Calendar of Discovery and Invention.

October 2, 1901.—The first British submarine, launched at Barrow on Oct. 2, 1901, was 63 ft. long and 11 ft. 9 in. wide. From the sixteenth century onwards, numerous attempts were made to produce a boat to travel under water, but the early models failed because they relied on man-power for propulsion. The greatest impetus to submarine building came with the 'Holland' vessel, constructed about 1897 by J. P. Holland in America. It was propelled by a gasolene engine on the surface, and used electricity for under-water work. It also had planes, which could be inclined to assist in diving and rising.

October 3, 1846.—Gun-cotton was the invention of Prof. Schönbein, of Basel, and was made known in 1846. On Oct. 3 of that year, the Diet of Frankfurt voted a recompense of 100,000 florins to Schönbein and Dr. Boettger, as inventors of the explosive, provided the authorities of Mayence, after seeing it tried, pronounced it superior to gunpowder as an explosive. Improvements were made by Baron von Lenk, an Austrian officer, about 1852, and in 1862 details of the manufacture were communicated to the British Government.

October 4, 1877.—The Ingram web rotary machine, invented by Mr. (later Sir) W. J. Ingram, M.P., for printing illustrated newspapers, was first used to print the *Illustrated London News*, Oct. 4, 1877.

October 5, 1896.—At the Paris Academy of Sciences on this date, MM. Berthelot and Vieille read a paper describing researches which had been made with the view of seeing what precautions, if any, are necessary in the preparation, compression, and storage of acetylene for commercial purposes. Acetylene was discovered by Edmund Davy in 1836, and first systematically examined by Berthelot. Wöhler, in 1862, prepared it by the action of water on calcium carbide, but its use as an illuminant only became practicable in 1892 when Moissan and Willson showed that it was possible to make calcium carbide on the commercial scale in the electric furnace. Storage of the gas by dissolving it in liquids such as acetone was first suggested by Claude and Hess in 1896. Later Janet and Fouche found that acetylene dissolved in acetone absorbed by a suitable porous material could not be made to explode.

October 6, 1807.—Potassium was isolated by Davy by electrolysis of the fused hydroxide on Oct. 6, 1807. By a similar method Davy isolated metallic sodium. The method of manufacture on the commercial scale was given its first impulse by Deville in 1854, and in consequence of the improved processes it became possible to sell sodium at 10*s.* a pound in 1868. The modern Castner electrolytic process was introduced in 1890.

October 7, 1847.—Sir Isaac Holden and Samuel Cunliffe Lister were responsible for great developments in the machinery for wool-combing. On Oct. 7, 1847, a patent was taken out in their joint names for a new method of carding and combing and preparing genappe yarns, and when the machinery had been brought as near perfection as possible, factories were built which in time became the largest wool-combing concerns in the world. The business was concentrated chiefly at Bradford, to which city it brought prosperity.

October 8, 1884.—On this date, *Rodney*, an ironclad battleship of the *Benbow* class, was launched at Chatham. The modern ship of the same name was laid down on Dec. 28, 1922, with her sister ship *Nelson*. Her length is 702 ft., beam 106 ft., mean draught 30 ft., and normal displacement 35,000 tons.

W. C.

Societies and Academies.

PARIS.

Academy of Sciences, Sept. 5.—Paul **Marchal**: The natural strains of Trichogramma.—**Riquier**: The investigation of the numerical solutions of any system of integral algebraical equations with any number of unknowns.—Léon **Pomey**: The existence of non-linear, partial differential equations which are quasi-normal.—J. A. **Lappo-Danilevski**: The algorithmic solution of the problem of Riemann.—Jean **Chazy**: The advances and retardations of the times of passage of Mercury on the sun's disc.—Raoul **Ferrier**: The theory of the molecular field.—F. **Gonseth** and G. **Juvet**: The equations of electromagnetism and Schrodinger's equation in a five dimensional universe.—Lucien **Vallery**: The stability of the catalytic properties of palladiumised asbestos. Details of experiments bearing on the determination of hydrogen in the atmosphere by the action of asbestos coated with palladium. Traces of hydrogen arsenide and antimonide do not appear to poison the catalyst, neither does the catalytic power of the metal appear to be affected by repeated use.—Pierre **Thomas** and Mlle. Marie **Sibi**: Contribution to the study of the structure of jellies. Researches on the crystallisation of *l*-arabinosazone. By the addition of a suitable foreign substance it is possible to modify the crystallisation of arabinosazone in such a manner that a pseudo-gel is produced. It is probable that the presence of impurities is a necessary condition for the production of gels of this nature, containing long hair-like crystals.—A. **Demolon** and G. **Barbier**: The application of viscosimetry to the study of colloidal clay. Some information can be obtained of the modifications of the state in a suspension of colloidal clay, especially the influence of electrolytes, by measurements of viscosity. It should be noted, however, that these suspensions do not obey Poiseuille's law, and hence the results have only a relative value.—**Pereira de Sousa**: The basalts of Portugal. At Lisbon and in its neighbourhood there have been at least two series of volcanic eruptions showing differences in their chemical composition.—O. **Munerati** and A. **Milan**: The possibility of detecting the presence of forage beet-root and semi-sugar beet-root amongst sugar beet at the commencement of growth.—L. G. **Seurat**: The presence of *Mercierella enigmatica* in a river in Tunis.—G. **Mouriquand**, A. **Leulier**, and P. **Sédallian**: The *p*H and the alkaline reserve in C-avitaminosis.—Edouard **Chatton**: The meiotic gametogenesis of *Paradinium Poucheti*.

CAPE TOWN.

Royal Society of South Africa, July 20.—A. **Ogg**: The symmetry and crystalline structure of the crystals potassium, ammonium, rubidium, and cæsium sulphate. The crystals were shown to belong to the space group O_h^{16} in Hilton's notation (V_h^{16} Schönflies notation). The elements of symmetry are:

Reflection planes $(100)_{\frac{1}{4}}$, $(100)_{\frac{3}{4}}$.
Glide planes $(010)_{\frac{1}{4}}$, $(010)_{\frac{3}{4}}$. Translation $c/2$,
$(001)_{\frac{1}{4}}$, $(001)_{\frac{3}{4}}$. Translation $\frac{a+b}{2}$.

with the corresponding dyad screw axes and centres of symmetry. The unit contains 4 molecules and the molecule has a molecular plane of symmetry. The proposed structure shows the SO_4 group in tetrahedral form, the distance between S and O centres being 1·5 Å.U. The nearest approach of a K centre to an O centre is 2·7 Å.U., and slightly increased distances for other members of the series. The structure gives an explanation of the twinning of these crystals and the