Baker concurred. Prof. Manton pointed out that apomixis (loosely defined) is not an exclusively recent development, and pointed to those ferns which fall into neat species despite apogamy. Dr. Baker emphasized that the worst classificatory tangles involve facultative apomicts. Dr. Heslop Harrison pointed to similar occurrences in the insect world. Drs. Cain and Richards also spoke on the nature of classificatory units, and Dr. Thoday replied to all the points. Dr. Crosby suggested that the significance of the species should not be denied because there are groups in which other concepts are necessary. Thus, the meeting ended with a very hopeful augury of future discussion.

H. G. BAKER

OBITUARIES

Prof. Aimé Auguste Cotton

PROF. AIMÉ COTTON, one of the most distinguished Frenchmen of his time and an experimenter of no mean order, died on April 16 at Sèvres. He was born on October 9, 1869, at Bourg-en-Bresse, where his father was a teacher of mathematics. He received his early education at the Lycée de Bourg, where he first became interested in experimental science, and at the Lycée de Clermont-Ferrand, where he received special training in mathematics. He entered the École Normale Supérieure in 1890, and hence came into contact with such men as Henri Poincaré, Emile Picard and Marcel Brillouin. In 1893 he became *agrégé des sciences*, and in 1896 obtained his doctorate.

Cotton's career as a scientific worker began at the University of Toulouse, where he was *maître de conférences* from 1895 until 1901. In 1900, he was given the title of professor in the University of Toulouse, and was also appointed *chargé de cours* in the École Normale Supérieure, where he was responsible for the training of students up to 1922; he was also on the staff of the corresponding girls' school, then at Sèvres, where he was assisted by his wife. While still on the staff of the latter institutions, he was appointed to the chair of theoretical and celestial physics at the Sorbonne in 1920, and to the chair of general physics in 1922. He was elected a member of the Paris Academy of Sciences in November 1923, and was president of the Academy in 1938.

At the outset of his career, Cotton made important discoveries concerning the absorption of circularly polarized light in coloured liquids. He found that when a beam of unpolarized white light, after traversing such a liquid, is submitted to examination by an analyser arranged for the detection of circularly polarized light, two differently coloured beams of different intensities were obtained. This was followed by the discovery of the phenomenon of anomalous rotatory dispersion—that in a coloured liquid which exhibits the property of optical rotation, the amount of rotation of the plane of polarization depends on the wave-length of the light in a manner quite different from that observed with uncoloured liquids. These two discoveries were of considerable importance in settling certain questions of molecular structure.

Following Zeeman's discovery of the effect of a magnetic field on emission spectra, Cotton carried out analogous experiments on absorption spectra, and showed that absorption lines were also changed by the application of a magnetic field to the absorbing medium; he discovered that the absorption spectrum of a coloured flame showed magnetic double-refraction

effects in the neighbourhood of the absorption lines. In order to give greater precision to such measurements, Cotton devised a special form of electromagnetic balance for the measurement of magnetic fields, and he was able to prove that the Zeeman effect is independent of temperature. It is often forgotten that, in collaboration with Pierre Weiss, he determined the specific charge on the electron by measurements on the blue rays of zinc excited in an accurately known magnetic field.

Cotton was also associated with Henri Mouton in a series of important researches on ultramicroscopic particles, designing a special total-reflexion ultramicroscope for the purpose. Together, they examined the magneto-optical properties of colloids and found that these substances exhibited magneto-optical rotation and dispersion, in addition to the magnetic double refraction previously observed by Majorana. From these experiments they concluded that the colloid particles were anisotropic and so oriented themselves under the influence of a magnetic field. In England, the results of their great series of experiments on the magnetic double refraction of homogeneous organic liquids, analogous to the Kerr effect, are summarized as the Cotton-Mouton Law.

Because of these experiments, Cotton will always be remembered; but perhaps he will be even better remembered in Britain because he was the first to construct in 1928 a large electromagnet for experimental purposes. This magnet is lodged at Bellevue, Paris, and while bigger and possibly more efficient magnets have since been made, one must pay tribute to the great enterprise and vision which inspired its building. It continues to give good service, and during the War its work was supplemented by the building of a very large permanent magnet under the noses of the Germans.

Prof. Cotton was a very charming person, and will certainly be missed by a wide circle of friends. In his younger days he was associated with the defenders of Dreyfus. He was interested in Esperanto. In the First World War he took an active part in the development of sound-ranging devices. During the recent occupation of France he did not escape German attentions, and for some weeks was kept in Fresnes prison with some of his fellow academicians. He was three times honoured by the Academy of Sciences; he received the Pierson-Perrin Prize in 1907, the Caze Prize in 1918 and the Albert I of Monaco Prize in 1928.

We deeply sympathize with all his friends in their great loss, and in particular with Mme. Cotton, his wife, M. and Mme. Eugène Cotton (son and daughter-in-law) and M. and Mme. Manigault (son-in-law and daughter).

L. F. BATES

Mr. W. W. Davies, O.B.E.

WILLIAM WHITRIDGE DAVIES, head of the Administration Division of the Road Research Laboratory of the Department of Scientific and Industrial Research, died on May 19, aged fifty-one years, after a long and painful illness borne with great fortitude. He was a nephew of the late Sir Walford Davies, Master of the King's Musick.

Mr. Davies saw service at Gallipoli as a midshipman in the Navy in the First World War, and after qualifying and practising for some ten years as a civil engineer he joined the Building Research Station. There he took a leading part in the setting

up of the Fire Research Station at Elstree, and was then selected for one of the senior posts in the Road Research Laboratory.

Mr. Davies had great powers of industry and concentration: he was first and foremost a sound engineer, quickly able to seize upon the essentials of any technical problem. Not only had he a mind that was clear and precise, but he had also a profound feeling for the use of words and a deep appreciation of good literature. Everything that he wrote had a certain grace; it was accurate and yet readable.

The growth of the Laboratory, and his exceptional abilities in handling administrative problems, pre-

vented him from taking an active part in the research projects, but this did not impair his vision of the directions in which progress could most fruitfully be made: thus he was a keen advocate of research in road safety, and took a large share in the formation and establishment in 1946 of the Traffic and Safety Division of the Road Research Laboratory. Men of his type work in the background of scientific endeavour, but they are essential to it. He combined an inner integrity of character with a charming courtesy and consideration for his friends and colleagues, for which they will long remember him.

T. LONSDALE

NEWS and VIEWS

Bacteriology at Glasgow:

Prof. C. H. Browning, F.R.S.

At the end of this academic year, Prof. C. H. Browning retires from the chair of bacteriology in the University of Glasgow which he has held since its foundation in 1919. A distinguished graduate of Glasgow, Prof. Browning later worked in Frankfurt with Ehrlich, from whom he derived his life-long interest in chemotherapy. In 1914 he was appointed director of the Bland Sutton Institute at the Middlesex Hospital, where he successfully developed certain methods for the isolation of intestinal pathogens, for example, the brilliant-green enrichment technique, which had a valuable application during the First World War for the recovery of the causal organisms of enteric fever when present even in very small numbers. Further studies on antiseptics revealed the powerful antiseptic action of the amino-acridines which proved so useful clinically in the prevention of wound sepsis. Prof. Browning returned to the University of Glasgow as the first occupant of the Gardiner chair of bacteriology, and despite his many teaching duties, he has maintained a remarkable output of research both in the scientific journals and in books. In 1924 a second edition of the important work "Recent Methods in the Diagnosis and Treatment of Syphilis" was published (jointly), and, first with Sir Robert Muir and later with T. J. Mackie, Muir and Ritchie's "Manual of Bacteriology" was carried on from the eighth to eleventh editions. Further work on chemotherapy with Miss R. Gulbransen led to the discovery of the phenomenon of therapeutic interference, which has helped to advance knowledge of the underlying principles of specific therapeutic affinity. More recently, jointly with Morgan and Walls, certain phenanthridinium compounds were found to have a remarkable therapeutic effect on *Trypanosoma congolense*, which has proved extremely useful in field-trials on cattle in Africa. Prof. Browning was elected to the Royal Society in 1928 and received an honorary LL.D. from the University of St. Andrews in 1934. In university life Prof. Browning's greatest attribute has been his intense interest in fostering the spirit of inquiry among the younger men in both laboratory and clinical fields, and he has gone to endless trouble in discussing and planning researches and in helping the results to appear in print. For this he will also be gratefully remembered by many generations of Glasgow graduates.

Dr. J. W. Howie

DR. J. W. HOWIE, head of the Pathology and Bacteriology Department and deputy director of the

Rowett Research Institute, has been appointed to succeed Prof. Browning. After graduating in medicine at the University of Aberdeen in 1930, Dr. Howie worked for a year there in the Bacteriology Department and then transferred to the Departments of Bacteriology and Pathology at the University and Western Infirmary of Glasgow, where he began research on experimental streptococcal infection. During 1934-35 he was lecturer in morbid anatomy and histology at Aberdeen, and then during 1935-38 was assistant in bacteriology at Glasgow. In 1938 he returned once more to Aberdeen as lecturer in bacteriology. Dr. Howie volunteered for military service in 1940, and during 1941-43 served in West Africa, where, besides doing the laboratory work for the hospital at Ibadan, Nigeria, he was one of those responsible for advising on and carrying out the measures needed to prevent the spread of yellow fever by aircraft passing through Nigeria to Egypt and India. For the last two years of the War he was at the War Office and was editor of the *Army Medical Department Bulletin* and of *Current Notes for Army Pathologists*; he also edited and wrote substantial portions of the eighth (1946) edition of the War Office handbook, "Memoranda on Medical Diseases in Tropical and Sub-tropical Areas". In 1945 Dr. Howie returned to his teaching duties in the University of Aberdeen, and in the following year was appointed head of the Department of Pathology and Bacteriology at the Rowett Institute, Aberdeen, later becoming deputy-director of the Institute. Under his guidance the research programme of the reconstituted Department of Pathology and Bacteriology has been organized into three main parts: the influence of nutrition of the host on the course of bacterial infection; the role of the intestinal microflora in nutrition of the host; and the morbid anatomy and histology of the nutritional diseases of animals. Dr. Howie's own particular field is centred on the first of these, but since going to the Rowett Institute he has also become greatly interested in the second field.

Physics at Bristol:

Dr. S. H. Piper

THE valuable services of Dr. Stephen Harvey Piper to the University of Bristol have been recognized by the creation of a special chair in physics, to be held by him from August 1 next. Dr. Piper graduated from King's College, London, and obtained the degree of D.Sc. of London. After holding a research appointment at University College, Nottingham, he joined the Department of Physics at Bristol in 1921, and was elected reader in 1933. He has been assistant director of the Wills Laboratory since 1948. In 1923