International review of cytology. Volume 13. Edited by J. F. Danielli. Academic Press. 1984. Pp. vii + 196. Price £27.50, $36.50(US).

This volume contains an arbitrary collection of five review articles. As the title is Nuclear Genetics the papers, by definition, deal mainly with eukaryotes. The contributions are on (i) nitrate assimilation; (ii) endocytosis and exocytosis in animal cells; (iii) stability of the cellular translation process; (iv) chromosome and DNA-mediated gene transfer in cultured mammalian cells; and (v) DNA methylation. There is no common theme and no obvious reason to group these papers under the title which is used. But as this is the last volume in this series to be edited by J. F. Danielli, who died on April 22 1984, this detail can be overlooked.

The first paper reviews the current state of knowledge on nitrate assimilation in plants and fungi—there being no nitrate assimilation by animal cells. There is a section dealing with the biochemistry of nitrate assimilation, a large section on genetic regulation of assimilation in fungi, and some useful summary tables on nitrate reductase structural gene mutants and molybdenum cofactor mutants in plants. The article concludes on an optimistic note by suggesting that this field of research is wide open to the activity of molecular biologists and genetic engineers who wish to further "understand the metabolic potentialities in eukaryotic cells" and to "enhance plant productivity through the application of recombinant DNA technology".

The paper on endocytosis and exocytosis is concerned with understanding how animal cells transport molecules from their surrounding environment into their interior, and from internal compartments out to the cell surface. It describes the various organelles involved in this molecular traffic and the underlying biochemical mechanisms which are involved. The presentation is highly readable and brings this field of work well within the grasp of the nonspecialist.

The review on the cellular translation process is a well-written and philosophical account of genetic translation. It presents the generalised theory of error propagation in the flow of genetic information into proteins, covers the evolutionary origins of translation and gives an indepth discussion on the error catastrophe theory of aging. While it is now well established that error feedback does occur, it is apparently unknown at present whether the level of this error is so small as to be unimportant or whether it may actually be the primary mechanism of cellular aging.

Gene transfer in cultured mammalian cells reminds us yet again how far the state of the science has advanced in animal tissue culture systems, and how far behind we are at present in any comparable work with plants. It reminds us too how these studies have been concentrated on a relatively small number of particular cell systems, how low is the rate of transformation and how much yet remains to be learned of the details of the gene transfer process. At the same time the authors point out how such work holds out great promise for applications in terms of gene mapping, gene isolation and studies on the regulation of eukaryotic gene expression.

The contribution on DNA methylation deals exclusively with animal cells. The main concepts covered are (i) that DNA methylation is a "gene silencing mechanism", (ii) the tissue specific patterns of methylation are established in the embryo and (iii) the formation of the patterns is brought about by levels of DNA methylase and the interplay between rates of replication and transcription of DNA.

Each of the articles comes complete with a full and extensive list of references and there is a general index covering all of the contributions. The volume is produced to the usual high standard we have come to associate with this series and it should find a useful place in the personal library of many of us who are engaged in teaching and research in genetics.

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Family studies in genetic disorders. A. J. Krush and K. A. Evans. C. C. Thomas, Springfield, Illinois. 1985. Pp. xi + 242. Price £28.50.

Over the last 15 years, "family studies" have become widespread in medical research. Due to this rapid growth, there have been inexperienced practitioners, resulting in studies which were, at best, ineffective. In area so vitally dependent upon the goodwill of its subjects, the unfortunate consequences of ill-planned studies can be far-reaching. In this text the authors have combined a wealth of experience in the practical organisation and conduct of family studies on both sides of the Atlantic, and presented it in a coherent and readable form.

The reader should not, however, rely on this book to provide methods of design and analysis. While the different approaches of "Type I" and "Type II" studies are usefully and clearly explained, few actual studies can be so neatly categorised. Such statements as "[for a recessive condition] ... 60 probands would probably be a sufficient number" are at best controversial, and at worst misleading. One fears lest "unbiased ascertainment includes progeny of proband, progeny of sibs of proband, and of sibs of all on the ancestral list" become the accepted dogma of uncritical students understanding neither bias nor ascertainment, and be used to justify all manner of statistical aberrations. The first four chapters on the more theoretical aspects of family studies are useful only as a general guide to terminology and ideas. As such, however, they are useful, and may serve both to convince those coordinating studies that they need statistical advice, and those working directly with families that there is a known framework for the analysis of their results.

The remaining six chapters deal with the practicalities of approaching families, conducting questionnaires, obtaining a response, follow-up on interviews,