

be of value to progressive farmers as well as to students of agricultural science who will use it as a standard text.

One of its most impressive features is the masterful way that Dr. Cooke has married the lessons of the long-term classical soil fertility experiments, especially those at Rothamsted, with the results of more recent experimentation not only in Britain but also abroad. A huge volume of literature, much of it of very recent origin, has been consulted and the essential features of it have been combined under appropriate chapter headings. This has resulted in some overlapping between chapters, but the small amount of repetition is not detrimental because each chapter can be read as one of a series of complete essays. After all, it is unlikely that anyone, except a conscientious reviewer, will want to read the book from cover to cover within the space of a few days. For most it will be an authoritative book of reference to be consulted in respect of its separate parts, and good indexing adds to its value in this respect.

The book is strongest in those parts concerned with arable crop production, and this is understandable because the end products are so easily measurable in contrast with those of grassland, where there is the complication of the grazing animal as a middleman in the production process. It is not enough to talk about fertilizer responses in terms of additional grass dry matter, for one must also have some account of the value of these in terms of milk or meat. The present situation is complicated by the convention, when assessing the value of grass which is fed in association with concentrates, of making it the residuary legatee of any errors of calculation which are based on the attainment of theoretical feeding standards. Dr. Cooke cannot be blamed for this because he can do no more than make the most of available information. In doing this he has drawn attention to the considerable deficiencies of knowledge in fertilizer practice for pasture and the need for more critical methods of assessing pasture productivity.

The penultimate chapter, dealing with relationships between organic matter and soil productivity, is particularly valuable because it is such an objective analysis of knowledge on a topic which so often creates emotional rather than factual argument. It is the best balanced discussion of this subject that has been published, but this can also be said of many of the chapter headings. It is a really authoritative book and its author has just cause to be proud of it.

M. M. COOPER

PRESERVATION BY IRRADIATION

Food Irradiation

(Proceedings of the International Symposium on Food Irradiation jointly organized by the International Atomic Energy Agency and the FAO of the U.N., and held in Karlsruhe, June 6-10, 1966.) Pp. 956. (Vienna: IAEA; London: H.M.S.O., 1966.) 517 schillings; 14s. 2d.; \$20; 80 D.M.

THIS symposium reviewed developments in the whole field of food irradiation which have taken place since the similar meeting in 1958. The symposium was optimistic, for developments have on the whole been favourable.

The fundamental difficulties of the process of food irradiation have still not been overcome. The chief fundamental advance has been the demonstration that irradiation at temperatures below -20°C reduces undesirable side effects to about one-third, which made possible the U.S. Army's plans for the sterilization of meats.

Nevertheless, the limitations are now better understood and, even accepting them, there is an already large list of potentially useful treatments. Furthermore, it is increasingly understood that feasibility must be regarded against alternative practices and, where this has been done, it seems that several irradiation processes might

be economically viable. Above all, the vast American programme of feeding irradiated foods to mammals has not yielded evidence of harmful effects, other than loss of vitamins comparable with canning; and a similar smaller programme in Britain gave similar results. The U.S. and Canadian authorities have permitted irradiation of particular foods, with more in prospect; and legislators in other countries are actively considering how to deal with the situation. While there have been substantial international exchanges, such as this symposium, where uniformity of view on technical matters has been sought, the conference noted the lack of similar attempts on the legislative plane, though this seems necessary to facilitate potential international trading in irradiated foods.

Several outstanding points of technical difficulty are evident in these proceedings, besides the obvious need to diminish the side effects and increase the microbicidal power of irradiation. These difficulties are the especially poor control by irradiation of viruses and enzymes; the significance of conceivable mutations in micro-organisms causing food poisoning; the discrepancy between the toxic effects of irradiated nutrients on single cells and the absence of corresponding effects in animal feeding trials; and the difficulty of detecting whether a food has been irradiated. The general impression is, however, that many possible processes would not be seriously affected by these difficulties, and that applications are likely in many countries as soon as the laws are regularized.

M. INGRAM

EARLY PREGNANCY

Pre-implantation Stages of Pregnancy

Edited by G. E. W. Wolstenholme and Maeve O'Connor. (Ciba Foundation Symposium.) Pp. xii + 430. (London: J. and A. Churchill, Ltd., 1965.) 65s.

THIS book is an account of the proceedings of one of the many small international conferences on a variety of topics of biological and medical research, which have been convened by the Ciba Foundation. This particular symposium was held in April 1965, under the distinguished chairmanship of Professor C. H. Waddington, and the resulting volume contains sixteen contributions on many different aspects of the pre-implantation stages of mammalian development.

The first two papers deal with the ultrastructural changes which occur in the egg during fertilization, and with the fine structure of the blastocysts of selected mammalian species. Others deal with energy metabolism, nucleic acid and protein synthesis, genetic aspects and the influence of various maternal factors on early embryonic development.

The short discussions which follow each paper that was read and the more extensive general discussions are quite as interesting as the papers themselves, and contribute substantially to the value of this interesting book.

B. MORRIS

OBITUARIES

Professor J. W. Heslop Harrison

PROFESSOR JOHN WILLIAM HESLOP HARRISON died at his home in Birtley, Co. Durham, on January 23, 1967, the day after his eighty-sixth birthday. Harrison was emeritus professor of botany of the Universities of both Durham and Newcastle upon Tyne.

He received his early education at Rutherford College, Newcastle upon Tyne, and in 1903 graduated B.Sc. from

Armstrong College in the University of Durham, with distinction in chemistry. He was science master at Middlesbrough High School between 1905 and 1917. During this time he obtained his M.Sc. and D.Sc. for research on the biology and systematics of species and hybrids, mainly of the Geometrid sub-family Bistoninae. He then joined the staff of Armstrong College and in 1920 was appointed lecturer in zoology. In 1926 he became the first reader in genetics in the University of Durham at Newcastle, and from 1927 until his retirement in 1946 he was professor of botany in Armstrong College (later King's College). From 1940-50 he was very active as secretary of the University of Durham School Examinations Board; he built up a relationship between the examining board and the grammar schools of the four northern counties which has been widely acclaimed by the heads and teachers of the schools.

In 1921 he was elected a Fellow of the Royal Society of Edinburgh and he became a Fellow of the Royal Society of London in 1928. He served on the Council of the Edinburgh Society for several periods and he was vice-president from 1945-48. He was on the editorial committee of the *Vasculum* from its foundation in 1915, and he was the sole editor of the *Vasculum Substitute* from 1942 until his death. He was also one of the original founders of the Northern Naturalists Union in 1924, and he held continuous office in this society, also until his death. After his formal retirement in 1946 Harrison held a senior research fellowship until 1949 in the agricultural faculty of King's College, Newcastle, and he was a member of the board of the faculty of agriculture until he died. Even after 1949 he continued to give courses of lectures, mainly on genetics, to agricultural and other students.

Harrison was a gifted biologist and field naturalist. His memory for biological facts was prodigious and his knowledge of flowering plants and insects was of a most unusual depth and understanding. Harrison published more than 500 papers and many thousands of biological records in the *Vasculum*, the *Entomologist* and similar journals. His chief research centred on evolutionary topics and he was particularly active in the years when Darwinists and Lamarckists fought almost pitched battles. He contributed to both sides and he was also a staunch mutationist. His work in these fields helped to lay the foundations for much future research when the processes of organic evolution were becoming better understood. In particular Harrison, by his work on the occurrence, significance and induction of industrial melanism in moths, set the pace for the future understanding of these phenomena. Harrison published his chief papers in studies of the Bistoninae, on the effects of chemicals on the insects *Selenia bilunaria* and *Tephrosia bistortata* and on the egg-laying insects of the sawfly, *Pontania salicis*. On *Selenia* he worked at first with F. C. Garrett, and he claimed to have induced mutations; he was thus among the first to induce mutations. He claimed that his work on *Pontania* showed a Lamarckian effect, and although this work has not been repeated neither has it been disproved. Harrison also worked on the systematics, cytology and genetics of the genera *Rosa* and *Salix*, and, to a lesser extent, *Rubus* in conjunction with Dr. Kathleen B. Blackburn.

In 1934 Harrison visited the Isle of Raasey with Professor A. D. Peacock of University College, Dundee, and the following year he initiated his own expeditions to many islands of the Inner and Outer Hebrides. Official parties from King's College, Newcastle, under Harrison visited these islands once or twice a year from 1935 to 1946. After 1946 Harrison continued his visits until about 1962. During these expeditions a thorough and systematic study was made of the flora and fauna (chiefly insects) of the Hebrides, and many finds and new records were made. Most of the results of this work were published in a series of papers in the *Proceedings of the University of Durham Philosophical Society*.

Harrison will be remembered for his scientific work which has become part of the history of evolutionary biology, but he will be particularly remembered for his wonderful gift of teaching.

P. G. FOTHERGILL

Professor F. C. Ormerod

FRANK ORMEROD, emeritus professor of laryngology and otology in the University of London, died at his home in London on January 25 at the age of 72.

Educated at Manchester Grammar School, he graduated M.B., Ch.B., at the University of Manchester in 1916; then followed three years of service with the R.A.M.C. in Mesopotamia and Afghanistan. He graduated M.D. in 1920, became F.R.C.S.Ed. the following year and F.R.C.S. in 1926. In 1921 he joined the staff of the Hospital for Diseases of the Throat at Golden Square in London, and he was also consulting surgeon to the ear, nose and throat department at the Westminster Hospital and consultant to the Brompton Hospital and King Edward VII Sanatorium, Midhurst. Despite an extensive private practice, Ormerod was always primarily interested in the academic side of his specialty, and after the formation of the Royal National Throat, Nose and Ear Hospital (in which he played a leading part) he was largely responsible for the creation and inauguration of the Institute of Laryngology and Otology of the British Postgraduate Medical Federation.

When the first, and still the only, chair of laryngology and otology in the United Kingdom was established by the University of London in 1949, he was the natural choice for the appointment. It was fortunate for otolaryngology that Ormerod was willing to relinquish his consultant appointments and private practice to accept this challenge. He built up at the institute a highly successful clinical and research unit. At various times he occupied official positions in the sections of otology and laryngology in the Royal Society of Medicine. Not only was he a co-founder, but also served as secretary of the British Association of Otolaryngologists, and just before his appointment to the professorship he became scientific secretary to the fourth International Congress of Otolaryngology held in London. As a member of the Court of Examiners of the Royal College of Surgeons of England, he was able to influence the training of young otolaryngologists, and the establishment of organized training programmes for these surgeons occupied much of his time. His knowledge of European otolaryngologists, both past and present, made him an invaluable source of reference for intending travellers overseas. In 1953 he gave the Scmon Lecture of the University of London, and in 1965 the James Yearsley Lecture. At one time or another he had lectured in most countries of the world, and although not gifted with natural eloquence these communications were so well prepared and constructed that he enjoyed an international reputation as a speaker.

His book *Tuberculosis of the Upper Respiratory Tract* was published in 1939, but his main interest lay in the management of malignant diseases of the head and neck. With his retirement from clinical work in 1959, he was appointed director of research and this permitted him to develop interests in the physiology of the endolymph and pathology of congenital deafness. Several important papers were written on these subjects. When he retired from the Institute of Laryngology and Otology in 1962, he continued to assemble a historic collection of instruments and photographs illustrating the development of otorhinolaryngology. This was dear to his heart and there was nobody living more fitted to accomplish the task successfully. Unfortunately he died before it was completed, but it will be continued by others and will serve as a unique memorial to an exceptional man.

D. F. N. HARRISON