and cytoplasmic DNA synthesis but the mechanism of control is still mysterious. It was postulated some considerable time back that both chloroplasts and mitochondria were closely related to the prokaryotes. Several contributions to this symposium go towards confirming this view. It remains something of a mystery, however, why it should be necessary for eukaryotes to maintain a small number of genes in these cytoplasmic organelles. The debt which the nucleus pays towards the maintenance of this DNA is very considerable indeed, and something of the order of at least 100 nuclear genes are required to support protein synthesis in chloroplasts or mitochondria. There must be considerable biological advantage in the maintenance of cytoplasmic genes for this debt to the worth while and much remains to be learned about the symbiotic relationship between cytoplasmic and nuclear genes.

Considerable progress has been made in the characterisation of the various types of transfer RNA found in chloroplasts and mitochondria. It is now clear that many of the unique types of tRNA found in cytoplasmic organelles are coded by cytoplasmic DNA. It is clear also, however, that some types of tRNA found in mitochondria of tetrahymena are nuclear in origin and that RNA must therefore be capable of penetrating from cytoplasm into mitochondria. It may be that mitochondria will yet provide one of the most profitable approaches to understanding of control mechanisms in eukaryotes.

T. S. Work

Biochemical Toxicology of Environmental Agents

by A. De Bruin
Elsevier; Amsterdam, 1977
x + 1544 pages. $ 130.75, Dfl 320

Not too long ago toxicology was considered a branch of forensic medicine. The publication of this book shows the changes that have occurred with the increasing complexity of knowledge in the biochemical field. The rapid increase in information has been due to the development of new analytical techniques for chemicals and their metabolites, and also to the development of molecular biology. Thus, it is becoming possible to provide exact information about the metabolism of foreign chemicals in vivo and also to identify the sites on macromolecules or membranes to which they become attached. A slower process is the synthesis of this information with the detail of biological responses to produce concepts of mechanisms of toxicity. This book illustrates how much easier it is for scientists to produce information than it is to provide a convincing theory how a substance brings about a particular clinical condition (or even at a lower level of biological complexity a change in a function of an organ).

My first reaction to receipt of this book was one of astonishment and admiration; that any one man could assemble a book of such a size and yet be so up-to-date. It would seem almost churlish to criticise it at all, taking into account the magnitude of the task. The book covers most chemicals to which man might be exposed either at work or in the general environment. There is no doubt that it will provide a valuable source book in the field. According to the Preface some 13 000 references are cited.

The arrangement of the book varies. Sometimes the emphasis is on the chemical or class of chemical, sometimes on a particular biological response produced by chemicals and sometimes on an aspect of biochemistry. This makes it difficult to find a way around the book. It would have been useful to include in the Contents page the main subtitles of the Chapters. These are informative and many are not in the index.

It is obvious that biochemical toxicology embraces

the whole of biochemistry and in its wider sense the whole of biology. An appreciation of the present position in all aspects is beyond the capacity of any one research worker. It will be apparent that the comments of the reviewer are restricted to his own sphere of expertise. Many of the descriptions of modes of action are excellent but in some cases important errors have crept in. Thus, it is stated that (page 867) triarylphosphates and other organophosphorus compounds bring about a primary demyelination of nerves, whereas it is now established that these compounds produce a dying-back lesion similar to Wallerian degeneration. Information accumulates so rapidly that it is inevitable that such a large book will be out-of-date in some respects. The description of the way carbon tetrachloride affects liver function is excellent, but although carbon disulphide is given a reasonable amount of space, significant information published in the last five years is missing.

The publication as a printing effort is good and the photo-offset process has produced a legible text. There are few errors in the text. The reproduction of the figures often is somewhat indistinct, presumably due to the line width in the original drawings. The index is good as it must be for a book of this kind. There is no doubt that this will be a book useful to many people. The price will effectively restrict its sale to libraries rather than to individual scientists. This book is recommended as a source of information on the biochemical reactions of chemicals in and with mammalian biological systems.

W. N. Aldridge

BOOK LIST No. 8 August 1977

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