Calendar of Industrial Pioneers.

November 5, 1800. Jesse Ramsden died.—Called by Delambre "le plus grand de tous les artistes," Ramsden, by the combination of great scientific ability and practical skill, rose to be the leading instrument maker of his day. Especially valuable was his invention of a dividing machine completed in 1773 after ten years' work. He was born in Halifax, Yorkshire, in 1735, worked first as a cloth worker, and then learned the art of engraving from a London optician.

November 6, 1913. Sir William Henry Preece died.—Born in Carnarvon in 1834, Preece, after passing through King's College, London, joined the Electric and International Telegraph Company and eventually became one of the principal telegraph engineers in the country. From 1892 to 1899 he was Engineer-in-Chief and electrician to the Post Office, in which situation he made some of the earliest experiments in wireless signalling and gave valuable support to Marconi. He was twice president of the Institution of Electrical Engineers and was also president of the Institution of Civil Engineers.

November 8, 1807. Pierre Alexander Laurent Forfait died.—A distinguished naval constructor whose skill proved of the highest value to the French nation, Forfait first gained a reputation by the building of sailing-vessels for maintaining regular communication between France and America. He was the author of a treatise on the masting of ships and wrote many papers for the Paris Academy of Sciences and the "Encyclopédie Méthodique." He carried out important work at Antwerp and on the Seine, and under Napoleon served in the Ministry of Marine.

November 8, 1911. William Edward Ayrton died.—The author of some 150 scientific papers, a prolific inventor, and one of the pioneers of technical education in London, Ayrton served in the Indian Telegraph Service from 1868 to 1872, was professor of physics and telegraphy at the Imperial Engineering College, Tokio, and from 1884 held the chair of physics and electrical engineering at the Central Technical Institution, London. His researches extended to all sides of modern electrical engineering, while among the positions he filled were the presidencies of the Physical Society and the Institution of Electrical Engineers.

November 11, 1906. John Devonshire Ellis died.—Trained as an engineer at Birmingham by his father, Ellis in 1854 joined John Brown at the famous Atlas Works at Sheffield, with which he remained connected till his death. He was largely responsible for the manufacture of the armour for our first ironclads, the *Black Prince* and *Warrior*, and was an ardent advocate of the Bessemer process of making steel. He also introduced a method of welding a hard steel face to a wrought-iron backing for the armour of ships. He succeeded Brown as head of the firm in 1870, and in 1889 received the Bessemer medal of the Iron and Steel Institute.

November 11, 1893. Anthony Reckenzaun died.—A pioneer of electric traction, Reckenzaun was born at Gratz, Styria, in 1850, and, after being trained as an engineer, worked in England and was engineer to the Electric Power Company. In 1881 he made a trial of an electric car, in 1882 built the launch *Electricity*, and in September 13, 1886, with the *Volta* crossed the Channel, the motive power being obtained from electric cells. He also visited America and applied his system of driving by electric batteries to some cars at Philadelphia. E. C. S.

Societies and Academies.

LONDON.

Association of Economic Biologists, October 13.—Prof. E. B. Poulton, president, in the chair.—E. J. **Butler**: Virus diseases in plants. The first demonstration that disease can be caused by a filtrable virus was by Iwanowski, in 1892, in mosaic disease of tobacco. Mosaic is now known in nearly 100 species of plants. Diseases like peach-yellows and others characterised by phloem-necrosis are probably caused by similar agents though the filtered juice is not infective. All hitherto tested can be transmitted by grafting, most of them by insects (the chief method in Nature), and many by inoculating with sap. Contact will not cause infection. Infection may be hereditary in the insect transmitter and in the plant. "Carriers" are known. The causal agents are believed to be living organisms. Several investigators have recently found large amoebiform corpuscles or smaller granules in infected cells. The former have been compared with cytoryctes or neuroryctes and the latter with Chlamydozoa but a resemblance to Rickettsia is suggested. The causal organisms appear to be obligate parasites.—J. A. **Arkwright**: Virus diseases in animals and man. The chief points of interest common to plant and animal "virus diseases" are (1) the nature and properties of the virus; (2) the means of transmission, *e.g.* "carriers" and insect vectors; (3) measures for prevention, *e.g.* breeding or selection, and isolation or destruction; (4) perhaps the concentration of the virus in certain special tissue cells. About fifty animal virus diseases have been described which may be roughly classified as follows: (1) visible, not filtrable, not cultivated, *e.g.* Rickettsia; (2) probably visible, filtrable, cultivated, *e.g.* pleuro-pneumonia of cattle, poliomyelitis; (3) filtrable, not cultivated, some (?) visible in the tissues, *e.g.* foot and mouth disease, vaccinia; (4) filtrable, very resistant, *e.g.* infectious anæmia of horses, fowl-pox. In general properties most do not differ much from bacteria, though some are very resistant to drying, glycerine, and heat. The smallest clearly visible and the largest filtrable particles are of the same order of size, *i.e.* about 0·2 micron. Living organisms may conceivably be much smaller than this. The differentiation of colloidal particles of about 0·2 micron in size by means of the microscope requires attention especially to their arrangement and their range of size and shape, rather than to the appearance of individual particles. Theoretically it is possible that an enzyme may be the cause of an infectious disease on the analogy of Twort's lytic substance and the bacteriophage of d'Herelle.

PARIS.

Academy of Sciences, October 2.—M. Albin Haller in the chair.—H. **Deslandres**: The emission of X-rays, ultra X-rays, and corpuscular rays by the celestial bodies. A summary of previous results on radiations of high frequency and great penetration given by the sun and stars. These radiations form an extremely minute proportion of the total radiation, but their remarkable electrical properties give them an important rôle in the electrical phenomena of atmospheres. Kohlhörster's experiment on the ionisation of gas in a closed vessel at high altitudes (9000 metres) should be repeated at several points on the earth, and extended to the highest possible altitudes attainable by captive balloons. The cost will be considerable, and international co-operation is suggested as desirable.—A. **Brachet**: The properties of the germinal