frequently that many pathologists now accept it as fact. The diagram showing cleaved cells progressing to non-cleaved cells reappears again in this issue. There is little factual evidence to support this sequence, and critical immunohistochemical studies on germinal follicles that show cytoplasmic immunoglobulin in cleaved but not in non-cleaved cells would argue against it.

This book is clearly not intended for diagnostic histopathologists except for those with a special interest in the lymphoreticular system. Clinical and laboratory workers in the field of lymphoreticular disease, who do not have ready access to an *Index Medicus*, will certainly find this book useful. Those who have good library facilities available will need to judge for themselves whether they consider it worthwhile paying £16.50 for having a literature survey covering the lymphoreticular system and neoplasms of that system. The apparent continued popularity of this series indicates that most workers consider this money well spent. For their sakes one hopes that Dr Taylor and his colleagues will continue to find the energy and time to undertake this formidable annual task but that they might be a little more critical of the material reviewed.

DH WRIGHT

Limiting Dilution Analysis of Cells in the Immune System. I Lefkovits and H Waldmann (Pp xiv + 262; illustrated; £15.) Cambridge University Press. 1979.

This is a bold attempt to put across a methodology and an outlook on experimentation in cellular immunology, which breaks away from the traditional approaches of experimental biologists who have analysed immunological mechanisms in 'whole' systems, be they living animals, organ cultures, or cell suspensions. The authors' approach in attempting to understand the organisation of cellular events in the immune response is to adopt a mathematically biochemical viewpoint of cell suspensions in tissue culture, regarding them as interacting molecular systems (ie, cell types) whose chance interactions in a positive or negative manner occur randomly, depending on the density of each cell type, and whose outcome can be predicted by a mathematical formula based on the Poisson distribution. The correctness of

this approach is validated when, on diluting a mixed cell suspension in which the concentration of one cell type is limited into a large number of microcultures, the number of 'positive' microcultures (ie, those in which all the necessary cell types are present to produce an antibody response) is related to the concentration of the limiting cells. A similar approach has been successful over the past 30 years in the *in vitro* analysis of the various reaction stages of the complement sequence, based on the one-hit theory of complement lysis.

After a brief outline of current ideas as to the nature of cellular events in immunology, the authors present two clear chapters on the methodology of the system which is both simple in approach and sophisticated in its analytical precision. The middle four chapters deal with the mathematical and statistical validation of the method and the means of analysing the responses, and I predict that these will prove hard going for most biologists. The last three chapters give examples of the ways in which the method can be used to answer questions on the nature of cellular reactions in the production of antibodies.

This is clearly a book for research immunologists. The method depends on being able to provide an excess of non-limiting cell types and deals almost entirely in mouse cell systems, which can be supplemented with 'pure' B or T or 'indifferent' cell types from syngeneic strains. This approach undoubtedly adds to the understanding of cellular interactions where it is not yet possible to isolate and manipulate antigen specific clones of cells. However, its application to problems of immunopathology is still a long way off, and while this book should be essential for those immunology departments involved in teaching and research, it is likely to have little appeal to immunologists or pathologists in the clinical field.

RA THOMPSON

Clinical Chemistry in Diagnosis and Treatment. Joan F Zilva and PR Pannall. (Pp xix + 492; illustrated; £7 paperback.) Lloyd-Luke (Medical Books) Ltd. 1979.

The third edition of this popular book has several major modifications including a new chapter on gonadal function and marked changes in the descriptions of hy-

drogen ion homeostasis and carbohydrate metabolism. A useful addition is the introduction of sections at the end of most chapters in which clinical indications for investigations are discussed. This complements the titles for further reading. For the sake of completeness a more comprehensive account of the biochemistry of pregnancy is required but, as with all textbooks aimed principally at the undergraduate, it is often difficult to draw a line between too much and too little.

The book is worthy of a place in every chemical pathology laboratory in addition to the knapsack of all undergraduates attempting to absorb the essentials of the subject. Already translated into Italian, Turkish, Spanish, and Serbocroat, the present edition is a worthy successor to its forerunners.

GW PENNINGTON

Functional Histology. A Text and Colour Atlas. PR Wheater, HG Burkitt, VG Daniels. (Pp 278; illustrated; £12 paperback, £18 hardback.) Churchill Livingstone. 1979.

The authors accept that 'histology has bored generations of students' and, having identified the fault as a divorce of structure and function, aim to present histology in relation to the principles of physiology, biochemistry, and molecular biology. They have succeeded in producing a high-quality atlas based almost entirely on human material and with photographs which reproduce the appearances of a good H & E stain section, supplemented where necessary by special stains. Line diagrams, electron micrographs, and a lucid text make this book a valuable teaching aid. This atlas is at least as good as any of the other atlases produced by Churchill Livingstone and it can be confidently recommended for undergraduates and particularly for trainees just beginning histopathology.

G SLAVIN

Flow Cytometry and Sorting. Ed MR Melamed, PF Mullaney, ML Mendelsohn. (Pp xv + 716; illustrated; £39.50.) John Wiley & Sons. 1979.

Since the introduction of the familiar Coulter Counters in most haematology laboratories, pathologists have become aware of the principles and advantages of