Calendar of Industrial Pioneers.

November 19, 1883. Sir William Siemens died.—One of four brothers who were all closely associated with the application of science and the management of great industrial concerns, Siemens was born in Lenthe, Hanover, on April 4, 1823. He settled in England in 1844 and in 1859 became a naturalised British citizen. His name is connected with the introduction of the regenerative furnace for steel-making and the enunciation of the principle of the modern dynamo. He designed the cable ship *Faraday*, and was president of various technical institutions.

November 20, 1713. Thomas Tompion died.—The father of English watch-making, Tompion began his apprenticeship in London in 1664 and by 1675 had gained a foremost place among his fellow mechanicians. He supplied the first clocks to the Greenwich Observatory, and under Hooke's direction made one of the first English watches with a balance spring. His work made English watches the finest in the world. He is buried in the nave of Westminster Abbey, in the same grave as his famous pupil and successor, George Graham.

November 20, 1898. Sir John Fowler died.—A great railway engineer, and jointly responsible with Baker for the design of the Forth Bridge, Fowler's early work was done in the Sheffield district, while he afterwards became engineer to the Metropolitan Railway.

November 21, 1555. Georg Agricola died.—Agricola has been called the Bessemer of his age. He was born in Saxony in 1494, studied medicine at Leipzig and in Italy, and practised in Bohemia. Subsequently he abandoned his profession, became absorbed at Chemnitz in the study of metals and mining, and was given a pension by the Duke of Saxony. He collected specimens of ores, studied their chemical characters, and described them accurately. His work, "De re Metallica," is considered the most important technical book of the sixteenth century.

November 21, 1863. Samuel Hall died.—A native of Basford, Nottingham, Hall made a considerable fortune by his invention of a method of gassing lace and net. In 1836 he took out a patent for a surface condenser for ships which embodied most of the features of condensers as in general use to-day.

November 23, 1902. Sir William Chandler Roberts-Austen died.—The successor of Graham as chemist to the Mint, Roberts-Austen did much valuable work on the study of alloys, and was regarded as an authority on all that appertains to coinage. He delivered many important lectures, and in 1899–1900 served as President of the Iron and Steel Institute.

November 24, 1916. Sir Hiram Stevens Maxim died.—One of the greatest inventors of the nineteenth century and a pioneer worker on the flying machine, Maxim, like Edison and Swan, assisted to introduce the electric light, and then, turning his attention to the construction of an automatic gun, brought out his Maxim gun, which ever since has played so important a part in all warfare. He was also the first to combine nitroglycerine and true gun-cotton in a smokeless powder.

November 25, 1893. Johann Bauschinger.—A distinguished investigator of the strength of materials and the founder of the International Association for Testing Materials, Bauschinger was born in Nuremberg in 1834, and for twenty-five years was professor of mechanics and graphic statics at the Technical High School at Munich.

E. C. S.

Societies and Academies.

LONDON.

Royal Society, November 9.—Sir Charles Sherrington, president, in the chair.—H. E. **Armstrong**: Studies on enzyme action. XXIII. Homo- and hetero-lytic enzymes.—A. V. **Hill** and W. E. L. **Brown**: The oxygen-dissociation curve of blood and its thermodynamical basis. An attempt has been made to test the validity of the hypotheses (i) that the reaction of hæmoglobin with oxygen is represented by the equation $(Hb)_n + nO_2 \rightleftharpoons (HbO_2)_n$, where Hb represents the simplest possible molecule of hæmoglobin (containing one atom of iron), and n the average degree of polymerisation of the molecule in the presence of the salts in blood: and (ii) that the dissociation curves of oxyhæmoglobin under various conditions can be deduced by simple application of the Laws of Mass Action. The heat of reaction q of one gm. mol. of hæmoglobin $(Hb)_n$, with oxygen has been determined by the application of the van't Hoff isochore to the effect of temperature on the dissociation curve of blood, while the heat of reaction Q of one gm. mol. of oxygen with hæmoglobin has been measured directly in a calorimeter. The value of q/Q is practically equal to n determined in other ways, affording strong confirmation of hypothesis (1). The apparent heat of reaction of oxygen with blood may be very considerably reduced by the driving off of carbon dioxide by the more acid oxyhæmoglobin formed. A direct measurement of the heat of combination of carbon dioxide with blood confirms the theory that carbon dioxide combines with blood by taking base from the ionised hæmoglobin salt to form bicarbonate, leaving the non-ionised hæmoglobin acid. The heat of combination of carbon monoxide with hæmoglobin in blood is about 50 per cent. greater than that of oxygen: this proves that temperature affects the equilibrium of oxygen and carbon monoxide with blood.—H. **Hartridge** and F. J. W. **Roughton**: The velocity with which carbon monoxide displaces oxygen from its combination with hæmoglobin. Pt. I. When light falls on a solution containing oxyhæmoglobin and carbon monoxide hæmoglobin, the incoming light energy changes the position of equilibrium, tending to cause a reduction in the amount of the latter with a corresponding increase of the former. In the dark the original position of equilibrium is gradually recovered, the rate of return depending on the velocity constants of the reactions. By determining the percentage saturation of the hæmoglobin with carbon monoxide gas at intervals after the light has been turned off, the velocity constants can be calculated. This is done by causing the fluid to flow through two glass tubes in series; in the first it is exposed to a powerful light, while in the second it is kept in the dark, so that the original position of equilibrium is gradually regained. The percentage saturation with carbon monoxide gas of the solution at different parts of the "dark" tube was determined with the reversion spectroscope. At 15° C. the two velocity constants had mean values of 0·0067 and 0·55 respectively. At 34·5° C. the value of K_2 was 2·66, which gives a temperature coefficient for this velocity constant of 2·3 for a 10° C. rise of temperature,—approximately that given by many ordinary chemical reactions. Pt. II. The method of measuring the velocity of the reaction $CO + O_2Hb \rightleftharpoons COHb + O_2$ consists in ascertaining, by means of an electrically controlled stop-watch, the time taken for the equilibrium to shift from an unstable position to a stable one, the change being ascertained by