chemicals are, in the authors' words, pure black (*i.e.* carcinogenic under all circumstances) or pure white (*i.e.* invariably non-carcinogenic) which makes the selection of suitable compounds for standardization extremely difficult. Similar problems of course exist in validation of bacterial short-term tests, discussed by Green, who also emphasized the relatively arbitrary distinction between carcinogens and non-carcinogens. He predicted that the high sensitivity of bacterial short-term tests was likely to help break down this distinction and place the emphasis more on risk evaluation. Basic biochemical mechanisms of carcinogenicity were discussed by Connors, who also dealt with the problems of extrapolation of test results to man. A particular problem are those chemicals which can only be shown to be positive in short-term screening tests with highly sensitive methods. Two different approaches can be taken with respect to such compounds; either they should always be treated as carcinogens, or it can be assumed that under normal conditions of exposure, the chances of such compounds binding to any significant extent to a target molecule are so remote that they will not be hazardous. The economics of carcinogenicity testing was reviewed by Conning, with emphasis on the effort and cost of screening individuals exposed to potentially hazardous chemicals and the cost to industry of testing individual compounds. The problems faced by regulatory authorities in interpreting and implementing results from carcinogenicity testing of medicinal and other products were discussed in terms of relative risk and benefit, and the difficulties involved in making such assessments were emphasized. Overall, the volume covers well the scientific, sociological and economic problems involved in carcinogenicity testing. The individual contributions have been well edited and the illustrations are of a high standard. There is a useful bibliography at the end of each paper and an index for the whole volume. It should be of interest to toxicologists, both in industry and in the academic field, to anyone who is concerned with the regulation of public exposure to environmental chemicals. It presents the problems and prospects, in this rapidly expanding field, in a particularly well-balanced way.

M. Fox

B and T Cells in Immune Recognition.

Eds F. LOOR and G. E. ROELANTS (1977). New York, London: John Wiley. 504 pp. £18.50 net.

Cellular immunology, as one of the foremost biomedical sciences, has undergone phenomenal expansion during the past decade. Texts which present the more recent developments in a coherent and readily assimilable form are therefore to be welcomed. This volume achieves just that aim.

The editors have assembled a series of review essays by a most distinguished panel of contributors, covering most of the major areas of cellular immunology.

The lymphocyte possesses a degree of heterogeneity not matched by any other cell type. The study of this diversity requires discussion of the early ontogeny of the lymphocytes, and of the organs in which they differentiate, under the influence of specific differentiation antigens or hormones. This information, together with that relating to migration patterns, lifespan and turnover of tissue cells and the regulatory influence of macrophages, is cogently presented in Chapters 1 to 6.

Chapter 7 (by Schreier and Nordin) is unique in being the only contribution with original data. It is concerned with the evaluation of *in vitro* models of immune responsiveness, and draws the conclusion that the utmost caution is required in attempting to understand *in vivo* phenomena via *in vitro* assay systems.

Several chapters (8–14) are devoted to the behaviour of lymphocytes when cultured *in vitro* in response to antigens and allogeneic lymphocytes, and in their maturation to antibody-secreting cells or to cells that can kill appropriate target cells. In all these responses, one is confronted with phenomena of mutual co-operation and suppression among lymphocytes. Many of these appear to depend on signals and receptors that are determined by genes in the major histocompatibility region of the genome—a region distinct from those which determine antibody specificity. The clarification of the relationship between these 2 sets of structural genes lies at the heart of the current efforts towards basic immunological understanding, since both appear to determine and restrict the recognition repertoire available to the immune system of the host.

The remaining chapters deal with the role of lymphocytes in various pathological situations (cancer, autoimmunity, lymphocytic disorders) and the association of histocompatibility genes and antigens with transplantation and with histocompatibility-associated diseases. A final chapter examines the problem of encompassing the multitude of

immunological phenomena within a simplified theoretical framework.

Immunology has always had dual roots, in biology and medicine. This book will continue to foster the common interests of basic and clinical immunologists.

M. MOORE