Biological effects of environmental agents

Biochemical Toxicology of Environmental Agents. By A. de Bruin. Pp.x+1544. (Elsevier/North Holland: Amsterdam and New York, 1976.) Dfl.320; $130.75.

INTEREST in the biological effects of environmental agents has increased enormously in the past three decades, stimulated by the growing awareness of the potential threat to human health of the increasing number of chemicals in the environment. There has been a corresponding increase in the number of toxicological investigations (in man and experimental animals) and these have come to rely more and more on biochemical techniques both in the assessment of toxic effects and in the study of the mechanisms of toxicity.

Dr de Bruin's book provides in 42 chapters an up-to-date review of the many aspects of biochemical toxicology. The first chapters are fairly general in scope, dealing with the metabolism of foreign chemicals, with factors which modify metabolism and toxicity, and also with tests of exposure to toxic compounds. There follows a systematic treatment of the various aspects of toxicity which are considered in different chapters, according to the biochemical or biological system which is affected. Thus, disorders of carbohydrate and lipid metabolism are first considered, then proteins, nucleic acids and so on, and, finally, immunological mechanisms and blood coagulation disorders. Each chapter has a short introduction outlining the normal biochemical principles relevant to the system, followed by the biochemical toxicology of chemical agents and the effect of ionising radiations.

Dr de Bruin's book will be a useful reference work. The amount of information presented is vast (about 13,000 references are quoted), and the book is unique in providing so much information on so many different aspects of biochemical toxicology in one single volume. That a single author should have been capable of covering so much ground on his own is in itself, a very considerable achievement.

Perhaps inevitably for a book of this size, treatment of the biochemical mechanisms of toxicity is sometimes superficial; the author presents all the data available in an exhaustive fashion with little critical appraisal, so that the reader is left without guidance as to which of the various findings reported are of particular significance.

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Secrets of the Universe still locked up

The Universe. By J. Kleczek. Pp. vi+259. (Reidel: Dordrecht and Boston, Massachusetts, 1976.) Cloth Dfl.70; paper Dfl.43.

THE idea of a book about the Universe linking the large and the small (galaxies and elementary particles), and starting from particle physics and the four basic forces to build outward, is a good one. Unfortunately, this is not a good book. The principle reason for this is the severe tailoring required to fit a quart story into a one-pint volume; as the preface says, this is only achieved by giving no references, short-cutting arguments, expressing quantities often as orders of magnitude and keeping formulae to a minimum. As well as all that, the author's English is not always very readable, and the text could have been improved by some sympathetic editing.

Of all these shortcomings, the worst is that where several theories or hypotheses exist to explain some phenomenon—as is so often the case in studies of the Universe—the author chooses only one for discussion, and presents it uncritically. On the solar neutrino problem, the author's treatment is even more deficient; we are simply told that "Many suggestions have been made to explain the discrepancy. There is no lack of ideas", without being told what any of the ideas are. The confused reader will gain little comfort from the index, in which some topics are broken down in nit-picking detail, whereas others receive no mention; the entry under "B", for example, consists solely of "Big-Bang", with no mention even of black holes, although they are discussed in the text.

If the same material, arranged under the same chapter and section headings, had been expanded to twice the size of the present book and edited into smoother English, the result would have been a valuable addition to the astrophysical literature. As it is, the present volume adds nothing of any value and cannot be recommended.

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Ecophysiology

Introduction to Physiological Plant Ecology. By P. Bannister. Pp. 273. (Blackwell Scientific: Oxford and London, 1976.) £4.75.

PLANT physiological studies have contributed, and continue to contribute a great deal to plant ecology, and many universities and colleges now teach undergraduate courses in ecophysiology. Many such courses have arisen from a desire to present plant physiology in its true evolutionary and environmental context. It is natural, therefore, that publishers have been anxious to provide suitable texts for such courses and the book reviewed here follows others by Etherington (*Environment and Plant Ecology*, Wiley, 1974) and Larcher (*Physiological Plant Ecology*, Springer, 1975).

Bannister covers the expected ground—energy balance, responses to light and temperature, soils, mineral and water relations and competitive interactions. The approach is concise and basic. He starts from first principles and relies mainly on verbal rather than numerical explanation of the principles discussed. This makes the text readable; also, it is rich in pertinent illustrations, largely drawn from British examples.

The attempt to portray such a wide and complex subject at an elementary level has necessitated a considerable degree of selection and pruning, and some topics are dealt with very briefly and may, consequently, be oversimplified. As a general criticism, I feel that too little information has been provided on relevant metabolic processes, which leaves one rather dissatisfied with some explanations. For example, an interesting collation of data concerning the tolerance of extreme temperatures by plant species stops short of explaining their metabolic consequences or the biochemical adaptations involved. At times the avoidance of biochemistry even obscures the text, as in the case of the C-4 photosynthetic system and the explanation of photorespiration. The same, however, applies to Etherington's book on this point.

Bannister's book stands out from the crowd by virtue of its rich use of examples of field problems which have been illuminated by physiological work. One can point students to it with the confidence that it will simulate their interest.

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