of polytene chromosomes, and others. The book contains 11 chapters: (1) Chromosome size, number, and shape; (2) Mitotic chromosomes; (3) Chromosomes in meiosis; (4) Chromosome banding; (5) Polytene chromosomes; (6) Lampbrush chromosomes; (7) Visualization of transcription (by Aimee H. Bakken & R. S. Hill); (8) In situ hybridization; (9) Autoradiography; (10) Measuring nuclear or chromosomal DNA; and (11) Safety and the law. The last chapter is a new one. It also contains a revised list of names, addresses and telephone numbers of suppliers.

This book contains so much useful information that it should be consulted by all biologists who desire to work with chromosomes seriously or just for fun. As the authors state in their Preface, they wrote this volume for three different kinds of person: high school and college teachers, inexperienced investigators, and experienced investigators. To this end, the authors successfully fulfilled their aim. The presentation is clear throughout, and most illustrations are good. On the negative side, I wish more photographs could have been included for instruction and for enjoyment, and hope that a few illustrations that are not of superior quality will be replaced in the next edition. At any rate, I can now display the first edition on the book shelf in my laboratory and keep the second edition in a secret place.

Dr T. C. Hsu is Professor Emeritus of the Department of Cell Biology at The University of Texas M. D. Anderson Cancer Center at Houston, TX, USA

ANNE WARNER

Gap Junctions, edited by E. L. Hertzberg and R. G. Johnson. *Alan R. Liss, New York. Pp. 566. $96.00 hardback, £85.00 paperback*

For many years the extraordinary order apparent in micrographs of gap junctions inculcated the belief that they were relatively simple structures, showing little variation from tissue to tissue, species to species. This book, based on a meeting held in July 1987 in California, demonstrates rather clearly how ill-founded such beliefs were, and shows that there is not one gap junction but many. Indeed, one might be forgiven for thinking that gap junctions are really so complicated that proper understanding is a long way off.

The explosion of new information that has been apparent for the past two or three years makes this book particularly useful, since it collects together recent work of most of those now engaged in the study of gap junctions from a variety of viewpoints. This is, at one and the same time, both the greatest strength and greatest weakness of the volume. Strength, because it is possible to gain a very good understanding of the overall state of the field; weakness, because the sheer volume of material threatens to overwhelm the reader.

There are seven sections. The first five (Biochemistry, Structure, Molecular Biology, Regulation, Biophysics) focus on the basic features of gap junctions and provide the framework for the last two sections on possible functional roles in Growth Control and Development. On the whole, the papers deal with issues in a matter-of-fact way, with most authors taking the trouble to point out where issues of contention or experimental difficulty arise. This means that one can really get the flavour of the way in which the field is developing. The ever-increasing number of cDNAs coding for gap junction proteins suggests that we may still be at the tip of the iceberg in our analysis and identification of the proteins that make up and regulate this deceptively simple structure.

The status of the gap junction as a structure in search of a function (as it was once described by Lewis Wolpert) is highlighted by the last two sections, which are in many ways the least satisfactory. Not because of the articles, which are well written and interesting, but from the stand-point of our understanding of what gap junctions actually do in organs, cultured cells and development. Because the sad fact of the matter is that, by and large, we are as ignorant now as we were over 20 years ago when the classic paper by Potter, Furshpan & Lennox on the squid embryo first appeared. The sections on cell–cell communication in transformed cells show rather clearly that as our knowledge has grown so our understanding has diminished, since there appears to be no simple relation between the efficiency of gap-junctional communication and the transformed state and general principles are hard to derive, at least from the present data. On a more positive note, the analysis of the cellular *src* gene in relation to gap-junctional communication demonstrates how molecular analysis and site-directed mutagenesis can illuminate our understanding of possible regulatory mechanisms.

The gap-junction field has always had its fierce controversies, with various protagonists taking up relatively entrenched positions. With time, the controversies have changed; as one set is resolved, so another emerges. This (dare I say characteristic?) feature of the field is still with us. Of course differences are to some extent glossed over in the published articles, but sufficient comes through to make me sad that I missed the live discussions and regret, just a little, that these discussions are not included. But that would have made the volume truly unmanageable for the student or interested outsider.

The past four or five years have seen a number, probably too many, multi-author volumes on gap junctions. The real advances in understanding have been too few to warrant such constant reiteration. What does this volume have that others do not? Like all Symposium Volumes, this freeze-frame of the gap junction field, taken in July 1987, will date rapidly. This makes it an unwise purchase for an individual. Nevertheless, there are many good things contained in it, both for the specialist and the novice. The attention to experimental detail and recognition that there are some real problems, makes this volume more useful than most. Get your library to buy it, be informed, instructed and even entertained. But let us hope that there can now be some moratorium on large books about gap junctions until some major clarifications have emerged that would enable the next book to escape the paper recycling industry for rather longer than the current norm.

Anne Warner is Foulerton Research Professor of the Royal Society at the Department of Anatomy & Developmental Biology, University College, London