would be possible to start a similar series for each of the faunal zones in our territory, to the undoubted delight of all present naturalists, while it would also result in the making of many new students of animal groups.

In the present volume, M. Berland, who is a learned and capable assistant in the great Museum d'Histoire Naturelle at Paris, takes up five families of the fascinating burrowing wasps. Practically all the noted hymenopterists of France have in the past adopted the most praiseworthy habit of donating their collections to the museum of Paris, so that M. Berland had abundant material before him. The wonderful habits of these wasps have been studied with especial zeal by Frenchmen of mark, from Réaumur down to Fabre and Ferton, so that it has been possible for Berland to include with very many of the species brief notes on life history. And in addition to this he gives in his introduction not only a full statement as to habits but presents in tabular form the character of the larval food captured and stored by the adults of the different families and genera. Such a table can not fail to give data on group habits that will be of great comparative value to students of burrowing wasps in all parts of the world. One realizes on glancing at it that on the whole these creatures are undoubtedly of distinct aid to the human species in destroying large numbers of insects that are inimical to our interests.

Although in this very capable introduction Berland shows that he is familiar with the work of the Peckhams on American forms, in the remainder of the volume he seems to ignore the taxonomic conclusions of both American and English authorities. Had I known, when I met him last summer in Paris, that I was to write this little review, I would have quizzed him as to his knowledge of the English-written literature. My learned colleague, Mr. S. A. Rohwer, seems rather exercised that Berland should have used *Ammophila* for *Sphex, Pompilus* for *Psammochares, Elis* for *Campsomeris,* and so on; but in one instance, in a footnote (p. 257), Berland defends his use of *Pompilus* (following the hundred-years-old custom). He adopts the view which even many of the strictest adherents of the rules of the international committee on zoological nomenclature cherish in the back of their minds, that the advantages of holding to the old universally used names *"sont infimes, à côté des perturbations . . . déjà causées dans la nomenclature zoologique."* Dr. Stiles will probably notice this when he reads this number of SCIENCE and will probably labor with me when he sees me next; but, of course, seriously, I am with him and with his international committee.

It must constantly be remembered that this book and the others of the series are primarily handbooks for the identification of the fauna of France, and from this point of view M. Berland has done a most excellent job. Further, he has really gone beyond the handbook idea and has given an admirably condensed summary of all the most important facts known about these most interesting creatures.

An interesting idea suggests itself: Had this excellent book of Berland's been in existence when Fabre was working on these wasps, would the Hermit of Serignan have used it to identify the creatures he was studying in his experimental way? Knowing Fabre's opinion of taxonomists, I fear not; but, according to Ferton and others, it would have been a very good thing if he had.

L. O. HOWARD

The Organization of Life. By SEBA ELDRIDGE. New York: Thomas Y. Crowell Company, 1925. $4.00.

THE merit of "The Organization of Life," by Seba Eldridge, is that in it masses of the data of biology are treated by one whose training and outlook appear not to be biological but logical, philosophical and metaphysical.

The author's main contention is that many of the facts of living nature presented by professional students in this field can not be fully accounted for without recognizing non-physical, non-material factors. In other words, we have here the resources of formal logic and speculative philosophy marshalled in behalf of the vitalistic school of biologists. Thus concerning the origin of variation in organisms we read: "If non-material factors are operative in vital phenomena. . . . It should be possible . . . to provide a metaphysical foundation for our synthetic theory of variations" (p. 53).

This statement fairly typifies, I think, the standpoint from which the book is written. And the work is done with so much industry, good temper, seriousness and technical skill that not biologists alone but scientists in general might profitably read and ponder well every argument presented.

The portions of vital phenomena taken by the author as specially defiant of explanation on the basis of "chemicals and energies" (a couplet much used in the book) are in the realm of variation and heredity. His discussions of adaptation and his defense of neo-Lamarckian theories may be mentioned as particularly instructive in the way just indicated.

But what he has to say about the different types and the weaknesses of prevailing mechanistic and materialistic conceptions is also worth careful study —as is his critical examination of recent vitalistic conceptions, notably those of Bergson, Driesch and Haldane.

One may question whether many biologists will be convinced that the "two specific categories of vital factors, the organizatory and the mental" (p. 394), which the author believes must be recognized, are real in the sense in which he conceives them, can be helpful in researches of the kind they carry on. What help, for example, could any working botanist or anatomist or biochemist get from entelechies (the Drieschian form which Eldridge adopts after subjecting them to rather radical revision) when they are presented to him in this way: "Must not our entelechies, like the chemists, have been limited in the beginning by the incompleteness of their knowledge, a knowledge, however, which has been extended through their efforts to utilize matter?" (p. 426).

This almost sounds as though an embryologist or psychologist, when in the course of a research he comes upon a particular knotty point, might go to his telephone and call in the entelechy that is a specialist in the field where his trouble lies.

But I reiterate that despite the meager value to biology of the positive results reached by Eldridge in this book, he has yet performed an important service to the science if only students in this realm of natural knowledge will take it for what it is essentially, namely, a critical study of certain of the logical processes and philosophical implications necessarily involved in some of the main subdivisions of that realm. For while this is an aspect of biology which can not be escaped finally by biologists themselves, they have so long tried either to ignore it or have treated it so skimpily or lightly that the science is now suffering grievously thereby.

It is good to note that Professor H. S. Jennings, who writes a brief introduction to the book, appraised it in much the same way that we do. So it may be hoped that the work will contribute substantially to putting biology on a broader and more intelligently critical basis than it is now on or ever has been on.

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SPECIAL ARTICLES

SOME PROBLEMS WHICH MAY BE STUDIED BY OXYGENATION

DURING my studies on the effect of oxygen under pressure on protozoa, bacteria, molds and yeasts, I have thought of many problems which might be attacked by means of oxygenation, and, since it is impossible for me to investigate most of them, I have decided to list them, together with brief comments, and pass them on to others for whatever they may be worth. No doubt many of the problems and suggestions when investigated will prove to be of no value whatever, but, I believe, some of them will.

A. PROBLEMS OF IMMEDIATE ECONOMIC IMPORTANCE

(1) *Protozoan parasites of the silkworm and other insects:* It is an important and difficult problem to keep silkworms free of protozoa of the genus *Nosema.* It is quite possible that by confining either eggs or cocoons of the silkworm in oxygen under pressure that this protozoan menace to the silk industry may be entirely got rid of. Similar protozoa occur in other insects; for instance, the honey-bee. They may be killed by oxygenation and without injury to their hosts.

(2) *Protozoan parasites of fishes:* More than three hundred species of microsporidia, one or more species of the flagellate genus *Hexamitus,* species of two ciliate genera, *Ichthyopthirius* and *Chilodon,* and other protozoa, are known to be parasitic on fishes. Some of these protozoa are pathogenic and do damage to fish, causing great losses to the fish industry, and *Ichthyopthirius* produces a disease which makes it a menace to fancy fish dealers and owners. It is known that *Hexamitus* may be killed by oxygenation and without the slightest injury to its hosts. Perhaps the other protozoan parasites of fishes will be killed in the same way.

(3) *Other parasites of fishes:* Trematodes and molds do considerable harm to fish. The ectoparasitic trematode *Gyrodactylus* and the mold *Saprolegnia* would be good examples to begin with in a study of the effect of oxygenation on the trematodes and molds of fishes.

(4) *Protozoa of plants:* Milkweeds harbor many flagellate protozoa of the genus *Herpetomonas,* but the means by which these protozoa are transferred from one plant to another is unknown. Protozoa morphologically identical to those in the milkweeds are found in abundance in the gut of insects (*Oncopeltus*) living on and near the infected plants. It has been impossible so far to determine whether the protozoa in insects and milkweeds are the same organisms or not. The insects may or may not transmit the protozoa from plant to plant. It has been impossible to get suitably uninfected plants and insects with which to carry out experiments.

Of course uninfected plants can be found easily, but such plants may not be susceptible to infection. There are also other difficulties, but by oxygenating plants and insects, thus freeing both hosts of protozoa (as oxygenation will probably do), it seems to me that many if not all difficulties of the problem—Are the protozoa transferred from plant to plant by means of these insects?—would be greatly if not en-