Not many people would be prepared to buy a solar distillation plant with a capacity of 100,000 gallons for $1 million when the same sized distillation plant would cost nearer a fifth of this amount.

Should anyone wish to obtain a well based knowledge of the theory and practice of electrodialysis, he would be well advised to read the admirable chapter by Shaffer and Mintz; it covers a very wide range of topics in the electrodialysis field in a clear and concise manner. Apart from some operating data from the large electrodialysis plants in America, and which have only fairly recently been published, this chapter covers most of the available electrodialysis information of interest to the desalination engineer. The same words could be echoed in the case of the chapter on reverse osmosis, though both chapters suffer from one small omission—pictures of actual operating equipment. The chapter on freezing tends to go to the other extreme with its almost exclusive devotion to operating plant description, but it does not discuss the difficulties of designing the more intractable components such as the compressor and the wash column; these are some of the main obstacles to the progress of this method of desalination.

Chapter 10 on scale formation and prevention is a useful brief introduction to the subject, but the serious reader would be advised to extend his reading before applying the information here. The final chapter in the book, entitled "The Cost of Conventional Water Supply", applies only to the United States; it does, however, give desalination engineers in other countries a very good idea of the type of local information with which he should be familiar.

On the whole, I and others in the field of desalination have found the book an extremely interesting and well balanced treatment of the subject, though a chapter on steam cycles for combined electric power and desalination plant and one on ion exchange would have made it more complete. A second volume on the same lines but filling in the gaps would make them both a valuable contribution for all those working in the field.

C. R. Bennett

BIOCHEMISTRY, 1966

Annual Review of Biochemistry

Vol. 35. Edited by Paul D. Boyer. In association with Alton Meister, R. L. Sinsheimer and Esmond E. Snell. Part 1: Pp. viii + 1–456 + 91. Part 2: Pp. iii + 457–908 + 91. (Palo Alto, California: Annual Reviews, Inc., 1966.) $11.50 the two parts.

Since it was first published in 1932, the *Annual Review of Biochemistry* has until now appeared each year in a single volume. But the 1966 edition has undergone binary fission and now appears in two parts, each of approximately 450 pages, containing about a dozen scientific articles. In addition, there is the usual introductory autobiographical essay by an eminent biochemist, the contributor on this occasion being A. C. Chibnall, who writes under the title "The Road to Cambridge". Author and subject indexes, together covering both parts of the volume, are printed in each of the two parts, as also is a list of the contents of the whole volume. In addition, there is a cumulative index of chapter titles and contributing authors which covers Volumes 30–35.

As might be expected, the biochemistry of amino-acids, peptides and proteins occupies much space, but a particularly interesting topic is "Water-insoluble Derivatives of Enzymes, Antigens, and Antibodies" by Israel H. Silman and Ephraim Katchalski, the last article in the volume. The "Biochemistry of Bacterial Cell Walls" by Hans H. Martin also covers a new and rapidly expanding field of study which, from an experimental point of view, can be said to date from 1951, when Salton and Horne described the first practicable method for isolating cell walls from whole bacteria on a preparative scale. Bacteria use building materials of complex composition, the macromolecular organization of which differs from that of the classical linear homopolymers of plant cell walls, and various names have been suggested for this class of substance. Hans Martin has adopted the name "murein", recently proposed in analogy with the term "protein". Whether this terminology will ultimately be used generally remains to be seen.

The review articles in general maintain their expected high standard, and one can say with certainty that the process of fission has had no discernible effect on the contents of the volume but has made available two parts of a size which is most convenient to handle.

F. G. Young

ARTHROPOD NEUROCHEMISTRY

The Neurochemistry of Arthropods

By J. E. Treherne. (Cambridge Monographs in Experimental Biology No. 14.) Pp. viii + 156. (London: Cambridge University Press, 1966.) 30*s*. net; $6.

To a considerable extent the limitations of the book are the limitations of knowledge about the neurochemistry of arthropods; its highlights depend on the topics that have so far interested the research workers. There is a concentration of research into the neurochemistry of insects and crustaceans mainly because of the availability of these animals.

The central nervous system (CNS) of the insect has a sheath around it which may limit the transfer of material between it and the haemolymph. Water soluble materials pass from the haemolymph into the CNS easily, however, and Treherne suggests that this may explain the problems of the vertebrate blood–brain barrier. In vertebrates there is a restricted extracellular system while in insects there is a large extracellular volume in the CNS.

Plant eating insects such as *Carausius* have blood with an interesting ionic composition; it is poor in sodium (15 mmoles/kg compared with 156 mmoles/kg for *Periplaneta*) and rich in magnesium (53 mmoles/kg compared with 5·3 mmoles/kg for *Periplaneta*). The nerve cord also has a high concentration of magnesium (22 mmoles/kg compared with 2·9 mmoles/kg for *Periplaneta*). Could Mg^{++} instead of Na^{+} be entering the nerve axons during nerve activity ?

There is still uncertainty about the nature of the chemical transmitters in the arthropod nerve–nerve and nerve–muscle systems. It is likely that acetylcholine is a central transmitter. One difficulty has been that fairly high concentrations of acetylcholine (10^{-3} g/ml.) have to be added to the CNS to produce a clear effect but, as Treherne and Smith have shown, this is most probably due to the high concentrations of choline esterase that lie beneath the sheath of the CNS. With regard to peripheral transmitters, the evidence for glutamate as the excitatory transmitter in insects and crustaceans is discussed and the more recent papers are mentioned in an addendum to this volume. There is fairly good evidence that gamma-aminobutyric acid may be the inhibitory transmitter at the nerve–muscle junction.

It would have been useful if there had been a chapter on neurosecretion in arthropods, but this might have made the volume too long. There is a limitation placed on the authors of these monographs with regard to space and it is certainly an advantage to the reader if the material is described concisely and succinctly. The present volume provides the best available general account of the neurochemistry of the arthropods—a subject that will be the basis of our understanding of the control system of arthropod behaviour, insecticides, clock mechanisms, and the like. The book should do much to stimulate work into this somewhat neglected subject.

G. A. Kerkut