spreading of this co-ferment into the rest of the organism is responsible for the general disturbance of such metabolism. HANS HELLER and FRITZ F. URBAN: Neutralisation of the poisonous action of pituitrin in the organism. Experiments *in vitro* show

that, if the specific adsorptive power of blood towards pituitrin is taken as unity, that of skeletal muscle and brain is 2-4, that of kidneys 10, and that of the liver 100-200. FRIEDRICH MORTON: Results of a journey to Abyssinia, Egypt and the Quarnero Islands in 1931-32. The plant-geographical relationships in these regions were investigated. EDGAR SCHALLY and FERDINAND NAGL: Observation of 'streaking' in chemical investigations (6). Streaking observed when liquids of similar refractive power are mixed. JULIUS PIA: Comparison of the anise Diplopore flora of Bosnia with that of southern Dalmatia. VICTOR F. HESS, H. TH. GRAZIADEI and R. STEINMAURER: Investigations on the changes in intensity of the cosmic ultra-violet radiation on the Hafelekhar (2,300 metres). HANS MOTZ: Investigation of rubber by electron deflection.

Forthcoming Events

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
(ABERDEEN MEETING)

Monday, September 10

- At 10 a.m.—Capt. T. A. Joyce: "The Origin and Uses of Yerba Maté" (Presidential Address to Section H).
Prof. J. A. S. Watson: "Scientific Progress and Economic Planning in Relation to Rural Industry and Country Life" (Presidential Address to Section M).
Prof. H. E. Roaf: "Normal and Abnormal Colour Vision" (Presidential Address to Section I).
At 8.30 p.m.—Prof. W. L. Bragg: "The Exploration of the Mineral World by X-Rays" (Evening Discourse in MacRobert Hall, Gordon's Colleges).

IRON AND STEEL INSTITUTE, September 10-14. Annual meeting to be held in Belgium and Luxemburg.

Official Publications Received

GREAT BRITAIN AND IRELAND

Ministry of Agriculture and Fisheries. Agricultural Statistics, 1933. Vol. 68, Part 1: Report on the Acreage and Production of Crops and Number of Live Stock in England and Wales; with Summaries for Great Britain and the United Kingdom. Pp. 91+3 plates. (London: H.M. Stationery Office.) 1s. 6d. net.
The North of Scotland College of Agriculture. Calendar, Session 1934-1935. Pp. viii+124. (Aberdeen.)
London School of Hygiene and Tropical Medicine. Classified Catalogue of Books in the Library, including Departmental Libraries. Class B: Natural Science. Pp. iii+31. (London.) Free.
Department of Scientific and Industrial Research. Report of the Food Investigation Board for the Year 1933. Pp. ix+248. (London: H.M. Stationery Office.) 4s. net.

OTHER COUNTRIES

Punjab Irrigation Research Institute: Research Publications. Vol. 2, No. 3: A Study of the Flow of Water under Works on Sand Foundations by means of Models. By Dr. E. McKenzie Taylor and Harbans Lal Uppal. Pp. 28+7 plates. 4 annas; 5d. Vol. 2, No. 4: A Study of the Flow of Water under Works on Sand Foundations by means of Models, Part 2. By Dr. E. McKenzie Taylor and Harbans Lal Uppal. Pp. 5+3 plates. 3 annas; 5d. Vol. 2, No. 5: An Investigation of the Pressures on Works on Sand Foundations, I. By Dr. E. McKenzie Taylor and Harbans Lal Uppal. Pp. 14+8 plates. 1 rupee; 1s. 6d. Vol. 2, No. 6: An Investigation of the Flow of Water under Khanki Weir and the Pressures on the Floor. By Dr. E. McKenzie Taylor and Harbans Lal Uppal. Pp. 34+18 plates. 1 rupee; 1s. 6d. Vol. 4, No. 5: The Relation between Exchangeable Sodium and Crop Yield in Punjab Soils and a New Method of Characterising Alkali Soils. By Dr. Amar Nath Puri. Pp. 4+1 plate. 2 annas; 3d. Vol. 4, No. 6: A Simple Method for Determining the Reaction and Titration Curves of Soils. By Balmokand Anand and Dr. Amar Nath Puri. Pp. 4+3 plates. 2 annas; 3d. Vol. 5, No. 2: The Transmission Coefficient of Water in Natural Silts. By Dr. V. I. Vaidhianathan and Hans Raj Luthra. Pp. 12+3 plates. 5 annas; 7d.

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MACMILLAN & CO., LTD.
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Telephone Number: WHITEHALL 8831
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