

Of crops and men

Joseph Hutchinson

Crops and Man. (Foundations for Modern Crop Science Series.) By Jack R. Harlan. Pp. xi+295. (American Society of Agronomy and Crop Society of America: Madison, Wisconsin, 1975.) \$11.25.

THIS is a good book. The expansion of studies of crop plant evolution in recent years has been so great that to produce a survey of the field in one volume is a daunting proposition. de Candolle and Vavilov provided respectively the roots and trunk of a tree that has now grown a crown almost too great to be encompassed by one man. Nevertheless, Jack Harlan has set out to do this. In his Preface he says: "The time has come for a third round of summary on what is known about crop origins".

Harlan has not only succeeded in accomplishing such a summary; he has contributed a most timely addition that substantially enlarges the field. de Candolle's interests were primarily botanical and geographical. Vavilov's were botanical, geographical and genetic. Harlan's are botanical, geographical, genetic and human. Although de Candolle was well aware of the human influences in the phenomena he studied, it was natural that for a long time the study of the origins of crops and of agricultural practice should be pursued separately. Their natural interrelation has been apparent in the past decade, and there are now numerous examples of the way in which biological and archaeological evidence together contribute to the elucidation of crop plant history. Harlan has taken these disciplines and fused them into a comprehensive account of the social as well as the biological changes that went into the evolutionary progression from hunting and gathering to a full agricultural economy.

The sponsors of the series of which this is the first volume, have sought to meet the needs of "upper level undergraduate college students". For students reading subjects in applied biology, archaeology, anthropology and geography this will be mandatory reading for a long time. It will also be invaluable for teachers who are developing 'A'-level Environmental Studies in schools.

This subject is my absorbing interest, and it would be surprising if I agreed with all of Harlan's views. I would add a South Asian Region to his list of

original crop regions, and would assign to it such crops as the Indian pulses (including pigeon pea), *Gossypium arboreum*, and some tetraploid and hexaploid wheats. I think he has overdrawn the protein shortage, and I do not think one can accept his statement (p253) that "it was not until World War II that significant increases in per hectare yields were achieved". There were at least two earlier periods in British agricultural history during which substantial advances in yield were made. But these are matters for debate, and it is a measure of the stimulus of the book that one constantly made a mental note of a new or unrealised aspect of the subject—that the hunter-gatherer lived in a golden age, for example—or of an interpretation one did not accept and would like to discuss with the author.

The book begins with a discussion of the way people lived before they farmed, how they began to farm (leaving open the question why they should want to), and our present ideas of the areas in which farming began. Then there are chapters on crops and weeds—which is which and why—and on the classification of cultivated plants. Genetic and evolutionary topics follow. Five chapters are devoted to regional studies, and finally there is one on recent spread much of which can be documented historically, and one of interesting and well controlled speculation on future prospects and possibilities.

I enjoyed it. □

Air pollution

C. P. Whittingham

Responses of Plants to Air Pollution. (Physiological Ecology: a Series of Monographs, Texts and Treatises.) Edited by J. B. Mudd and T. T. Kozłowski. Pp. xii+383. (Academic: New York and London, November 1975.) \$29.50; £15.35.

THE study of the response of plants to aerial pollutants is relatively new. In our present state of ignorance it is important to differentiate between proven facts and generalisations which have become established only by frequent repetition. There is a need to pose pertinent questions which require experimental investigation and to formulate primary problems in analytical terms. Unfortunately this book does not attempt these tasks. It consists largely of literature reviews of current work and since all the authors are American most of the book relates to conditions in America and to work undertaken there.



Scorpion fish (*Pterois volitans*). Taken from *An Age of Fishes: The Development of the Most Successful Vertebrate*. By Joy O. I. Spoczynska. Illustrated by Melchior Spoczynski. Pp. 145. (David and Charles: Newton Abbott, London and Vancouver, February 1976.) £3.95.

Separate chapters discuss the influence of sulphur dioxide, ozone, fluorides and peroxyacyl nitrates, oxides of nitrogen, and particulates. Some chapters include more references than others and are correspondingly more valuable, but essentially all are concerned with reviewing the literature rather than discussing principles. Subsequent chapters deal with the response to mixtures of pollutants and the interaction of air pollutants with vegetation. There is little reference to the importance of the physiological status of the plant—for example, the influence of water stress or mineral deficiency in relation to plant response to pollutants—and there is only a limited reference to the importance of aspect in relation to pollution damage. One chapter is concerned with the interaction of pollutants with vegetation canopies; unfortunately there is little discussion relating the spread of pollutants to physical processes. Other chapters are concerned with the specific effects of pollutants in forests and in relation to agriculture. There is also a chapter on the influence of pollutants on plant structure and on the growth of lichens and bryophytes. In many chapters reference is made to the biochemical action of specific pollutants and perhaps it is premature to seek an account of the general interaction of pollutants with plant metabolism.

The book will be useful to those who require an introduction to the literature of plant response to pollutants. It does not provide a critical view of our present state of knowledge of the subject. It makes general statements without quoting evidence such as "yields of virtually all important crop plants have been greatly depressed by air pollution"; with certain exceptions it fails to emphasise the important facts which still need to be established in the face of the possible need to define air quality standards for future legislation. □