

tributed articles on these and other invertebrates to natural histories, scientific journals and the "Encyclopaedia Britannica".

His main interest, however, was in the higher vertebrates, and this was further stimulated by trips to Spain and the Balearic Islands with Oldfield Thomas to collect small mammals. Much to the regret of his colleagues, he resigned from the Museum in 1904 to take up the post of superintendent of the Zoological Society's Gardens.

Here his first research was on mimicry in insects and their palatability to birds, which was almost his last contribution to invertebrate zoology. His new post gave him opportunities of studying live mammals in the collection under his care, and in the prosectorium he could carry on researches on the more detailed anatomy of the groups in which he was interested, especially Primates, Carnivora and Ungulata.

In 1911 he was elected to the Royal Society, shortly after the publication of what Pocock himself regarded as his most important paper, "On the Specialized Cutaneous Glands of Ruminants". Among other of his many papers, which appeared in the *Proceedings of the Zoological Society* and other journals, special mention should be made of that "On the External Characters of the Lemurs and *Tarsius*" and another "On the Classification of Existing Felidae".

Pocock retired from his post at the Zoological Society in 1923 and returned to the British Museum (Natural History) as a temporary scientific worker. He devoted himself to the study of his favourite groups of mammals, and entered into correspondence with naturalists and sportsmen in many parts of the world with the object of filling gaps in the national collection. He contributed the volumes on monkeys and Carnivora in the "Fauna of British India" and was also preparing a volume on the Ungulata, and a "Catalogue of the Felidae in the British Museum".

Apart from his numerous scientific publications Pocock also found time for more popular writing, and was for many years natural history editor of *The Field*. His untiring energy remained until the last, the Zoological Society having received from him the MSS. of three papers within the past two months.

He had considerable artistic talent, possibly inherited from his great-grandfather Nicholas Pocock, marine artist by appointment to George III, and he illustrated many of his own papers and articles.

He was deeply interested in sport, winning many prizes in athletics in his youth. As a Rugby footballer he gained his cap for Gloucestershire, and later, after taking up residence in London, he played for Blackheath in its first XV until about 1890. This interest in sport he retained until the day of his death, which he had intended spending at Lords.

Pocock married, in 1889, Constance, daughter of Mr. Thomas Osborne, and is survived by one son.

EDWARD HINDLE

Dr. Alex Müller

DR. ALEX MÜLLER, who died on July 2, at the age of fifty-eight, received his early training in physics and mathematics in Zurich, where he took his doctorate in 1915 by a thesis entitled "Messungen der thermischen Ausdehnung von kristallisiertem Quarz und von Gold zwischen 18 und 540°". Later he studied in Göttingen and then in the Cavendish Laboratory, Cambridge.

Before coming to Britain he had acquired a sound knowledge of X-ray techniques; he had made one of the earliest determinations, by X-ray methods, of

the value of Planck's constant, and he had experience in the design of X-ray tubes. While at the Cavendish he was associated, in its early stages, with the work by Miss C. Elam and Prof. G. I. Taylor, which later formed the substance of the Bakerian Lecture for 1923, and he himself made sodium crystals and experimented on their plastic deformation. He also became interested in the determination of crystal orientation by X-ray methods, one of the more important of present-day industrial applications of X-ray crystallography.

In 1922 he joined the staff of University College, London, where Sir William Bragg was Quain professor of physics; and in 1923 he moved with Bragg's research team to the Royal Institution, where he worked for the rest of his life, first as research assistant, then, from February 1928, as assistant director, and, from November 1946, as deputy director of the Davy Faraday Research Laboratory.

His contribution to the work of that team was unique. W. H. and W. L. Bragg had opened up an immense field of investigation in the twin sciences of X-ray spectroscopy and X-ray crystallography. They had used ionization methods with great success in the first instance, but for many purposes these were proving inadequate. Müller, however, had had considerable experience of photographic methods; in 1921 he had made wave-length measurements of the *L* spectrum of mercury, using an X-ray tube with a liquid mercury anticathode; and he now devoted himself on one hand to the development of equipment for the photographic technique of structure analysis, and on the other to the practical application of that technique to the study of the structure and properties of long-chain carbon compounds. His work, carried out partly in collaboration with Dr. G. Shearer, on materials prepared by Dr. Saville and later by Miss Gilchrist, gave, for the first time, definite information of the dimensions of molecules of the fatty acids and of the *n*-hydrocarbons, by the use of finely powdered material. Later he succeeded in growing single crystals of some of these compounds and in determining their structures more completely. But his greatest achievements were on the technical side. Gas-tubes, induction coils, vacuum pumps and X-ray spectrometers were made to his design in the Davy Faraday Laboratory, and it was largely because of his initiative that an increasing number of research workers could be supplied with apparatus at relatively small cost. Later he developed the powerful X-ray tubes with rotating, water-cooled anticathodes, using inputs of 5 kw. and 50 kw. respectively, with which he investigated the elastic properties of solid *n*-paraffins, and on which also most of the research into the thermal vibrations of atoms in crystals was carried out.

A succession of research workers at the Davy Faraday Laboratory has owed much to his unfailing advice and to his skill in technical matters. They would wish to remember him not so much in his later years, when the shadow of ill-health and of war-time anxieties had fallen upon him, but in the earlier days when he delighted them with stories of his beloved Switzerland and even, on occasion, with his yodelling. He was a competent skier, and before the War he spent nearly all his holidays in his home country, of which he remained a national. A lover of country life, he had had a keen interest in biology ever since his student days, and he sometimes regretted the fact that he never had the opportunity of carrying out research in that field. K. LONSDALE