quality of page layout varies from reasonably acceptable to appalling (e.g., see pages 27 and 48). Many of the chapters fall between two stools in that they give too much detail for the general reader but not enough for those actually attempting to perform the experiments, who would probably have to go to original papers or to Methods in Enzymology.

Nonetheless, I remain convinced that this book should be closely read by all workers in the field of Plant Biochemistry. Its price is not excessive in view of its information content.

B. Halliwell

Energetics and Structure of Halophilic Microorganisms

Edited by S. R. Caplan and M. Ginzburg
Elsevier/North-Holland; Amsterdam, New York, 1978
xxii + 672 pages. $78.00, Dfl 160.00

This book summarizes a workshop on Halophilism, sponsored mainly by the European Molecular Biology Organization, at the Weizmann Institute, Rehovot in May 1978. It contains 24 invited papers, most followed by group discussions, 32 contributed papers (presumably representing posters) and 2 roundtable discussions and represents the work of some 100 participants. Space limitations preclude naming individual contributors, but a good representation of all those scientists studying halophilic and salt-tolerant microorganisms took part.

As the editors point out, a great deal of interest (and support) for studies of extremely halophilic bacteria comes from the discovery in the 'purple membrane' of the halobacteria of the retinal protein, bacteriorhodopsin (BR), a fascinating proton pump which can convert light to chemical energy. The treatment of this subject, occupying almost half the book, is detailed and specialized. The contributors are mainly concerned with the coupling of the BR photocycle with proton translocation and with possible changes in BR conformation during this process. Retinal proteins are also involved in the behavioural response of an extreme halophile to light.

Interesting as the BR system is, extreme halophiles can live very well without it and there is still much uncertainty about its role in halophilic life in the laboratory and in Nature. Fortunately, the book contains much material on other aspects of such life. Discussions of the physical chemistry of highly concentrated solutions and of the state of water and solutes in halophiles, with which it begins and ends, are especially pertinent. There are valuable sections on transport, metabolic systems, enzymes and enzyme regulation and on the highly unusual lipids, cell surface components and ribosomes of the halobacteria. For some years the need for very high salt concentrations to prevent denaturation limited the work that could be carried out on these enzymes. Affinity chromatography and other chromatographic techniques now make it possible to obtain some enzymes in a state of high purity and to re-examine earlier explanations of salt effects based on kinetic data alone.

The chemical peculiarities of the extreme halophiles are not necessarily connected with their salt requirement. Their ether-linked phospholipids, or similar compounds, have recently been found in methanogenic and thermo-acidophilic bacteria and hence may point to a common evolutionary origin of these unusual but physiologically distinct groups of microorganisms. The protein-synthesizing systems of halobacteria do require high salt concentrations but also have certain properties (initiating sites, sequences of certain ribosomal proteins and of ribosomal RNAs) which seem closer to eucaryotic than to most procaryotic cells. In cell surface components and in ferrodoxins, halobacteria also seem to have evolutionary links to eucaryotic cells.

Of special interest (to this reviewer) were short chapters on other halo-tolerant and halophilic bacteria, yeasts and algae, which include material on mechanisms of osmotic regulation, effects of antibiotics and bacteriophages.

As might be expected, the book does contain some repetition. Figures and reproduction of typescripts are generally good. Some of the manuscripts could have used more extensive editing. In general, however, the book gives a good account of a very exciting meeting. It is strongly recommended for the library of those studying or intending to study halophilic or salt-tolerant microorganisms, who will find the experimental detail most useful. The review chapters will give the general microbiologist a good background in the subject (though many by the same authors have been published recently in such sources as Microbiological Reviews and Advances in Microbial Physiology.) The book should be in university or departmental libraries but not necessarily in those of all individual microbiologists or biochemists.

D. J. Kushner

A Double Image of the Double Helix

by Clifford Grobstein
W. H. Freeman; San Francisco, 1979
xii + 177 pages. £ 6.90 (hardcover), £3.50 (softcover)

This short history of the debate of the merits and hazards of recombinant DNA research will annoy those in the field and confuse those outside it. Much of the text is reprinted from the United States NIH documents on recombinants; there is little acknowledgement that the rest of the world exists, either scientifically or politically. The author comes down against regulation on philosophical grounds and discusses laboratory risk in detail, but industrial and military dangers hardly at all. Any book in a rapidly moving field like this is sure to be out of date when published, but in this case it is a particular pity that the author did not discuss hazard analysis of the type suggested by Sidney Brenner, which allows any dangers from recombinant DNA to be put in perspective with other microbiological and chemical hazards. The flowery language of the book will irritate scientists, who are used to more direct writing. Radicals will be interested in the statement that physical attractiveness, personality and intelligence are 'polygenic' characteristics (page 61); intelligence may be debatable, but physical attractiveness? By the time the more interesting speculations at the end of the book are reached, most readers, I feel, will have been sufficiently offended by one or another of the views of the author to stop reading. This interesting field deserves better.

Bob Williamson

Specificity of Embryological Interactions

Edited by D. R. Garrod
Chapman and Hall; Andover, 1978
xii + 274 pages. £15.00

It is a widely held view that during development the position that cells come to occupy is determined by their adhesive properties, and that specificity of adhesion could account for the patterning of cells including neural connections. This excellent volume fairly represents the range of current views on this

Others subsequently resolved the DNA double helix by using imaging solutions containing very high concentrations of Ni2+ (~50 mM).2. Employing the same DNA immobilization strategy as Leung et al., our goal was to resolve the helical structure of loosely bound DNA using the low and precisely controlled imaging forces enabled by PeakForce Tapping mode, as achieved by Pyne et al.3 To demonstrate that this type of spatial resolution is not specific to a particular AFM system or probe, we carried out. PeakForce Tapping experiments on the MultiMode 8, Dimension FastScan Bio, and BioScope Resolveâ„¢ at The Double Helix: A Personal Account of the Discovery of the Structure of DNA is an autobiographical account of the discovery of the double helix structure of DNA written by James D. Watson and published in 1968. Watson is a U.S. molecular biologist, geneticist and zoologist, best known as one of the co-discoverers of the structure of DNA in 1953 with Francis Crick. A double helix resembles a twisted ladder. Each 'upright' pole of the ladder is formed from a backbone of alternating sugar and phosphate groups. Each DNA base (adenine, cytosine, guanine, thymine) is attached to the backbone and these bases form the rungs. There are ten 'rungs' for each complete twist in the DNA helix. Template from Francis Crick and James Watsonâ€™s molecular model of DNA from 1953. Image credit: Wikimedia Commons.Â Illustration to show the structure of the DNA double helix. Image credit: Genome Research Limited. From structure to function. The concept that DNA was made of a sequence of paired bases along a sugar-phosphate backbone allowed James Watson and Francis Crick to draw two important conclusions