

British botany was widespread—far outside the research laboratory itself. His books must have inspired thousands of students, many of whom in due course entered the schools and thus transmitted to their even younger pupils the outlook on botany which they themselves had absorbed.

Though Prof. Bower left his Glasgow chair more than twenty years ago, his influence on British botany is still strong and will continue to be so for many years to come.

L. J. F. BRIMBLE

Mr. J. L. Chaworth-Musters

JAMES LAWRENCE CHAWORTH-MUSTERS died on April 12. Born in 1901 at Annesley, Nottinghamshire, the son of a landowning family, the associations of his early youth with country life and pursuits led to an enduring interest in natural history, more especially in animals as living creatures. He was educated at Rugby and Caius College, Cambridge; but lack of sympathy with studies in which animals are more often seen as dead objects for dissection in the laboratory than as living organisms, and the horizons opened to him through participation in an expedition to Jan Mayen in 1920, impelled him to cut short his academic career. The possession of property in Norway resulted in his spending much time there, and he became deeply interested in the faunal differences he observed as compared with Britain. This interest was widened as he studied the subject; but he mainly concerned himself with mammals and birds, and commenced a serious study of the Palearctic members of the groups at the British Museum (Natural History), with frequent field expeditions to collect

and observe. His journeyings took him to Cyrenaica in 1926, the mountains of Greece in 1931, the U.S.S.R. in 1936, the High Atlas of Morocco in 1937 and Afghanistan in 1939; from all these expeditions he brought back new knowledge and additional material for study and to amplify the national collection.

When war came, Chaworth-Musters' knowledge of Norway and the Scandinavian languages resulted in his appointment as British vice-consul in Bergen. He was trapped there by the German invasion, but not captured; he left the consular offices by the back door as the enemy entered by the front. After months spent in hiding and travelling through the mountains, he eventually escaped to Britain in a fishing vessel. Photographs he brought back with him proved of great interest and importance to the Admiralty, and he was commissioned in the R.N.V.R. (Special Branch); the services he rendered were acknowledged by the award of the Norwegian Freedom Medal. When released from the Navy he at once returned to the British Museum to lend a hand in the formidable task of reconstruction, and was appointed a temporary assistant keeper.

His death has removed a colourful personality from the zoological world. He was as independent in mind as he was arresting in physical appearance. Always apparently impatient of detail and paper work, his published scientific papers are few; but his knowledge of palæarctic mammals was great. Though essentially a man of the country and little concerned with literature and the arts, he nevertheless read deeply, especially of the lives of the old naturalists and explorers. Simple in faith, he never lost the zest of youth.

H. W. PARKER

NEWS and VIEWS

Physics at the University of Bristol: Prof. A. M. Tyndall, F.R.S.

At the end of the present academic year, Prof. A. M. Tyndall will retire from the Henry Overton Wills chair of physics and complete his fiftieth year as a member of the University of Bristol. During those years he has been successively undergraduate, postgraduate student, lecturer, professor and acting vice-chancellor of the University, a continuous record probably unique in the English provincial universities. He entered University College, Bristol, in 1898, intending to qualify as an analytical chemist, but soon came under the influence of Prof. Chattock, who was responsible for the transference of his interest to physics. He succeeded to the chair of physics in 1919, and since then has promoted the growth of his department from modest beginnings to its present outstanding position in the world of science. His enterprise and initiative quickly attracted the generous support of the Wills family, and led to the building and endowment of the present H. H. Wills Physical Laboratory, which was opened in 1927. It required considerable courage to build so large a laboratory in what was then a small university; it could scarcely have been anticipated how well such a bold policy would be justified twenty years later.

Prof. Tyndall's most important original contributions to physics have been made on the subject of the electrical conductivity of gases, and he was early in this field with Chattock, making experiments on the 'electric wind'. By 1925 a whole literature on

the subject had accumulated, running into some hundreds of papers; but the number of significant results was very small. Tyndall took the view that the lack of agreement in the measurements of different experimenters was due to impurities. The earlier workers had commonly employed apparatus constructed of brass, sulphur and similar materials, and made gas-tight, where necessary, with wax or rubber gaskets; substances all of which could give rise to impurities in uncontrolled amounts. He therefore first constructed apparatus using the new high-vacuum techniques which had recently been developed, and paid great attention to obtaining very pure gases. Secondly, he developed an ingenious new method of measurement, analogous to that employed by Fizeau to measure the velocity of light, the 'four-gauze' method. With this new technique, and working with a number of young colleagues, he measured the mobilities of a great variety of monatomic and monomolecular ions in most of the commonly occurring gases, in a wide range of temperatures. For this work he was elected a fellow of the Royal Society in 1931, and the main features of it are described in his well-known monograph on the subject.

It is a remarkable feature of Prof. Tyndall's career that, in addition to his original work, he has been able to give such a large proportion of his time towards establishing the conditions in which young workers could develop to the best advantage. It has never been his policy to devote himself primarily to his own researches; he has had at heart the success of every man working in his laboratory. Under his