

BOOK REVIEW

Principles of Plant Biochemistry: V. L. KRETOVICH. Pergamon Press, Oxford, 1966. 454 pp., £5.

THIS book is an English translation of the fourth Russian edition published in Moscow in 1964. It is evidently designed to present an outline of plant biochemistry to a non-biochemist because it describes not only pathways of plant metabolism but also the structure, occurrence and some of the more important biological properties of many different plant metabolites. It is therefore potentially useful as a text-book for first-year botany students.

After an interesting introduction summarizing the history of plant biochemistry, and in particular the contribution of Russian scientists, the next five chapters are concerned mainly with the chemistry of plant products. The chemical components described are proteins, amino acids and nucleic acids, carbohydrates, lipids including carotenoids, vitamins, and secondary plant compounds. This last chapter is concerned with aliphatic organic acids, aromatic compounds, glycosides, tannins, essential oils, rubber and gutta-percha, alkaloids and growth substances and antibiotics.

A chapter on enzymes in which a completely non-mathematical account of enzyme-substrate complexes and enzyme inhibition is given is followed by a chapter on the role of metabolism in living organisms in which the materialistic as opposed to the vitalistic approach are compared. The remaining seven chapters describe photosynthesis and chemosynthesis, the interconversion of carbohydrates, fermentation and respiration, organic acid metabolism, fat and lipid metabolism, amino acid and protein metabolism, the inter relationship of metabolic processes and the effect of environment on metabolism.

The division of the book into two parts inevitably means that there is some overlap between the various chapters. Unfortunately in some cases little attempt seems to have been made to correlate separate pieces of information on single topics.

One example of this is found in the treatment of terpenoid biosynthesis which is not given completely in one chapter but is scattered piecemeal through the book. The formula of mevalonic acid is given in the section on carotenoids in the chapter on lipids and two pages later in the section on steroids we have the formula of isopentenyl pyrophosphate. The reaction sequence from acetyl-CoA via both mevalonic acid and isopentenyl pyrophosphate to steroids, carotenoids and rubber is given in the chapter on secondary plant compounds but in the much later chapter on lipid metabolism there is only the statement that sterol synthesis involves coenzyme A and that mevalonic acid, isopentenyl pyrophosphate and squalene are intermediates. Again there is no reference back to the earlier statement of the complete scheme.

A further example of inconsistent treatment may be found in two separate descriptions of hemicellulose biosynthesis. In the chapter on the interconversion of carbohydrates which is in the "metabolic" section of the book the generally accepted views on the interconversions of the UDP-derivatives of glucuronic and galacturonic acids, xylose and arabinose are presented. However in the earlier chapter on carbohydrates ("structural" part of the book) it is suggested that, in the plant, galactans are most probably converted into polygalacturonic acid by an oxidation and that the latter can then be decarboxylated to yield arabans.

The impression is given that the original edition of the book has been revised haphazardly and this seems the most likely cause of the inconsistencies mentioned. Lack of revision is noticeable in the chapters on respiration and photosynthesis.

Little mention is made of oxidative phosphorylation and none of the importance of an organized series of electron carriers in a respiratory chain in mitochondria, although the possible importance of *o*-diphenol oxidase and ascorbate oxidase as terminal oxidases is discussed. The role of ATP in photosynthesis is discussed in a few lines and the functions of light are glossed over very rapidly.

Long lists of reference papers are given after each chapter, but they are not referred to in the text. The references are a mixture of source material, much of it in Russian publications, and references to books, reviews and recent papers which will give the reader more modern material than that in the book itself.

Because of its limitations the book cannot be recommended for use as a text-book but several sections, especially in the first part, may provide useful background reading.

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