

States Bureau of Entomology for many years, sets himself the task of educating the lay mind in the methods by which the entomologist is coping with the depredations of insect pests.

In the initial chapters Dr. Howard explains why insects with their vast range of structural adaptations, extending over a period of forty million years, have achieved such a marked degree of ascendancy over practically all other living organisms save man. It is further shown that the achievement of economic status as pests by insects has been mainly determined by human agency, which has also fostered their spread from region to region and country to country by reason of the facilities offered by modern systems of rapid transport.

If one has any doubts of the extent of the damage caused by insects, the formidable figures—even approximate as they are—furnished by statisticians will go far to remove them. For example, during the year 1919 it was estimated that insect ravages were responsible for a reduction of four hundred million pounds in the value of the crops of the United States alone. It almost staggers the imagination to think of the extent of the losses reckoned in terms of the crops of the whole world. It is readily comprehensible how these losses must and do affect the prices of many staple commodities such as cotton, sugar, maize and wheat as well as the conditions of the labour market in different parts of the world. Then again there is still to be considered that toll of human health and efficiency, to say nothing of domesticated animals, which is exacted by the pathogenic micro-organisms, that are transmitted by insects, blood-sucking and non-blood-sucking, in both tropical and temperate countries.

In view of all the facts, there is cause for congratulation that to-day there are more than seventy countries which have come to realise the importance of applied entomology, and are now providing staffs of trained entomologists, who either act in an advisory capacity or carry on research on specific problems. It is recognised that human resource and ingenuity are being taxed to the utmost to cope with the insect menace. Methods of attack vary with the individual insect species. Now it may be biological, as in the case of the cottony-cushion scale of California and the Levuana caterpillar of Fiji. Again it may be mechanical and chemical, as in the case of the cotton-boll weevil; or again it may be legislative, involving stringent measures of quarantine and eradication,

as in the case of the Mediterranean fruit-fly. That solutions of what at one time seemed hopeless problems have been achieved is shown by the present negligible status in the United States of the Rocky Mountain locust, the cotton-boll weevil and the Mediterranean fruit-fly. Elimination of the breeding grounds in the North-West by settlement and cultivation has obliterated the swarms of the first of these; in regard to the second it has been shown that cotton can be successfully grown despite the weevil, if the plants are dusted with arsenate of lime; and the dreaded fruit-fly introduced into Florida in 1929 was speedily eradicated by the destruction of all infested fruit and restriction of shipments of fruit from infested to non-infested areas.

In conclusion, we would say that Dr. Howard has admirably achieved the purpose with which he set out. The educated layman will find no difficulty in following his arguments, and we can guarantee that the reader's interest will be sustained from cover to cover. The book should enjoy a wide circulation among those who are anxious to extend their knowledge of Nature's ways.

A. E. CAMERON.

### Short Reviews

*A Scheme of Egyptian Chronology: with Notes thereon including Notes on Cretan and other Chronologies.* By Duncan Macnaughton. Pp. xii + 406 + 19 plates. (London: Luzac and Co., 1932.) 25s.

THE author here follows up certain suggestions in reference to Egyptian chronology which were put forward in his "Scheme of Babylonian Chronology", but were not worked out. Further study has now shown him the possibilities of a number of clues to the dating of the early Egyptian dynasties. His theory, broadly, is that the 'births' of the gods in the Palermo Stone refer to the commencement of planetary cycles, which could probably only occur in historic times at a certain period, reinforced by his interpretation of the evidence of the list of Eratosthenes, and other calendrical and astronomical evidence.

The author himself regards his results as of varying value, some being classed as highly probable and others as only "mere possibilities". The result as regards the crucial dates are certainly high in comparison with more conservative systems. Thus Dynasty I is put at 5776 B.C. as against the 4360 B.C. of Petrie or the 3315 of Meyer. The author is scrupulously fair in the full statement of his data, and even those who do not agree with him, will find his book a useful compendium of the facts relating to the controversial questions of Egyptian chronology.