

Calendar of Patent Records.

April 14, 1720.—The 'stoving' process of seasoning timber for shipbuilding—in which the timber is heated in wet sand—was the invention of John Cumberland, whose patent is dated April 14, 1720. The process, which was reported by the Admiralty to be much superior to the old method of charring that it displaced, was used in the Royal dockyards for some years, an allowance of £200 a year being guaranteed to the inventor. An application for a prolongation of the grant was dismissed.

April 17, 1882.—The 'telpher' system of transportation—in which goods are carried by electrically operated and automatically controlled trolleys travelling on a mono-rail—was the invention of Prof. Fleeming Jenkin, his patent being dated April 17, 1882. The first commercial installation in England was opened in 1885 for carrying clay from the pits at Glynde in Sussex to the railway.

April 18, 1707.—On April 18, 1707, there was granted to the first Abraham Darby a patent for his invention of "casting iron bellied potts and other iron bellied ware in sand only without loam or clay," which greatly increased the use of iron for founding purposes. Previous to this invention, such articles were only made in the more costly brass, iron castings being confined to the production of simpler articles such as fire-backs and grave-slabs. Abraham Darby's name is an honoured one in the history of the iron industry, for it was he who, about 1710, first discovered and put into practice a satisfactory process for the smelting of iron with coke.

April 18, 1818.—The omnibus dates from the French patent granted to De Berekem of Paris on April 18, 1818, for what he called a 'Parisienne,' carrying eighteen persons. A previous attempt—with which Blaise Pascal was associated—had been made to run public vehicles of this kind in Paris, but it was not successful and was soon abandoned.

April 18, 1838.—William Barnett's patent, dated April 18, 1838, is an important milestone in the history of the gas engine, for it was in this that the advantages of compressing the combustible mixture before igniting it were first pointed out. In Barnett's engine the air and gas were compressed separately and were mixed in the cylinder at the beginning of each stroke. A special ignition cock, which remained long in use, was also a feature of the invention.

April 18, 1885.—One of the early suggestions for utilising the principle of the gyroscope to replace that of the magnetic needle in the mariner's compass was the invention of two Dutchmen, Gerardus van den Bos and Barend Janse, whose German patent was applied for on April 18, 1885.

April 19, 1758.—The achromatic telescope of John Dollond was patented on April 19, 1758. No action seems to have been taken by the Privy Council on a petition signed by most of the instrument-makers of London, alleging that object-glasses in accordance with Dollond's patent had been made and publicly sold before the date of the grant and praying for the revocation of the patent, and the patent was afterwards upheld in the Courts in an action for infringement. But there seems to be little doubt that Chester Moor Hall was the first inventor.

On the same day, April 19, 1758, there was granted to Jedediah Strutt a patent for the rib-stitch hosiery frame, which was the first important modification of Lee's stocking frame. Strutt invented the rib-stitch machine for his hosier brother-in-law, William Woollatt, and the two started what became very successful works at Derby and Nottingham.

No. 3102, VOL. 123]

Societies and Academies.

LONDON.

Mineralogical Society, Mar. 19.—A. W. Groves and A. E. Mourant: Inclusions in the apatites of some igneous rocks. Apatite crystals with dark cores of inclusions have been observed among the heavy minerals of some English sedimentary rocks, but there are few records of such apatites in igneous rocks. The authors record several such occurrences in granites and in volcanic rocks from Normandy, Jersey, and Brittany. Five different types are distinguished in the granite of northern Brittany alone. In one type with a definitely pleochroic core the inclusions appear to consist of biotite or chlorite, but in other types it has not been possible to determine their nature.—L. A. Narayana Iyer: Calc-gneisses and cordierite-sillimanite-gneisses of Coimbatore, Madras Pres., and similar occurrences in India. The paper dealt with a suite of crystalline gneisses in the ancient Archæan complex of India of Dharwar age (Huronian), consisting of the above two facies, which are in close association. Similar suites of rock occur in different parts of India, forming a definite stratigraphic horizon. The author considers their formation as due to thermal or 'infra-plutonic' metamorphism followed or accompanied by regional or dynamo-thermal metamorphism of pelitic schists and calcareous sediments.—F. A. Bannister: A relation between the density and refractive index of silicate glasses with application to the determination of imitation gem-stones. The study of simple glass families leads to a relation between the refractive index and density which can be applied in a modified form to the determination of imitation gem-stones. $(n - N)/(d - D)$, where N and D are the refractive index and density of silica glass, is plotted against n by a simple graphical method, whereupon the various imitations separate into groups; the members comprising any one group are chemically similar. Doubtful cases can be solved by measuring in addition the relative dispersion.—H. E. Buckley: The crystallisation of potash-alum. The author described the results of experiments on the differences of crystal habit obtained under varying conditions of cooling and evaporation, and in the presence of various substances in solution such as strong acids, $AlCl_3$, FCl_3 , amyl alcohol, Bismarck Brown, etc.

PARIS.

Academy of Sciences, Mar. 4.—A. Deslandres: Simple relations between the most intense and highest radiations of the chemical elements in the photosphere of the sun. In previous communications it was shown that the frequencies of the highest and most brilliant lines of the sun were multiples of a constant d_1 , 1062.5. Additional data showing the importance of this constant are given.—Charles Moureu, Charles Dufraisse, and Léon Enderlin: Recherches on rubrene. The action of acids. The liberation of iodine from hydriodic acid by rubrene, with decolorisation of the hydrocarbon, has been studied in detail. Except possibly in ether solution, there is no evidence of any hydrogenation: the colourless hydrocarbon produced appears to be isomeric with rubrene.—J. Favard: Problems of extremums relative to convex curves.—Maurice Janet: The ratio of the mean values of the squares of two differentials of consecutive order.—Mandelbrojt: How several theorems of Taylor's series can be transformed into Dirichlet's series.—J. Delsarte: Symmetroid nuclei.—L. Ahlfors: The number of asymptotic values for an integral function of finite order.—M. Lavrentieff: A problem of P. Montel.—Gr. C. Moisil: Functional groups.—D.

Rosenthal: Assemblages connected by lateral bands tested in extension and in compression.—**Maris Bos-solasco**: The ellipticity of the terrestrial equator.—**Foch**: The maintenance of the vibrations of a fluid column by change in the regime of flow. From Reynolds's definition of the critical velocity an equation is derived which has been applied to the cases of vibrating flames, the chemical harmonicon, and notes emitted by certain hot-water systems.—**T. Pecsalski** and **J. Chichocki**: The thermionic emission of copper tubes filled with salts.—**J. Peltier**: The magnetic testing of the shafts of machines.—**R. Coustal** and **F. Prevet**: A new method of preparing phosphorescent zinc sulphide. Zinc (in impalpable powder) and sulphur are heated together, with or without the addition of foreign substances. The reaction is explosive and must be controlled by reducing the proportion of zinc.—**R. de Malleman**: The theory of optical activity in a homogeneous medium.—**René Delaplace**: Some chemical phenomena connected with the contraction of hydrogen in discharge tubes. Discharges through tubes of Pyrex glass, not fitted with taps or ground glass connexions, produce measurable amounts of carbon monoxide and methene. These may be attributed to the dissociation of the glass under the influence of radiations emitted by the tube.—**Raymond Delaby** and **Pierre Dubois**: The preparation of allyl alcohol. The method described permits of a yield of 435 grams of allyl alcohol per kilogram of glycerol.—**Miles. Jeanne Lévy** and **Frajda Gombinska**: The dehydration of some symmetrically substituted α -glycols and the isomerisation of the corresponding ethylene oxides. The influence of the relative affinity capacities of the cyclic and acyclic radicals.—**A. Seyewetz** and **J. Blanc**: The fluorescence of colouring matters in Wood's light. The principal dyes of each class have been submitted to Wood's light in powder, in solution, and on fibres, in order to see whether they would present any fluorescence sufficiently characteristic for use in analysis. Preliminary results are given.—**Assar Hadding** and **René van Rubel**: The structure of the crystalline uraninite of Katanga (Belgian Congo). The X-ray method of P. Debye has been applied to Katanga uraninite. Its crystalline network is that of a face-centred tube.—**P. Fallot**: The date of the latest orogenic phenomena in the sub-Betic and Betic zones at the height of Caravaca.—**Jean Lacoste**: The extension of the Cretaceous in the southern region of the western Rif.—**Edouard Roch**: New observations on the Stephanian of western Morocco.—**Ch. Maurain** and **E. Salles**: Atmospheric ionisation.—**Albert Nodon**: Researches on electromagnetic perturbations, seismic and solar. The results obtained at the Santiago Observatory (Chile) confirm work previously published by the author, and show that close relations exist between electromagnetic, seismic, telluric, atmospheric, and solar phenomena. It is possible from the indications of the magnetograph to predict earthquakes some hours in advance.—**C. I. Popesco**: The influence of grafting on the development of some Papilionaceæ.—**Mme. L. Randoïn** and **Mlle. A. Michaux**: The comparative variations of the proportion of water in the blood and of the globular resistance in the normal guinea-pig and in the guinea-pig submitted to a regime deprived of the antiscorbutic vitamin.—**Mme. M. L. Verrier**: The biology and peculiarities of the respiratory apparatus of an isopod from the Sahara, *Hemilepistus Reaumuri*.—**J. Magrou**, **Mme. M. Magrou**, and **Mlle. F. Choucroun**: The action at a distance of *Bacterium tumefaciens* on the development of the egg of the sea-urchin. New experiments.—**E. Roubaud**: Autogenous cycle of waiting and hidden active winter generations in the common mosquito.

Culex pipiens can have two different biological methods of adaptation to the winter. In one, well known, the females hibernate at low temperatures; in the other, described in the present communication, both sexes survive if the temperature is maintained above 20° C. in presence of water. Reproduction is continuous during the winter without food being taken.—**Marcel Labbé**, **F. Nepveux**, and **Hejda**: The ammonia of human blood in normal and pathological conditions. In cases of jaundice, cirrhosis of the liver, and diabetes, the proportion of ammonia in the blood varies very slightly from the normal: the amount is increased to a marked extent in pulmonary tuberculosis.—**H. Bierry**: Biochemical researches on the specificity and transformations of the proteids of the blood plasma.—**L. Hugounenq** and **E. Couture**: The photochemical action of sterols of various origins.—**A. Dorier**: *Gordius* as a parasite of myriapods.—**A. and R. Sartory**, **Marcel** and **Jacques Meyer**: Contribution to the study of the mycetones. A new case of actinomycosis with yellow pustules.

ROME.

Royal National Academy of the Lincei, Dec. 16.—**T. Levi-Civita**: Addition to the note on the motion of a body of variable mass.—**Gino Fano**: Congruences Ω_0 of rational curves, and Cremonian transformations inherent in a linear complex.—**A. Russo**: Nuclear divisions in *Cryptochilum echini* Mps. In this organism the processes of nuclear division are dependent on the category of the individuals to which the nuclei belong, since the nuclei of one category (*A*) divide by mitosis, and those of another (*B*) by amitosis. These two categories being distinguished by different quantities of nuclear substance, with which correspond particular activities of the whole individual, it appears that the special division of the nucleus is determined by internal factors which regulate the process.—**L. A. Herrera**: Further investigations on the imitation of organic forms with albumin. Structures obtained by means of egg-albumin and closely resembling *Crococcus*, *Botrydina vulgaris*, *Desmidium Grevilli*, *Bulbochaete*, *Vaucheria*, and *Nitella flexilis*, are illustrated.—**U. Cassina**: The conception of limits. A short, elementary account is given of the results of the author's historical and critical investigation into the conceptions expressed by the term 'limit.'—**L. Fantappiè**: Functional operators and the calculus of infinite matrices in the theory of quanta (1).—**M. Picone**: Demonstration of a theorem of analysis, of which use is made in plane physics.—**G. Supino**: Certain limitations valid for derivatives of a harmonic function.—**L. Toscano**: Reciprocal matrix equations.—**G. Vranceanu**: Second fundamental quadratic form of an anonomous variety and its applications.—**V. Glivenko**: The law of high numbers in functional spaces.—**A. de Mira Fernandes**: Isoclinic transports and associated directions.—**F. Lamberti**: A third cardinal equation in the dynamics of material systems.—**E. Gugino**: The extension to continuous motion of the Lagrange-Bertrand theorem relating to impulsive motion.—**G. Silva**: The definition of normal gravity.—**E. Benedetti**: Experiments on the amplification and detection of bio-electric currents by means of thermionic valves (2). The photographic registration of the curves of the amplified currents. Use is made of a ray reflected by a mirror set in motion by an electrodynamic complex similar to those used to move the membranes of 'loud speakers.'—**Clara Forti**: The action of vapours of ethyl and methyl alcohols, ethyl ether, and chloroform, and of lighting gas on leucocytes isolated from the organism. The vapour evolved by minimum quantities (0.1-0.5 c.c.) of ethyl or methyl alcohol, ether or chloroform suffices to paralyse

the amœboid activity of the leucocytes of toad-blood within a few minutes. The action of illuminating gas is slow and results first in an increase in the vivacity of movement of the leucocytes, but later to a gradual retardation of the motion, which is completely arrested after exposure to the gas for eight or nine hours. These effects may be either transient or permanent, according to the duration of action of the reagent.—G. Galatà: Investigations on the circulatory effects of increases in the atrial pressure.—R. Margaria and E. Sapegno: Blood mass, red corpuscles, and hæmoglobin, in acclimatised individuals, in the mountains and on the plain. The observations described were made on ten individuals, first, in August 1927 at Col d'Olen (altitude 2901 metres), and, secondly, in the autumn and winter of 1927-28 at Turin, the temperatures in both cases being 10°-13°. At Col d'Olen, increases in the number of red corpuscles and in the hæmoglobin-content of the blood were invariably found. The extents of these increases varied markedly in different individuals, the mean values being 12.8 per cent for the corpuscles and about 4 per cent. for the hæmoglobin. There is, therefore, a diminution in the hæmoglobin-content of the red corpuscles, which may be the expression of the immission into circulation of young red corpuscles less rich in hæmoglobin—a phenomenon perfectly analogous to that observed after blood-letting. As regards the mass of the blood, determined by Haldane and Smith's method, the variations found amounted only to about 5 per cent, which corresponds with the limit of error for a single experiment; there is a mean increase of 1.8 per cent, which indicates that there is a slight increase in the mass of the blood following a sojourn of 15-25 days in the mountains, this being possibly due to the improved hygienic conditions.—R. Grandori: Embryological studies on polyvoltine races of the mulberry *Bombyx*.

VIENNA.

Academy of Sciences, Jan. 10.—R. Holzapfel: Results of radiation and polarisation experiments on the Hochobir in the summer of 1927 at an altitude of 2040 metres.—E. Philippi and E. Galter: The action of ammonia and amines on the esters of unsaturated acids.—E. Philippi: Memoranda for the preparation of some aliphatic unsaturated acids and esters.—F. Hernler: The three isomeric tolyl-1-dimethyl-3, 5-triazole-1,2,4 and some of their salts.—G. Grekowitz: A meningitis producer from the Pasteurella group. In three cases of middle ear discharge a germ was isolated, a small coccus-like bacterium easily stained with the usual aniline dyes, but not with Gram. A faint smell is characteristic of the colonies. Gelatine was not liquefied. Milk sugar and mannite were neither acidified nor fermented.—F. Werner: Scientific results of a journey of exploration to Western Algeria and Morocco. Snakes, lizards, and scorpions are recorded.—E. Bersa: The culture and nutrition physiology of the genus *Pilobolus*. Easily cultivated on horse-dung decoction agar. Of nitrogen sources leucine and peptone, of carbon sources xylan, gum arabic, galactose, starch do best. A wheat straw extract with peptone and agar proved a good culture medium, also Liebig-extract-agar-peptone.—K. Menger: On the sum of regular curves.—K. Przißram: Coloration of rock-salt by radium rays and re-crystallisation. Apparently rock-salt on compression undergoes re-crystallisation, the more rapid when pressure is greater. After such re-crystallisation the blue colour and the capacity of turning blue have vanished.—O. Watzl, K. Swoboda, and R. Singer: Report on a botanical and geological expedition in the Caucasus. The Caucasian Alpine Society supplied

intelligence. The Dongusorun glacier pass (3200 metres) was difficult. The Chodschal mountain group (3309 metres) was examined. Valleys choked with thick primitive forest were difficult to penetrate, the few paths being mostly on slopes above the tree limit. Collections were made of Rhododendron and other shrubs and of the very rich fungus flora.

Official Publications Received.

BRITISH.

- The Scientific Proceedings of the Royal Dublin Society. Vol. 19 (N.S.), No. 18: The Photo-Electric Measurement of the Illumination in Buildings. By Dr. W. R. G. Atkins and Dr. H. H. Poole. Pp. 173-188. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 1s.
- Transactions of the Royal Society of Edinburgh. Vol. 56, Part 1, No. 9: On the Feeding Mechanism of the Syncarid Crustacea. By Dr. H. Graham Cannon and Miss S. M. Manton. Pp. 175-189. 2s. Vol. 56, Part 1, No. 10: A Human Blastocyst *in situ*. By Dr. C. Witherington Stump. Pp. 191-202+10 plates. 5s. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.)
- Education in Kent during the Five Years 1923-1928. Pp. xi+314. (Maidstone: Kent Education Committee.)
- The Journal of the Institution of Electrical Engineers. Edited by P. F. Rowell. Vol. 67, No. 387, March 1929. Pp. 317-436+xxxvi. (London: E. and F. N. Spon, Ltd.) 10s. 6d.
- Report of the Medical Research Council for the Year 1927-1928. (Cmd. 3276.) Pp. 165. (London: H.M. Stationery Office.) 3s. net.
- Dove Marine Laboratory, Cullercoats, Northumberland. Report for the Year ending June 30th, 1928. Edited by Prof. Alexander Meek. (New Series 17.) Pp. 50. (Cullercoats.) 5s.
- Department of Scientific and Industrial Research: Gas Cylinders Research Committee. Ordinary Commercial Cylinders for the "Permanent" Gases. Summary of Recommendations (revised). Pp. iii+7. (London: H.M. Stationery Office.) 4d. net.
- The New Education Fellowship (English Section). Annual Report, 1928. Pp. 19. (London.)
- The Federation of Lancashire and Cheshire Museums. First Annual Report, 1928, adopted at the Annual General Meeting, January 30th, 1929. Pp. 11. (Liverpool.)
- Annual Report of the Calcutta School of Tropical Medicine, Institute of Hygiene and the Carmichael Hospital for Tropical Diseases, 1928. Pp. 103+3 plates. (Calcutta: Bengal Government Press.)
- Journal and Proceedings of the Asiatic Society of Bengal. New Series, Vol. 23, 1927, No. 3. Pp. 249-560+plates 6-13. (Calcutta.)
- The Education Question and the General Election: being the Annual Report of the National Education Association presented to the Annual Meeting on Tuesday, January 22nd, 1929. Pp. 12. (London.) 3d.
- The British Mycological Society. Transactions. Edited by Carleton Rea and J. Ramsbottom. Vol. 14, Parts 1 and 2, March 11. Pp. 178. (Cambridge: At the University Press.) 15s.
- The Proceedings of the Physical Society. Vol. 41, Part 2, No. 227, February 15. Pp. viii+113-179. (London.) 7s. net.
- Department of Scientific and Industrial Research. Building Science Abstracts. Compiled by the Building Research Station and published in conjunction with the Institute of Builders. Vol. 2, (New Series), No. 1, January. Abstracts Nos. 1-200. Pp. ii+54. (London: H.M. Stationery Office.) 9d.
- Transactions and Proceedings of the Perthshire Society of Natural Science. Vol. 8, Part 5, 1927-28. Pp. 235-264+li-ix+plates 35-46. (Perth.) 3s. 6d.; to Members, 2s. 6d.
- Air Ministry: Aeronautical Research Committee. Reports and Memoranda. No. 1189 (Ae. 351): Notes on Longitudinal Stability at Stalling in Gliding Flight. By S. B. Gates. (T. 2647.) Pp. 7+5 plates. 6d. net.
- No. 1191 (Ae. 353): Full Scale Tests of a Standard Bristol Fighter Aeroplane fitted with "Pilot Planes" at the Wing Tips. By W. G. Jennings. (T. 2663.) Pp. 5+3 plates. 6d. net. (London: H.M. Stationery Office.)
- St. Andrews Provincial Committee for the Training of Teachers. Summer School, St. Andrews, July 8th to July 26th, 1929. Pp. 20. (St. Andrews.)

FOREIGN

- Transactions of the San Diego Society of Natural History. Vol. 5, No. 14: Discocyclina in California. By Hubert G. Schenck. Pp. 211-240+plates 27-30. Vol. 5, No. 15: A new Pocket Gopher and a new Antelope Ground Squirrel from Lower California, Mexico. By Laurence M. Huey. Pp. 241-244. (San Diego, Calif.)
- Bulletin of the American Museum of Natural History. Vol. 58, Art. 5: Functional Adaptations of the Pelvis in Marsupials. By Herbert Oliver Eftman. Pp. 189-232+plates 9-14. (New York City.)
- Veröffentlichungen des Instituts für Meereskunde an der Universität Berlin. Neue Folge, A: Geographisch-naturwissenschaftliche Reihe. Heft 19: Stabile Lagerung ozeanischer Wasserkörper und dazugehörige Stromsysteme. Von A. Defant. Pp. 33. Heft 20: Schichtung und Tiefenzirkulation des pazifischen Ozeans auf Grund zweier Längsschnitte. Von Georg Wüst. Pp. 64+4 Tafeln. (Berlin: E. S. Mittler und Sohn.)
- Ministry of Agriculture, Egypt. The Agricultural Journal of Egypt. New Annual Series, 1924 and 1925. Pp. ii+166. (Cairo: Government Publications Office.) 5 P.T.
- Annual Report of the Meteorological Observatory of the Government-General of Työsen for the Year 1926. Pp. v+154. (Zinsen.)
- R. Osservatorio Astrofisico di Catania. Annuario 1929. Pp. iii+39. (Catania.)
- Japanese Journal of Engineering. Abstracts. Vol. 6. Pp. x+89. (Tokyo: National Research Council of Japan.)
- Proceedings of the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge. Vol. 67, No. 4, 1928. Pp. xx+319-384. (Philadelphia, Pa.)