

Calendar of Patent Records.

July 14, 1730.—On July 14, 1730, a patent was granted to Captain Robert Hamblin, a shipowner of Lynn, for "a new method for distinguishing of lights, whereby one light erected for the guidance of shipping may be perfectly known from another, and consequently every ship's crew be informed what coast they are off". The invention was, however, held to be an infringement of the powers of Trinity House, and the patent was revoked. Hamblin also financed the first light-ship, which was established at the Nore in 1732 by David Avery, and again brought him into conflict with Trinity House. The Admiralty agreed, however, that tolls might be levied although the ship itself should become the property of Trinity House.

July 14, 1808.—The bobbin-lace machine, the foundation of a large industry, was invented by John Heathcoat, whose first patent for the invention was sealed on July 14, 1808. The first factory was set up by Heathcoat at Loughborough, but this was attacked and the machinery destroyed by the Luddites in 1816, and the manufacture was transferred to Tiverton, where the firm is still operating.

July 15, 1846.—An early example of the 'pedrail' system of locomotion is shown in the specification of Edmund Leahy's English patent, which was enrolled on July 15, 1846. The invention is described as for the purpose of easing the motion and reducing the friction of wheels of carriages while passing over irregular surfaces, and consists in the "adaptation of a series of short rails to the wheels, which rails are linked together in a manner resembling an endless chain, arranged on rollers round the peripheries of the wheels".

July 15, 1869.—Margarine was the invention of the French chemist, Hippolyte Mège, and was patented in France on July 15, 1869, and in England the same year. The manufacture received a great impetus during the Franco-Prussian war, and was rapidly developed.

July 16, 1867.—One of the earliest systems of reinforced concrete was due to Joseph Monier, a gardener of Paris, who was the first to make extensive use of reinforced concrete and was mainly responsible for its general adoption. His French patent was granted on July 16, 1867, and the new method of construction was firmly established by the German firm of Freytag und Heidschuch, which purchased the German and Austrian rights.

July 17, 1790.—The English patent granted to Thomas Saint, a cabinetmaker of London, on July 17, 1790, contains the earliest description of a sewing machine. The machine, which is for sewing leather for boots and shoes, makes a chain-stitch, and has a perpendicular action, automatic feed for the material, and an eye-pointed needle.

July 18, 1783.—John Broadwood's piano patent, which is dated July 18, 1783, revolutionised the construction of the early square piano and represents an important step in the history of the instrument. Broadwood placed the tuning pins at the back of the case instead of as usual at the right-hand side, and added dampers and pedals. The construction was copied by all the leading makers, including those of Germany.

July 18, 1833.—On July 18, 1833, a patent was granted to Francis Maceroni for his steam-carriage, which had a multi-tubular boiler with fan-draught behind the carriage, and a horizontal two-cylinder engine below the body. A carriage was built in 1833 and ran between Edgware and Paddington for some time, attaining an average speed of 10 miles an hour. Carriages were also sent to Paris and Brussels, where they were received favourably.

Societies and Academies.

LONDON.

Geological Society, May 29.—K. S. Sandford: The Pliocene and Pleistocene deposits of Wadi Qena and of the Nile Valley between Luxor and Assiut (Qau). Wadi Qena is a broad and deep dry valley which joins the Nile from the north at Qena, about 40 miles north of Luxor. The oldest beds visible within the walls of the valley system are of Pliocene age, deposited in a gulf of the Mediterranean. This had been cut by river erosion during the elevation of the Egyptian plateaux in Miocene and (in the south) partly in Oligocene times, and it was then flooded to a height of at least 550 feet above present sea-level. A non-fossiliferous series of strata was deposited in it. Great thicknesses of travertine are locally present in the series. Re-elevation carried the flooded valley system back to fluvial conditions in Plio-Pleistocene times, accompanied by the irruption of enormous quantities of detritus from the Red Sea Hills. In Pleistocene times an ordered succession of river terraces was laid down in the Nile valley and in all the major wadis. Thereafter (in Upper Palaeolithic times) desert conditions began to assert themselves, and the Nile alone survived. At about the same time the Nile carved a deep channel and re-excavated the deeper parts of the Pliocene-filled Miocene gorge. The process of filling this up still continues.

Mineralogical Society, June 11.—E. J. Wayland and L. J. Spencer: Bismutotantalite, a new mineral from Uganda. This was found in a pegmatite vein at Gamba Hill, about 35 miles north-west of Entebbe. The large rough crystals, weighing up to a kilogram or more, are orthorhombic with a habit and axial ratios similar to those of columbite. Analyses made by Mr. W. O. R. Wynn at the Imperial Institute give the formula $\text{Bi}_2\text{O}_3 \cdot \text{Ta}_2\text{O}_5$, analogous to stibiotantalite ($\text{Sb}_2\text{O}_3 \cdot \text{Ta}_2\text{O}_5$).—L. Hawkes: On a partially fused quartz-felspar rock and on glomero-granular texture. In a partially melted granite, fusion began at the quartz-felspar contacts. It is suggested that the temperature was raised above the eutectic point but not to the melting-point of any of the constituent minerals, and that a granite of quartz-orthoclase-albite eutectic composition will melt completely in the dry state below 950° C. Coarse-grained granites may exhibit a segregation of quartz and felspar, revealed in section by monomineralic areas of several grains in anhedral intergrowth. The name 'glomero-granular' is proposed for this texture, which may result from the normal undisturbed crystallisation of the magma.—P. Marshall: The occurrence of a mineral hitherto unrecognised in the phonolites of Dunedin, New Zealand. A mineral with low birefringence and low refractive index, hitherto taken to be either nepheline or sodalite, is distinct from these and nearer microsomite or davyne. It is usually allotriomorphic but also occurs as very small (0.15 mm.) hexagonal prisms. Analyses of hydrochloric acid solution of phonolites containing this mineral to the exclusion of other soluble silicates, indicate that it is a sodium aluminosilicate loosely combined with sodium chloride. The mineral stains dark violet when treated with silver nitrate. The name proposed for the mineral is ameletite.—G. T. Prior: The meteoric stone of Lake Brown, Western Australia. The stone, weighing when found 4.75 kgm., has been known since 1919. Chemical analysis and microscopic examination prove it to be an intermediate hypersthene-chondrite of Baroti type.—I. de Finály and Sándor Koch: Fülöppite, a new Hungarian mineral of the plagiogonite-

semseyite group. This was found at Nagybánya, Hungary [=Baia Mare, Rumania] as small monoclinic crystals of the plagiomite habit. Analysis shows it to be an acid member of the group with the formula $2\text{PbS}\cdot 3\text{Sb}_2\text{S}_3$. Associated with it is an acicular (probably orthorhombic) lead-antimony mineral with the composition $3\text{PbS}\cdot 4\text{Sb}_2\text{S}_3$, which is compared with the Bolivian keeleyite.

Optical Society, June 13.—W. M. Hampton: The beam given by dioptric apparatus. The light in the axial direction given by a lighthouse lens using a white source can only be white if the source is greater than a certain limiting size. For such sources a simple expression is deduced for the axial beam candle-power for revolving lenses. A graphical method is given for computing the candle-power of smaller sources. The effect of the dispersion of the glass of the lens on the maximum distance at which satisfactory candle-power readings can be made is considered. A general solution is obtained for the intensity of light of any colour in any direction and at any distance when using fixed lenses.

Royal Meteorological Society, June 19.—F. J. W. Whipple: Potential gradient and atmospheric pollution; the influence of 'summer time'. The Kew Observatory records for periods before and after 1916 have been compared. There are normally two oscillations of potential gradient in the 24 hours; the early morning minimum and the forenoon maximum were both advanced when 'summer time' came in, whereas the second oscillation of the day was reduced in amplitude.—A. J. Bamford: Vertical air-currents as measured by pilot balloons. The results of the last seven years' pilot balloon observations at Colombo show that in the first half kilometre the average rate of ascent is considerably faster than the theoretical rate given by the Dines formula, while in the next half kilometre it is appreciably less than this value. This can be reconciled with a general atmospheric movement that is, on the whole, upwards in these layers, by accepting the idea that tropical convection occurs in the form of large rolling whirls of at least a kilometre in diameter, the effect of such whirls being to displace balloons from the ascending side towards the descending side after they pass the level of the centre. The next part of the paper deals with cases where the simple whirl system is complicated by monsoonal and other circulations, and the last part deals with observations up to ten kilometres.—George Slater: Studies on the Rhone glacier, 1927: the relationship between the average air-temperature and the rate of melting of the surface of the glacier. Work in Spitzbergen suggested the following formula: If M = thickness (in feet) of ice melted per month (30 days) and t = average monthly temperature ($^{\circ}\text{F}$.), $M = (t - 32)/2$. This gives 0.2 inches of ice melted per day for each degree ($^{\circ}\text{F}$.) above zero under normal atmospheric conditions, wind and rain producing deviations from the normal. The relationship was confirmed by observations on the Rhône Glacier in 1927 over a period of twenty days. The average temperatures (July 26 to Aug. 15) used were: Maximum 50.6°F ., minimum 34.5°F ., noon 43.79°F ., giving a daily average of 8.8°F . above 32°F . Assuming the rate of 0.2 inches of ice melted per day for each degree, the total amount melted would be 35.2 inches, which is confirmed by actual measurement.

PARIS.

Academy of Sciences, June 3.—Ch. Achard and M. Enachesco: Chloride elimination in acute diseases and its relations with the acid-base equilibrium.—Georges

Claude: The utilisation of thermal energy. Directing attention to a suggestion published by d'Arsonval in 1881 for the utilisation of the energy of hot springs with sulphur dioxide as the working fluid.—E. Bataillon: The physiological condition of male and female stereomitoses in the immature eggs of Anoura.—Achille Le Bel was elected a free Academician in the place of the late Marshal Foch.—André Blondel: A new method for the laboratory study of the beams of optical apparatus.—J. Neyman: A method of verification of hypotheses.—V. Fock and D. Iwanenko: Linear quantum geometry and parallel displacement.—N. Cioranescu: The method of Riemann for systems of equations of the second order.—Jacques Chokhate: The summation of certain series of integrable functions. Application to orthogonal functions.—Paul Lévy: The influence of the arguments of the coefficients on the growth of integral functions.—J. Haag: The elastic suspension of pendulums.—Emile Belot: The forms and evolution of the terrestrial mass before its spheroidal condensation.—Thadée Banachiewicz: The correction of orbits with the aid of co-ordinates referred to the plane of the movement.—E. Prévot: The determination of the international zero of altitudes, taking into account the law of variation of the mean annual level of the sea.—Alex. Véronnet: The electronic theory of the ether and electromagnetism.—Henri Chaumat: An electrostatic machine giving continuous current.—Daure: The comparative study of the Raman spectra of some hydrogen compounds. From the comparison of the Raman spectra of more than forty compounds, all in the liquid state, it is concluded that although it is not possible to interpret the Raman spectra of all compounds by their molecular constitution, it is possible in the limited field of hydrogen compounds alone empirically to connect certain lines with particular linkages in the molecule.—Bourguel: A relation between the boiling point and the molecular structure of cis-trans ethylenic saturated and acetylenic acids. The boiling points of acids containing from four to nine atoms of carbon, saturated, cis and trans ethylenic and acetylenic acids are given both in tabular and graphical form. Certain regularities appear in the latter and these are summarised.—F. Bourion and Ch. Tuttle: The cryoscopic determination of the molecular equilibria of resorcinol in aqueous solutions of sodium chloride.—Maurice Fallot: The magnetisation coefficient and structure of gelatine solutions. The curve showing the coefficient of magnetisation as a function of the concentration consists of two straight lines, with a sharp angular point at 0.8 per cent of gelatine. This concentration was also found by Marinesco to correspond to a sudden change in the dielectric constant. These results confirm the view (Smith) that gelatine can exist in two molecular forms in solution.—Maurice François: The action of gaseous ammonia on mercuric bromide and chloride.—Ch. Courtot and J. Pierron: Contribution to the study of the α -ethylenic chlorides and alcohols.—A. Mavrodin: The action of organomagnesium derivatives on ethyl ethylcyanacetate.—L. Berthois: The heavy minerals of the eruptive and crystallophyllian rocks of Brittany. Detailed study of occurrence and morphology of the zircons and tourmalines. A study of these in a disintegrated rock may give useful indications as to the nature of the mother rock (granites, granulites, gneiss or mica schists).—Marcel Casteras: The western termination of the Massif of Arize and the structure of the secondary deposits of the neighbourhood of Saint-Girons (Ariège).—Auguste Chevalier: An ancestral form of the cultivated *Arachis*.—Paul Genaud: The exchanges of ions between yeast cells and solutions of ammonium chloride.

From the experimental data given it is concluded that the law of mass action is capable of accounting for the equilibria between a living cell and the solution in which it is placed.—E. Blanchard and J. Chaussin: The influence of a complete manure on the osmotic pressure in some agricultural plants. The special action of potash manures. The more rapid development of certain plants (oats, beetroot) under the action of manures coincides with a greater osmotic pressure in the interior medium, and the potash manures (sylvinite and potassium chloride) play a special part in this effect.—Maurice Parat: The active chondriome of the animal cell and the phenomena of pachynesis.—Raymond-Hamet: Some pharmacological properties of the alkaloid of *Banisteria Caapi*.

CAPE TOWN.

Royal Society of South Africa, Mar. 20.—James Moir: Colour and chemical constitution (26). (a) Pigments of yellow flowers, (b) addenda to previous parts. The first portion deals with flavone and its derivatives the yellow flower-pigments; a miscellaneous part follows dealing with (a) 'loading'-phenomena, (b) analogues of the quinoline-cyanine dyes, and some interesting little-known colour phenomena.—Sir Thomas Muir: Note on the Lagrangian of a special unit determinant.—S. H. Haughton: Notes on the Karroo Reptilia from Madagascar. Redescriptions of material in the Paris Museum. All the genera fall within the order Eosuchia, which is re-defined; and two main lines of descent from *Youngina* within the order are indicated.—K. H. Barnard: A study of the genus *Colophon* (Coleoptera). The genus is essentially a mountain form, living on the summits of the peaks, and is flightless. Only two species were known, one of which has never been rediscovered since its description in 1855. Five new species have now been discovered.—S. Schonland: The South African species of *Rhus*, L. There is comparatively little diversity in the flowers of our *Rhus*. Inflorescences and fruits yield distinctive characters in many cases, but on the whole one has to rely on vegetative organs, which, however, vary often on the same plant within wide limits. The plant is usually unisexual, and male and female plants are sometimes different. Further, coppice shoots often show distinctive features. Interspecific hybridisation is not uncommon.—F. E. Fritsch and Florence Rich: Contributions to our knowledge of the freshwater Algæ of Africa. (8.) Bacillariales (Diatoms) from Griqualand West. In point of actual abundance, Diatoms form an important part of the algal flora of Griqualand West, but the actual number of species present is small. The total number here recorded is 72, of which 5 are new, while 4 new varieties are described. There are 25 new records for South Africa.

CRACOW.

Polish Academy of Science and Art, Mar. 8.—W. Swietoslawski, Z. Blaszkowska, and E. Jozefowicz: The boiling-point method of determination of the constant of chemical equilibrium.—W. Swietoslawski and J. G. Zawidzki: The application of reduced equations in chemical kinetics.—L. Marchlewski and J. Meyer: The absorption of ultra-violet rays by certain organic substances. The substances under examination included derivatives of furfuran, and isomeric bisubstituted benzene derivatives.—J. Wasowicz: The limits of perpetual snow in the Cordilleras of Alaska and Canada.

April 8.—C. Fuja: The formation and development of the stems and roots on the isolated cotyledons of *Cucurbita*, *Cucumis*, and *Lupinus*.—S. Maziarzki: The striated ramified muscular cells in the liver of spiders.

—J. Wiszniewski: Two new species of rotifers: *Pedalia intermedia* and *Paradicranophorus limosus*.—M. Gieysztor: Contributions to the knowledge of some species of Rhabdoceles belonging to the genera *Dalyellia*, *Castradella*, *Castrada*.—S. Wisniewski: The genus *Archigetes*: its anatomy, histogenesis, and biology.—W. Szafer: The flora of Poland.

May 6.—T. Wazewski: The change of the variable in simple integrals.—Ladislas Natanson: Certain properties of groups of waves.—Nalini N. Bosc: Fourier's series subjected to a quantic condition.—Satyendra Ray: (1) The regressive wave. (2) The generalisation of the virial of Clausius. If the pressure of the gas is not uniform but varies in the neighbourhood of the vessel walls according to a fixed law, the equation of the virial still holds good.—L. Kwiecinski and L. Marchlewski: The absorption of ultra-violet rays by benzene.—L. Marchlewski and B. Skarzynski: The absorption of ultra-violet light by certain hormones and by some analogous substances.—R. Malachowski: The constitution of anhydrotetracarballic acid.—F. Poznanski: The reactions of nitrous acid and of the diazo compounds on the substances contained in plants.

GENEVA.

Society of Physics and Natural History, April 18.—Sw. and Th. Posternak: The configuration of inactive inosite. By controlled oxidation of inosite with alkaline permanganate, the authors have obtained allomucic acid. This result, taken in conjunction with the optical properties of certain natural inositol-phosphoric esters previously described by the authors and by Anderson, leads to the selection for inactive inosite of that one of the seven stereochemical formulae predicted by the theory which shows five hydroxyl groups on the same side of the plane of the ring, the sixth being found on the opposite side. The formation of ribosophosphoric acid of the nucleotides at the expense of the monophosphate of inosite, by the opening of the ring, becomes probable. This throws some light on the obscure question of the physiological rôle of inosite.

May 2.—L. Duparc: The geology of the lower Congo (left bank of the Niari). The author has prospected a region situated to the west of Mindouli. Two formations were found: the limestone schist at the base, supporting, sometimes discordant, red grits (Kundelungu). Two systems of orthogonal folds, east-north-east and north-north-west, were verified, the crossing of which gave rise to formation of domes.—M. Gysin: Some optical properties of mucic acid. The author has successfully applied Fedorow's method and the usual petrographic methods to crystals of mucic acid of very small dimensions ($60 \times 15 \times 10$ microns). He has proved a very strong double refraction $n_g - n_p = 0.33$ and an angle for the optic axes $2V = -75^\circ$.

May 16.—L. Duparc, P. Wenger, and Ch. Cimerman: The combination of nitrogen with manganese. The authors have studied the part played by the five following factors on the course of the reaction: the composition and origin of the manganese, temperature, duration of the reaction, pressure, catalyst. For the last two the results are new: the nitrogen fixed increases with the pressure and lithium nitride used as the catalyst increases the fixation of the nitrogen and accelerates the dissociation.—A. Jayet: The presence of old glacial and interglacial formations in the northern part of the Canton of Geneva. The author has found a typical base moraine covered by stratified clays. The latter in turn support a recent moraine. The old moraine has never been distinguished in visible outcrop except by excavation. Up to the present, only two moraines have been proved in the