borer." It was intimated that *eburia quadrigeminata* (Say) spent forty years growing from egg to mature larva, in the top piece of an old birch bookcase. A number of such stories are current, but I am of the opinion that the simple solution of the whole matter is as follows: *Eburia quadrigeminata* breeds in the heartwood of dead, dry, seasoned logs and wood,—*Hicoria, Quercus, Robinia, Betula, Fagus, Fraxinus, Castanea, Ulmus* and perhaps others. The eggs are placed in the cracks and crevices of dry, weathered or seasoned scars, "cat faces," and similar placed. An impregnated female in some manner got into the house, and in crawling over the piece of furniture took advantage of a crack in the varnish or wood, and inserted an egg.

I can not believe that any Cerambycid larva could exist for forty years in a piece of furniture. In fact, the normal duration of the larval stage of insects of this family is from one to five years.

I think the same explanation will cover the other case mentioned in this article. The adults of this species often hide beneath bark, and might have crawled between the bricks and doorsill.

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PERCIVAL LOWELL

THE absorbing interest that Dr. Percival Lowell was able to throw about the astronomical investigations of his later years has obscured to an extent the fact that he was a man of many parts. There are comparatively few who are familiar with his keen observations of the nearer Orient, crystallized into published essays, and fewer still have known of his interest in botany, geology and general natural history, in one or more departments of which he has made contributions to science.

A comprehensive view of him is presented in Miss Louise Leonard's recent volume, "Percival Lowell—An Afterglow" (Boston: The Gorham Press), a book which through the medium of selections from his own writings shows him in his variety of studies. No serious undertaking has yet been made towards a biography of Lowell—the time since he passed on is perhaps yet too short, but in this volume one has a valuable reminder of him. Extracts from his letters are deftly framed in a Foreword, a prelude and an afterpiece, the last a poem that he loved. There is no appraisal of Dr. Lowell's scientific achievements, but everywhere is reflected his spirit of investigation, cheerfulness and wish to help his fellow man.

J. R.

THE PASTEUR CENTENARY

THE year 1922 marks the lapse of a century from the year of Louis Pasteur's birth and a "Centenary" volume of Pasteur's collected scientific writings would be a fitting homage to the memory of such a man.

In view of the conditions in Europe, is it not possible for investigators here to sponsor such an undertaking, in the English language, and contribute to it by means of translations of the original French articles and memoirs?

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SCIENTIFIC BOOKS

Insect Transformation. By GEORGE H. CARPENTER, D. Sc., Professor of Zoology, Royal College of Science, Dublin, London. Methuen & Co. Ltd. 1921, pp. 282, figs. 124.

PROFESSOR CARPENTER for many years has been doing admirable work in Ireland. Well trained in biology, and a broad zoologist, he has interested himself in many aspects of scientific work. His publications on crop and animal pests have been of great service to the Irish farmers and stock growers; he has been much interested in the admirable zoological garden in Dublin, where they breed lions in confinement more successfully than in any other place in the world, and has been active in the Royal Irish Academy, of which he is secretary.

His book on "Insect Transformation," just published, is a mature book, written by a broad man, and differs in many interesting and important ways from any book yet published.

It bears on every page evidence of competent knowledge, very broad reading and deep reflection.

There are only seven chapters in the book of nearly three hundred pages. The first one is devoted to "Form, Growth and Change," beginning with an examination of the structure, both external and internal, of the adult insect. His second chapter is entitled "The Open Type of Wing Growth," using this term to characterize those insects which have incomplete metamorphosis. The next chapter is devoted to "The Hidden Type of Wing Growth," in which he makes a careful and full exposition of the structure in different stages of those insects which have complete metamorphosis and therefore in which the wing growth is hidden in the larval form. Another chapter treats of "Some Wingless Insects." Then comes a fascinating and very full chapter, covering nearly sixty pages, on "Growing Insects and Their Surroundings," a condensed insect ecology of great value and admirably done.

The last chapter is devoted to "The Problems of Transformation," in which he contrasts the transformations of insects and the changes which other animals undergo in the course of their development, considering the primitive type of insect larva, the two types of wing growth, and the history of the insect orders as revealed by the rocks.

In the earlier chapters it will be seen that the author gives an account of the growth and transformation of the insects of the different orders, showing especially the astounding variations among the early stages, particularly the larvae. The excellent and extensive ecological chapter "On the Surroundings of Growing Insects" follows most naturally; while in the final chapter, with equal happiness of arrangement, he really considers the meaning of the facts described in the earlier pages.

Prepared in this way and by a thoroughly competent man, this attractive, well printed, and very well illustrated book will find its readers not only among the entomologists but among those interested in biology in a broad way.

L. O. HOWARD

RESEARCH FUNDS IN THE UNITED STATES

IN the Bulletin of the National Research Council for March, 1921, Callie Hull has compiled information on the funds available in the United States in 1920 for scientific research. This is the first compilation of its kind, and readers of SCIENCE will be interested in seeing a brief summary of the contents of this paper. The following review of these statistics can not be considered absolutely accurate. In some cases it is difficult to judge of the application of some arbitrary rules that had to be adopted in order to make the tables brief. I am satisfied, however, that the tables are essentially reliable, and that if absolutely correct figures could be obtained in every case, no great variation from the figures here given would result.

Annual incomes from funds for scientific research in the United States, which have been set aside by private individuals or corporations, range in amounts from less than $25.00 to more than $10,000,000. It is interesting to note the distribution over our land of the institutions that dispense these funds. Most of them are on the Atlantic coast, from Connecticut to South Carolina. The principal centers are Boston, New York and Washington. There is a broad belt of smaller centers extending from the Atlantic westward through the northern states to beyond the Mississippi. On the Pacific coast we find a center in and around San Francisco. Very few research funds have been established in the states lying on the high plains and plateaus of the west, where culture is recent, or in the southern states, where there is as yet relatively little centralization of wealth.

Funds of this kind have been established only in 26 states. Of these, New York ranks first and North Dakota last. In the amount of established funds the rank of these states is as follows: (1) New York, (2) Massachusetts, (3) Illinois, (4) California, (5) Maryland, (6) Pennsylvania, (7) Minnesota, (8) New Jersey, (9) Iowa, (10) Connecticut, (11) Ohio, (12) Kansas, (13) Utah, (14) Wisconsin, (15) Indiana, (16) Michigan, (17) Missouri, (18) Alabama, (19) Washington, (20) Texas, (21) Rhode Island, (22) Idaho, (23)