

Societies and Academies.

LONDON.

Geological Society, Dec. 4.—Edward Greenly: Foliation in its relation to folding in the Mona Complex at Rhoscolyn (Anglesey). The major, minor, and minimum foldings (with their thrustings) have each given rise to a foliation and developed in chronological order. The relations of major to minor folding furnish an explanation of the fact that the major cross-foliation, unlike a slaty cleavage, fails to traverse the pelitic beds. The foliation of the plutonic intrusions, and the tremolite-schists, are products of the major movements. The principal metamorphism is independent of, and older than, the major and subsequent movements. Its foliation is developed along innumerable thrusts, but these are at angles so acute to the bedding that, especially when thrown into rapid isoclines, they easily escape notice. This is the true explanation of 'monoplastic schists'. The early foliation is really the regional metamorphism. But the thrusting to which it is due, unlike those of the three later series, can be referred to no visible folding. Accordingly, its disentanglement goes to confirm the hypothesis that recumbent folding exists, and is the dominant structure of the Mona Complex.—H. P. Lewis: The Avonian succession in the south of the Isle of Man. The rocks described occupy a 'key' position in relation to Carboniferous rocks of the Irish Sea area. They lie within a basin, which is partly tectonic, between the Port St. Mary-Arbory fault on the north-west, and the line of the Langness Ridge on the south-east. The lithological and palaeontological divisions have been worked out.

Linnean Society, Dec. 5.—Mrs. E. S. Grubb: The biological station of Alto da Serra, São Paulo, Brazil. This station consists of about 150 acres on the summit of the Serra do Mar, between the town of São Paulo and the sea. Von Ihering, in 1909, when he was director of the São Paulo Museum, had his attention directed to the rich and interesting vegetation, and, obtaining a concession of land, began the organisation of the Biological Station, which, however, he was unable to carry on, and sold to the Government. In 1923 it again became attached to the Museum. A valuable feature of the area is that it comprises not only mountain forest, but also stretches of open marshland and grass vegetation, all alike subjected to extreme and continuous humidity. The chief point about the Station is that no interference is allowed: nothing is taken out and nothing planted, and no clearance beyond cutting paths through the virgin growth to facilitate research and exploration. It is the object of the Director both to retain the original vegetation so far as possible and to give what assistance he can in its investigation.

Optical Society, Dec. 12.—J. Guild: The insensitivity and personal equation errors of optical settings. The paper contains the results of observations on the insensitivity, that is, mean difference of the individual observations of a large series from the mean of the series, in the case of X-type gratings set on vertical lines. The influence of the following factors was investigated: (1) Thickness of cross-wires (best thickness subtends 60°-90° at the eye); (2) angle between cross-wires (best angle about 45°); (3) field brightness; (4) pupillary aperture (ordinary illuminations and apertures of 0.5 mm. and upwards have little effect on the insensitivity). Observations were also made of the magnitude of the 'personal equation' error in such settings.

Physical Society, Dec. 13.—J. H. Awbery and Ezer Griffiths: Apparatus for determining the specific heat of a material in powder form. A calorimeter suitable for heavy powdered materials, such as dry clay, is described. It utilises the electrical method, and embodies a special form of stirrer suitable for these materials.—W. Edwards Deming: On the determination of the parameters in an empirical formula. Some cautions regarding the use of the method of least squares were recalled. The method recently mentioned by Awbery is compared with those of least squares and zero sum, from the practical point of view. The method of zero sum appears to be the quickest and its results to be well in accord with common sense judgment.—N. S. Alexander: The *J*-phenomenon in X-rays. A series of experiments has been carried out with the view of repeating so far as possible the work of Barkla and others on the *J*-phenomenon. The results obtained in no case provide any evidence for this phenomenon, and, considered in conjunction with the work of Dunbar, Worsnop, and Gaertner, they suggest that it has no real existence as an X-ray absorption effect.

DUBLIN.

Royal Dublin Society, Nov. 26.—J. H. J. Poole: The thermal instability of the earth's crust. It has already been shown (*Phil. Mag.*, March 1928) that the thermal history of the earth's crust depends on the fact that the melting point curve for the crustal materials is, almost certainly, steeper than their adiabatic curve in the fluid state. The present paper is an attempt to solve the problem more completely, assuming that the crust may be treated as a crystalline solid with a definite melting-point. The stability of a liquid layer in such a crust is investigated. Taking the rate of transference of heat from the liquid to the overlying solid as proportional to their difference of temperature, two simultaneous differential equations are obtained, giving the rates of upward motion of the bottom and the top of the liquid layer, respectively. These equations can be solved for the portion of the crust below the equilibrium position of the melting-point geotherm, where the loss of heat by conduction is sensibly zero, owing to the smallness of the temperature gradient. When the layer moves upwards sufficiently to lose heat by conduction through the upper solid, the equations can be solved approximately if numerical values are inserted. This process has been carried out, and the history of the postulated system investigated.—T. Donnelly and J. Reilly: Low temperature carbonisation of peat. Specimens of Irish peat were subjected to low temperature carbonisation under conditions which prevented any appreciable cracking of the tars, and preserved the wax and heavy oil. A yield of 16.6 per cent of tar was obtained from an air-dried black peat; this tar contained 5.4 per cent phenol; unidentified higher acids; 4.4 per cent of 'resinals', and 0.9 per cent of 'resamines'. The peat also yielded 22.6 lb. of acetic acid and 17.4 lb. of ammonium sulphate per ton. This is nearly twice the usual yield for these products. The yield of gas obtained is low (8.6 per cent by weight) and the quality poor, 42 per cent of carbon dioxide being present. Wax and bitumen are present in the peat to the extent of 10.5 per cent.—J. Reilly, T. V. Creedon, and P. J. Drumm: The nitration of substituted phenylbenzylamine derivatives.—M. Grimes: A study of two new species of bacteria belonging to the genus *Chromobacterium*. In the course of the bacteriological examination of 36 samples of surface water, bacteria belonging to the genus *Chromo-*

bacterium were isolated in 17 cases. These cultures represent two new species named respectively, *Chromobacterium hibernicum* and *Chromobacterium cohaerens*.

PARIS.

Academy of Sciences, Nov. 18.—E. Mathias: Contribution to the study of fulminating material. The serpentine forms.—A. Bigot: The dome-shaped ridges of the Cambrian of Carteret and the *Chlorellopsis* ridges.—Charles Nicolle and Charles Anderson: The Moroccan recurrent spirochaetes of the *hispanicum* group are not separable into species. The spirochaete of Mansouria is proved to be recurrent in man. Only one group of spirochaetes appears to be transmitted by ticks, *Sp. hispanicum*.—G. Nicoladze: The characteristic points of a curve belonging to a continuous system.—J. Favard: Researches on convex curves.—Georges Valiron: Some properties of algebraoid functions.—Harald Bohr: A problem of M. Borel.—Gaston Julia: A development of holomorph functions.—Jacques Chokhate: The polynome of Techebycheff of the best approximation.—Radu Badesco: The distribution of singularities. The solution of a linear integral equation.—Gr. C. Moisil: The theorem of infinite groups.—W. S. Fédoroff: The growth of analytical functions and their differentials.—Kourenský: The most general case of integrability of the equations of motion of a solid body in a liquid.—A. Lokchine: The bending of an anisotropic beam.—A. Danjon: The periodic displacement of the pole.—Pauthenier and Mallard: Contribution to the study of the cylindrical field in ionised air at the ordinary pressure. The experimental control. The results predicted by theory and found experimentally are compared graphically.—J. Peltier: The localisation of flaws in shafting.—P. Chevenard: The thermal treatment of ferro-nickels with two constituents.—René Delaplace: The disappearance of hydrogen in Geissler tubes. If the tube is separated from the rest of the apparatus by a Dewar tube containing liquid air and this allowed to remain for 24 hours, in the tube thus freed from traces of water and mercury vapours hydrogen does not undergo irreversible contraction and no trace of carbon monoxide or of methane could be found. This negatives the suggestion that the dissociation of the internal wall of the glass tube may give rise to carbon compounds. This is attributed by the author to the fact that when the tube is perfectly dry there is little or no production of atomic hydrogen.—Raymond Charonnat and Raymond Delaby: A new product derived from pyramidon. Description of a product obtained by the reaction of pyramidon and perhydrol: empirically, its composition is a pyramidon dioxide.—Georges Darzens: Hexahydrophenylethyl alcohol and some of its derivatives.—Marcel Faidutti: Transpositions of ethylene oxides in the terpene series. Camphene and nopinene oxides, prepared by Prilejaieff's method, on distillation in the presence of silica or pumice powder, are really transposed into aldehydes. Zinc chloride also causes the same change.—A. Grebel: Variations of the temperature of spontaneous inflammation of hydrocarbons in admixture with various substances, as a function of the proportion of these different substances in the mixture. The mixtures studied were petrol and absolute alcohol, and ternary mixtures of petrol, absolute alcohol, and benzene. The effect of small additions of acetone and of aniline was also studied.—E. Raguin: Has the vermicular bundle of Zermatt its homologue in the geological structure of the Haute-Marianne?—J. Thoulet: Submarine mineral springs.—Pierre Dangeard: Some new algæ containing iodine. 120 species of marine algæ have been examined by a microchemical method for iodine.—H. Labbe, Heim

de Balsac, and R. Lerat: The theosterols of cocoa. Estimations of the sterols in cocoa butter, and in the beans, germs, and husk. The fat extracted from the husks was very rich in sterols, about twenty times the amounts found in the butter extracted from the whole bean.—Emile F. Terroine: The preparation of artificial milks for raising cattle.—André Mayer and Georges Nichita: The water emitted by vaporisation and its relations with the respiratory exchanges in homeotherms. The ratio H_2O/CO_2 .—Loeper, André Lemaire, and Jean Patel: A method of recording graphically the pressure of the cephalo-rachidian fluid.—Fernand Mercier and Jean Régnier: Lævorotatory cocaine and dextrorotatory pseudococaine: the comparative toxicity and different destruction by the animal organism.—René Hazard: Researches on the antagonism of the base tropine (tropanol) and of pilocarpine on the heart.—Marcel Mascré and Maurice Herbin: The influence of formaldehyde on the precipitation of the nitrogenous matters of urine by trichloroacetic acid.—E. Brumpt: The evolutive cycle of *Schistosoma bovis* (*Bilharzia crassa*), a spontaneous infection of *Bullinus contortus* in Corsica.—M. Belin: The presence of antibodies in the pus of the fixation abscess.

VIENNA.

Academy of Sciences, Nov. 7.—W. J. Müller and L. Holleck: The theory of passivity phenomena (7). The anodic behaviour of copper in sulphuric acid electrolytes. The behaviour of the copper was tested under varying conditions of concentration of acid, of saturation of copper sulphate and of temperature. The equation previously found connecting initial current density and time of passivation was confirmed. The first formed layer is of copper sulphate pentahydrate. Afterwards this is transformed, as shown by polarised light.—W. J. Müller and L. Holleck: The theory of passivity phenomena (8). The anodic behaviour of zinc in sulphuric acid electrolytes. Zinc shows surface passivity, at first due to zinc sulphate heptahydrate. A secondary transformation sets in the more rapidly the weaker the sulphuric acid.—W. J. Müller and K. Konopicky: The theory of passivity phenomena (9). The passivity of lead in sulphuric acid and the contribution to the theory of the formation of the lead anode. Results were obtained by measuring the current-time curves of lead in accumulator acid at constant potential. The passivation time is very short corresponding to the difficultly soluble lead sulphate. Current-time curves were measured with the oscillograph. An increase of solubility is explained by the hydrolysis of quadrivalent lead going into solution.—W. J. Müller and K. Konopicky (10): The time law of self passivation.—W. J. Müller and W. Manchu (11): The anodic behaviour and passivity of iron in sodium sulphate solutions. An oxidised film forms on iron both in air and in air-saturated solutions, and very rapidly. This introduces a difficulty in the determination of the passivation time for iron.—L. Moser and F. Siegmann: The determination of indium and its separation from the monoxides and sesquioxides. Indium has little analytical resemblance to gallium. $In(OH)_3$ is practically insoluble and may be precipitated with ammonia. In_2S_3 is completely precipitated by hydrogen sulphide in acid solution and allows of a quantitative separation of indium from iron and aluminium. Zinc, nickel, and chromium are separated from indium by potassium cyanate, cobalt by potassium cyanide.—N. Fröschl, J. Zellner, and H. Zak: Synthetic experiments in the sugar group (1). Some derivatives of fructose and lactose. With heptaacetyl-bromlactose there were obtained good crystallising acetyl-lactosides of menthol, glycol, etc.—G. Machek: The linear pentacene series (18). Two

isomeric dibromo-derivatives of the linear pentacene-diquinone-5, 7, 12, 14.—F. Lieben and G. Ehrlich: The decomposition of glucose and fructose by *Bacillus coli*. Fructose is more rapidly attacked than glucose.

Nov. 14.—M. Beier: Results of a zoological expedition to the Ionian Islands and the Peloponnesus. (4) Myriopoda by K. Attems. (5) Reptilia, Amphibia, Orthoptera, Embidaria, and Scorpiones by F. Werner.—J. Mayer: The absolutely smallest discriminants of the biquadratic number-body.—G. Nöbeling: The theory of regular curves. The theory of universal assemblages. Remarks on a theorem by O. Schreier.

Nov. 21.—W. Figdor: The positive geotropism of the axial bulbs in *Gloriosa superba*.—H. Pettersson: The disappearance of radon in quartz capillary tubes during electrodeless discharge. To be compared with the disappearance of xenon in discharge tubes.—S. Schneidt: The electro-chemical behaviour of polonium in solutions of various hydrogen ion concentration. Polonium must be in the colloidal form in dilute solutions.—M. Hoschtalek: The conductivity on old and new rock-salt surfaces in damp air. The conductivity is first noticeable when the vapour pressure of the air is above 4.4 mm.—K. W. F. Kohlrusch: The calculation of chemical bonding forces from the frequencies of the Raman lines.—A. Steuer: The species of the Copepod genus *Acartia* in the Mediterranean province.

Official Publications Received.

BRITISH.

The North of Scotland College of Agriculture. Report on the Work of the North of Scotland College for the Year 1928-29. Pp. 30. (Aberdeen.)
Records of the Indian Museum. Vol. 31, Part 2, July. Pp. 81-159+ plates 6. 2.12 rupees; 5s. Vol. 31, Part 3, September. Pp. 161-257+ plates 7-11. 2.12 rupees; 5s. Vol. 30, Appendix: List of Literature referring to Indian Zoology (excluding Insecta) received in Calcutta during the Year 1928. Pp. xxvi. 7 annas; 9d. (Calcutta.)
Memoirs of the Indian Museum. Vol. 9, No. 3: A Revision of the Fissilabioidae (Cordulegasteridae, Petallidae and Petaluridae). Part 1: Cordulegasteridae. By Lieut.-Col. F. C. Fraser. Pp. 69-107+ plates 9-12. (Calcutta.) 4 6 rupees; 7s. 6d.

FOREIGN.

Report of the Aeronautical Research Institute, Tôkyô Imperial University. No. 49: A New Index to Control Cable Endurance. By Taitiro Ogawa and Sigetake Suzuki. Pp. 243-258. 0.22 yen. No. 50: Air Flow through Suction Valve of Conical Seat. Part I: Experimental Research. By Keikiti Tanaka. Pp. 259-360+ plates 13-16. 1.17 sen. (Tôkyô: Koseikai Publishing House.)
Regenwaarnemingen in Nederlandsch-Indië. Vijftigste Jahrgang, 1928. Pp. ii+133. (Wetvreden: Landsdrukkerij.)
Proceedings of the Imperial Academy. Vol. 5, No. 8, October. Pp. xvii-xx+307-402. (Tokyo.)

Diary of Societies.

SATURDAY, DECEMBER 28.

ROYAL INSTITUTION OF GREAT BRITAIN (at Institution of Electrical Engineers), at 3.—S. R. K. Glanville: How Things were done in Ancient Egypt (Christmas Lectures) (1): The Elementary Use of Nature.

MONDAY, DECEMBER 30.

ROYAL SOCIETY OF ARTS, at 3.—Capt. C. W. R. Knight: The Golden Eagle (Dr. Mann Juvenile Lectures) (1).

TUESDAY, DECEMBER 31.

ROYAL INSTITUTION OF GREAT BRITAIN (at Institution of Electrical Engineers), at 3.—S. R. K. Glanville: How Things were done in Ancient Egypt (Christmas Lectures) (2): Making a Home.

WEDNESDAY, JANUARY 1.

ROYAL SOCIETY OF ARTS, at 3.—Capt. C. W. R. Knight: Wild Life in the Treetops (Dr. Mann Juvenile Lectures) (2).
CHILD-STUDY SOCIETY (at University College), at 5.30.
ROYAL MICROSCOPICAL SOCIETY (Biological Section).

THURSDAY, JANUARY 2.

ROYAL INSTITUTION OF GREAT BRITAIN (at Institution of Electrical Engineers), at 3.—S. R. K. Glanville: How Things were done in Ancient Egypt (Christmas Lectures) (3): Building in Stone.
PHYSICAL SOCIETY (at Imperial College of Science and Technology), at 5.—

FRIDAY, JANUARY 3.

INSTITUTION OF MECHANICAL ENGINEERS, at 6.—Eng. Vice-Admiral R. W. Skelton: Progress in Marine Engineering (Thomas Lowe Gray Lecture).

INSTITUTION OF ELECTRICAL ENGINEERS (Meter and Instrument Section), at 7.—J. G. Wellings and C. G. Mayo: Instrument Transformers.
ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN (Pictorial Group—Informal Meeting), at 7.

SATURDAY, JANUARY 4.

ROYAL INSTITUTION OF GREAT BRITAIN (at Institution of Electrical Engineers), at 3.—S. R. K. Glanville: How Things were done in Ancient Egypt (Christmas Lectures) (4): Boats and Furniture.

CONFERENCES.

JANUARY 1 TO 8.

EDUCATIONAL ASSOCIATIONS (at University College).

Wednesday, Jan. 1, at 3.—Prof. Winifred Cullis: The Lure of Investigation (Presidential Address).

EUGENICS SOCIETY.

Wednesday, Jan. 1, at 5.—Prof. E. W. MacBride: The Teaching of Biology in General Education.

CHILD-STUDY SOCIETY.

Wednesday, Jan. 1, at 5.30.—Dr. H. Crichton-Miller: The Study of the Child.

SCHOOL NATURE STUDY UNION.

Thursday, Jan. 2, at 3.—Dr. C. T. Green: Our Beautiful Wild Flowers.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

Tuesday, Jan. 7, at 3.—Discussion: Preventable Mental and Physical Strains of School Life.

JANUARY 1 TO 4.

SCIENCE MASTERS' ASSOCIATION (at Imperial College of Science).

Wednesday, Jan. 1, at 8.15.—Prof. J. C. Philip: Presidential Address.

Thursday, Jan. 2, at 10.30 A.M.—A. F. Walden: Lecture on Liquids, with Discussion on Broadcasting.

At 6.—S. R. Humby: Lecture Experiments in Sound with an Electrically Controlled Source.

At 8.15.—Prof. W. A. Bone, assisted by R. P. Fraser: The Photographic Investigation of Flame Movements in Explosions (Lecture).

Friday, Jan. 3, at 9.30 A.M.—W. Corbridge: Lecture Demonstration on Some Home-Made Physical Apparatus.

At 10.45 A.M.—Dr. J. C. Munro: Industrial Biology (Lecture).

At 12.—Prof. Truscott and others: Discussion on Openings for College Trained Men in the Mineral Industry.

At 5.15.—Discussion with the Physical Society on Examinations in Practical Physics.

At 8.15.—Discussion on School Certificate Biology.

Saturday, Jan. 4.—Visits to the National Physical Laboratory and the Government Laboratory.

JANUARY 2 TO 6.

GEOGRAPHICAL ASSOCIATION (at London School of Economics).

Thursday, Jan. 2, at 11.30 A.M.—Sir Henry G. Lyons: Presidential Address.

At 5.—Discussions:—Village Survey Making. Opened by Miss J. K. Jones.—The Inter-Relation of History and Geography in Central Schools. Opened by Miss D. Sargeant.—Land Utilisation Map of Northampton. Opened by E. E. Field.

At 8.15.—H. E. Raynes: Mortality of Europeans in Equatorial Africa—A Study of the Effect of Improved Conditions and Mode of Life (Lantern Lecture).

Friday, Jan. 3, at 10 A.M.—Discussions:—The Physical Basis of Geography in Independent Schools. Opened by B. B. Dickinson.—Geography and the Training of Teachers. Opened by T. Herdman.

At 11.30 A.M.—Col. H. L. Crosthwait: Air Survey (Lantern Lecture).

At 2.30.—The Geography I was Taught, by Members of the Association.

Saturday, Jan. 4, at 10.30 A.M.—Sir E. J. Russell: Agricultural Developments in South Africa (Lantern Lecture).

At 11.45 A.M.—Dr. Vaughan Cornish: National Parks.

JANUARY 6 AND 7.

MATHEMATICAL ASSOCIATION (Annual Meeting) (at London Day Training College).

Monday, Jan. 6, at 4.—B. L. Gimson and others: Discussion on Arithmetic of Citizenship.

At 5.30.—Prof. S. Chapman: The Use of Spherical Harmonic Functions in Mathematical Physics.

Tuesday, Jan. 7, at 10 A.M.—G. W. Spriggs and others: Discussion on Problems of Individual Education, with Special Reference to Work in Mathematics.

At 11.45 A.M.—Prof. W. M. Roberts: Gunnery and some of its Mathematical Problems (Lecture).

At 2.30.—Dr. W. F. Sheppard: Mathematics for Study of Frequency Statistics.

At 3.45.—Miss Hilda P. Hudson and others: Discussion on The Mathematician in Ordinary Intercourse.

EXHIBITION.

JANUARY 7, 8, AND 9.

ANNUAL EXHIBITION OF THE PHYSICAL SOCIETY AND THE OPTICAL SOCIETY (at Imperial College of Science), from 3 to 6, and from 7 to 10.

Jan. 7, at 8.—Lord Rayleigh: Iridescent Colours in Nature from the Standpoint of Physical Optics (Lecture).

Jan. 8.—S. G. Brown: Gyro Compasses for Gun-Fire Control (Lecture).

Jan. 9.—Sir Ambrose Fleming: Television, Present and Future (Lecture).