

onset of the nervous disease which frequently complicates the later stages of pernicious anæmia is prevented. Liver, in fact, has played in the treatment of this disease a similar part to that of insulin in the treatment of diabetes.

Johann Carl Friedrich Zöllner (1834-82)

ON November 8, the centenary occurs of the birth of Johann Carl Friedrich Zöllner, who in the course of a comparatively short career raised himself to a distinguished position among German astronomers as a pioneer in astrophysics. He was born at Berlin, and passed through the Universities of Leipzig and Berlin with distinction; after holding office as an extraordinary professor, he was appointed in 1872 to the chair of physical astronomy at Leipzig. That same year he was elected an associate of the Royal Astronomical Society. In 1865 he had turned his attention to the larger planets, and he afterwards advanced a theory of their constitution which met with wide acceptance, directed attention to the rapid changes in the cloud-belts of Jupiter and Saturn, and made observations of the rotation of the planet. On February 6, 1869, before Janssen and Lockyer devised their method of observing solar prominences in broad daylight, Zöllner read a paper before the Saxon Society of Sciences on a method of doing this, but did not obtain a suitable instrument until some months later. In some of his work, Zöllner was assisted by his pupil Hermann Carl Vogel (1842-1907), afterwards director of the astrophysical observatory at Potsdam. Zöllner died on April 25, 1882, at the age of forty-seven years.

Legislative Control of British Fisheries

IN its report on the herring industry, the Sea-Fish Commission made far-reaching and drastic proposals for the re-organisation of the industry to meet the altered conditions of marketing, and thus to prevent a ruinous decline. The main recommendation was that a Herring Board should be appointed with very wide powers of control over the whole industry. The members of this Board should be nominated by the appropriate Ministers, and should number not more than eight, of which three, including the chairman, should be independent of the trade. Before asking the Government or the Treasury to consider any of the Commission's proposals, however, the Secretary of State for Scotland and the Minister of Agriculture and Fisheries desired to ascertain the views of the fishermen and of the other interests concerned. Accordingly, they arranged to meet a representative conference of all branches of the industry, and this meeting took place at the Scottish Office on October 25. It is learned that, subject to certain reservations made on behalf of Clyde fishermen and exporting interests, the recommendations of the Commission met with the unanimous approval of the industry. If (as now seems likely) the Government decides to go forward with the Commission's proposals, the subjection of the British fisheries to legislative control will be complete. With local by-laws controlling fishing within territorial waters, orders-in-council

governing the trawl fisheries of the high seas and the Herring Board directing the herring fisheries, administrative machinery will have superseded individual freedom in fishing and marketing. This greatest of all experiments in the modern history of British fishing is all the more remarkable because it has the general approval of the industry itself. It will surely command the closest attention and interest of economists and biologists alike.

Electrical Properties of Insulating Materials

PROF. W. M. THORNTON, of Armstrong College, Newcastle-on-Tyne, took as the subject of his inaugural address, given to the Institution of Electrical Engineers on October 25, the electrical properties of insulating materials. He said that there is much in the advanced electrical science of to-day that can never come into practice, yet in the maze of experimental research and wave mechanics which constitute modern physics, there is hidden the explanation of some of the outstanding problems of electrical engineering. Industry is impatient and has to advance without waiting for the slow formulation of fundamental theory. As a result, the insulation engineer in the past found himself responsible for vast expenditures, with little but empirically gained experience for his guidance. In these circumstances, it is not surprising to find that in many respects it is the problem of electrical insulation that is holding back the fullest development of high-voltage engineering for the transmission of large blocks of electrical power. There is at the present time no theory of dielectric behaviour that covers all the facts. Yet there seems to be behind the phenomena a hidden simplicity at least as simple as the free-electron theory of conductors. For example, it has been shown experimentally that the electric strength of air is in fact a physical constant comparable in accuracy of determination with most of the constants of Nature. We know also that all insulators break down at a lower voltage when the frequency of the field is raised. Prof. Thornton showed some beautiful experiments to illustrate that dielectrics obey simple laws. The nineteenth century was the age of the machine. Perhaps the twentieth century will be regarded as the age when insulation was made perfect.

Australian Wool and Capt. John Macarthur

IN the course of his Australian tour, the Duke of Gloucester visited the Ercildoune shearing sheds, where he sheared a sheep which is reported to be a direct descendant of the original merinos introduced into New South Wales by Capt. John Macarthur (*Times*, Oct. 30). Capt. Macarthur was born at Plymouth in 1767, and was educated at a local school. Becoming a lieutenant in the 102nd Foot, or New South Wales corps, raised for service in the colony, he retired with a captaincy in 1804. Macarthur possessed an extensive grant of land at Paramatta, and as one aspect of his agricultural pursuits, engaged in improving the breed of sheep in the colony; the "Dictionary of National Biography" says of him that he "practically created the trade in

Australian wool". Sir Joseph Banks, then president of the Royal Society, was also interested in the introduction of breeds of sheep into Australia, and received fleeces from Macarthur which were reported upon by H. Laycock. Banks, in fact, had many dealings with Capt. Macarthur concerning sheep and wool and also grants of land, some leading to acrimonious letters and mutual distrust. These may well be viewed by posterity with lenient tolerance, as being perhaps inevitable on both sides with the masterful types of men who were then involved in discussions affecting methods of colonisation. Macarthur died in 1834.

Photochemical Reactions

AN admirable account of the history and present position of photochemistry was given by Prof. A. J. Allmand, of King's College, London, in delivering the twenty-seventh Bedson Lecture at Armstrong College, Newcastle-upon-Tyne, on October 27. Tracing it from the work of Cruikshank and Scheele to that of Planck, Einstein and Warburg, he gave a concise account of the interpretation of absorption spectra, and the conception of activation, along with the application of kinetics to photochemical reactions, with consideration also of sensitised reactions. He related that the German chemical warfare records mentioned the difficulty experienced in the complete chlorination of methyl formate, in which the yield obtained varies apparently capriciously from eighty to about two per cent. This was actually due, as Luther had shown for the homologues of benzene, to the absence or presence of air, oxygen being a powerful inhibitor. Further, it has been shown that under various conditions reaction tends to vary as the square root of light intensity, instead of being directly proportional to it, and in the case of the decomposition of hydrogen peroxide a maximum is reached in the plot of concentration against rate. In the combination of hydrogen with chlorine, intensive drying does not in fact inhibit the reaction. In the sensitisation of the decomposition of ozone by chlorine, there is formation of the oxide Cl_2O_6 . In the bromination of benzene in the light, the red or brown liquid residues were found to contain $\text{C}_6\text{H}_6\text{Br}_2$, and possibly $\text{C}_6\text{H}_6\text{Br}_4$. Summarising, Prof. Allmand said that photochemical reactions tend to be complex, consisting of consecutive interactions of the free groups or atoms which are the primary products.

A Fast American Stream-line Train

IN France, the United States, Germany, Italy and Great Britain, experiments are being made with train units driven at high speed by internal combustion engines. The carriages are constructed of either stainless steel or aluminium, all weights are reduced to a minimum and the trains are stream-lined to lessen so far as possible the resistance due to the air. Oil or petrol engines are used, generally with electric transmission. Several of these train units have been described in our contemporaries, the *Engineer* and *Engineering*, and the *Times* of October 26 recorded a very fast passage made across the United States by a stream-line train belonging to the Union

Pacific Railroad. This train, named *M 10001*, which it is stated is driven by a 900 h.p. Diesel engine, arrived at the Grand Central Terminal, New York, at 9.55 o'clock on October 25, after crossing from Los Angeles in 56 hours 55 minutes, beating every existing record in America. During the passage of the 508 miles between Cheyenne and Omaha, the train had an average speed of 84 miles an hour, while over short distances it ran at 120 miles an hour. The train with two others, larger and more powerful, which are being built, will be put in regular service between Chicago and California.

Centenary of Lloyd's Register

THE world-famous society, Lloyd's Register of Shipping, celebrated on October 25 the centenary of its reconstitution by a dinner at the Savoy Hotel, which was attended by about four hundred distinguished guests, members of the staff and representatives of various shipping and commercial interests. The society has been described as a voluntary association of underwriters, shipowners, shipbuilders and others existing for the purpose of surveying and classifying the shipping of the world. It provides a means of self-government for shipping, and is neither State-aided nor a profit-making concern. Of British shipping, more than three quarters is at present classed with Lloyd's Register, and of the ships being built throughout the world, 74 per cent are being constructed under the society's supervision. Its surveyors are found in every important seaport in the world, and in paying a tribute to its work, Mr. Runciman, the president of the Board of Trade, said that for many years Lloyd's Register has classified more ships than all the other classification societies in the world, and it has done so on an international basis which has given uniformity to the trade it has served so well. It has standardised the basis of material and design, and has made a contribution to the safety of travel which could not have been made by any other means. The society is shortly publishing a centenary edition of the "Annals of Lloyd's Register", which will contain a wealth of information anent the development of merchant shipbuilding from the days of the wooden ship to the launch of the *Queen Mary*.

Texture and Chemical Resistance of Materials

DR. C. H. DESCH delivered a public lecture on October 26 before the Institution of Chemical Engineers on "Texture and Chemical Resistance". Dr. Desch pointed out that the resistance of materials of construction to attack by chemical agents depends not only on their composition, both ultimate and proximate, but also on their texture. This is illustrated by the differences between the behaviour of wrought iron and mild steel, the attack of sulphates on limestone, and the action of hard and soft waters on concrete dams. On a finer scale, the resistance of metals and alloys to chemical attack is affected by the grain size, the presence of cold-worked regions, the smoothness of the surface, and the directional effects of rolling and drawing. In steels, the distribu-