

technique of reassociation, or hybridisation as it is called when the DNA chains are from different organisms, or involves an RNA chain, has led to a new understanding of the nature of the base sequences, their repetition and their location, in the very long DNA molecules thought to comprise each eukaryotic chromosome. In Busch's volume seven articles refer to various aspects of this problem and Strauss makes useful comparisons with the genomes of bacteria and viruses. The most thoroughly understood sequence is that coding for ribosomal RNA (Choi, Nazar and Busch), but the article on the fine structure of the site of its transcription, the nucleolus, may leave readers in a confused state because of the lack of a suitable schematic diagram and because of the variation in the terminology used for the different zones.

Second, in 1960, Barski discovered the spontaneous hybridisation of different cell types. Cell fusion has been called "the new gift to biology" and the reasons will become clear from Sidebottom's excellent article on heterokaryons. Cell fusion is the analogue of gamete fusion and Kucherlapti, Creagen and Ruddle describe its use in genetic analysis of somatic cells. The genetic content of the nucleus can also be studied by implantation into eggs and Gurdon summarises his elegant experiments which show that cell differentiation is not accompanied by loss of, or permanent alteration of, genes.

Five articles, including a lucid, basic introduction by Arrighi, provide a comprehensive survey of mammalian metaphase chromosomes and their recently discovered banding patterns. There are, however, numerous texts on these topics and the article showing clinical pictures of the effects of chromosome imbalance could have been omitted to help reduce the high cost of these volumes. Substantial articles deal with heterogeneous and other nuclear RNAs, nuclear proteins and DNA polymerases, and DNA-dependent RNA polymerases. Franke and Scheer, and Kasper, have contributed extensive and detailed articles on the nuclear envelope and their enthusiasm is evident from the number of recent results added in proof. There are also excellent chapters by Edström and by Hennig on polytene chromosomes. An aspect of chromosome structure, other than the base sequence, is the way in which the DNA molecule is folded up in association with proteins, and Solari skilfully steers us through the complexities, but unfortunately the book is already too out of date to include exciting new results on  $\nu$ -particles, nuclease-protected fragments and so on.

*The Cell Nucleus* contains most

of the relevant material conveniently collected in one place (in addition to those mentioned the volumes include a number of other valuable articles) and will be an important source of references. Some subjects are, however, controversial—for example, the nature of heterochromatin—or complex—like repetitious DNA and its possible functions—and readers no doubt will feel a real need to consult the dozen or so annual reviews where related and sometimes more lucid articles can be found. Most chapters are very specialised and won't be suitable for undergraduate study.

There is no doubt that the books, which seem at first sight formidable in their bulk, would have benefited greatly from a good historical introduction outlining the important discoveries and showing how articles were chosen so as to fit into the general scheme.

Howard G. Davies

## Plants and salts

*Ion Transport and Cell Structure in Plants.* By David Clarkson. Pp. xi+350. (European Plant Biology Series.) (McGraw-Hill: London and New York, April 1974.) £6.95.

THIS is the first book on plant-salt relations I have seen which takes full account of the advances in the subject which have been made in the last 10 years. In this respect it makes some recent American texts look distinctly old fashioned.

Here the undergraduate, for whom the book is intended, can read about isotope washout curves, the electrochemical approach and the chemiosmotic hypothesis, topics which have not been seen together before in a book of this type. The first six chapters are concerned with the cellular level and include an excellent chapter on the cell membrane. To illustrate the principles Dr Clarkson frequently refers to the alga *Hydrodictyon africanum* as a model; a good idea for an undergraduate text.

The second half of the book deals with the salt relations of the higher plant and in particular the root. It is not as well set out or as well written as the first half which one feels would make an excellent book on its own.

There are one or two errors in the text which might confuse the undergraduate such as the one on page 227 where in a discussion about the structure of the endodermis the reader is referred to a figure which turns out to be a scanning electron micrograph of a xylem vessel. Despite these blemishes Dr Clarkson is to be congratulated on his bold modern approach.

D. J. F. Bowling

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