unusual duties for Civil servants, the topics involved are frequently highly technical and have been found to be such as can be handled reasonably and economically in the Patent Office.

The immediate problems for the Office are to dispose of the arrears of work resulting from the Second World War and its aftermath, and to make more effective the search for novelty over as wide a field as possible. At the moment, the Office is in serious need of scientific and engineering graduates to deal with the technical side of its work. Most scientists naturally look to research for their careers, but the application of research is also of vital importance; and in that connexion, the Office offers useful and interesting work for university graduates with the appropriate training and aptitude.

OBITUARIES

Prof. E. G. Conklin

By the death of Edward Grant Conklin we have lost the last representative of the great American school of classical experimental embryology which dominated this science in the period from 1900 until the rise of the Spemann school in the 1920's. Conklin retired in 1933 from the professorship of zoology at Princeton, which he had held for twenty-five years; but the fact that he had become emeritus was very far from bringing the fruitful period of his life to an end.

Conklin's main scientific work is enshrined in a series of large and fundamental papers dealing with three groups: Ascidians, *Amphioxus* and Molluscs (*Crepidula*). His work on the mollusc *Crepidula* began in 1890 but was not published until 1897. It was immediately recognized as a classical study on cell lineage. Other contemporaries of Conklin had, however, studied molluscan eggs, and his main fame rests on his description and experimental investigations on Ascidians, particularly *Styela* and *Amphioxus*. His careful descriptions of the cleavage and later development in these two groups is the foundation on which not only his own but also a very large quantity of later work by others has been based; but it was his experimental work which placed him in the front rank. In the early 1900's he found in Ascidians evidence, the clarity of which has not been surpassed to this day, for the existence of several different kinds of cytoplasm within the newly fertilized egg. Further, he demonstrated by experiment that the 'ooplasms', as they are now called, exert a determining influence over the course of the later development, so that any region composed of a particular ooplasm will always develop into the corresponding organ or tissue. He spoke of the special types of cytoplasm as 'organ-forming substances', and although our outlook on them has somewhat changed in the past forty years, the facts he produced have stood the test of time, and they, together with his discussion of them, remain as one of the three main bases of the existing theories of experimental embryology.

Although he published more than two hundred scientific papers, it would give the wrong impression to speak of Conklin as a prolific writer; his work is outstanding for that quality of clarity and precision which comes only through the long processes of checking and counter-checking the observations and maturing the thought. In spite of the time he devoted to this, he played a very full part in the general

scientific life of his time, acting for long periods as editor or co-editor of the *Journal of Morphology*, the *Journal of Experimental Zoology*, the *Biological Bulletin* and *Genetics*.

Conklin's interests were not confined to the narrowly professional aspects of zoology. By birth the son of a country doctor in the Middle West, he originally intended to enter the Methodist ministry, and spent his undergraduate years at the Ohio Wesleyan University, graduating both in science, in 1885, and in arts in the following year. Even after he took the decision to devote his main energies to science, he never relinquished a profound interest in wider matters of philosophy and of man's spiritual life. During the course of his long life he published several books on such subjects, of which the best known are "The Direction of Human Evolution" (1921) and "Man, Real and Ideal: Observations and Reflections on Man's Nature, Development and Destiny" (1943). He thus earned the distinction of becoming the president both of the American Philosophical Society and the American Academy of Arts and Sciences, as well as of several purely scientific organizations such as the American Association for the Advancement of Science, the American Society of Zoologists and the American Society of Naturalists.

C. H. WADDINGTON

Prof. J. G. Lawn

JAMES GUNSON LAWN, whose eminence as a mining engineer had received world-wide recognition, died at Eshowe, Natal, on October 21 in his eighty-fourth year. Of Cornish descent and the son of a mining engineer, he was born at Dalton-in-Furness on January 4, 1868.

Before entering the Royal School of Mines in 1888 he had already acquired practical experience in the hematite mines in Cumberland, and this experience enabled him to smooth some of the difficulties of his fellow-students, by whom he was remembered for the readiness with which, as a somewhat senior student, he was always ready to help them.

On completing the course in 1891 and with the award of the Murchison Prize and the De la Beche Medal, Lawn returned to Cumberland as chief surveyor to the Barrow Hematite Steel Co. and as a lecturer in mining for the Cumberland County Council. During 1893-96 he was back at the Royal School of Mines as the instructor in mine surveying and assistant to Sir Clement Le Foster. Then began his first association with mining education and practice in South Africa. When the first South African School of Mines was set up at Kimberley in 1896 Lawn became its first principal and, in the years that followed, the organization of that School owed much to his energy and foresight. During 1903-6 his long association with the Johannesburg Consolidated Investment Co. as a consulting engineer began, although there were interludes between 1907 and 1910 when he became, in succession, head of the Camborne School of Mines (Cornwall) and the first principal and professor of mining, at Johannesburg, of the South African School of Mines and Technology, to which the Kimberley School had now been transferred.

Thus, both in the last decade of the nineteenth century and in the first of this century, Lawn's activities had been divided between mining education and the gold mining industry. It was to the latter,

however, that the greater part of his life was to be devoted. For the next forty years—1910–50—(except for a period during the First World War, when he occupied posts with the Explosives Department of the Ministry of Munitions, finally as controller of that Department) his professional work was entirely linked with the manifold activities of the Johannesburg Consolidated Investment Co., first as consulting engineer, then as managing director in Johannesburg, and later as director and consulting engineer in England.

Lawn possessed wide technical knowledge and experience and, above all, was one of the wisest of the long line of mining engineers whose reputations have been made on the goldfields of South Africa.

During his long association with the Institution of Mining and Metallurgy, of which he was elected president for 1930–31, he took a very active part in discussions on technical and scientific matters. His comments were clear, concise and always constructive, even when critical. The award of the Institution's Gold Medal in 1935 and his subsequent election as an honorary member were fitting tributes to his long and unremitting services to mining education and to the mining industry.

In 1934 the University of the Witwatersrand conferred on him the honorary doctorate of science and

in 1943 he was elected to the honorary fellowship of the Imperial College of Science and Technology, thus forging another link with the Royal School of Mines which he had entered as a student fifty-five years before.

In later years Prof. Lawn had found an absorbing hobby in botanical pursuits. I well remember a chance meeting with Prof. Lawn in a hotel on the Great North Road, after returning from a successful plant-hunting expedition on the slopes of Ingleborough; he was most enthusiastic about some of his finds. His last letters from South Africa were also full of details regarding interesting plants he had recently discovered near his South African home.

J. A. S. RITSON

WE regret to announce the following deaths:

Sir William Dampier, F.R.S., senior Fellow of Trinity College, Cambridge, on December 11, aged eighty-four.

Dr. Sven Hedin, Hon. K.C.I.E., known for his explorations of Central Asia, aged eighty-seven.

Dr. C. H. Kellaway, F.R.S., director-in-chief of the Wellcome Research Institution, London, on December 13, aged sixty-three.

NEWS and VIEWS

Long Range Weapons Establishment, Australia : Dr. C. F. Bareford

DR. C. F. BAREFORD has been appointed to the post of chief superintendent of the Long Range Weapons Establishment, Australian Department of Supply, in succession to Mr. H. C. Pritchard, who returns to the United Kingdom next year. In his new office, Dr. Bareford will be responsible for the operation of both the base research and development establishment at Salisbury, and the ranges at Woomera, where trials are carried out for the Australian Government and also the Guided Weapons Directorate of the U.K. Ministry of Supply.

Dr. Bareford is a graduate of the University of Sheffield, where he carried out research under Prof. S. R. Milner on the vacuum arc and spark discharges. He gained some industrial experience with the Mazda Valve Organization during 1934–36, before joining the experimental staff of H.M. Signal School, Portsmouth. He was one of the small band of early workers on naval radar. As early as 1937, together with the late Mr. E. M. Gollin, he built a 20-cm. radar equipment, and a little later the first experimental prototype of the 50-cm. gunnery radar. In 1940, when the need for radar navigational aids became more pressing, he transferred his attention to this field, and to the associated field of precision direction-finding equipment. An early form of pulsed navigational aid was conceived and developed by a team under his leadership in the New Cavendish Laboratory in Cambridge. Special direction-finding equipments using radiation from 100 Mc./s. (33 cm.) to 10,000 Mc./s. (3.3 mm.) were evolved by this team, and were used extensively in the months prior to the Normandy landings by the Allies in 1944. Dr. Bareford had, meanwhile, assumed the control of the Radio Reception Division of the Admiralty Signal Establishment in Haslemere, and sponsored the development of the

communication receiver series which is now standard equipment in H.M. ships. In 1947 Dr. Bareford became head of the Mullard Research Laboratory. Under his leadership the staff of the laboratory has grown from less than twenty to more than a hundred scientists, in addition to the ancillary staff, and has completed many important projects in the broad field of electronic engineering. In particular, the 15-MeV. linear electron accelerator and neutron spectrometer now in use at Harwell were built there. A radar system for the automatic exploration of the meteorological conditions in the upper atmosphere has been developed. The laboratory has also studied extensively cavitation phenomena, and developed instrumentation for various measurement problems and techniques for the mass production of precision components.

Melchett Medal for 1953: Dr. H. Hartley, C.B.E.

THE Institute of Fuel has awarded the Melchett Medal for 1953 to Dr. Harold Hartley, in recognition of his high scientific attainments in the development of domestic heating appliances, coupled with the administrative skill with which he has guided a great industrial organization devoted to the practical efficient use of fuel. Dr. Hartley is chairman of Radiation, Ltd., manufacturers of heating and cooking appliances for domestic, commercial and industrial purposes. A native of the Isle of Man, he was educated there, at the Manchester Grammar School and at the University of Manchester, graduating in chemistry in 1907. He was then elected to a Gartside scholarship of industry and commerce, and, after a year spent in the School of Economics at Manchester, he visited Norway and Canada to study the production of power for electrochemical industries. Returning to England, he worked for three years as a Gas Research Fellow at the University of Leeds under the