

came on so unexpectedly that there can be little doubt but what all the Blue Birds that ventured so far north at that time must have perished.

The consequence was that there was practically an entire absence of these birds in this district the following summer.

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ON THE EARLY LIFE-HISTORY OF THE AMERICAN LOBSTER (*Homarus americanus*).—Were this tiny creature, just after it has emerged from the egg, to be enlarged to say ten inches in length and a regular ten-inch long lobster put along side of it, two forms, quite unlike in general appearance would be seen. The reason for this difference in general form is because whilst the mature lobster crawls about upon the bed of the sea, the little juvenal does nothing of the kind, but swims, or rather floats upon its back, through the water or near the surface of the water. It would be interesting to follow out in detail how this most valuable of all crustaceans becomes more and more modified as it passes from moult to moult, but it must suffice for the present to point out that by the time the lobster has acquired the crawling mode of locomotion it has not then reached an inch in length. Obviously the free swimming mode of movement is primitive, and there are crustaceans, for

instance the phyllopods, which swim upon their backs throughout their life-histories, but in the case of the decapods, which stand higher in the scale of crustacean life, and to which shrimps, crabs, and the lobster belong, this phenomenon is usually only temporary, and in the case of the lobster is purely so. Now when the mother lobster, guided by her instincts, approaches the more shallow parts of the sea in order that her eggs may hatch off her swimmerets, and once the eggs are all hatched off, her maternal duties are over, for that is all the maternity she has. The young nauplii are now left to their own resources. It was a wise provision of nature that led the mother lobster to the shallows, for the little helpless creatures are there defended against many dangers which would have been encountered further out at sea. Furthermore, they undoubtedly meet there with a plenteous supply of surface food. Nor is this all. In the sheltered harbors and bays the little lobsters have an opportunity to undergo their metamorphosis until as little crawling creatures they seek refuge among the sea-weeds and under the rocks; from which time on they become better and better equipped, through increase in size, a shell hardened with carbonate of lime, and a pair of powerful claws, to protect themselves at considerable depths in more exposed parts of the bed of the sea.

ANDREW HALKETT.

#### BOOK NOTICES AND REVIEWS.

INJURIOUS INSECTS AND USEFUL BIRDS. By Prof. F. L. Washburn. J. B. Lippincott Company, Philadelphia and London; 414 illustrations in text and four coloured plates. Price \$2.00.

This volume prepared particularly for high schools and agricultural colleges is largely the result of 21 years of work in economic entomology on the part of the author. It will of course also be a useful work of reference for gardeners and farmers generally. Chapters one to six deal with the losses to agriculture due to insects and rodents; farm practices to lessen these; external structure of insects; collecting and preserving insects; insecticides, spraying and fumigation. Chapters seven to eighteen discuss insect affecting various crops, such as apple, pear, small fruits, grain, roots, etc. Chapter XIX on "Our Insect Friends"; XX, "The Relation of Birds to Agriculture" and XXI, "Some

Four-Footed Pests of the Farm," complete the volume.—A. G.

OUTLINES OF ECONOMIC ZOOLOGY. By Albert M. Reese, Ph.D., Professor of Zoology in West Virginia University. Philadelphia, P. Blakeston's Son & Co. 316 pages. 194 illustrations.

This volume which has been based upon a brief course in economic zoology given by the author for several years in the above university, will be found of special value to students, not only those who are taking courses in general zoology, but also those who are interested in agriculture. The book is divided into fourteen chapters, as follows: I, Protozoa; II, Porifera; III, Coelenterata; IV, Echinodermata; V, Platyhelminthes; VI, Nematelminthes; VII, Annelata; VIII, Mollusca; IX, Arthropoda; X to XIV, Chordata. The importance of the study of economic zoology is becoming more apparent every day.—A. G.