

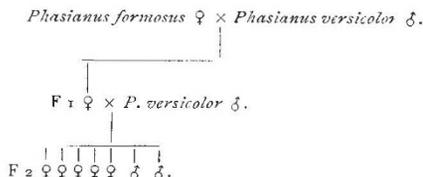
Great attention has been given to the development of the botanical departments, the work of which is directed largely towards the specific demands of the vegetable industries, whether at home or abroad. Great progress has been made and a demand has arisen for a new building to house two new departments, one dealing with the technology of woods and fibres, the other with physiology and pathology, and the governors have authorised its erection and equipment. Similarly, the School of Zoology has been extended and developed in many new ways, and has become the resort of many advanced students. Soon, too, it is hoped to call into being a great department of chemical technology. In fact, Sir Alfred Keogh has to record a gratifying account of strenuous endeavour on the part of the authorities, succeeded by an immediate and remarkable success.

PROF. W. C. UNWIN, F.R.S., president of the Institute of Civil Engineers, was the guest of the evening at the fourteenth annual dinner of the Old Students' Association of the Central Technical College, held on Saturday, February 10. Mr. W. Duddell, F.R.S., occupied the chair, and was supported by a very representative gathering of about 180 old Centralians and their friends. The guests included Sir John Wolfe Barry, K.C.B., F.R.S.; Sir Wm. White, K.C.B., F.R.S.; Profs Armstrong, Dalby, Klugh, and Mather, from the City and Guilds College; Prof. S. P. Thompson, of Finsbury Technical College; and Prof. H. McLeod, a former colleague of Prof. Unwin's at Coopers Hill. The toast of Prof. Unwin was proposed by the chairman, who emphasised his services to the Central Technical College, to education, and to engineering, and read letters and telegrams of congratulation received from old students in all parts of the world. Mr. H. A. Humphrey, one of the first and most distinguished of Prof. Unwin's students, seconded the toast, after which a presentation was made to Prof. Unwin. In replying, Prof. Unwin gave some account of his career, and more particularly of the early days of the Central. He laid stress on the high standard of knowledge at entry required for their matriculation examination, and the value of the training given by the complete course; he regretted the interference with this course which the submission to the London University examinations had entailed. Sir John Wolfe Barry, who is to be the next president, proposed the association in appropriate terms, emphasising the value of such organisations. In reply, Dr. E. F. Armstrong referred to the fact that the membership was approximately 1000, and stated that they were there that evening, not only to do homage to their former professors, but also to honour those members of the City and Guilds Institute who by great expenditure in time and money had founded and maintained the college of which they were all so proud.

SOCIETIES AND ACADEMIES.

LONDON.

Zoological Society, February 6.—Mr. E. G. B. Meade-Waldo, vice-president, in the chair.—Mrs. Rose Haig Thomas: A breeding experiment with pheasants. The experiment was undertaken to confirm a previous one, in which it had been observed that a male pheasant had transmitted to his F₂ ♀ offspring the female plumage of his species. The following cross produced the same result:—



The five hens hatched in F₂ had grown up, and were all *versicolor* in pattern, colour, dimensions, and moral character. One of these hens had been kept to breed with to test her purity, and the skins of the other four were exhibited, together with the skins of a *Ph. formosus* ♀ and a *P. versicolor* ♀ for comparison. The results of

these two experiments did not appear to conform to the theory that the cock was homozygous for sex ♂♂. These experiments had also shown that the male had not transmitted to his female F₂ offspring such constant purity of male plumage. In the first experiment, Silver × Swinhoe, out of four males three were "Si. Sw.," one only pure "Sw.," and the only two males that lived in the second experiment, *formosus* × *versicolor*, were both "Fo. Ve."—J. T. Cunningham: Mendelian experiments on fowls.

The paper described the characters of ten individuals of the F₂ generation reared from a pair of F₁'s produced by a cross between Silky ♀ × Bankiva ♂ made by Mr. D. Seth-Smith. The characters recognised were seven in number, namely, colour of plumage, character of plumage (whether silky or normal), comb, pigmentation of skin and internal tissues, toes (*i.e.* presence or absence of extra toe), feathering of legs, crest on head. The Silky of the original cross had white "silky" plumage, rose comb, crest on head, double hallux, feathered legs, and black pigmented skin. The Bankiva had black-red plumage of normal structure, single comb, unfeathered shanks, normal toes, and normal unpigmented skin, *i.e.* crest. The dominant characters in the F₁ were coloured plumage of normal structure, rose comb with crest, pigmented skin, feathered legs, and double hallux, but several of these characters showed irregular dominance or intermediate condition. The most important results recorded in the paper were imperfect segregation in the F₂ generation in at least two of the characters, namely, the absence of pigmentation in the plumage and the absence of pigmentation in the skin and tissues. The recessive white of the plumage occurred in four individuals, in all of which, but especially in one, some pigment was present. Only one specimen apparently recessive with regard to the absence of pigmentation in the skin had been examined *post mortem*, and in this unmistakable traces of pigmentation in the skin and peritoneum were observed.—J. Lewis

Bonhote: A further collection of mammals from Egypt, received from Captain S. S. Flower. The communication dealt with some twenty species, of which the following two were described as new:—*Meriones crassus pallidus*, from Atbara, Sudan, similar to *M. crassus selysii*, from which it differs in its larger size, paler coloration, and more pointed snout. *Acomys russatus aegyptiacus*, from the desert near Cairo. A race of *A. russatus*, from which it differs in its smaller size and much yellower coloration.

—H. Wallis **Kew**: The pairing of pseudoscorpiones. The paper was based on observations made by the author on living specimens of *Chelifer (Chelifer) latreillii*, Leach, and *Chelifer (Chernes) cyrnes*, L. Koch.

PARIS.

Academy of Sciences, February 5.—M. Lippmann in the chair.—C. Moureu and Amand **Valleur**: The question of the symmetry of sparteine. Details of the properties of the hydriodides and iodomethylates of sparteine. There is no proof of the two nitrogen atoms in this alkaloid being symmetrical, and the stereoisomerism of the two sparteine iodomethylates is proved.—A. **Lacroix**: The volcanoes of central Madagascar. The *massif* of Itasy.—E. **Vallier**: The present position of the ballistic problem.—S. **Pozzi**: Some cases of ossification of the ovary.—Henri **Parenty**: A temperature regulator of precision. The instrument described by E. Esclançon in a recent number of the *Comptes rendus* was anticipated by MM. Parenty and Bricard in 1896.—A. **Perot**: The wave-length of the solar line D₁. The results of the application of the interference method to the study of the line D₁. A curve is given showing the increase of the wave-length as a function of the distances from the centre along a line N.-S.—G. A. **Tikhoff**: The photographic registration and reproduction of the twinkling of the stars. A photograph is taken of the spectrum of the star by means of a prism objective, a uniform movement perpendicular to the length of the spectrum being imparted to the sensitised plate. In the case of Sirius, the changes of intensity of different rays are usually independent of each other, whilst in the case of the planet Venus all the rays change simultaneously.—M. **Tzitzéica**: The Laplace equations with quadratic solutions.—Henri **Lebesgue**: The problem of Dirichlet.—G. **Cotty**: A class of quadratic forms with four variables

connected with the transformation of Abelian functions.—**Gabriel Sizes**: The multiple resonance of bells. Details of the harmonics given by the four principal bells of Montpellier Cathedral.—**E. Besson**: The condensation of water vapour by expansion in an atmosphere of carbonic acid. The experiments were recorded photographically. Condensation commenced for expansion between 1.30 and 1.32; if the gas was previously ionised by exposure to the Röntgen rays for two seconds, the condensation appeared a little sooner. The importance of removing all traces of air in these experiments is emphasised.—**L. Verain**: The dielectric constant of carbon dioxide in the neighbourhood of the critical point. The results of measurements of the dielectric constants of liquid and gaseous carbon dioxide for temperatures between -4° and 30° C. are shown graphically. The constant varies between 1.00 and 1.60, the experimental error being under 0.05. At 31.4° C. the values for the gas and liquid become identical.—**G. Urbain**: A laboratory balance with electromagnetic compensation for the study of systems giving off gas with a sensible velocity. The final adjustment of this balance is made by altering the intensity of an electric current in a solenoid acting upon a small magnet suspended from one of the beams. The balance described had a maximum load of 0.1 gram and a sensibility of 0.01 milligram.—**Marcel Boll**: The application of the electrometer to the study of chemical reactions in electrolytes.—**E. Baud**: A general law of solution.—**Pierre Achalme**: The rôle of the inter-atomic electrons in catalysis.—**A. Seyewetz**: The preparation and properties of a silver oxybromide. This oxybromide is prepared by the action of an aqueous solution of benzoquinone containing potassium bromide upon finely divided silver, and purifying the crude product by crystallisation from hot ammonia solution. The analyses correspond to Ag, Br, O.—**A. Guntz** and **M. de Greiff**: Copper amalgam. The properties of the amalgam depend on whether it has been prepared in the cold by electrolysis or by heat. The former leaves the amalgam HgCu when submitted to great pressure; the latter, under similar treatment, leaves nearly pure copper.—**G. Vavon**: A method of preparation of the aromatic alcohols. The addition of hydrogen to the aromatic aldehydes in the cold under the catalytic action of platinum black gives high yields of aromatic alcohols. Numerous applications of the reaction are described, proving the method to be a general one.—**V. Grignard** and **Ch. Courtot**: Some new α -indene derivatives.—**E. Chablay**: The reduction of the amides and esters of the fatty series by the metal-ammoniums. The amides give the sodium derivative and the corresponding sodium alcoholate.—**Louis Ammann**: The influence of the extraction liquid upon the composition of the beet-root pulps from sugar works and distilleries. The residues from the sugar works are less valuable as cattle food than those from the distilleries, and this difference is mainly due to the nature of the liquid used in the extraction of the beet.—**E. Boullanger**: The action of flowers of sulphur upon vegetation. Small quantities of sulphur mixed with the soil have a favourable action upon the growth and yield of various plants.—**A. Berg**: The diastatic activity of the various organs of *Ecballium elaterium*. The physiological function of the pulp surrounding the seeds.—**A. Trillat**: The action of putrid gases upon the lactic ferment.—**H. Cardot** and **H. Langier**: The localisation of stimulations in the unipolar method.—**J. Thiroloin** and **M. Jacob**: Prolonged forms of experimental pancreatic diabetes.—**L. Grimbert** and **J. Morel**: The determination of the acidity of the urine. The calcium salts are removed from the urine by addition of potassium oxalate, and the ammonia determined and allowed for.—**Gabriel Bertrand**: The importance of manganese in the formation of the conidia of *Aspergillus niger*. In the absence of manganese the conidia of this mould are not formed. The amount of manganese required is extremely small.—**M. Javillier**: The influence of the suppression of zinc in the culture medium of *Aspergillus niger* on the secretion of sucrase by this mould. *Aspergillus* deprived of zinc allows no sucrase to diffuse into the culture medium nor into distilled water. The cells secrete sucrase, but the quantity is much less than when a trace of zinc is present.—**J. Dewitz**: Experimental apterism in insects.—**Georges Bohn**: Variations in sensibility in relation to the variations of internal chemical state.—**E. Vasticar**: The struc-

ture of the spiral membranous sheet of the slug.—**M. Fabre-Domergue**: The bacterial purification of oysters by treatment with artificial filtered sea water.—**Louis Calvet**: Remarks on the parasitic Bryozoa, *Watersia paessleri*.—**L. Joubin**: The cephalopods captured in 1911 by the Prince of Monaco.—**L. Sudry**: The importance and function of air-borne dusts.—**G. Grandidier**: A new example of the extinction of giant animal forms closely allied to existing species.—**M. Parvu**: The natural defence of rocks against the destructive action of the sea.

February 12.—**M. Lippmann** in the chair.—**Ch. Bouchard**: An optical sphygmo-oscillograph. A description of an optical arrangement designed to reduce, so far as possible, the inertia of the Marey sphygmograph.—**M. De Launay** was elected a member of the section of mineralogy in the place of the late A. Michel Lévy.—**J. Guillaume**: Observations of the sun made at the Observatory of Lyons during the fourth quarter of 1911. Observations were possible on fifty-five days, and the results are given in tabular form.—**Emile Borel**: The fundamental theorems of the theory of real variable functions.—**Jules Drach**: The differential equations of geometry.—**Federigo Enriques**: The theorem of existence for algebraic functions of two independent variables.—**A. Lapresle**: The distribution of pressures and velocities in the disturbed region round a surface in a uniform current of air. The region was explored with the aid of a Pitot tube.—**M. Julhe**: The permeability to hydrogen of balloon envelopes. An additional layer formed of calico impregnated with a solution of gelatine in glycerine is placed inside the ordinary material. It prevents large losses of hydrogen.—**Paul Jégou**: The effect of secondary resonance in the receivers used in wireless telegraphy.—**G. Reboul**: Photochemical actions and photo-electrical phenomena. Ultra-violet light from a quartz mercury lamp was allowed to fall on a metal plate, and the emission of the negative charges studied.—**Eugène Bloch**: The use of photoelectric cells as photophones. An extension of the experiments of Bergwitz on the changes in the resistance of potassium by exposure to light.—**Albert Colson**: Methods of observation of the dissociation of nitrogen peroxide. Data are given for the dissociation pressures of nitrogen peroxide measured by three methods. These are compared with the dissociation phenomena observed for the same gas in chloroform solution, and it is shown that the results do not agree with the view that the dissolved and gaseous particles are identical.—**M. Dubrisay**: Chemical equilibria in solution. An experimental study of the reversible reaction between succinic acid and barium acetate.—**H. Baubigny**: Researches relating to the action of alkaline sulphites on copper salts. It is proved that a dithionate is formed when copper sulphate is acted upon by an excess of alkaline sulphite.—**Eyvind Boedtker**: Some menthone derivatives. A proof of the constitution of the derivatives obtained by the interaction of benzylidene-menthone and alkylmagnesium bromides.—**H. Gault**: The lactonisation of the α -ketonic esters.—**H. Cousin**: The action of bromine and chlorine upon dehydro-dicarvaicol.—**G. Malfitano** and **Mlle. A. Moschkoff**: The formation of dextrine from starch by drying. Starch placed in a vacuum over phosphorus pentoxide was found to become increasingly soluble in water. This is attributed by the authors to the formation of dextrin, and regarded by them as evidence that in the starch particles water serves as a link between the $C_6H_{10}O_5$ molecules.—**E. Bodin**: The purification of oysters in filtered artificial sea water. The author's experiments confirm those of Fabre-Domergue on the possibility of purifying oysters by artificial storage without commercial depreciation.—**E. Rouquette**: The sterilisation of drinking water by the action of ozonised oxygen and chlorine compounds in the nascent state. The simultaneous action of sodium bisulphate, hydrogen peroxide, and bleaching powder is suggested. The complete sterilisation of the water is shown to be rapid, the residual salts are harmless and very small in amount, and the cost is not excessive. It is of special service in cases of urgency.—**A. Magnan**: The cæcum in mammals. In previous papers the author has shown the relation between the length of the cæcum and the nature of the food in birds. It is shown that a similar relation holds in mammals.—**Mieczyslaw Oxner**: Experiments on the faculty of learning in the marine

fishes, *Coris julis*. A small piece of coloured paper was suspended on a line above a baited hook. The fish learnt to associate the hook with the paper, as after being twice caught on successive days, it refused the bait when the paper was attached, but took it when the paper was removed.—F. Kerforne: The tectonic of the region south of Rennes.

BOOKS RECEIVED.

Calcul et Construction des Alternateurs Mono- et Polyphasés. By Prof. H. Birven. Translated by P. Dufour. Pp. 179. (Paris: Gauthier-Villars.) 6 francs.

Théorie de la Couche Capillaire Plane des Corps Purs. By Dr. G. Bakker. Pp. 95. (Paris: Gauthier-Villars.) 2 francs.

Organisation et Direction des Usines. D'après de livre allemand intitulé "Der Fabrikbetrieb" de A. Ballewski. By A. Mayer. Pp. vi+220. (Paris: Gauthier-Villars.) 7.50 francs.

Kant's Gesammelte Schriften. Herausgegeben von der Königlich Preussischen Akademie der Wissenschaften. Band xiv. Dritte Abtheilung: Handschriftlicher Nachlass. Band i.: Mathematik-Physik und Chemie-Physische Geographie. Pp. lxii+637. (Berlin: G. Reimer.) 19 marks.

Ruins of Desert Cathay. Personal Narrative of Explorations in Central Asia and Westernmost China. By M. Aurel Stein. Vol. i. Pp. xxxviii+546+plates and map. Vol. ii. Pp. xxi+517+plates and maps. (London: Macmillan and Co., Ltd.) 2 vols. 42s. net.

Diesel Engines for Land and Marine Work. By A. P. Chalkley. With an introductory chapter by Dr. R. Diesel. Pp. xi+226. (London: Constable and Co., Ltd.) 8s. 6d. net.

Mineralogy. By F. Rutley. Eighteenth edition. Pp. viii+267. (London: T. Murby and Co.) 2s. net.

Vanished Arizona. Recollections of the Army Life of a New England Woman. By M. Summerhayes. Second edition. Pp. 319 (Salem, Mass.: The Salem Press Company.) 1.60 dollars.

Practical Chemistry for Engineering Students. By A. J. Hale. Pp. xvi+192. (London: Longmans and Co.) 3s. net.

An Experimental Course of Physical Chemistry. By Dr. J. F. Spencer. Part II. Dynamical Experiments. Pp. xvi+256. (London: G. Bell and Sons, Ltd.) 3s. 6d.

Solutions of the Exercises in Godfrey and Siddons's Solid Geometry. By C. L. Beaven. Pp. 164. (Cambridge: University Press.) 5s. net.

Examples in Arithmetic, Part I. Taken from A School Arithmetic. By H. S. Hall and F. H. Stevens. With Answers. Pp. vii+115+xxii. (London: Macmillan and Co., Ltd.) 1s. 6d.

A.B.C. of Hydrodynamics. By Lieut.-Colonel R. de Villamil. Pp. xi+135. (London: E. and F. N. Spon, Ltd.) 6s. net.

The Gardener and the Cook. By L. H. Yates. Pp. x+260. (London: Constable and Co., Ltd.) 3s. 6d.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 22.

ROYAL SOCIETY, at 4.30.—Bakerian Lecture: The Variation of the Specific Heat of Water investigated by the Continuous Mixture Method: Prof. H. L. Callendar, F.R.S.—Index to Reports of Physical Observations—Electric, Magnetic, Meteorological, Seismological—made at Kew Observatory: Dr. C. Chree, F.R.S.—On the Velocities of Ions in Dried Gases: R. T. Lattey and H. T. Tizard.—The Observation by means of a String Electrometer of Fluctuations in the Ionisation produced by γ Rays: Prof. T. H. Laby and P. W. Burbidge.—The Wave Problem of Cauchy and Poisson for Liquid of Finite Depth and for Slightly Compressible Liquid: F. B. Piddock.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Supply and Transmission of Power in Self-contained Road Vehicles and Locomotives: J. C. Macfarlane and H. Burge.

FRIDAY, FEBRUARY 23.

ROYAL INSTITUTION, at 9.—The Gyrostatic Compass and Practical Applications of Gyrostats: George K. B. Elphinstone.

PHYSICAL SOCIETY, at 5.—A Method of Accurate Comparison of Quantities of Radium: Prof. E. Rutherford, F.R.S., and Mr. Chadwick.—The Absorption of the γ -rays by Gases: Mr. Chadwick.—On Wave-form Sifters for Alternating Currents: A. Campbell.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Works for the Prevention of Coast-erosion: W. T. Douglass.

SATURDAY, FEBRUARY 24.

ROYAL INSTITUTION, at 3.—Molecular Physics: Sir J. J. Thomson, F.R.S. ESSEX FIELD CLUB, at 6 (at Essex Museum, Stratford).—Report on the Lichens of Epping Forest. II.: R. Paulson and P. G. Thompson.

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MONDAY, FEBRUARY 26.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Economic Geography of the Type: A. J. Sargent.

ROYAL SOCIETY OF ARTS, at 8.—The Loom and Spindle: Past, Present and Future; Primitive Weaving Appliances: Prehistoric, Ancient, and Modern: L. Hooper.

INSTITUTE OF ACTUARIES, at 5.—On the Principle Provisions of the Law of Bankruptcy in England, with References to some Decisions of Interest to Life Insurance Companies: N. J. Carter.

TUESDAY, FEBRUARY 27.

ROYAL INSTITUTION, at 3.—Optical Determination of Stress, and some Applications to Engineering Problems: Prof. E. G. Coker.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Further Discussion: Some Features of the West African Government Railways: F. Shelford.—Probable Papers: (1) Roller and Ball Bearings; (2) The Testing of Antifriction Bearing Metals: Prof. J. Goodman.

WEDNESDAY, FEBRUARY 28.

GEOLOGICAL SOCIETY, at 8.—Late Glacial and Post-glacial Changes in the Lower Dee Valley: L. J. Wills.—The Glen Orchy Anticline (Argyllshire): E. B. Bailey and M. Macgregor.

ROYAL SOCIETY OF ARTS, at 8.—Education in Science as a Preparation for Industrial Work: H. A. Roberts.

BRITISH ASTRONOMICAL ASSOCIATION, at 5.

THURSDAY, FEBRUARY 29.

ROYAL SOCIETY, at 4.30.—Probable Papers: The Bacterial Production of Acetylmethylcarbinol and 2.3. Butylene Glycol. II: Dr. A. Harden, F.R.S., and Dorothy Norris.—An Instrument for Measuring the Distance between the Centres of Rotation of the Two Eyes: H. S. Ryland and B. T. Lang.—The Locomotor Function of the Lantern in *Echinus*, with remarks on other Allied Lantern Activities: Dr. J. F. Gemmill.—The Relation of Wild Animals to Trypanosomiasis: Capt. A. D. Fraser, R.A.M.C., and Dr. H. L. Duke.—The Transmission of *Trypanosoma nanum* (Laveran): Dr. H. L. Duke.—The Development of a Leucocytozoon of Guinea-pigs: E. H. Ross.

FRIDAY, MARCH 1.

ROYAL INSTITUTION, at 9.—The Total Solar Eclipse in the South Pacific, April, 1911: Dr. W. J. S. Lockyer.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Design and Construction of Masonry Dams: H. J. F. Gourley.

SATURDAY, MARCH 2.

ROYAL INSTITUTION, at 3.—Molecular Physics: Sir J. J. Thomson, F.R.S.

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