

PLANT BIOCHEMISTRY

Plant Biochemistry

By James Bonner. Pp. xvii+537. (New York: Academic Press, Inc., 1950.) 6.80 dollars.

THERE are many reasons why studies on the biochemistry of plants have appealed to so few research workers in the past. The plant is a very independent organism, and for its growth or sustenance it requires no prepared organic nutrients. When starved or diseased it may look 'off colour'; but it cannot, like most mammals, yell and so let the whole world know. Perhaps it is this self-sufficiency which unconsciously leads us to take all its living processes for granted and to withhold our pity when it is ill. Certainly the endowment for research on plants has lagged far behind that for research on the animal or human: a rich man may pay readily in the hope of prolonging his own life, yet when all is not well in his garden he generally thinks only in terms of gardeners' wages. Fortunately, that greatest of all industries, agriculture, has at last become alive to the lack of fundamental knowledge in the physiology, biochemistry and pathology of plants, and there is reasonable hope that within the next few decades the leeway may be made up.

It must be admitted that the plant is not an easy medium for physiological or biochemical research. The well-trod paths for the study of the intermediary metabolism in the mammal, the blood stream, food ingestion and excretion, etc., are not available, and attempts have had to be made to obtain knowledge indirectly by treatment or analysis of organs such as the root system, leaves and fruits as entities; seldom, indeed, has it been possible to make use of their more highly specialized component parts. For this reason, many have felt that research on the plant might well await the outcome of the present intense drive to elucidate the biochemistry (especially) of the micro-organisms. While the subject-matter of Prof. J. Bonner's book demonstrates that such work is of value as a guide to studies with higher plants as well as with mammals, it also brings out quite clearly that many of the recent advances in various branches of plant biochemistry itself have contributed more than their share towards establishing the basic similarity in the metabolic processes of living organisms in general. There can be no doubt that plant biochemistry has an interest and a discipline of its own which should not be overlooked by the younger workers who are considering the field of research to which they might devote their lives. More recruits for plant biochemistry are certainly needed, and those who are still hesitant will find all the inspiration they need from a close reading of Prof. Bonner's text.

The book is cast in the form of a brief introduction, followed by six main parts dealing respectively with carbohydrates and carbohydrate metabolism, the cell wall and cell-wall metabolism, plant acids and plant respiration, metabolism of nitrogenous compounds, secondary plant products, and certain aspects of plant growth. These parts are further subdivided into appropriate chapters, each of which is a resume of the present knowledge of some particular topic and carries its own list of selected references to the original literature. The subject-matter throughout is very readable and is not overburdened with chemical detail: the author has, in fact, struck an admirable balance and has written a book which is far more

comprehensive than any of its predecessors. Recent advances in the knowledge of the proteins, carbohydrates and lipids are described in a concise and illuminating way, the emphasis being directed towards their metabolism and their inter-relationships through the Krebs cycle and respiration. The carotenoid and other plant pigments receive adequate attention. Prof. Bonner is to be congratulated on a fine presentation of a subject that is clearly very dear to his heart.

ELECTROMAGNETISM FOR ENGINEERS

The Principles of Electromagnetism

By Dr. E. B. Moullin. (Oxford Engineering Science Series.) Second edition. Pp. viii+312. (Oxford: Clarendon Press; London: Oxford University Press, 1950.) 20s. net.

PROF. E. B. MOULLIN's book on the principles of electromagnetism, first published in 1932, very quickly took its place among the standard text-books of the subject. The new edition is a reprint of the old, but incorporates an extensive second appendix.

In scope the book may be said to cover the basic electromagnetism required for a university course in electrical engineering. Various topics are, however, selected for a detailed treatment which is much more thorough than is common in undergraduate texts. The topics so selected are naturally those which are of major importance in applied electromagnetism. "Iron in a Magnetic Field", for example, occupies some eighty-five out of a total of just over three hundred pages. Phenomena and concepts which are often uncritically accepted are examined in a searching fashion so as to elucidate their mechanism. A case in point is the discussion of the behaviour of the iron ring with a concentrated magnetizing coil. Magnetic shielding also receives an unusually thorough treatment, and the same may be said of the analysis of eddy-current phenomena. The new appendix, besides extending the discussion of eddy currents, makes a brief but useful excursion into the dielectric field to deal with the energy loss in capacitors. The final chapter is devoted to the development of Maxwell's equations, and there is a short section on retarded functions. The treatment does not presuppose a knowledge of the methods of vector analysis.

The whole book expresses originality of outlook. No doubt one or two of the basic postulates will be unacceptable to some readers, for example, the isolated magnetic pole or the identity of character of the quantities B and H ; but cogency and lucidity of argument and aptness of illustration transcend such barriers. The following sentences dealing with the calculation of mutual inductance may be quoted as typical, and such aphorisms abound. "So when the reader has to calculate M for a particular problem, he should remember that if the integration seems intractable for evaluating M_{12} , it may be quite simple for evaluating M_{21} . If a coil B looks unpleasant, in a mathematical sense, when viewed from coil A , then go to coil B and see if coil A presents a more pleasing prospect. The property that $M_{12} = M_{21}$ presumably supplies the answer to some definite integrals which could not otherwise be evaluated." This book is not