

Societies and Academies.

LONDON.

Royal Society, Dec. 6.—A. E. Boycott, C. Diver, S. Hardy, and F. M. Turner: The inheritance of sinistrality in *Limnaea peregra*. This snail is normally dextral; a sinistral variety, in which the spiral twist of body and shell is completely reversed, is very rare. Sinistrality behaves as a Mendelian recessive, but the appearance of any change of twist imposed by crossing is delayed one generation. Albinism is also a simple Mendelian recessive but inherited directly. The delayed inheritance of sinistrality may be due to the twist of animal and shell being determined before the spermatozoon has time to be fully effective.—R. H. Burne: A system of 'fine' vessels associated with the lymphatics in the cod (*Gadus morrhua*). These vessels follow the chief arteries (except those to viscera). They have minute connexions with efferent branchial vessels, and peripherally they break up in skin and mucous membrane of the mouth and pharynx, there communicating with the capillary plexus of lymphatics. It is suggested that the lymphatics evolved from a blood vascular system containing both arteries and veins; the venous component became definitive lymphatics, whereas the arterial component vanished. In Teleosts the arterial component persists as the 'fine' vessels.—E. Hindle: Further observations on Chinese kala-azar.—Eric Ponder: Hæmolysis by brilliant green and serum.—A. V. Hill, Grace Eggleton, and P. Eggleton: The coefficient of the diffusion of lactic acid through muscle.—C. H. Best, K. Furusawa, and J. H. Ridout: The respiratory quotient of the excess metabolism of exercise.—A. V. Hill and W. Hartree: The energy liberated by an isolated muscle during the performance of work. A new point of view is presented in connexion with the thermodynamics of muscle. Extra energy is given out, when work is performed, only if work be done during continuance of stimulus. The muscle behaves like a gas suddenly brought in contact with a reservoir of heat and allowed to expand. If such contact be maintained during expansion, extra energy, equal to work, will be taken from reservoir and work will be greater. In muscle some 'intensity' factor is increased by the stimulus; if the stimulus be continued, 'intensity' is maintained at full value, more work can be done and extra energy set free.—A. V. Hill: The diffusion of oxygen and lactic acid through tissues. The diffusion of dissolved substances through tissues is considered for certain cases—a plane sheet, a semi-infinite solid, a cylinder—which are mathematically soluble.—D. Keilin: Cytochrome and respiratory enzymes. Cells of aerobic organisms contain four hæmatin compounds, an unbound hæmatin and the three hæmatins (*a'*, *b'*, and *c'*) of cytochrome, and a thermolabile indophenol oxidase. The latter takes an important part in cellular respiration. Cytochrome (especially *a'* and *c'*) is oxidised by it and is reduced by dehydrases. Cytochrome acts therefore as a carrier between two activating mechanisms of cells: dehydrases and oxidases. Autoxidisable component *b'* of cytochrome and free protohæmatin can act as carriers between the dehydrase system and molecular oxygen, and also as direct catalysts.—F. R. Miller and N. B. Laughton: Myograms yielded by Faradic stimulation of the cerebellar nuclei.—D. Burk: The free energy of glycogen-lactic acid breakdown in muscle.—F. C. Smith: The ultra-violet absorption spectra of certain aromatic amino-acids and of the serum proteins. *Amino-acids*.—In tyrosine, two new bands have been found, at wave-lengths 2240 Å. and 1940 Å. *Serum Proteins*.—Samples of exceptional purity were em-

ployed. True absorption occurred. Though proteins are precipitated by ultra-violet radiation, exposure for photography causes no measurable change. Contrary to the work of Judd Lewis, horse and human serum-albumin spectra are found to be identical within experimental limits. The ratio of extinction coefficients at head and foot of curve may be taken as index of purity of protein.—A. S. Parkes: The functions of the corpus luteum. (Pts. 1-3).

Geological Society, Nov. 7.—Sydney George Clift and Arthur Elijah Trueman: The sequence of non-marine lamellibranchs in the Coal Measures of Nottinghamshire and Derbyshire. The succession of the genera *Carbonicola*, *Anthracomya*, and *Naiadites* is discussed. In general features, the sequence is similar to that of the South Wales coalfield. The lowest horizons are rich in large specimens of *Carbonicola*. Above them, but below the horizon of the Barnsley Seam, occur species of *Anthracomya* and *Carbonicola* characteristic of the zone of *Anthracomya modiolaris*. The zone of *Carbonicola similis* is not separately recognised in the area. The sequence of faunas, and particularly the range of *Carbonicola* and *Naiadites* within the '*Similis-Pulchra*' zone, appear to be of value in determining horizons above the Barnsley Seam.

Physical Society, Nov. 23.—G. Temple: The physical interpretation of wave mechanics. The principles are illustrated by discussions of the propagation of free electric waves in uniform electromagnetic fields, of bound electric waves in the hydrogen atom, relativistic wave mechanics (prior to the work of Dirac and Darwin) and the Compton effect.—Allan Monkhouse: The effect of superimposed magnetic fields on dielectric losses and electric breakdown strength. Both are seriously affected by superimposed magnetic fields. A theoretical explanation is suggested by a paper read by Prof. A. Smouloff before the International Mathematical Conference at Bologna in September last.—Albert Campbell: A new A.C. potentiometer of Larsen type.—E. F. Herroun and E. Wilson: Ferromagnetic ferric oxide. The authors confirm the observation by Messrs. Sosman and Posnjak that lepidocrocite, but not göthite, yields on dehydration a strongly ferromagnetic ferric oxide. As all the specimens of lepidocrocite examined contained 3 or 4 per cent of manganese oxide, this substance may be an essential constituent of this crystalline form of the hydrate. The temperature at which the ferromagnetic oxide is permanently transformed into the common paramagnetic kind is largely dependent upon its mode of preparation. Although copper ferrite has a higher maximum permeability than ordinary precipitated magnetic oxide of iron, it falls far below that of the purer forms of native magnetite. The different susceptibilities of ferric oxide resulting from the oxidation of natural magnetites are attributed to impurities, particularly magnesia, which forms a magnetic ferrite.

Linnean Society, Nov. 29.—T. A. Sprague and E. Nelmes: The herbal of Leonhard Fuchs. Identifications of the 511 plants figured, with a general account of the herbal. The classification is mainly (1) pharmaceutical and economic, but sometimes (2) philological: thus (1) *Campanula Rapunculus* L. is classed with the swede and the beet, because it has an edible root, and is widely separated in consequence from *C. Trachelium* L., which was used as a remedy for ulcers; and (2) *Momordica Balsamina* L. and *Impatiens Balsamina* L. are placed in the same chapter (genus) because the former was called *Balsamina* and the latter *Balsaminum*.

PARIS.

Academy of Sciences, Oct. 29.—Ch. Fabry: The rôle of the atmospheres in the occultations of stars having an apparent sensible diameter. Excepting the passage of one of the satellites of Jupiter behind the planet, phenomena of this class are rare. An occultation of the satellites of Jupiter by Mars would be much easier to observe, but such an occultation is unfortunately very rare.—R. Bourgeois: The work carried out by the geographical service in 1926 and 1927. An outline of the work included in the last published report.—Pierre Weiss and G. Föex: The atomic moments. Theories relating to atomic moments attempt to connect the moments deduced from magnetic measurements with the principles of atomic mechanics and the electronic models of the atom, either for comparing the moments obtained in other ways, especially from spectrum analysis, or to study the effects of atomic linking, polar or complex, on the atomic moment. Adopting the value 1126.5 as the number for the experimental electron, the atomic moments of various ions and elements are recalculated.—Charles Nicolle and Charles Anderson: A new recurrent spirochæte, pathogenic for the guinea-pig, *Sp. sogdianum*, transmitted by *Ornithodoros papillipes*. This organism has its origin in Russian Turkestan. White rats, white mice, and the ape (*Macacus*) can be infected, but not so seriously as the guinea-pig. As regards its specificity, a first attack confers immunity, but *Sp. hispanicum*, *Sp. duttoni*, *Sp. crociduræ*, *Sp. normandi* do not confer immunity against *Sp. sogdianum*.—Piazzolla-Beloch: Surfaces of the third order possessing curves with connected branches.—Bertrand Gambier: Sub-groups of the group of homographies. Application to the study of skew curves.—Walter Saxer: The structure of normal families of meromorph functions.—R. Mazet: The commencement of the flow through a thin-walled weir.—L. Escande: Flow on overflow weirs.—Jean Uilmo: Polarisation in the theory of light quanta.—Adolpho T. Williams: The ultimate lines of mercury and aluminium.—M. Prettre and P. Laffitte: The ignition temperature of hydrogen and air. The figures given are about 100° C. lower than those of other workers, with the exception of Dixon.—A. Travers and Malaprade: A new fluoboric acid. Boric and hydrofluoric acids react instantaneously, giving a fluoboric acid which differs from HBF_4 , as its salts are easily decomposed by alkalis. HBF_4 is formed slowly, a state of equilibrium between the two fluoboric acids being finally reached.—Raymond Delaby and Pierre Dubois: The formation of allyl alcohol. The preparation of the forms of glycerol.—L. Maume and J. Dulac: Correlation between positive antagonism and absorption by the plant. Studies on the amounts of lime absorbed by wheat in the presence of sodium salts.—Charles Pérez: The evolutive cycle of *Rhizocephalus* of the genus *Chlorogaster*.—J. Legendre: The psychology of *Culex pipiens*. The final act of reproduction in females of *C. pipiens* is not due to a physiological automatism. The emission of the eggs is delayed if the necessary water is not present.

Nov. 5.—Ch. Fabry: Remarks on the diffusion of light and of Hertzian waves by free electrons.—H. Douvillé: The Pic de Rébenacq and its eruptive rocks.—J. Costantin: A fungus station recently started in the forest of Fontainebleau. An account of experiments on the culture of *Pleurotus Eryngii* in the forest of Fontainebleau. The possibility of the culture of this edible fungus on the large scale has been proved.—H. Vincent: The toxic index of the strains of *Bacillus coli*. New remarks on the basis of anticolibacillus serotherapy. The toxic power of coli bacilli is dependent of the strain and of the

biological peculiarities (secretion of indol, fermentation of lactose, action on neutral red). Both true coli and para coli bacilli have the common property of fabricating a neurotropic toxin.—Charles Nicolle, Charles Anderson, and Jacques Colas-Belcour: Experimental study of the spirochæte of the gondi (*Ctenodactylus gondi*).—Charles Nicolle, Charles Anderson, and Jacques Colas-Belcour: First attempts at the adaptation of a spirochæte of fowls to various species of *Ornithodoros*.—A. Th. Masloff: A class of *W* congruences.—G. C. Moisl: Functional varieties.—Mandelbrojt: Some new theorems on the singularities of Dirichlet's series.—K. Abramowicz: Transformations of automorph functions.—Georges Valiron: The values of a meromorph function in the neighbourhood of a singularity.—R. Swyngedaew: The relations which connect the various kinds of slip to be distinguished in belt transmission.—Paul Ditisheim: Correction for the effect of the magnetic field on the rate of watches.—Carl Störmer: An echo of short electromagnetic waves arriving several seconds after the emitted signal: its explanation according to the theory of the aurora borealis. In the autumn of 1927, J. Hals noted an echo of the radio-signals emitted from Eindhoven, arriving about three seconds after the original signal. In an attempt to repeat this observation, after a long series of negative results, a series of echoes was observed on Oct. 11 last. The delay in the echo varied from three to fifteen seconds, averaging eight seconds. These echoes have their origin in space beyond the moon's orbit. A theory is developed to account for the phenomenon based on the supposition of the existence of swarms of electrons under the influence of the earth's magnetic field: this gives a delay in hearing the echo of the order of those observed (see NATURE, Nov. 3, p. 688).—H. Deslandres: Remarks on the preceding communication.—Mario Bossolasco: The ellipticity of the terrestrial equator.—H. Roussilhe: The correct restitution of a figure in three dimensions. Application to aerial photographs.—Th. De Donder: Relativist generalisation of the new theory of Einstein.—A. Féry: The variation of the specific resistance of thin layers of platinum as a function of the thickness and of the temperature. The specific resistance of thin films of platinum deposited by cathode dispersion is a function of the thickness, and the experimental results can be expressed by two equations: $2 \log (\rho/\rho_0) = 11.48 - 0.0135a$ and $2 \log (\rho/\rho_0) = 3.245$, where ρ is the specific resistance given by experiment, ρ_0 the specific resistance of ordinary platinum, and a the thickness in $\text{mm} \times 10^{-6}$. For a thickness greater than $287 \text{ mm.} \times 10^{-6}$, the specific resistance becomes independent of the thickness, but still has a resistance 40 times that of ordinary platinum. If the film is heated to 340° C., its resistance falls to that of ordinary platinum.—G. Foëx: The crystallisation of mesomorphic substances in the magnetic field. The preparation of a solid with oriented molecules. L. Décombe: Electrified spherical pellicles and the privileged orbits of Bohr-Sommerfeld.—P. Daure: Study of the secondary radiations observed in the molecular diffusion of light by fluids (Raman effect).—M. Ponte and Y. Rocard: The Raman effect in the domain of the X-rays.—Paul Gaubert: The structure of the crystals of heulandite.—Henri Mémerly: The summer of 1928 and the solar variations. Two facts are emphasised, that the year 1928 is the maximum of the solar period commencing in 1923, and that an important recrudescence of sunspots and faculæ occurred between June and October 1928. With rare exceptions, such as the summers of 1900 and 1911, corresponding to a small number of sunspots, the cause of nearly all abnormal temperature variations on the earth can be traced to variations in

solar phenomena.—Léon Aufrère: The orientation of sand dunes and the direction of the wind.—C. Dazère: A storm observed at the Pic du Midi and the formation of hail.—J. Chaze: The localisation and disappearance of alkaloids in the epidermis of the tobacco leaf. The theory which regards alkaloids in plants as excretory substances is now generally admitted. New experiments are described of morphological and microchemical order which support this view.—Marc Simonet: The number of chromosomes in the common iris (*Iris germanica*).—Marc André: Researches on the post-larval development of *Leptus autumnalis*.—Serge Youriévitich: A new method of recording ocular movements. The ocular cinegraph.—Georges Bourguignon and Henri Laugier: The variations in chronaxy in fatigue by sustained voluntary contraction in man.—R. Leriche and R. Fontaine: Experimental indication of peripheral vaso-motive regulation independent of the general circulatory regulation.—Philippe Fabre: The production of a rectangular wave for researches in chronaxy.—Mme. M. L. Leroux-Legueux: Some points concerning reproduction in amphipod Crustacea: the temporary ovisacs, their formation and their function.—Mlle. D. Van Stolk, E. Dureuil, and Heudebert: The conditions of formation and destruction of vitamin-D during the irradiation of ergosterol. A continuation of the work of Heilbron, Kamm, and Morton on the action of ultra-violet light on ergosterol. The destruction of the vitamin in the course of the reaction is regarded by the authors as due to oxidation, and this can be prevented, or at least retarded, by working in an atmosphere of nitrogen.

LENINGRAD.

Academy of Sciences (*Comptes rendus*, No. 22).—D. A. Grave: Evaluation of the true influence of the electric hyper-atmosphere on terrestrial magnetism.—B. P. Titov and A. A. Levin: A method of determination of the variations in the volume of the arm due to the pulsations of heart. An apparatus for observing and recording the variations is described.—L. S. Berg: New data on the problem of the origin of the fauna of Lake Baikal. The endemic fauna of Baikal consists of two elements: (1) forms which developed in the lake itself during its long geological history; (2) relies of a fresh-water (and brackish-water) fauna which inhabited northern Asia (and North America) and parts of central Africa during the late Tertiary. A large number of forms which have been for a long time considered peculiar to Lake Baikal are now known from other places.—A. I. Argiropulo: The systematic position of the Turkestan rat (*Rattus turkestanicus* Satunin). The Turkestan rat is distinct from *Rattus rattus* (L.), but conspecific with the Indian *R. vicereis* (Bonh.), though representing another race. A diagnosis of *R. turkestanicus turkestanicus* Sat. and the characters separating it from *R. turkestanicus vicereis* (Bonh.) are given.—K. K. Flerov: The seasonal variations in the hairs of *Capreolus*. Detailed descriptions of colour changes in the hairs during different seasons are given. The winter coloration is caused by the gradual loss of the lustre and by the brown and fawn shades of colour being replaced by grey, owing to the rubbing off of some hairs.—J. P. Kravetz: Magnetic anomalies. The paper by D. A. Grave (*Comptes rendus*, No. 16-17; 1928) on the subject is discussed, and the arguments of that author stated to be founded on a misunderstanding.

VIENNA.

Academy of Sciences, July 12.—R. Weiss and J. L. Katz: Triphenylmethanes with linked benzol nuclei.

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Preparation of an imino-phenylene-acredine-derivative, and the dependence of the colour of the compound upon the nature of the atomic groups forming the rings.—O. Brunner: The amyrynes. Dehydrogenating experiments with amyryl.—J. Pollack and E. Gebauer-Fülnegg: Coupling reactions.—E. Gebauer-Fülnegg and J. S. Reese: The directing influence of carbethyloxy groups in phenols.—E. Gebauer-Fülnegg and E. Neumann: Note on sulphur-containing derivatives of *p*-dichloro-benzol.—E. Gebauer-Fülnegg, W. H. Stevens, and E. Krug: Sulphuric acid esters of the carbohydrates.—E. Riess, F. Berndt, and G. Hitschmann: Phenol and cresol sulpho-chlorides.—E. Riess and F. Pilpel: Determination of the constitution of cresol disulpho-chloride.—E. Späth and F. Breusch: The electrolytic reduction of cyclic acid imides to hydrated cyclic bases.—E. Späth and E. Kruta: The synthesis of berberine-like bases from compounds of the type of tetra-hydro-papaverine.—F. Sigmund and F. Haas: The reduction of the secondary hydroxyl group in ricinoleic acid.—A. Kieslinger: Geology and petrography of the Kor Alps. (9) The structure of the Kor Alps and their relations to neighbouring regions.—F. Bothe: The influence of the substratum and some other factors on the luminescence and growth of *Mycelium x* and *Agaricus melleus*. Alkali chlorides and sulphates promote luminescence, alkali nitrate in 2 per cent solution still more, but ammonium salts weaken. Zinc increases both growth and luminescence. An addition of dead fungus material of the same or other species, also in varying order fructose, glycerine, cane-sugar, promotes the effects. The optimum temperature is about 16°.—E. Chwalla: The stability of centrally and excentrically compressed rods of construction steel. The invalidity of the Euler formula has led to further inquiries about slender rods.—K. Höfler: Visible alterations in living protoplasm evoked by salts. Onion scales were placed in various innocuous neutral salts in isotonic or plasmolysing solution. With favourable cell material the resulting appearance depends on the special salt. The appearances due to alkali salts are different from those due to cane sugar or to the alkaline earths.—W. Leopold: The genus *Cardamine* with special reference to the question of hybrids in the section *Dentaria*.—F. Weiss-Tessbach: Communications of the Radium Institute. (224) Micro-calorimetric measurement of the absorption of γ -rays from radium-C. An ether calorimeter was used.—G. Kirsch and H. Pettersson: Communications of the Radium Institute. (225) The question of the yield in atomic disintegration experiments.—F. Urbach: Communications of the Radium Institute. (225a) The theory of the form of the bands in absorption of light and emission from solid bodies. By one argument the oscillating atom would give a spectral line with minimum intensity at the mean frequency; by another argument a superposition of many such abnormal frequency curves would give a normal frequency distribution.—A. Basch: The error-tensors and the law of transfer of error in the elementary operations of vector algebra.—F. Emich: The observation of streaks in chemical work. By observing the streaks with a microscope when a drop of one liquid enters another it is possible to tell which liquid is optically denser.—F. Hölzl: Organic acids and bases in non-aqueous solutions. (4) Phenols and amines. Electric conductivity measurements made it possible to trace the combining proportions of ammonia and the amines with the phenols.—O. Amperfer and W. Hammer: Results of the geological exploring expedition in West Servia. (3) Tectonics and morphology of the Zlatibor massiv.—R. Wagner: Symmetry relations of the panicles of *Paulownia Rehderiana*.