gests, however, that the cut-off is fairly abrupt, leading to the conclusion that transmission through the ionosphere in the two directions, from below and from above, appears to be different. Such lack of reciprocity could arise from the effect of the earth's magnetic field.

The work described in this paper is part of the research programme of the Division of Radiophysics, Council for Scientific and Industrial Research, Commonwealth of Australia.

¹ Mofenson, J., *Electronics*, **19** (4), 92 (April, 1946).

² Bay, Z., *Hungaria Physica Acta*, **1**, 1 (1946).

³ Grieg, D. D., Metzger, S., and Waer, R., *Proc. Inst. Rad. Eng.*, **38**, 652 (1948).

⁴ Appleton, E. V., and Beynon, W. J. G., *Proc. Phys. Soc.*, **52**, 518 (1940); **59**, 58 (1947).

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OBITUARIES

Dr. F. H. A. Marshall, C.B.E., F.R.S.

BORN at High Wycombe on July 11, 1878, Francis Hugh Adam Marshall died suddenly after an operation in a Cambridge nursing home on February 5. He was the younger son of Thomas Marshall, and was educated at St. Mark's School, Windsor, and privately. After a short time at University College, London, he went up to Christ's College, Cambridge, in 1896 and took the Natural Sciences Tripos. Inspired by the work of Walter Heape in Cambridge on sex physiology, he then accepted an invitation to work in Edinburgh with Prof. Cossar Ewart, who at that time was conducting his well-known experiments on telephony in farm animals at Penicuik. Here he started his research career and worked in conjunction also with the distinguished group of research physiologists centred around Sir Edward Sharpey Shafer. During this time he published many valuable papers on the oestrous cycle in the sheep (1903), the ferret (1904) and the dog (1905); but perhaps one of the most important was that on "The Ovary as an Organ of Internal Secretion", for it led to large developments in this field later. The University of Edinburgh honoured him with a D.Sc. and later with an LL.D. degree, and he was elected a fellow of the Royal Society of Edinburgh.

In 1908 Marshall returned to Cambridge, where he became lecturer in agricultural physiology in the newly formed School of Agriculture. He was also elected a fellow of Christ's College and lectured to medical students in the Department of Physiology on reproduction. It was during these years that he gathered the materials for and wrote his classical book on "The Physiology of Reproduction", which was first printed in 1910, a second edition appearing in 1922. This book appeared at an opportune time, for during that period research work was expanding rapidly in the United States and elsewhere, and the book, giving complete references to the literature on the subject, formed a background for the spectacular advances made later on the internal secretions of the reproductive organs, a subject to which much of Marshall's earlier work was devoted. At the time of his death he was busy with proofs of the third edition of this book, chapters for which had been contributed by many of his former pupils and associates whom he had inspired by his passionate devotion to his subject.

In the period of some thirty-five years during which he was lecturer, and afterwards reader, in agricultural physiology at Cambridge, he also laid the

foundation for this subject as a basis for training in animal husbandry, and his book on the "Physiology of Farm Animals" is widely used and has run through several editions. In conjunction with the late Prof. T. B. Wood, the first director, he helped to develop the Institute of Animal Nutrition at the School of Agriculture, Cambridge, and became director himself for a short time after Wood's death. For his work for agricultural science he was made a C.B.E.

Marshall's literary talents were well developed and he wrote with a clarity and ease of style which held the attention of his readers. These powers he put to good use not only in his books but also as editor of the *Journal of Agricultural Science* and as a founder member of the editorial boards of the *British Journal of Experimental Biology* and the *Journal of Endocrinology*.

In 1920 he was elected a fellow of the Royal Society and served on the Council from 1933 until 1935. In the following year he delivered the Croonian Lecture on "Sexual Periodicity and the Causes which Determine it", in which he stressed the exteroceptive factors, especially of light, a subject on which he did much experimental work in his later years. He was awarded a Royal Medal in 1940.

At Cambridge Marshall played his part, too, in academic affairs, becoming tutor, dean and finally, in 1940, vice-master of Christ's College. He was a proctor during 1911-12 and afterwards served on the Council of the Senate. His kindly and gentle manner endeared him to his students and to the many aspiring research workers who came to seek his advice from far and wide.

JOHN HAMMOND

Prof. L. Farkas

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THE death of Ladislav Farkas, at the age of forty-four, removes from our midst a relatively young physical chemist of singular charm and undoubted ability.

Ladislav Farkas was the younger son of a Hungarian pharmacist living at Dunaszerdahely, and, like his elder brother, revealed a particular aptitude for physical chemistry. He attended the Technische Hochschule in Berlin, and then worked with Prof. Fritz Haber at the Kaiser Wilhelm Institut in Berlin-Dahlem at the period when the possible participation of atoms and radicals in chemical reactions had been recognized and demanded intensive investigation. His work here was so effective that he was promoted to 'assistant'. As the Nazi regime in Germany became more definitive, he found his position becoming more difficult, and he emigrated to work in the Department of Colloid Science at the University of Cambridge.

Deuterium, at that time, was scarcely obtainable in Britain, and its obvious utility, on account of the mass and zero point energy differences, in throwing light on the detailed mechanism of homogeneous, heterogeneous and catalytic reactions, suggested a promising field for inquiry. Farkas prepared deuterium compounds by the orthodox electrolytic and diffusion processes, and in addition elaborated a number of ingenious partition and chemical methods for its separation. The results of the investigation of a number of chemical and catalytic reactions, in which hydrogen and hydrogen-containing compounds were replaced by deuterium, were presented in a series of papers. His experimental work was characterized by elegance in design and execution, while his theoretical insight, already appreciated by Haber, was confirmed by his British co-workers.

Before the Second World War, when the Hebrew University of Jerusalem was undergoing extension, Farkas, at the request of Dr. Ch. Weizmann, joined the staff there and was appointed professor of physical chemistry in 1936, a post which he held at his death. During the last ten years he was particularly active in training young chemists in Israel. Early in 1942, the Palestine War Supply Board set up a scientific advisory committee to co-operate with the Middle East Supply Centre in Cairo, and Farkas became its scientific secretary. He developed methods for the local production of many important chemicals such as ethyl chloride, ethylene bromide and vitamin D.

He took an active part in the exploitation of the Dead Sea minerals, particularly the recovery and utilization of bromine.

At the end of December Farkas left Jerusalem for the United States to purchase scientific equipment, and on this journey he was the victim of an aeroplane crash in the vicinity of Rome. ERIC K. RIDEAL

WE regret to announce the following deaths:

Dr. Tenney L. Davis, emeritus professor of organic chemistry in the Massachusetts Institute of Technology, and editor-in-chief of *Chymia*, an annual publication devoted to historical chemistry, on January 25, aged fifty-nine.

Prof. T. S. Patterson, Gardiner professor of organic chemistry in the University of Glasgow, on February 14, aged seventy-six.

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NEWS and VIEWS

Department of Scientific and Industrial Research:

Sir Edward Appleton, B.E., K.C.B., F.R.S.

THE appointment of Sir Edward Appleton to be principal and vice-chancellor of the University of Edinburgh was announced in November last, and he will be taking up his new duties there in May. Sir Edward became secretary of the Department of Scientific and Industrial Research in February 1939, after a brilliant university career, during which he conducted his classical researches on the transmission of radio waves which led to the award of the Nobel Prize for Physics in 1947 (see *Nature*, November 22, 1947, p. 703). During the ten years he has been with the Department of Scientific and Industrial Research, Sir Edward has devoted all his energy to its interests and purposes. These are broadly: first, to seek scientific truth by carrying out research in the Department's establishments and by encouraging programmes of research in other appropriate places; and secondly, to foster the application of scientific knowledge for the benefit of the community. This period of service has included the arduous war years during which the duties and responsibilities of the head of the Department were particularly onerous and of vital importance to the nation. As an administrator, Sir Edward has come to be respected by all the staff who worked under him; as the Civil servant who represented the Government in all branches of science, except medicine, agriculture and fisheries, he has commanded the attention and appreciation of the whole of Britain. His wisdom, shrewdness and gentle, but persuasive, drive have made him much sought after as chairman of national committees of all types, whether these were concerned with scientific or technical matters or with the practical details of staffs and their organisation. Throughout his decade of Government service, Sir Edward has succeeded in maintaining a close and active interest in the field of radio science which he has made his own and for which he has an international reputation. There is little doubt that, while in his new position he will naturally be mainly concerned with university administration, he will find opportunities to continue his favourite line of research work.

Sir Ben Lockspeiser

SIR BEN LOCKSPEISER, who succeeds Sir Edward Appleton as secretary of the Department of Scientific

and Industrial Research, was born in 1891. He was educated at the Grocers' School, London, and Sidney Sussex College, Cambridge. He served in the First World War, taking part in the Gallipoli Campaign. Invalided home, he worked under Prof. A. V. Hill on problems relating to fuses. His association with aeronautics started in 1920, when he went to the Royal Aircraft Establishment, Farnborough. He was at first engaged in research on crystal structures with Dr. A. A. Griffith; later he worked on aerodynamics and instrument design. He made valuable contributions to the theory of aircraft flutter and to the development of a chemical method of de-icing. He was placed in charge of the Air Defence Section at the Royal Aircraft Establishment in 1937, and it was perhaps in this that his best work, most of it secret, was done. He was transferred to the Ministry of Aircraft Production to take charge of armament research, being made assistant director in 1939 and deputy director in 1941; he became director of scientific research in succession to Dr. D. R. Pye in 1943, and director general in 1945. When the Ministry of Supply took over the responsibilities of the Ministry of Aircraft Production for aircraft, the need for a man of science to co-ordinate the scientific investigations of the whole Ministry was apparent, and Sir Ben was appointed as chief scientist to take over this work. Throughout his career Sir Ben has taken a strong interest in the status of scientific workers in the Civil Service; much of the improvement in conditions of service that has been achieved is due to his untiring efforts.

Physiology at University College, London:

Prof. C. Lovatt Evans, F.R.S.

PROF. CHARLES LOVATT EVANS is retiring at the end of the present session from the Jodrell chair of physiology at University College, London, which he has occupied since 1926. He was originally a student and is now an honorary LL.D. of the University of Birmingham. He then went to University College as Sharpey Scholar in Starling's laboratory and qualified in medicine at University College Hospital. As a fellow of the College, as professor and as dean of the Faculty of Medical Sciences, he has spent a large part of his active life in the place. As a member of the Medical Research Council, of the council of the Royal Society (vice-president), of the council of the Royal Veterinary College and of many other bodies,