

not written to the Duke for two years; and to receive this extraordinary information puzzled the whole Bench of Bishops."

So far Sir William Fraser, whose account may be regarded as authoritative. Fraser (1826-98, Eton, Christ Church, and 1st Life Guards) worshipped the memory of Wellington with a devotion that almost reached fanaticism; his "Words on Wellington", from which this account is taken, is one of the most remarkable collections of sayings and doings that have ever been recorded concerning one individual—remarkable not only in the variety of its Wellingtoniana, but in the insight which it gives into the character of its compiler. The book is long out of print, and has a certain historical value. The author carried out a first-rate piece of detective work, of which he gives a full account, in his identification of the scene of the Duchess of Richmond's famous ball on the eve of the battle of Waterloo.

#### Scientific and Industrial Research in Australia

THE Australian Government has announced that the work of the Council for Scientific and Industrial Research is to be extended in the interests of secondary industry generally. Since its establishment in 1926, the Council has deliberately restricted its attention to problems of the primary producing industries, though no such restriction is imposed upon it by the Act under which it is constituted. It has always been assumed that an extension was only a matter of time in view of the contraction of world markets for primary products and the consequent pressure to increase the home market by expanding secondary industries. A recent decision to establish aircraft and motor production in the Commonwealth has intensified a growing demand for an extension of national scientific research, and an influential committee, including leading engineers and industrialists, is now at work preparing a definite scheme of work. Existing institutions will be utilized wherever possible, but it is fully recognized by the Government that considerably increased financial obligations must be carried by it. A first step is to establish an agency for the maintenance of accurate fundamental standards of measurement and for the testing of master gauges for controlling precision manufacture. It is intended that in all developments intimate contact shall be maintained with, and guidance sought from, established British institutions engaged on work of the same type.

#### Luminous Phenomena on the Sea during a Thunderstorm

THE occurrence, during a tropical thunderstorm between Singapore and Bangkok on the morning of May 21, 1936, of a diffused white light over the surface of the sea, pulsating at regular intervals of about two to the second, so that the ship seemed to be sailing through waves of light and darkness, was referred to by a correspondent in *The Times* of June 26. The phenomenon is said to have continued for about half an hour. Another correspondent referred to a similar phenomenon in the Persian Gulf in March

1908, when waves of light were observed wheeling round the ship. Both these phenomena would appear to have been due not to electrical conditions but to phosphorescence. A description and sketch of a "Phosphorescent Wheel" near Sumatra (with an interval of about one second between the waves of light) is given in the *Marine Observer* of the Meteorological Office of November 1926; waves of light with an interval of half a second were observed on October 27, 1924, at 1 a.m. near Krakatoa Island (*Marine Observer*, October 1925); streaks of luminescence, observed in January 1927 in the Equatorial Atlantic, were practically parallel with the wind, which was south-east, about force 4 (*Marine Observer*, January 1928). These observations indicate that phosphorescence is not uniform over the wave profile, and consequently streaks of light will appear to an observer on board ship to move as the ship moves relative to the waves. Phosphorescence is most readily observed on ripples or on the breaking crests of waves, and while no one has yet worked out in detail the conditions under which the streaks will appear, the period of pulsation, which is reported as 0.5-1 second, is probably equal to the interval of time between the passage of the ship over successive waves.

#### Lightning and Atmospheric

IT is now generally agreed that the majority, if not all, the atmospheric encountered in radio communication originate in lightning flashes. When the storm is close to the receiver, it is possible to identify the stronger atmospheric with the neighbouring flashes. In a recent communication, Mr. P. F. Fyson, Langherne House, Rushwick, Worcester, claims to have observed that the atmospheric crackle produced on a broadcasting receiver was heard before the lightning flash which caused it was perceived visually. If this difference in the perception of the two effects is real—it obviously needs verification by other observers—it would appear on first consideration that the human eye is rather more sluggish in its operation than the ear; and Mr. Fyson suggests that this may be due to the time required for the chemical change in the retina to affect the optic nerve. An alternative explanation, however, may be found in the fact, which has arisen from recent research on lightning, that an intermittent electrical discharge appears to precede the actual main lightning flash. It is possible that this discharge may be invisible and yet may be capable of producing audible effects on a wireless receiver. These sounds may thus be heard a very short time before the visible flash was observed.

#### Champollion and Hieroglyphics

In "Science News a Century Ago", in *NATURE* of August 8 (p. 257), an extract appears from the *Athenæum* describing an obelisk erected to the memory of Champollion, and bearing the inscription "To the memory of F. J. T. Champollion, who first penetrated into the mysteries contained in the writing and monuments of ancient Egypt. . . ." A correspondent has pointed out that, even allowing

for the generosity of interpretation of a 'lapidary inscription', Champollion has no claim to the honour of first penetrating into the mysteries of the writing of ancient Egypt. That honour, beyond all question, belongs to our versatile countryman, Thomas Young. In 1819, Young published an article, "Egypt", in the supplement to the "Encyclopædia Britannica", in which he gave a list of *alphabetic and syllabic characters*, an article which has been described by Sir E. A. Wallis Budge as "practically the foundation of the science of Egyptology". In 1821, two years later, Champollion published a treatise in which he shows not the slightest trace of knowledge of anything alphabetic in hieroglyphic or hieratic characters; Champollion's publication of an alphabet dates from 1822. Concerning Champollion's alleged attempt to suppress his unfortunate work of 1821, we need say nothing here; the whole story of the Rosetta Stone and the decipherment of the hieroglyphic characters was discussed some years ago in an article in NATURE (April 30, 1932, p. 638). It is sufficient here to say that the inscription on the tablet to the memory of Young in Westminster Abbey states no more than the bare truth when it describes him as the one who "first penetrated the obscurity which had veiled for ages the Hieroglyphics of Egypt".

#### Recent Acquisitions at the Science Museum

AMONG the objects recently placed on exhibition in the Science Museum, South Kensington, is a model of the complete lay-out for a 120-ton 10,000 horse-power Mond gas producer plant with ammonia recovery apparatus which has been lent by the Power-Gas Corporation, Ltd. Mr. Edward J. Willis, an American authority on astronomical navigation, has sent from the United States an example of a navigating machine which was invented by him and constructed at a cost of about £300. The machine solves problems in spherical trigonometry connected with navigation. An example of Selling's calculating machine which has long lain neglected in the stores of the Imperial College of Science and Technology has been lent to the Museum for exhibition. The machine was invented fifty years ago and made ingenious use of the 'lazy tongs' mechanism in order to perform multiplication and division. A representative selection of fourteen stone (chert) weights and a plaster cast of a fragment of a linear measure, all found in excavations at Mohenjodaro, Harappa, and elsewhere in northern India—relics of a civilization of c. 3250–2750 B.C., that formed great cities along the Indus valley, contemporaneous with the ancient Egyptian first to fifth dynasties, and the ancient Sumerian kingdoms in Mesopotamia—have been presented by the Archaeological Survey of India.

#### Frontier System in Roman Scotland

A FURTHER effort to settle the question of the number and character of the occupations of the Roman fort of Birrens, near Ecclefechan, Scotland, is being made by excavations now proceeding in charge of Mr. Eric Birley, of the University of Durham.

The problem to be solved is whether the occupation of the fort was part of the organization of the Antonine Vallum, as Sir George Macdonald has suggested, or whether it is to be related to Hadrian's Wall, as the Dere Street forts to the east recently have been shown to be by Mr. Ian Richmond's excavations. Two periods of occupation separated by a destruction were demonstrated in 1925 by excavation, but the examination of the stratification was not, nor was it intended to be, exhaustive. Search for further evidence is now being made, and with this object excavations are proceeding at two points down to the subsoil for a thorough examination of the stratification and the pottery. Up to the present, a section in the *retentura* of the fort, it is reported in *The Times* of August 10, has shown that a wooden building and two of stone preceded the two periods, of which evidence was found in excavations made in 1895. The wooden structure is assigned to the latter part of the first century and it is said that traces of Agricola have been found; while the two stone periods which follow are thought to belong to the Antonine occupation. Under the earlier of the two periods previously known, two vessels have been discovered, for which there are parallels from Hadrian's Wall. A second excavation in the *praetentura* has been more fruitful as a source of pottery and other finds, including a large piece of a cut-glass bowl, of which a fragment was found in 1895. Excavation at the west gate has exposed what is described as "the worst Roman masonry so far found in Scotland".

#### Archæological Finds in Iraq

DR. HENRI FRANKFORT'S assiduity in making known to the public at an early date any points of special interest arising out of the excavations of which he has been in charge, season by season, is worthy of all commendation, especially since he became field director for the Oriental Institute of the University of Chicago at Tell Asmar, the ancient Eshnunna. The important and extensive operations of the Oriental Institute in the field of the Ancient East possibly are not so widely known, outside the circle of specialists, as they deserve. In his report on the results of the past season (*The Times*, August 1), Dr. Frankfort mentions a number of finds of exceptional interest. As is generally known, one of the objects to which he has given special attention at Tell Asmar and on the neighbouring site of Khafaje is the problem of the early relations of Mesopotamia with both the Indus Valley and the Mediterranean. On both these questions he is able to record new and important evidence, in the former instance pointing to a more intimate relation than the purely commercial connexion, which is all that it has been possible to infer from previous finds. In a temple on a new site, Tell Agrab, the expedition has found among a quantity of interesting material some remarkable examples of stone vases with surprising sculptures. Among these is one fragment which shows the sculptured figure of a humped bull standing before a manger and enclosed in the poles of arches which support a roof. Not only is this a