

trees cease to produce a deterrent, or do the beetles become by degrees less affected by constant exposure to it? Dr. C. F. C. Beeson replied that trees certainly do react to these attacks, but not to such an extent as to be able to control large-scale attacks.

Dr. W. H. Thorpe referred to the probable influence of parasites in reducing or eliminating a polyphagous host species on certain of its food-plants. In this connexion he directed attention to the desirability of placing on record, with as much detail as possible, particulars of differences in percentage parasitism associated with different food-plants. Dr. B. Barnes remarked that just as related species of insects attack members of Rosaceae and Salicaceae, so do related species of fungi; he stressed the need for biochemical investigation.

Prof. H. G. Champion emphasized the point made by Dr. Beeson, that the influence of insect attack on the specific composition of vegetation is relatively greater in the earlier stages of plant colonization or succession, when the competition between species is most severe, and it may take very little to tilt the balance one way or the other.

On the more general aspects of the subject, Dr. G. C. Varley suggested that problems of numbers, or of animal or plant distribution, are insoluble until the fundamental problem of what factors control the population density of the species of plant or animal in the community have been solved. He believes that when ecology can go beyond the descriptive stage, and studies and analyses the problems numerically, a rapid advance will follow. Dr. B. P. Uvarov said that to him it was very significant that practically all speakers had concentrated their attention on problems of the individual ecology of species, or of groups of species, rather than on community ecology. The way of individual ecological studies may be a long and arduous one, but it is a very healthy symptom that British ecologists are deliberately choosing it instead of the easier, but barren, method of mass collecting, counting and statistical analysis of populations assumed to form communities.

OBITUARIES

Sir David Prain, C.M.G., C.I.E., F.R.S.

THE death of Lieut.-Colonel Sir David Prain on March 16 has removed from the botanical world a distinguished man of science and an endearing personality.

Born at Fettercairn, Kincardineshire, nearly eighty-seven years ago, Prain was a product of the period when recruits to the botanical ranks were mostly obtained from the medical profession. From Aberdeen Grammar School he passed to the University, where he graduated with honours in science, and after an interlude of two years teaching turned to medicine, for which he qualified with distinction in 1882. The two following years were occupied in the positions of demonstrator in anatomy at the Edinburgh College of Surgeons and then at the University of Aberdeen. In 1884 he entered the Indian Medical Service, where his botanical aptitude at once attracted attention, so that at the age of thirty he began an official botanical career as curator of the Herbarium at Calcutta and eight years later became professor of medical botany. Thus the earlier years of Prain's life were largely spent in the art of imparting knowledge to others, but with his appoint-

ment as director of the Botanical Survey of India and superintendent of the Calcutta Botanic Garden in 1898, Prain entered on the career of administration in which he achieved such conspicuous success. During this period he not only acquired a considerable knowledge of the Indian flora but also was instrumental in furthering the cultivation of species of medicinal value. In particular the cinchona production of India is almost wholly an outcome of his foresight and initiative.

When in 1903 Sir Francis Younghusband led the Sikkim-Tibet Boundary Commission, Prain accompanied it as botanist and, as a result, our then scanty knowledge of the flora of that area was greatly augmented.

Among the earliest of his more important scientific works was an account of the plants of Bengal which dealt with nearly three thousand species and provided descriptions of all the genera and keys to the individual species. A substantial monograph of the Indian species of *Pedicularis*, of which sixty-nine were then known, contained an analysis of their distribution, and this was also a feature of the comprehensive account of the genus *Dioscorea* in four folio volumes which he wrote with I. H. Burkill. His interest in regional botany was again seen in his "Vegetation of the Coco Group" (1891), "The Botany of the Laccadives" (1893), and the "Flora of the Sundribuns" (1893). To Prain also we owe the first authoritative monograph of the genus *Meconopsis*, which has gained in both botanical and horticultural interest with the passage of time. His contributions to botanical knowledge were recognized by his election in 1905 to the Royal Society, which he served as treasurer for ten years from 1919.

Prain's appointment as director of the Royal Botanic Gardens, Kew, in 1905 was the beginning of seventeen years of efficient control of an institution that had already become by its size, functions and importance the chief taxonomic centre of the British Empire, and where advice was sought on the widest range of botanical interests. Here the new director's many gifts found scope to the benefit of the Gardens themselves and to science in general. His winning and kindly personality coupled with a humour, no less real because it had a subtle Scots quality, endeared him to his colleagues, while even those who might not agree with him could not fail to respect an integrity that was always courteous and just. Many of his minutes, written as director, are models of lucidity and well-chosen phraseology which lost nothing of their trenchant forcefulness by reason of their meticulous correctitude.

No one was in greater demand as a president of societies or conferences, and as a chairman of difficult committees his qualities of sound judgment and firm tolerance were seen at their best. It would be tedious to enumerate the list of important offices he filled, but by reason of his long tenure mention may be made of his service for thirty-four years as chairman of the governors of the John Innes Horticultural Institution, for twenty-seven years as a Carnegie Trustee, and for twenty years as a trustee of the British Museum. He also served for many years as chairman of the Advisory Council for Plant and Animal Products of the Imperial Institute and was director of the Forest Products Research Board, not the least of the services he rendered to the progress of economic botany.

The later years of Prain's life were marred by increasing deafness and, although his mental alertness

was unimpaired, he felt keenly the sense of isolation which this engendered. The extent to which he prized personal contacts can be gauged from a passage in one of his letters, written in 1937: "the tragedy of age, and the only one that hurts is the loss of friends whom one has survived". We too have suffered the loss of a much-valued friend, and science one who served her well.

E. J. SALISBURY.

Flight-Lieut. J. A. Moy-Thomas

By the death, in a motor accident while on duty, on February 29, of Flight-Lieut. J. A. Moy-Thomas at the age of thirty-five, we have lost one of the most distinguished of the younger generation of zoologists. The study of fossil fishes attracted him most, and he made many valuable contributions to our knowledge of their structure and classification. Particularly did he devote himself to unravelling the difficult problem of the true affinities of certain well-known forms of very obscure relationship.

A pupil of Archer Vassal at Harrow School, he obtained a scholarship at Christ Church, and read honours in both zoology and geology at Oxford. His first published research was on the development and attachment of teeth in fishes (*Quart. J. Roy. Micro. Soc.*, 76; 1934). There followed a series of memoirs on Chondrenchelys, Pristychius, Petrodus and other early shark-like forms, many of which he had collected himself during his expeditions to Scotland and elsewhere. These researches threw much light on the evolution of the Selachii and Brachyodonti including Holocephali. Already, in 1934 (*Proc. Zool. Soc.*), he had pointed out the affinity that very aberrant Palæoniscid, called Tarrasius by Traquair, may have with the living Polypterus (of which he had published a description of the chondrocranium), and thence passed to the detailed study of Palæoniscids in another series of memoirs not yet completely published. In the course of this work he brought out several papers in collaboration with E. I. White, of the British Museum, and Miss Bradley Dyne. With the same admirable powers of observation and happy interpretation he next dealt with the Coelacanth, and described those of Madagascar. In 1939 he joined an expedition to Greenland to collect material with his intimate friend Prof. E. A. Stensiö of Stockholm.

Particularly important and characteristic of his careful method of dealing with difficult material is Moy-Thomas's work on Palæospondylus, recently published (*Phil. Trans. Roy. Soc.*; 1940). This little fish from the Mid-Devonian of Scotland has been a puzzle to all observers since Traquair first described it in 1890 and assigned it to the Cyclostomes. This interpretation was generally accepted, though some believed it to be a larval form of some higher fish or even amphibian. Moy-Thomas, after examining a vast number of specimens, rejected the larval theory as inconsistent with the presence of well-formed vertebral centra and the condition of the elements of the skull, and also was unable to confirm the presence of many alleged Cyclostome characters. More important still, he discovered that the tail had hitherto been misinterpreted, had been described upside down, and was really heterocercal with a larger ventral lobe supported by jointed radials; he also provided good evidence of the presence of paired fins, and of jaws. Thus he seems to have established that Palæospondylus belongs to the Gnathostomes. Fortunately, the most important results of these various researches

were embodied in his excellent little book on "Palæozoic Fishes" (1939), published just before the War.

Deeply interested in the comparison of the dermal bones of the skull in the various groups of Osteichthyes and Tetrapoda and the tracing of their homologies, Moy-Thomas was not content with mere observation and description, but tried by experimental methods practised on living forms to discover the causes which may influence their shape, size and number. Already in 1941 he had reached important results on the rainbow trout, and concluded that, contrary to earlier theories, the origin of such bones is not due to the presence of the sense organs of the lateral line system or of the central nervous system (*NATURE*, May 31, 1941, p. 681).

Moy-Thomas began his teaching career under Prof. W. Garstang at Leeds, where he went soon after taking his degree. Returning to Oxford, he was made University demonstrator and lecturer in the Department of Zoology and Comparative Anatomy in 1933, and also became the first holder of the fellowship founded by the late E. T. Browne at the Queen's College.

Moy-Thomas's love of accuracy and his excellent memory made him a most successful teacher and tutor. But his influence on his pupils was not only academic. Possessed of great gaiety, sense of humour and zest of life, he was a continual source of stimulation and pleasure to everyone who knew him. With these attractive gifts he could make criticism, not only of their work but also of their life and manners, acceptable to his pupils.

Thus by this tragic accident has been cut short the life of one who will be much regretted by colleagues and many friends in Oxford and elsewhere. He leaves behind his wife and two children.

E. S. GOODRICH.

Prof. H. Buisson

HENRI BUISSON, professeur de physique générale à l'Université de Marseille, est mort le 6 Janvier 1944 à l'âge de 70 ans, après une courte maladie. Il s'était fait connaître par de nombreux travaux sur l'optique, souvent avec Charles Fabry (métrologie interférentielle, repères spectroscopiques formant le 'système international des longueurs d'onde', photométrie, 'équivalent mécanique de la lumière', etc.). Depuis 1912, il s'était consacré, avec Fabry, à l'étude de l'ozone atmosphérique, travail qui avait été l'origine de nombreuses recherches, principalement en France (Cabannes, Dufay, Gauzit, Chalonge, Vassy, etc.) et en Angleterre (Dobson et ses collaborateurs).

CH. FABRY.

THE work of MM. Fabry and Buisson on atmospheric ozone was the foundation of all later work on the subject. It had been suggested that the remarkably sudden 'cut off' of the solar spectrum at about 3000 Å. was due to absorption in the earth's atmosphere. To test this hypothesis, they made careful measurements of the absorption by ozone of light of different wave-lengths in the laboratory and compared this with the extinction of sunlight passing through the atmosphere. From these measurements they were able to confirm the hypothesis, and also showed that the total amount of ozone in the atmosphere was equivalent to a layer of pure gas about 3 mm. thick.