SCIENTIFIC BOOKS

A Textbook of Plant Physiology. By N. A. MAXIMOV, translated from the Russian. Edited by A. E. Murneek and R. B. Harvey. McGraw-Hill Book Company, New York and London, 1930.

THREE Russians and their translators have given us treatises on plant physiology in English within the last twenty years. Of these the one most readable and, one would say, the only one likely to be read by the so-called general public, has drawn little attention. Entitled "The Life of the Plant," by the eminent Timiriazeff, its text fits its title: it is an admirable treatise, in a style now old-fashioned. The second has experienced repeated revisions and additions. "Plant Physiology," by Vladimir Palladin, edited by Livingston, represents, like its predecessor, the voluntary effort of author and Anglicizer. It exhibits the chemicalizing of the science. The third, Maximov's "Textbook of Plant Physiology," edited by Murneek and Harvey, carries the chemicalizing and physical chemicalizing still further, and was produced under the changed conditions in Russia to-day. It is one of the many works which we must expect to see produced in the Russian scientific laboratories, works characterized by the brilliancy and unevenness of the Russian. I will not attempt a disquisition on the character, quality, volume and value of the products of social and economic conditions in which one is not free to follow one's inclination, but in which one is so protected against "loss of the job" that one may be as "crazy" as one pleases. The tangential brilliancy of certain Russian scientific workers at the present moment is, I believe, to be explained in part by two convictions: that they are sure, for themselves and their families, of subsistence and shelter, of a sort; and that, however careful they need be about political matters, they are perfectly and irresponsibly free about other intellectual interests. They may indulge themselves in mitogenetic rays or any other inventions, as they choose! Furthermore, if writing is more to their taste than operating microscopes, microtomes and physiological apparatus, it seems to be a perfectly possible alternative. This may, therefore, account for the stream of Russian "contributions to science," of which we are, I believe, only at the beginning, and which is likely to continue as long as the present Russian economic system.

We have in Maximov's text-book an attempted summary of the essentials of plant physiology to-day. In the case of a translation especial care is called for in discussing a book; but in this instance certain details can readily be attributed to the author and others as readily to the editors. While the author's preface to the English translation states that "the translation of the book" was done at his request by three women in Leningrad and a fellow countryman in this country, the result was "edited" by two Americans. The result is an *American* not an *English* translation. The language is not what the merits of the book justify. Colloquialisms ("ironed out") and awkwardnesses are too frequent. The grammatical error of disagreement of subject and predicate in number is difficult to understand, though surprisingly common in certain areas of this country. To cite two examples: On page 67, "Some geologists, as for instance Vernadsky, attributes to the accumulating power," etc., the superfluous *s* being italicized; and on page 214, "However, very soon there *is* revealed in such cells many irregularities and digressions," etc., where *are* should be used instead. These are not errors in proof-reading, such as the wrong number of a figure cited at the top of page 111; they are errors of speech, localism, perhaps a dialect, but none the less regrettable.

The author is presumably responsible for the illustrations, almost without exception borrowed, never in any sense original, even where greenhouses are photographed for the purposes of this volume. Definition and conception of what constitutes a text-book are individual matters, but where author and editors claim that "The text brings up to date the results of physiological research both in Russia and in the United States," one may reply to this challenge by citing that what in the United States is now generally called photosynthesis is in the book still named carbon assimilation; that there is no mention of carbonates and bicarbonates as sources of carbon, the fifty-year-old doctrine of Liebig being the only one mentioned; that the definition of osmotic pressure on page 109 is a definition rather of turgor pressure than of its cause; that the well-known researches of Sponsler are not mentioned, although they throw light on the subject discussed on page 202; that, like its predecessors, this book pays almost no attention to the second and presumably no less important product of photosynthesis, namely, the oxygen, although one should realize that, unless it is released through a wound, its escape from the tissues which liberate it is inconspicuous, slow and incomplete; that Sir James Dewar is the name of the inventor of the most effective insulators so far produced for laboratory or commercial use and not Dewars. It is unfortunate that

the eminent Hollander Went, and his remarkable son, should have their name Germanized to Wendt; and in this connection one may remark that, while the author is probably right, his complete devotion at this time to the idea of hormones as regulatory influences would be regarded by conservatives as premature, and by most persons as too partisan for the author of a "textbook."

So much for some faults. The excellences of the book are no less marked. The treatment of those physiological processes and relations in which water is so largely involved, as in photosynthesis, absorption and transpiration, is that of the master dealing with facts to which he has made his own contributions. Other parts of the book are more compilatory and involve again the individual sense of perspective. The book is so valuable, so usable, that its faults are the more regrettable.

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Introduction à la Biologie Expérimentale. Les êtres organisés. Activités, instincts, structures. By PAUL VIGNON. Preface by M. E. L. Bouvier. Encyclopédie Biologique VIII. Paul Lechevalier, Paris, 1930. Octavo. Pp. viii + 731. 890 figs. 23 pls., 3 in colors. Price 210 frs.

THOSE who have had the pleasure of attending the brilliant lectures of Professor Paul Vignon at the Catholic Institute in Paris will not be surprised at their culmination in a book that is both unique and fascinating. The charm of this versatile guide is irresistible as he conducts us in this book through the fields of animal behavior, protozoology, mimicry and protective resemblance, and the evolution of types by mutation and orthogenesis.

Plentiful, excellent illustrations accompany the story, many of which, especially those on protective coloration and form, including three colored plates, are original. Vignon is a skilful artist.

He is also a thorough-going Aristotelian philosopher. An organism, an organ, any natural phenomenon, is to him an "idea," the expression of ultra-spatial, supernatural control. "The living being is enclosed within a wall behind which the drama of life is enacted." By peering through crevices in this impenetrable fortress, the biologist seeks an inkling into that which is taking place. A plan is in it all; ideas are everywhere, even though some of them are whimsical, such as the monstrously overgrown protuberances of the prothorax in certain leaf-hoppers, which are grotesque and, except as disguises, useless. Yet, in spite of such caprices of nature, nothing is fortuitous nor the outcome of blind mechanism.

Although this philosophy runs like the theme of a symphony through the book, emerging here and there in summaries, the author presents an array of facts from his own observations and the works of others which will be of interest to the psychologist, protozoologist, entomologist and biologist generally.

In the chapters on animal behavior, upholders of the Gestalt-theory and of emergent evolution will find much that is in harmony with their way of thinking; the observations and experiments of Koehler and Jennings, for example, are by no means neglected; but one looks in vain for the name of Jacques Loeb or mention of his theory of tropisms. Naturally the more dramatic incidents in the lives of insects and protozoa are stressed, and they are narrated vividly, but with the careful regard to fact characteristic of a well-trained zoologist.

The mysterious organ-forming "idea" appears in the numerous forms of great beauty in the Radiolaria and in the choice and arrangement of materials for the shells of Foraminifera. No hope is offered that biophysics and biochemistry may eventually explain any of these phenomena, but evolution by mutation is regarded as the way by which organisms proceed toward their goal of utility and beauty. Natural selection, however, is a vain formula; to Vignon orthogenesis, teleological control, is paramount.

The chapter on mimicry, which is defined broadly to include protective resemblances, amply describes the disguises of gastropods, crabs, spiders, and many insects, and is especially valuable because it treats of the flower- and leaf-like Orthoptera to which the author has devoted much research. These include African and Indian mantids which lurk among flowers and turn toward the light and their prey the brilliant colors of their ventral surfaces. Flat expansions of prothorax and coxal segments, colored like flowers, attract small insects into the grasp of the mantid's fore legs.

Even more remarkable are the leaf-like grasshoppers of tropical America, *Pterochroza* and its allies, many of which have been described for the first time by Vignon.[1] The fore wings, even of those which are green, mimic old leaves, with highly variable excised margins and blotches like fungus colonies. These spots are of various sizes in some cases, apparently representing different stages of development of the make-believe fungus.

Other South American grasshoppers of the phaneropterid genus *Pycnopalpa* have great blotches on their green wing-covers, suggesting the ravages of the elm-leaf beetle.

That physiological, physiochemical processes play

[1] P. Vignon, "Recherches sur les sauterelles-feuilles de l'Amérique tropicale," Archives du Muséum, 6, V, pp. 57–214, 1931. 58 figures. 1 pl. en couleurs, 12 pls. en simili-gravure, 12 pls. en phototypie.