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BOOK REVIEWS

The Ribonucleic Acids: edited by P. R. STEWART and D. S. LETHAM. 2nd edn. Springer, Berlin, 1978. 374 pp. U.S. $23.70.

The stated aim of this book is to provide a comprehensive, though not excessively detailed, outline of the biological roles of RNA. The preface indicates that it is intended mainly for students with a basic training in biochemistry but otherwise with a wide variety of biological interests. It is well suited to this purpose and should also provide a useful guidebook to those researchers whose interests lead them to enter the continuously expanding field of RNA biochemistry.

As is fashionable in such expansive areas, the book is a collection of short monographs written by a number of specialist authors. The balance has, nevertheless, been nicely maintained by the editors who also contribute to three of the chapters. The topics covered range from transcription, through the various species of RNA, to translation. Individual chapters deal with the RNA of the nucleus, mitochondrion and chloroplast. Although, inevitably, some of the chapters are better written and more easily digested than others, they do integrate successfully to achieve the stated aim. Diagrams and formulae are clearly presented and blend well into the text. One or two of the tables are perhaps over detailed, but this does not detract significantly from the general presentation. I liked the final chapter which deals with the techniques of extracting and purifying RNA. Unlike the other chapters, it necessarily contains a more detailed account of laboratory procedures, but nevertheless provides the newcomer to the field with a clear outline of the practical problems encountered in trying to avoid the formation of artefacts during the extraction of RNA. In brief, the editors offer a balanced account of RNA biochemistry which can be recommended to final-year undergraduates and to those postgraduates comtemplating research in the nucleic acid area.

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Physiology and Biochemistry of Seeds in Relation to Germination: edited by J. D. BEWLEY and M. BLACK. Vol. 1. Springer, Berlin, 1978. 122 figs., 41 tables. ix + 306 pp. Cloth DM 90.

This is the first volume of a two volume treatise. The organization of the book is a little unconventional in that following an introduction there are six chapters dealing with the structure of seeds and their food reserves, the legacy of seed maturation, imbibition germination and growth, biochemistry of germination and growth, mobilisation of reserves and control processes in the mobilisation of stored reserves. The physiology of germination and dormancy are left for the second volume. The overall coverage is very thorough and quite up to date. Quite a few references from 1976 appear, although it seems that most of the text was completed earlier. The literature selection in any volume is always a subjective matter, but it is nevertheless surprising not to find any mention of Hendricks, Borthwick or E. H. Toole, and only a single reference to Evenari to mention but a few examples. In order to put the subject in historical perspective some of those who laid the basis for seed research should be recalled. The book is said to be aimed at advanced students and research workers but at times it is not clear just at what level the book is written. For example, it is superfluous to give the structure of starch (Fig. 2.9) or show a centrifuge tube with a density gradient (Fig. 6.10). Other figures, e.g. Fig. 5.11 can only be understood by experts in the field. The authors discuss in great detail various biochemical pathways, e.g. starch biosynthesis, sucrose biosynthesis, yet assume that the reader is fully acquainted with the infinitely more complicated intricacies of protein and nucleic acid synthesis. This dichotomy is unfortunate. At times there are repetitions: on p. 7 there is a footnote about gymnosperm endosperm being haploid, but the matter is again discussed on p. 11. Perisperm is discussed both in Chapters 2 and 3. The discussion of various controversial subjects is generally very thorough and fair. Nevertheless at times controversies are dismissed almost without discussion, e.g. the role of c-AMP. The stress on the formation of reserve materials, their breakdown and metabolism is very considerable, perhaps too much so. The chapter on control processes in mobilisation of reserve materials is mostly about the cereal seeds with some discussion of embryo and embryonic axis interaction.

The discussion of GA effects in cereals is extremely comprehensive and clear and reflects the economic interest in cereal seeds. How generally applicable it is to other seeds, even to other Gramineae and how relevant to germination is another matter. There must be other

control mechamisms in germinating seeds, at the biochemical level, not concerned with hormones. In addition of course metabolic control operates at other steps in germination. Presumably they will be dealt with elsewhere, in Vol. 2.

Inevitably, even a comprehensive text like this one must have omissions. Thus a more detailed discussion of non-protein amino acids and their function and proteinase inhibitors would have been welcome. The important work of the Danish workers on factors determining the composition of protein in barley should have been mentioned. A discussion of how the great stability of enzymic protein in dry seeds arises would also be in place.

It is difficult to judge the overall comprehensiveness of the treatment in this volume, since only an outline of the contents of Vol. 2 is provided. Undoubtedly the treatment of viability, dormancy and dormancy breaking which are to be covered in Vol. 2 will fill in many of the apparent gaps noticed in the first volume. Minor inaccuracies have crept into the text here and there, e.g. p. 224 Raison and Evans, do not entirely reject the idea that a transphosphorylation reaction with phytin as donor could take place. One would have liked to have seen a detailed analysis of the curious results of some groups claiming to have actually shown such a reaction. On p. 26 it is not made clear that Con A is not a glycoprotein, but a metallo protein.

The above points do not in any way detract from the value of this book. It is a mine of information, generally accurate, extremely well produced. Among the more interesting discussions are those on water uptake and imbibition, the section on conserved *m*RNA and *r*RNA and *t*RNA. The copious illustrations throughout are clear and many electron micrographs are included. These are very helpful and very clear.

Hardly any misprints or printing blemishes were noted. I have no doubt that this book is an extremely useful contribution to the relatively scant literature about the biochemistry and physiology of seeds. It will help to stimulate interest and provide an invaluable literature source. Assuredly every research worker in the field would like to have this book on his shelves. Unfortunately the publishers have done a disservice to the authors and to the potential readership. The price of DM 90 is exorbitant and will discourage many potential purchasers. The publishers should make an effort to reduce the price of the second volume, perhaps by changing its binding and not using chrome paper throughout. The purpose of books is that they be read by as many people as possible, and not to be simply library specimens.

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