

Calendar of Industrial Pioneers.

July 16, 1824. **Simone Stratico died.**—An Italian engineer and mathematician, Stratico held professorships at Padua and Pavia, where he assisted Volta in his physical work, while under the rule of Napoleon he became an inspector of roads and bridges. He was also the author of works on hydraulics.

July 17, 1794. **John Roebuck died.**—The friend of Joseph Black and Watt, Roebuck was trained as a doctor and practised for a time at Birmingham. Turning his attention to chemical manufacture, he was successful in introducing leaden chambers in place of glass ones in the manufacture of sulphuric acid. In 1760 he founded the famous Carron Iron Works on the river Carron in Stirlingshire, but though a sound metallurgist, his business operations failed financially.

July 17, 1857. **Pierre Louis Frederic Sauvage died.**—Remembered as one of the independent inventors of the screw propeller, Sauvage was well known as an ingenious mechanic, and had works in the neighbourhood of Boulogne. He patented the propeller in 1832, but reaped no benefit from it; and though granted a pension by Louis Philippe, the failure of his scheme affected his mind and he died in an asylum. A statue of him was erected at Boulogne in 1881.

July 17, 1886. **David Stevenson died.**—A member of the well-known Scottish family of lighthouse engineers, Stevenson was trained as a mechanic, made surveys, wrote scientific papers, and with his brother Thomas (1818–1887) designed and built 28 beacons and 30 lighthouses in various parts of the world. He also took a leading part in the introduction of paraffin in place of colza oil.

July 17, 1891. **Willoughby Smith died.**—Entering the service of the Gutta-Percha Company in 1848, Smith superintended the making and assisted in the laying of the first submarine cables, and became chief electrician and manager of the Telegraph Construction and Maintenance Company. He made experiments on coating wire with gutta-percha, introduced improvements in cable manufacture, and was connected with the various Atlantic cable enterprises. In 1882 he served as president of the Society of Telegraph Engineers, now the Institution of Electrical Engineers.

July 19, 1879. **Louis Favre died.**—The son of a Swiss carpenter, Favre learned his father's trade and afterwards became noted as a builder of railways in the south of France and in Switzerland. In 1872 he became the engineer of the St. Gothard's tunnel, in the construction of which he made use of compressed air as suggested by Colladon. This tunnel is 14,900 metres in length. Favre's death occurred suddenly in the tunnel a short time before its completion.

July 22, 1869. **John Augustus Roebling died.**—One of the greatest bridge builders of last century, Roebling was a native of Germany, being born on June 12, 1806, at Mulhausen, Thuringia. He graduated from the Polytechnic School at Berlin, and in 1831 emigrated to the United States, where, after experience in canal and railway engineering, he founded a wire-rope manufactory. He constructed a wire-rope suspension aqueduct and a bridge over the Monongahela River, and suspension bridges over the Niagara Falls and the Ohio River, the latter having a span of 1057 feet. The success of his work led to the acceptance of his design for a great bridge over the East River to connect New York and Brooklyn, and it was while superintending the laying out of one of the towers of this bridge that he received the injury from the effects of which he died. E. C. S.

Societies and Academies.

LONDON.

Royal Microscopical Society, June 21.—Prof. F. J. Cheshire, president, in the chair.—A. Chaston Chapman: The use of the microscope in the brewing industry. The use of the microscope for research and control purposes has been directly responsible for greater technical advances and, indirectly, for more far-reaching discoveries in brewing than in any other industry. The larger breweries have laboratories in which both chemical and biological tests are carried out and much time is devoted to the examination of yeast, to the forcing of beers as a test of stability, to the testing of the efficiency of the air-filters, etc. The successful conduct of brewing operations depends almost entirely on such control work. The introduction of the microscope into the brewery as the result, chiefly, of Pasteur's investigations, has been responsible for the replacement of empirical methods by processes based on scientific knowledge.—J. Strachan: The microscope in paper-making. The microscope was introduced into the industry by amateur microscopists more than a century ago, and during the past twenty-five years, which have witnessed the application of exact scientific methods to paper-making, the technologist found the microscope already in common use. The microscope is used in the paper-mill chiefly for the analysis of paper and of its raw materials and in controlling the blending and preparation of these substances. It has also been applied to the beating process, which is largely a matter of colloid physics, and to sizing, dyeing, impurities in air and water, the valuation of new raw materials, etc. In spite of recent research work, which indicates that the cellulose basis of plants is of a uniform chemical composition, and that X-ray spectrographic methods have proved this substance to be of definite crystalline character, the constitution of cellulose remains unsettled. No important work had been done on its refractive index (about 1.555). Microscopic work on this matter and the application of the polariscope and ultra-microscope would probably yield important evidence.

Mineralogical Society, June 27.—Dr. A. Hutchinson, president, in the chair.—A. Brammall and H. F. Harwood: The Dartmoor granite; its accessory minerals and petrology. Minerals of general occurrence: tourmaline, ilmenite, magnetite, apatite, monazite, garnet, zircon [(1) in water-clear, small crystals, (2) in tawny, zoned, larger, and more abundant crystals], pyrites and pyrrhotine. More restricted: fluor (colourless, blue, and purple), topaz, cassiterite, andalusite, sphene, anatase, barytes. Biotite is abundant; muscovite is scanty. Streams have yielded, in addition, rutile, brookite, and blue-green anatase. Analyses are given of granite types (bulk), biotite, porphyritic feldspars (baryta-bearing), and some accessory minerals. In the tor area (Haytor-Widcombe), the granite occurs as successive sheets or flows, differing appreciably in chemical composition. The texture becomes coarser, porphyritic feldspars become more abundant and richer in plagioclase content, and the percentage of biotite and accessories increases with vertical descent in a flow. The relationship of topography to pseudo-bedding, jointing, veining, and probable faulting is discussed.—W. F. P. McLintock and F. R. Ennos: On the structure and composition of the Strathmore meteorite. From microscopical examination of thin sections of this meteorite, stones of which fell in Perthshire and Forfarshire on December 3, 1917, the structure is that of the intermediate chondrite group (Ci). An apatite-like mineral is present. Detailed chemical analyses of the magnetic and non-

magnetic portions agree closely with the Barot group.—H. F. Collins: On some crystallised sulphates from the province of Huelva, Spain. Analyses are given of pisanite, chalcantinite, coquimbite, copiapite, voltaite, roemerite, etc., from various pyrites mines. Experiments were made to determine the range of miscibility of iron sulphate and copper sulphate in mixed crystals of pisanite ($R''SO_4 \cdot 7H_2O$) and chalcantinite ($R''SO_4 \cdot 5H_2O$).—H. Hilton: The graphical construction of the constants of a shear. A graphical construction, based on the gnomonic projection, is given for obtaining the two circular planes of a shear, when the initial and final positions of two crystal-poles or edges are known.—H. Hilton: A note on crystallographic notation. A notation is suggested for the 32 crystal-classes and the 230 groups of movements, which is easy to write and print, and is based on the fundamental principles of structure-theory.—A. F. Hallimond and E. G. Radley: On glauconite from the Greensand near Lewes, Sussex; the constitution of glauconite. A boring through 325 feet of gault at Iford Manor yielded glauconite sand. A discussion of the analysis of this material and of some previously published analyses leads to the formula $R_2O \cdot (4R_2O_3, RO) \cdot 10SiO_2 \cdot nH_2O$.—L. J. Spencer: Ninth list of new mineral names.

DUBLIN.

Royal Irish Academy, June 12.—Prof. Sydney Young, president, in the chair.—G. H. Carpenter and Miss K. C. J. Phillips: The Collembola of Spitsbergen and Bear Island. The collections made by the Oxford University Expedition of 1921 include ten species of Collembola, one of which—*Folsomia sexoculata*—is an addition to the known fauna of Spitsbergen, while another—an *Isotoma* closely allied to the common *I. viridis*—taken on Bear Island is new to science. Twenty species of these insects have now been recorded from Spitsbergen; seven of these have been found also on Bear Island, which possesses, in addition, four species not yet detected on Spitsbergen. Sixteen members of this arctic fauna are represented in Great Britain and Ireland, while thirteen occur in Greenland and North America. Such distributional facts suggest paths of migration to the north of the Atlantic.

EDINBURGH.

Royal Society, June 19.—Prof. F. O. Bower, president, in the chair.—J. Stephenson: On the pharyngeal glands of the Microdrili (Oligochaeta). The chromophil cells in the anterior segments of the body of the Microdrili have, contrary to the usual view, no direct communication with the alimentary canal, and are not cells of the alimentary lining which have retreated from the epithelial layer while still retaining their connexion with it by means of a long thin neck which acts as a ductule. They are mesoblastic in origin; in the enchytraeids (where they form the septal glands) their secretion reaches the pharynx by percolating along special strands of tissue; in all other cases special channels are wanting and the products of the cells simply mix with the coelomic fluid; their secretion is thus an internal secretion.—W. Peddie: On self light, fatigue, inhibition, and recurrent visual images. Formal development of the trichromatic hypothesis is made beyond the stage at which it was left at the time of Helmholtz's death. Phenomena of contrast and after images, steadily decaying or oscillatory, and phenomena of fatigue and inhibition, are treated. The trichromatic theory of colour vision is founded securely on fact.—R. A. Fisher: On the dominance ratio. The "dominance ratio" upon which the relationship correlations depend, when inheritance follows the Mendelian scheme, has a numerical value

for certain human measurements, very near to one-third. This value presents a difficulty to the Mendelian interpretation of the human relationship correlations, in that it could occur only if the frequency ratio of the several factors were unsymmetrically distributed, in such a way that the dominant phase was commonly more numerous than the recessive phase. When, however, the effects of selection are taken into account the distribution of the frequency ratio may be calculated; the distribution obtained is unsymmetrical in the manner required, and the dominance ratio is exactly one-third. The distribution produced by selection also explains the occurrence among the non-recessives of the harmful character sometimes brought out by inbreeding.—A. P. Laurie: Chemical combination and Sir Alfred Ewing's magnetic atom. Sir Alfred Ewing's paper on hysteresis of iron has profound significance for the chemist, for it shows that it is possible to devise an atom of fixed and rotating magnets free from polarity, and that on the approach of another atom the rotating unit can be swung into an unstable position and then fall into a new stable position with evolution of heat. If we assume the electrons to be moving in the tiny orbits but arranged in space round a positive nucleus, the results obtained by Sir Alfred Ewing can be applied to chemical combination, ionisation, and catalytic action.

Official Publications Received.

Royal Botanic Gardens, Kew. Bulletin of Miscellaneous Information, 1921. Pp. 4+415+42. (London: H.M. Stationery Office.) 10s. net.

Department of the Interior: United States Geological Survey. Water-Supply Paper 487: The Arkansas River Flood of June 3-5, 1921. By R. Follansbee and E. E. Jones. Pp. 44. Water-Supply Paper 477: Surface Water Supply of the United States, 1918. Part 7: Lower Mississippi River Basin. Pp. 38. (Washington: Government Printing Office.)

Memoirs of the Department of Agriculture in India. Botanical Series, Vol. 11, No. 7: Correlation of Colour Characters in Rice. By G. P. Hector. Pp. 153-183. (Calcutta: Thacker, Spink and Co.; London: Thacker and Co.) 1.4 rupees; 1s. 8d.

Smithsonian Miscellaneous Collections, Vol. 72, No. 15: Explorations and Field-Work of the Smithsonian Institution in 1921. (Publication 2669.) Pp. 128. (Washington: Smithsonian Institution.)

Survey of India. General Report, 1920-21, from 1st October 1920 to 30th September 1921. Pp. vi+48+8 maps. (Calcutta: Surveyor-General's Office.) 2 rupees; 4s.

Botanical Survey of South Africa. Memoir No. 4: A Guide to Botanical Survey Work. Pp. 89. (Pretoria: Department of Agriculture.) 1s. 6d.

Southern Rhodesia. Geological Survey Bulletin No. 8: (1) The Geology of the Diamond-bearing Gravels of the Somabula Forest, by A. M. Macgregor, with Notes by the late A. E. V. Zealley; (2) On a Collection of Fossil Plants from Southern Rhodesia, by Dr. A. C. Seward and R. E. Holtum. Pp. 48+12 plates. (Salisbury: Geological Survey.)

Board of Scientific Advice for India. Annual Report for the Year 1920-21. Pp. vii+64. (Calcutta: Government Printing Office.) 12 annas.

Imperial Department of Agriculture for the West Indies. Report on the Agricultural Department, Grenada, January-December 1921. Pp. iv+15. (Barbados.) 6d.

Imperial Department of Agriculture for the West Indies. Report on the Agricultural Department, Montserrat, 1920-21. Pp. iii+33. (Barbados.) 6d.

Diary of Societies.

FRIDAY, JULY 14.

INTERNATIONAL NEO-MALTHUSIAN AND BIRTH CONTROL CONFERENCE (at Kingsway Hall, Kingsway, W.C.2), at 10.—Dr. C. K. Millard: Birth Control and the Medical Profession.—Dr. A. Nyström: The Necessity for abolishing Laws against Preventive Measures.—Dr. H. Rohleder: Neo-Malthusianism from the Medical Standpoint.—N. Haire: Sterilisation of the Unfit.—Dr. D. R. Hooker: Effect of X-rays upon Reproduction in the Rat.

INTERNATIONAL CONFERENCE OF SETTLEMENTS (at Toynbee Hall, 28 Commercial Street, E.1), at 10 and 2.15.—A. Greenwood, Miss E. M. McDowell, F. J. Marquis, J. J. Mallon, and others: Settlements and Industry.

SATURDAY, JULY 15.

INTERNATIONAL CONFERENCE OF SETTLEMENTS (at Toynbee Hall, 28 Commercial Street, E.1), at 10.—H. R. Aldridge, T. Adams, Capt. Reiss, Rev. D. MacFadyen, and others: The Relation of Settlements to Health and Housing Reform.

WEDNESDAY, JULY 19.

FELLOWSHIP OF MEDICINE (at 1 Wimpole Street, W.1), at 5.—V. Bonney: Myomectomy as opposed to Hysterectomy.