

Book Reviews

Techniques in Somatic Cell Genetics. Edited by JERRY W. SHAY. Plenum Press, New York and London. \$49.50 in U.S.A. and Canada, \$59.40 elsewhere.

A 'Techniques' book can be prepared at different levels, depending on what the primary aim of the book is thought to be. At one level it can be treated as a basic laboratory manual, which seeks to explain with simple and clear instructions the various steps necessary to complete experimental protocols. At the other extreme it might be handled through the medium of review, to give an overview of the different kinds of experimental procedures, their particular problems, and the subtle effects of varying experimental conditions. This latter approach aims to point the reader to the original papers to find out the specific details of methods, which seem to be most suited to the particular task in mind. The end results of these two approaches are, of course, very different and I wonder how useful it is to mix them in the same volume, when different techniques are treated in very different ways.

'Techniques in Somatic Cell Genetics' is such a mixture. For example, there is a chapter by Hsiung and Kucherlapati which describes the detection of specific DNA sequences in somatic cells and cells that have been transfected with exogenous DNA. It takes the reader step by step through precise experimental details of one method for each of the necessary procedures. In another chapter by Dev and Tantravahi we are given their precise technical protocols for making chromosome preparations and staining chromosomes to give G-, R-, Q-, C- bands etc. At the other end of the spectrum are three review-type chapters describing the cytoplasmic basis and inheritance of Oligomycin, Rutamycin and Erythromycin resistance in cultured mammalian cells. Some chapters combine these approaches nicely, but yet another kind of treatment is encountered in a highly specialised chapter by Linnenbach and Croce. In this are detailed experiments which follow the expression of plasmid sequences transfected into a mouse teratocarcinoma cell, which is then induced to differentiate *in vitro*. It is more in the nature of a research paper than a didactic exercise which explains the methods used. This is not to say that it does not have its uses by opening horizons and giving some idea of the sophisticated experiments that are now possible when the powerful methods of molecular biology are brought to bear on the problems that the somatic geneticist may see as his or her legitimate interest. There may, however, be ways of doing it that would be more accessible to the non-specialist or student.

Somatic cell genetics is a huge subject area whose methods encompass anything which seeks to place genes in different somatic environments, in order to study them in isolation from one another or to examine their interactions with different genes or cytoplasms. To attempt to cover such a wide subject matter must have been a daunting task, but it is one in which the editor, Jerry Shay, succeeds remarkably well. For my taste the first half of the book is biased in the emphasis it puts on certain topics, and tends to be a little repetitive. Various aspects of enucleation, karyoplasts and cytoplasts, for example, are to be found in no less than ten chapters. As the book continues, however, the chapters sort themselves out into more clearly defined topics. A chapter on chromosome isolation and separation (Wray and Stubblefield) is followed by chapters which describe how to put chromosomes, genes or macromolecules back into cells; these include the calcium phosphate precipitation method (McBride), erythrocyte ghosts (Rechsteiner), liposomes (Straubinger and Papahadjopoulos) and direct microinjection (the Graess-

manns). Although the bulk of the book is concerned with mammalian cells, two chapters do deal, albeit too briefly, with yeast cells (Bollon and Silverstein) and plant protoplasts (Binding and Nehls). There is also a good, concise chapter on the future perspectives in somatic cell genetics by Slate and Ruddle. It is the final chapter, but could equally well have begun the book, since it beautifully summarises and relates one to another all the components that form the bulk of the book. Those people who normally have a tendency to cheat and read the end of a book first will be rewarded in this case!

There are many more topics dealt with in the 36 chapters which comprise the book; too many to list here. It is a very comprehensive and useful coverage, but one which, taken overall, is more of a guide to the kinds of methods available than a source of practical instructions of how to do them. It is the sort of book for a library rather than a working text for the laboratory bench, although I expect one or two chapters may find their way to the bright lights of copying machines to be transformed into everyday recipe sheets. It often seems that methodology is an end in itself; that what is important is to have the latest techniques working and then to look around for some problem on which to use them. 'Techniques in Somatic Cell Genetics' should be welcomed because, in bringing together such a diverse collection of methods, the reader is treated to a range of experimental possibilities. Perhaps this will allow more scope for thought about what questions are important and, secondly, how they may be amenable to solution. 'Techniques in Somatic Cell Genetics' is a hybrid book, but then we all know what hybrid cells have done for somatic cell genetics.

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Neuronal Development. Edited by NICHOLAS C. SPITZER. Plenum Press, New York and London. \$45.00.

This is an excellent collection of review articles by leading American developmental neurobiologists on aspects of neuronal development. It is noteworthy in this field how ingenious use has been made of the special characteristics of a wide range of animal groups favourable to the investigation of particular problems. Here, each article concentrates on one or other of these, which in only one case is mammalian; the other 10 articles are concerned with work on the leech (1), *Daphnia* (1), insects (3), amphibians (1) and the chick (4). The problems they confront are fundamental, centred upon the question of how a system which must become so complex and precisely ordered can yet be arrived at through the interaction of intrinsic and extrinsic factors which permit flexibility and modification in its development.

G. S. Stent and colleagues discuss the significance of cell lineage and describe their elegant work on the nervous system in the leech, whose development they have studied using a new fluorescent-tracer technique. K. Barald describes the application of monoclonal-antibody-marker techniques in studies on the ciliary ganglion of the chick. C. S. Goodman follows the differentiation of the progeny of two identifiable neuronal precursor cells in the early embryo of the grass-hopper, and their specialization in different segments of the late embryo. P. C. Letourneau discusses the control of axon growth by cell-stratum adhesion and chemotactic responses in chick sensory neurons studied *in vitro*. J. S. Edwards is also concerned with axon growth, and specifically with the factors which guide afferent fibres to the central nervous system in the cricket. M. S. Flaster and colleagues describe the very interesting connections between the ommatidial cells of the eye and the laminar cells of the optic ganglion in the parthenogenetic water