

use required to meet the demands of the human population for food and for manufactures. The concern that action should be taken to conserve these non-renewable resources has been displayed by a relatively few committed workers, among whom the editors of this book—Sir Otto Frankel and Professor Jack Hawkes—have been prominent. The institutional acceptance of the need for co-ordinated action first resulted in a joint review of the problem by the UN Food and Agriculture Organisation (FAO) and IBP. The outcome of this was the publication, as an IBP Handbook, of *Genetic Resources in Plants—their Exploration and Conservation* (edit. by O. M. Frankel and E. Bennett, Blackwell, 1970).

FAO continued to be active in the field of plant exploration and conservation through an Expert Panel. This led in 1974 to the establishment of an International Board for Plant Genetic Resources (IBPGR) under the auspices of the Consultative Group on International Agricultural Research which, co-ordinated by the World Bank, channels funds from governmental and non-governmental donors into the international research centres. The involvement of the IBPGR in plant exploration and conservation marks the initiation of a new phase in the development of this work and one in which it may be expected that wide scale effort will be backed by adequate resources.

Whatever happens in the new phase, however, it will be necessary for those concerned to draw to a large extent on the philosophies and methodologies developed during earlier work. These are well portrayed in *Crop Genetic Resources for Today and Tomorrow* which shows the point reached at the end both of the decade of the IBP and of joint work between FAO and IBP. The book contains contributions made at a technical conference organised by FAO and IBP, one of the important objectives of which was to produce a book collating a range of relevant subjects and approaches. It achieved this objective very well.

The subjects covered included the nature and basis of genetic variation in plant populations and how the explorer should sample populations and regions. Attention is paid to the ways in which, in crop plants, material collected from the wild or in primitive cultivars can be used to provide agriculturally valuable disease-, insect-, drought-, or frost-resistant parents in breeding programmes. As would be expected there is extensive discussion of the problems of how living plant material can be stored as seed, pollen, tissue or cells in culture, or as sporophytic plant members such as roots,

tubers or woody branches. Another approach to 'storage' is to protect plant populations *in situ*, and this is discussed in terms of population genetics by S. R. Jain. The storage of data relating to conserved plants, and their retrieval, is of crucial importance if the collections are to be used effectively by breeders; possible methods are discussed by D. J. Rogers and others.

This book is principally concerned with genetic conservation for plant-breeding purposes. The collectors and



Larger than life winged figure carrying a buck, probably Persian. Engraved by W. Holt from a relief in the Palace of Ashurnasirpal II at Nimrud. Taken from Fallow Deer: Their History, Distribution and Biology by D. and N. Chapman. Pp. 256. (Terence Dalton, Lavenham, Suffolk, UK, 1975.) £7.80. A whole chapter is devoted to Persian fallow deer, a very rare and endangered species.

the conservers are therefore undertaking a service for breeders. It would seem desirable on future occasions when the topic is discussed for consideration to be given to the methods by which genetic variability can be transferred in breeding programmes because this defines the systematic range that interests breeders and the kinds of genetic variation that may be useful.

There would have been increased stimulation in the book if the organisers of the conference had invited a devil's advocate to marshal the arguments against conservation instead of entirely confining themselves to the 'in group'. Good arguments can be advanced against the idea that we can always generate the required genotypes by mutation or by the release of variation following hybridisation but no opportunity was given for their expression. This would perhaps have caused

greater emphasis to be placed on the need to conserve not individual alleles but those complexes of genes that have become coadapted over long periods of selections. This was not ignored but was in my view not given the necessary weight.

I am also surprised that no attention was paid at the conference to the conservation of non-nuclear genes. We knew in 1970 that susceptibility to the 'T' race of *Helminthosporium* which caused serious maize losses in the US was determined cytoplasmically. The susceptibility is now known to be determined by mitochondrial DNA. There are important genes in both the mitochondria and the chloroplast DNA. This is well displayed by S. G. Wildman and his colleagues in relation to variation in the large subunit of Fraction 1 protein which is coded for in chloroplast DNA. In considering the kinds of resources we must conserve, and their selection and evaluation, it will be increasingly necessary in the future to give thought to organelles.

This book should provide a useful primer on crop plant collection, conservation and utilisation at a time when such is badly needed. **Ralph Riley**

Photosynthesis and Productivity in Different Environments. (International Biological Programme 3.) Edited by J. P. Cooper. Pp. xxiv+715. (Cambridge University: Cambridge, London, New York and Melbourne, September 1975.) £22.00.

THE main aim of IBP was the international study of the biological basis of productivity and human welfare and it is natural, therefore, that much of the research effort which IBP engendered should have centred on the primary stage of energy conversion, photosynthesis. The informed management of the world's resources and the support of its human population is dependent on a knowledge of this process in which solar energy becomes available for the nutrition of animals and man. Surprisingly little data was available on the productive potential of different natural and seminatural vegetation types until the initiation of the IBP in 1964 and much of the research which has since been conducted has been concerned with the accumulation of such vital information. Participants in this exercise gathered together in Aberystwyth in 1973 to present summaries of their findings and this book is based on a selection of the papers which were read at that Conference.

Perhaps the emphasis should be placed on the summary aspect of this collection of papers. One thing which has resulted from the decade of IBP is the assembly of vast quantities of