

Calendar of Discovery and Invention.

March 27, 1827.—A hundred years ago, on Mar. 27, 1827, Darwin, then just eighteen years of age and a medical student at Edinburgh, contributed to the Edinburgh Plinian Society a paper on the larvæ of the Flustra or sea-mat, one of the Polyzoa.

March 27, 1895.—After making known the discovery of argon, Ramsay, through a suggestion of Sir Henry Miers, made experiments with the mineral cleveite, which it was thought would contain a compound of argon. From these experiments he was led to the isolation of helium, detected by Lockyer in the sun in 1868, but hitherto unknown on the earth. This discovery was made known on Mar. 27, 1895, at the annual meeting of the Chemical Society, the *Transactions* of which contain Ramsay's account of his investigations.

March 27, 1899.—The first wireless message across the English Channel was sent on Mar. 27, 1899. With an aerial erected on Dover Town Hall, signals were sent to Wimereux, near Boulogne, 32 miles distant, this being the record distance for wireless telegraphy up to that time.

March 29, 1810.—The modern printing machine can be traced back to Friedrich König, a printer of Leipzig. König visited England in 1806, and four years later, on Mar. 29, 1810, took out the first of four patents for printing machines in which he employed revolving cylinders. The *Times* was first printed by König's machines on Nov. 14, 1814, while the first book printed by machinery was Blumenbach's "Physiology."

March 31, 1795.—The hydraulic press so extensively used to-day was described by Bramah in his patent of Mar. 31, 1795, and his demonstration apparatus is preserved in working condition at the Science Museum, South Kensington. Pascal, 150 years previously, had, however, stated the principle of the machine. If a vessel, he said, had two openings, one a hundred times as large as the other, and if each be supplied with a piston which fit it exactly, then a man pushing the small piston will equilibrate that of 100 men pushing the larger piston.

March 31, 1889.—Commenced on Jan. 28, 1887, the Eiffel Tower in Paris, the highest structure in the world, was completed on Mar. 31, 1889. Its height is 300 metres and its weight 6875 tons.

April 1, 1823.—On April 1, 1823, the Treasury requested the opinion of the Royal Society on the merits and utility of a plan submitted by Babbage for applying machinery to the purpose of calculating and printing mathematical tables. This referred to the "difference engine" invented by Babbage in 1812. Its construction was authorised in 1823, suspended in 1833, and abandoned in 1842, after the Government had provided about £17,000 and Babbage had expended some £6000 of his own. This and many other calculating machines are now to be seen in the mathematical collections at the Science Museum, South Kensington.

April 2, 1799.—For more than seven centuries the home of Benedictine monks, the Priory of Saint Martin-des-Champs, Paris, in 1790 was appropriated by the French nation, and on April 2, 1799, became the home of the Conservatoire des Arts et Métiers, instituted by law on Oct. 10, 1794.

April 2, 1845.—The photographic study of the sun may be said to have been begun in 1858 with De la Rue's 'photo-heliograph,' but thirteen years before that, on April 2, 1845, Foucault and Fizeau obtained a daguerreotype of the sun which was reproduced in his "Popular Astronomy" by Arago, at whose suggestion the experiment was made.

E. C. S.

Societies and Academies.

LONDON.

Royal Society, Mar. 17.—W. L. Bragg and J. West: The structure of certain silicates. In a number of compounds the oxygen atoms are arranged in one of the forms of closest packing, the atoms of metal or silicon being inserted into this oxygen assemblage and causing only a slight distortion of its ideal arrangement. Typical examples are the compounds Al_2O_3 , BeAl_2O_4 , MgAl_2O_4 , Mg_2SiO_4 , MgCaSiO_4 , $(\text{MgOH})_2\text{Mg}_3(\text{SiO}_4)_2$, Al_2SiO_5 (kyanite). In the diffraction of X-rays by these crystals, which are often characterised by low symmetry and large unit cell, the simple pattern produced by the oxygen arrangement is evident, superimposed upon the pattern produced by the crystal as a whole. Other silicates are based upon more complicated arrangements of oxygen atoms, but these atoms appear in all cases to play a highly important part in determining the structure.

W. A. Wooster: The analysis of beams of moving charged particles by a magnetic field. The intensity distribution in the line produced by a magnetic field acting on a beam of homogeneous particles is determined (a) for a source of particles which is infinitely narrow, and (b) for sources of various finite widths. The conditions under which the analysis of moving charged particles is most favourably carried out are derived from this structure of the lines. The method can be applied to the determination of the velocity distribution of particles passing through thin sheets of matter.

J. F. Spencer and E. M. John: The magnetic susceptibility of some binary alloys. The magnetic susceptibility of the pure metals gold, silver, lead, tin, bismuth, aluminium, and cadmium, and a complete series of binary alloys of lead with gold, silver, and tin; tin with aluminium, bismuth, gold, and cadmium; and gold with cadmium have been measured by means of a Curie balance. The susceptibility-composition curves indicate the existence of some intermetallic compounds which have not previously been recognised, for example, Al_4Sn_3 , Ag_9Pb_2 , and Sn_4Bi_3 ; they confirm the existence of some other compounds, for example, Pb_3Au_2 , AuSn_2 , AuCd_3 . The curves and measurements show that the alloy of lead and silver containing 29 per cent. of lead is comparatively strongly paramagnetic, that of lead and gold containing 94 per cent. lead is strongly diamagnetic, and the aluminium-tin alloy containing 75 per cent. of tin is also strongly diamagnetic. The susceptibilities of the lead-tin alloys, where compounds are not formed, may be calculated by the mixture rule.

H. T. Flint and J. W. Fisher: A contribution to modern ideas on the quantum theory. An account is given of the four-dimensional aspect of de Broglie's phase wave, followed by a suggestion for the inclusion of quantum phenomena into the general theory of relativity by the introduction of a four-vector, to complete the current four-vector of electrodynamics, of which the divergence does not vanish. This leads by a simple assumption to a generalised form of Schrödinger's wave equation.

Royal Meteorological Society, Feb. 16.—J. Glasspoole: The variability of average monthly rainfall throughout the year. The variability of the monthly averages for the thirty-five years, 1881–1915, has been circulated for some 550 stations in two ways. In (1) the range has been used, *i.e.* the difference between the largest and smallest monthly averages. It varies from 1 inch at stations along the east coast and in central England, to 9.8 inches at both Glenquich, in the western Highlands of Scotland, and