

Historic Natural Events.

May 18, 1680. Hailstorm in London.—According to Dr. Hooke, about 10.30 the sky grew very dark and there was thunder, very near. Soon after there began to fall “a good quantity of hailstones, some of the bigness of pistol-bullets, others as big as pullets’ eggs, and some above 2½ inches, and near 3 inches over the broad way; the smaller were pretty round, and white, like chalk or sugar plums; the others of other shapes”.

May 18–19, 1888. Thunderstorms.—On the night of May 18–19, a thunderstorm passed across England and southern Scotland from south to north at the rate of 50 miles per hour. On May 19 there was a series of isolated thunderstorms. In Glasgow the storm was described as “the most awful occurrence of the kind which has been recorded in the annals of the Observatory”. It was accompanied by torrential rain and hailstones as large as pigeon’s eggs. Much damage was done by lightning in several parts of the country, and people were killed at no fewer than ten different places in southern Scotland and northern England.

May 19, 1780. ‘Black Friday’ or ‘The Dark Day’.—In New England on May 19, 1780, the sky was cloudy and the sun was just apparent and of reddish hue in the early morning. Then it rained slightly and thundered, and the darkness grew, so that large print could not be read, nor could business be transacted. Schools were dismissed, and all work ceased. Fowls went to roost as at night, frogs began to pipe, night birds sang and cocks crew. The darkness began to clear at 1.30 P.M. and by 3.15 P.M. the light was as usual for a thick cloudy day.

May 19, 1809. Hailstorm in London.—A violent thunderstorm began about 5 P.M. accompanied by hailstones an inch in diameter. Carried by a strong south wind, they destroyed a great number of skylights and south windows, and collected in great drifts. The stones travelled with such speed that they left clean round holes in the glass, like bullet holes.

May 19, 1811. Whirlwind near Sheffield.—A whirlwind, accompanied by hailstones up to five inches in circumference, tore up seven trees by the roots, broke others in the middle, and unroofed many buildings. Nearly all the water was carried out of a mill-dam and dispersed in the air.

May 21, 1846. The Beginning of the Notably Hot Summer.—This date was the beginning of the ‘Notably Hot Summer’ and severe drought which continued until Sept. 23. From the effects of this amazing summer, many horses and some men died; and many kinds of provision were much spoiled, whether bread, meat, cheese, butter, ale or wine; and many other articles were greatly injured. The corn harvest was very early, and the wheat crop good. This was, for continuance, the hottest summer since 1780, if not since 1750; but 1818 and 1826 were rather similar.

May 21, 1890. Refraction Phenomena.—The rising sun at Brunn in Bohemia was observed to take a series of remarkable shapes before it finally rose well above the horizon and became circular. The earliest form was a conical tower with a flat cap, changing through cylindrical to urn-shaped. The next stage showed the form of a mushroom complete with a short stem, and finally the stem became detached and gradually disappeared. The whole series of changes occupied eight minutes.

May 24, 1681. Drought.—Under this date Evelyn records: “There had scarce fallen any rain since Christmas.” On June 11 he adds, “It still continued so great a drought as had never been known in England. In the Rector’s Book of Clayworth, Notts, June 18: “Barley found dry in ye fields, having lain so, ever

since sowing time”, and in his summary of the year: “It was a very dry and drought year fro ye beging of April [the Rector’s year began on April 1, old style] to ye 20th June, not having raynd, except on ye 7th of May.” At Townley in Lancashire the rainfall this year was only 76 per cent of the average.

May 24, 1783. Dust Haze.—From May 24 until almost the middle of August, there was an unusually dense and very persistent high fog over the whole of Europe, Asia Minor, Syria, Iceland, and many other countries. This was probably due to volcanic dust from the eruption of Laki, Iceland. The weather was greatly disturbed; in Europe there was a persistent southerly wind and great heat, and the Nile flood was abnormally low. The following winter, 1783–84, was very long and very rigorous over the whole of Europe and in North America. Gilbert White records hard frost so late as April 2.

Societies and Academies.

LONDON.

Physical Society, May 9.—E. J. Williams: (1) The induction of electromotive forces in a moving liquid by a magnetic field, and their application to the investigation of the flow of liquids. Preliminary experiments on the flow through straight tubes show that potential differences of the order of 10^{-4} to 10^{-3} volt set up by a magnetic field in a moving liquid consisting of an aqueous solution of copper sulphate can be satisfactorily measured.—(2) The motion of a liquid in an enclosed space. The increase of resistance of a column of mercury in a magnetic field is due to the internal motion of the liquid produced by the action of the ampere forces between the magnetic field and the electric current traversing the mercury. The hydrodynamic significance of the results of such experiments is considered; e.m.f.’s as small as 10^{-6} to 10^{-7} volt, induced by a magnetic field in moving mercury, can be accurately measured.—E. Simeon: The generation of sound by the siren principle. The paper discusses various undesirable features of the simple siren considered as a sound-source for technical work, and describes a siren with a reasonably pure note, the intensity of which can be kept constant throughout a range of pitch from about 70 to about 7500 cycles.—L. Hartshorn: Surface resistivity measurements of solid dielectrics. The paper describes (1) a new form of electrode suitable for surface resistivity measurements on insulating materials in sheet form, and (2) a method for the determination of the ‘volume leakage’ correction for any system of electrodes. Data are given on the volume leakage correction for the various types of electrode in general use, and on the ‘leakage resistivities’ of materials commonly used in the construction of laboratory instruments.

PARIS.

Academy of Sciences, Mar. 31.—Mesnager: Must the solution of the problem of the cylinder given by Saint-Venant sometimes be rejected? A criticism of a recent communication by Henri Villat and Maurice Roy. Without questioning the mathematical work, the author is not in agreement with the practical interpretations deduced.—Marcel Brillouin: Dynamical tides with continents. The law of depth and the attraction of the ring.—C. de La Vallée Poussin: The conformal representation of plane areas multiply connex.—Paul Pascal and René Lecuir: The chemical and magnetic study of complexes derived from the triazine nucleus.—A. Tonolo: A physical interpretation of the tensor of Riemann and of the principal curvatures of a

variety *V*₃.—**Mohamed A. Haque**: The magnetic double refraction of ethyl alcohol, of water and of aqueous solutions of nitrates.—**F. Baldet**: Observations, with the large Meudon telescope, of the celestial body discovered at the Lowell Observatory. A trans-Neptunian planet, with the distance and diameter given by the discoverers, should shew a planetary disc of about 1.0", of the same order of magnitude as the satellites of Jupiter, and this should be easily visible with the large telescope of the Meudon Observatory (83 cm. objective), which has a separating power of 0.17". Observations on four days, one under exceptionally good conditions, failed to shew any trace of a disc.—**E. Hehriot and Mlle. A. Marcelle**: The direct measurement of the ratio of the absolute retardations in double refraction by deformation.—**B. Bogitch**: The preparation of blue glass and the decomposition of sodium sulphate by silica.—**M. Prettre and P. Laffitte**: The inflammation and combustion of carbon disulphide. For percentages of carbon disulphide vapour varying between 1.3 and 34.0 by volume, the temperatures of inflammation vary linearly between 138° C. and 338° C. For mixtures containing more than 10 per cent of carbon disulphide, luminescence of the gaseous mixture is observed before inflammation, but this is always less intense than that observed in the case of carbon monoxide. In all the experiments there was noticed a slight brown deposit on the walls of the apparatus: this was shewn to be the monosulphide, CS or a polymer.—**Marcel Godchot and Max Mousseron**: New methods of formation of 2:5-dimethyl-piperazine. Three new methods are given, the first two starting with 2.5-dimethylpyrazine: catalytic reduction with hydrogen in presence of nickel at 150°-160° C., reduction with hydrogen in acetic acid solution with platinum as the catalyst: the third method, the simplest, is the reduction by hydrogen in presence of platinum in acetic acid solution of isonitrosoacetone.—**F. Francois**: The action of selenoxanthidrol on ureas and carbamic esters. The typical reaction between xanthidrol and ureas and carbamic esters occurs when the oxygen of the pyrane nucleus is replaced by sulphur or by selenium.—**Paul Gaubert**: The dehydration of heulandite.—**Henri Vincienne**: Stratigraphical and tectonic observations on the southern termination of the Crédo chain.—**Henri Mémery**: The winter of 1930 and solar activity.—**H. Buisson, G. Jausseran, and P. Rouard**: The transparency of the lower atmosphere. The results of direct measurements of atmospheric absorption over distances of 600 metres and 2500 metres for wave-lengths varying from 5780 to 2482. It is hoped to extend the results to smaller wave-lengths.—**Link and Hugon**: Direct measurements of atmospheric absorption.—**V. N. Lubimenko and Mme. Rauser-Cernocoussova**: The fossil remains of chlorophyll in marine mud deposits. Observations published in 1921 suggested that the pigment of chlorophyll, in the absence of oxygen, possesses great stability and might be preserved as a fossil substance. Results are given in the present paper confirming this view. Four specimens, of varying age, one belonging to the Tertiary age, gave alcoholic extracts containing chlorophyll, as shown by spectroscopic examination.—**Jakob Eriksson**: The hibernation of *Puccinia Ribis* is the vegetative state in the winter buds of the plant acting as host.—**J. des Cilleuls**: The phytoplankton of the Loire in the course of the summers of 1928 and 1929. Owing to the exceptional warmth and dryness of the summers of 1928 and 1929 the plankton of the Loire was unusually abundant, recalling a lake regime. Analogous observations were made on the plankton of the Elbe, near Dresden, and also near Hamburg, during the dry summer of 1904.—**Pierre Dangeard**: The

mobility of certain cells of *Porphyridium cruentum*.—**Roymond-Hamet**: The physiological analysis of the intestinal action of Uzara.—**Georges Truffaut and V. Vladykov**: The microflora of the rhizosphere of wheat.—**J. Vellard**: Antivenomous vaccination. Results of experiments on the production of vaccines exerting a protective action against the bites of poisonous snakes.—**J. André Thomas**: A neoplastic reaction due to the degenerescence of the ovocytes and sometimes of the bristles in *Nereis diversicolor*. The formation of conjunctive tissue from the newly-formed amibocytes.

ROME.

Royal National Academy of the Lincei, Jan. 19.—**T. Levi-Civita**: Characteristics and bicharacteristics of Einstein's gravitational equations (2).—**U. Cisotti**: Dynamic actions of circulatory currents around a bilateral strip or an arched strip. The considerations advanced in an earlier note are illustrated by two concrete examples.—**V. Nobile**: Intermediary trihedra of reference for stellar dynamics; criteria of choice.—**L. Cambi and A. Cagnasso**: The reactions between ferrous compounds and nitric oxide (2). Nitric oxide undergoes association with ferrous salts having anions of slight electro-affinity and of a high degree of oxidisability (such as the carbonate, hydrogen carbonate, and acetate), giving first nitroso-salts with groupings (NO') having a halogen-like function unlike that of hyponitrous acid, into which such groupings undergo subsequent transformation. This transformation is effected by decomposition with silver salts in a neutral or feebly acid medium, or by a sufficient increase of the pH value, such as is caused by addition of excess of the alkali salt of the same acid as is present in the ferrous salt used.—**R. G. Harrison and P. Pasquini**: Grafting experiments with *Clavelina lepadiformis* (Müller).—**L. Petri**: Experimental reproduction of *mal del secco* of lemons. This disease, which causes serious damage to lemon plantations on the eastern coast of Sicily, is the result of attack by two distinct fungi. The wood is first attacked by *Deuterophoma*, which causes tracheomycosis or adromycosis, which is shown externally only by partial or total yellowing of the leaves and cortical tissue. This primary phase of the disease renders possible subsequent antracnosis of the buds and young branches, the cause in this case being infection with *Colletotrichum gloeosporioides* Penz. The disease may be produced by artificial inoculation with the two organisms.—**Rina Baldoni**: Systems of principal normals to a variety at its π_3 (1).—**S. Cherubino**: A general theorem on real Abelian varieties.—**N. Cioranescu**: Approximation of a function by another function belonging to a given linear functional, and approximation of any vectorial field by an irrotational field.—**H. Lewy**: The unicity of the solution of Cauchy's problem for an elliptical equation of the second order in two variables.—**A. Lulis**: Investigation of the permutable functions of the first species with a given function.—**Maria Cibrario**: The non-existence of congruences *W* of certain hyper-spacial straight lines.—**R. L. Gomes**: Isoenergetic movements.—**B. Finzi**: Dynamic actions relative to plane irrotational currents of viscous liquids. The analytical formulæ recently deduced are applied to the determination of the dynamic actions exerted on a rigid profile enclosed by a regular current.—**G. Viola**: Fluctuations of the light curve of U. Cephei. The various hypotheses capable of explaining this phenomenon are discussed.—**G. Scagliarini and P. Pratesi**: Potentiometric determination of alkaline sulphides. The interaction of sodium nitroprusside and an alkaline sulphide results in the formation of a complex salt comprising one molecule of each of the reagents. Investigation of the curve of electrometric titration of

decinormal solutions of the two compounds reveals a well-marked point of flexion corresponding with equivalence of the solutions. This result furnishes the basis for a method of determining sulphides, even in the presence of large proportions of other salts.—Z. Jolles and J. Krugliakoff: Investigations on diazohydrates, azoxy-compounds, and nitrones. It was recently found that normal diazohydrates exhibit all the properties characteristic of an energetic oxidising agent. Further experiments show that the same is the case with the analogous compounds, α - and β -azoxy-compounds, nitrosophenylhydroxylamine, and nitrones.—M. Anelli: A geological section of the Reggian Apennines.—G. B. Cacciamali: Problems of Lombardy tectonics (with reference to investigations on the sub-soil).—S. Di Franco: The lava from the eruption of Etna in 1928. Study of the different lavas of Mount Etna shows that these may be grouped into seven types. The lava from the eruption of 1928 is dark grey, tending to reddish, and moderately heavy, and is analogous microscopically to those of the later eruptions and also to some of the older ones. It contains pheno-crystals of plagioclase, augite, and olivine, disseminated in a basic mass composed of plagioclase, augite, magnetite in abundance, and vitreous substance in small proportion. It belongs to type III. of the author's classification.—G. Mezzadrolì and E. Varetton: Further investigations on the action exerted by a radio-oscillator for ultra-short waves (2-3 metres wavelength) on the germination of seeds and on the growth of plants (2). Experiments on cotton, beans, peas, and maize show that when seeds and plants are subjected to the action of these waves, the germinators being placed between the coils of the receiving oscillating circuit, the effect is even greater than that observed with an interposed Lakhovsky oscillating circuit or with systems of Lecher wires in the zone of greatest intensity.

VIENNA.

Academy of Sciences, Feb. 20.—R. Schumann: The vectorial adjustment of triangle-nets.—A. Skrabal: The development of chemical mechanics. Our kinetic equations of 'relation' are valid as limiting laws for constant media, that is, for dilute systems. They can be generalised and carried over to systems however variable if for relations we substitute 'activities'.—G. T. Whyburn: (1) Possibly regular point-quantities.—(2) The structure of regular curves.—(3) Irreducible ϵ -partition quantities.—G. Lock: Cannizzaro's reaction.—M. Beier: Zoological expedition to the Ionian Islands. (8) Coleoptera, with the help of A. Schuster, R. Hicker, and H. Strouhal.—(9) Spiders, with the help of E. Reimoser and C. F. Roewer.

Feb. 27.—K. Fuchs and P. Gross: The action of alkali-organic compounds on aromatic sulphonates. The experiments were carried out in a nitrogen atmosphere.—P. Gross and A. Goldstern: Optical determination of electrolytic dissociation in very dilute alcoholic solution. Coefficients of extinction were measured in solutions of lithium picrate alone and with addition of lithium chloride, and in picric acid alone and with addition of lithium chloride.—F. Heritsch: A coral from the Gradwacke zone of the Veitsch in Upper Styria.—A. Dadiou and K. W. F. Kohlrausch: Studies on the Raman effect (7). The Raman spectrum of organic substances.

Mar. 6.—B. Machan: Two new fish forms from Padang.—M. Beier: Zoological expedition to the Ionian Islands (10). The shell-bearing land and fresh-water molluscs, worked out by F. Käufel.—P. Gross and M. Iser: Salting out. The distribution of acetone and of prussic acid between benzol and the aqueous solutions of various salts.—T. Pintner: Further contributions to the anatomy and systematics

of *Tetrarhynchus*.—K. Menger: A distance concept in groups.—G. Nöbeling: N -dimensional universal spaces.

Mar. 13.—P. Gross and S. Klinghoffer: The influence of alkali chlorides on the solubility of calcium iodate.—O. Schindler: A new *Hemirhamphus* from the Pacific Ocean.—E. Späth and K. Gibian: The constitution of sappanin.—E. Späth and J. Píkl: New bases in angostura bark: quinoline, 2-methylquinoline, 2-n-amyloquinoline and 1-methyl-2-keto-1, 2-dihydroquinoline.—K. Przißbram: (1) The coloration of kunzite.—(2) The influence of cathode rays on the swelling of gelatin.

Official Publications Received.

BRITISH.

Transactions of the Optical Society. Vol. 31, No. 1, 1929-30. Pp. iv + 52. (London.) 10s.

The Scientific Proceedings of the Royal Dublin Society. Vol. 19, N.S., Nos. 29-39. 29: Studies on Peat, Part 3, Low Temperature Carbonization of Peat, by James T. Donnelly and Joseph Reilly; 30: The Nitration of Substituted Phenylbenzylamine Derivatives, by J. Reilly, T. V. Creedon and P. J. Drumm; 31: A Study of Two new Species of Bacteria belonging to the Genus *Chromoacterium*, by Dr. M. Grimes; 32: The Thermal Instability of the Earth's Crust, II., Dr. J. H. J. Poole; 33: Study of the Polysaccharides, Part 1, Inulin and Inulan, by J. Reilly and P. P. Donovan; 34: Responses of Plant Tissues to Electric Currents, II., by Prof. H. H. Dixon and T. A. Bennet-Clark; 35: Electrical Properties of Oil-Water Emulsions with special reference to the Structure of the Plasmatic Membrane, by Prof. Henry H. Dixon and T. A. Bennet-Clark; 36: Studies in Peat, Part 4, Low Temperature Carbonization under various Conditions, by Colm O'Sullivan and Dr. Joseph Reilly; 37: The Application of Gamma Radiation to Deep-seated Tumours, by Dr. J. J. Joly; 38: A Study of the Polysaccharides, Part 2, Note on the Purification of the Natural Products, by J. Reilly and Declan T. McSweeney; 39: Some Geochemical Applications of Measurements of Hydrogen Ion Concentration, by Dr. W. R. G. Atkins. Pp. 365-460. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 6s.

Harper Adams Agricultural College, Newport, Shropshire. Grassland Problems: the Making of Grassland, the Maintenance of Grassland, the Utilisation of Grassland; Report of Conference held at the College on Wednesday, February 5th, 1930. Pp. 15+ix. Sugar Beet Problems: Report of Third Conference held at the College on Thursday, March 13th, 1930. Pp. 28. (Newport.)

Transactions of the Institute of Marine Engineers, Incorporated. Session 1930, Vol. 41. April. Pp. 983-990+lxvii+xxxviii. (London.)

Papers and Proceedings of the Royal Society of Tasmania for the Year 1929. Pp. v+151+31 plates. (Hobart.) 10s.

FOREIGN.

Det Norske Videnskaps-Akademi i Oslo. Resultater av de Norske Statsunderstøttede Spitsbergenekspeditioner (Skrifter om Svalbard og Ishavet). Bind 1, Nr. 1: The Norwegian Svalbard Expeditions 1906-1926. By Adolf Hoel. Pp. 104+2 plates. (Oslo: Jacob Dybwad.) 10.00 kr.

Annuaire de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, 1930. 96^e année. Pp. 155. (Bruxelles: Maurice Lamertin.)

Agricultural Experiment Station: Michigan State College of Agriculture and Applied Science. Circular Bulletin No. 130: Cultural Methods in the Bearing Vineyard. By N. L. Partridge. Pp. 19. Circular Bulletin No. 131: The Cherry Fruit-Flies. By R. H. Pettit and G. S. Tolles. Pp. 11. Special Bulletin No. 195: Maintaining the Productivity of Cherry Trees. By V. R. Gardner. Pp. 27. Technical Bulletin No. 102: Keeping Qualities of Butter. vi. Experiments on the Production of Metallic Flavor in Butter and Milk; vii. The Microbic Flora of Off-flavored Butter. By G. L. A. Ruehle. Pp. 46. Technical Bulletin No. 103: The Pathogenicity of the Species of the Genus *Brucella* for the Fowl. By I. Forrest Huddleston and M. W. Emmel. Pp. 30. (East Lansing, Mich.)

Biblioteca Nacional. Exposição de Física, Abril de 1930. Catalogo. Pp. 96. (Lisboa.)

U.S. Department of Agriculture. Farmers' Bulletin No. 1624: The Mexican Bean Beetle in the East and its Control. By Neale F. Howard. Pp. ii+14. (Washington, D.C.: Government Printing Office.) 5 cents.

Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 82. A new Woodpecker from Angola: Fourth Preliminary Paper on the Birds collected during the Gray African Expedition, 1929. By W. Wedgwood Bowen. Pp. 89-90. (Philadelphia.)

University of Illinois Engineering Experiment Station. Bulletin No. 204: The Hydroxylation of Double Bonds. By Sherlock Swann, Jr. Pp. 14. 10 cents. Bulletin No. 205: A Study of the Ikeda Short-Time (Electrical Resistance) Test for Fatigue Strength of Metals. By Herbert F. Moore and Seichi Konzo. Pp. 31. 20 cents. Bulletin No. 206: Studies in the Electrodeposition of Metals. By Prof. Donald B. Keyes and Sherlock Swann, Jr. Pp. 18. 10 cents. (Urbana, Ill.)

Mitteilungen der Naturforschenden Gesellschaft Bern aus dem Jahre 1929. Pp. xi+136+18 Tafeln. (Bern: Paul Haupt.)

Achema Jahrbuch, Jahrgang 1928-30: Berichte über Stand und Entwicklung des chemischen Apparatewesens. Herausgegeben von Dr. Max Buchner. Pp. 260+64+xi. (Seele bei Hannover und Berlin: Dechema, Deutsche Gesellschaft für chemisches Apparatewesen E.-V.) 10 gold marks.

Acta Phytochimica. Edited by Prof. Keita Shibata. Vol. 5, No. 1, April. Pp. 97. (Tokyo: The Iwata Institute of Plant Biochemistry.)