Heat Shock; Edited by B. Maresca and S. Lindquist; Springer-Verlag; Berlin, Heidelberg, New York, 1991; xiv + 320 pages; DM 138.00. ISBN 3-540-54711-x.

Back in 1962, the December issue of Experientia included a brief submission with the title "A new puffing pattern induced by temperature shock and DNP in *Drosophila*" by F. Ritossa. This turned out to be the beginning of a trail that led to the analysis of a cellular stress response that was shared by all organisms from bacteria to man. After three decades of intensive study, this stress response (sometimes called the heat-shock response) has now emerged as a vital homeostatic mechanism that seems to enable cells to survive a variety of environmental stresses. For a while the heat-shock response was studied in a wide variety of organisms as a model system to analyse control mechanisms regulating the synthesis of heat-shock proteins, providing important general insights into the regulation of gene expression. However, a spectacular revelation which has captured the attention of a very wide range of biologists was the appreciation that heat-shock proteins are major players in an extraordinary variety of normal cellular processes. These include protein trafficking, signal transduction, DNA replication, transcription, protein synthesis and the assembly of a diverse range of complex protein structures.

Books on the latest research findings related to the heat-shock proteins are now appearing quite regularly. This is important as it is now a fascinating field which moves rapidly and in many directions simultaneously. This present volume is a collection of chapters representing the state of knowledge presented at a meeting held in Italy in late 1990. Whilst, in principle, it is therefore a little dated it nevertheless serves very adequately to introduce readers who have not kept abreast of the field to the new and exciting research directions that have considerable implications for medical research. These embrace immunology, infectious diseases, chronic degenerative disease, as well as cancer and cancer therapy.

In all there are some 34 contributions sectioned as follows: analysis of heat-shock regulation; heat-shock protein functions in *E. coli* and yeast; analysis of heat-shock protein functions; heat-shock proteins and translocations; immunological aspects and medical applications of heat-shock responses. In summary, despite its production time, it probably represents the most up-to-date 'collection' of contributions representative of the very extensive field that this has become. Because of this it will be a useful guide to the wide range of biologists becoming interested in the considerable ramifications of heat-shock protein function. Certainly we will all need another volume of recent findings in this area by next year, but for the present this will serve as a very useful 'progress report'.

Roy H. Burdon

Prokaryotic Structure and Function: A New Perspective (Society for General Microbiology Symposium, Volume 47); Edited by S. Mohan, C. Dow and J.A. Cole; Cambridge University Press; Cambridge, 1992; xii + 440 pages; £60.00. ISBN 0-521-41570-5.

This volume reports the proceedings of the 47th Symposium of the Society for General Microbiology, held at the University of Edenburgh in April 1991. The book sets out to reassess the topic of prokaryotic structure and function, last reviewed at an SGM Symposium thirteen years previously. Its fifteen chapters are wide-ranging in their subject matter and reward careful reading. However, the material is not quite so wide-ranging as the editors suggest in their Preface; although their book aims to include the topic of environmental sensing by bacteria, important omissions include signal transduction via histidine protein kinase/response regulator systems, chemotaxis and outer membrane structure.

The chapters break down into several themes and this is reflected in the order in which they appear in the book. In the first chapter, Doolittle et al. present an erudite discussion of the evolution of gene and genomic structure in which they highlight the naivete of the (common) assumption that eukaryotes have evolved by recent additions to an earlier *E. coli*-like molecular biology. In addition to providing an excellent review of Archae biology, they demonstrate how this cellular type has contributed to our understanding of which differing features of bacteria and eukaryotes are primitive and which are derived. In the second chapter, Rouvière-Yaniv and co-authors review the bacterial nucleoid and DNA supercoiling, and discuss the structure, biochemistry and genetics of histone-like protein, HU, and its role in nucleoid architecture, chromosome segregation, DNA replication, transposition, site-specific recombination and transcription control. These topic lead naturally to a consideration of the bacterial cell cycle and Thomas and Jagura-Burdzy consider the subjects of DNA replication and segregation under the cover of a re-evaluation of the Replicon Hypothesis. Their chapter, which covers both bacterial plasmids (their own speciality) and the chromosome, is particulary detailed and includes a wealth of references. The cell cycle theme is taken up in later chapters by Bi and Lutkenhaus (the genetics of cell division) and by Wheals (a comparative study of the bacterial and eukaryotic cell cycles). This theme is developed further by Nanninga et al. who consider the spatial and temporal organisation of cell envelope growth in *E. coli*.

Bacterial transport systems are covered in one chapter (Pugsley) which deals with systems involved in uptake and those concerned with export. This chapter considers transporters ranked within superfamilies as defined by sequence similarities their components. It reviews the general secretion pathway and signal peptide-independent protein secretion. The section on the 'ABC' transporter family also covers medically important eukaryotic members. There is a useful chapter on bacterial storage polymers (by Dawes) and several chapters on aspects of cellular compartmentalization and development. These include material