Parasites in the immunized host: mechanisms of survival


Vaccination against many important helminth and protozoan parasites of man (and of domestic animals) will probably become possible only if methods are developed to produce better immunisation than occurs after natural infection; as one contributor to this symposium put it, we must aim to “improve on nature”. One important element of induced resistance must be to counter the escape mechanisms employed by parasites that allow them to survive in the immunised host, and this book is the product of a symposium concerned with a detailed review of these mechanisms.

The book contains 13 chapters, which were the working papers for the symposium, together with the extensive and carefully edited discussion on each topic—certainly as valuable a part of the book as the formal presentations. There is, first, a brief and general review of immune responses to parasites, followed by four chapters on antigenic variation. These cover the genetics of antigenic variation in the free-living protozoan Paramecium and consideration of the extent to which some of the observations made might be applicable to parasitic protozoa; the induction of and immune response to intra-strain variants in malaria; antigenic variation in trypanosomes, and the nature of the antigens and their expression; and survival of the rat nematode Nippostrongylus brasiliensis in an immune host and comparison of “adapted” and normal worms.

The next chapter deals with variations in immunological responsiveness that leads to a spectrum of clinical manifestations of disease, e.g., in leprosy, leishmaniasis, syphilis and Chagas’ disease. There are two chapters concerned with depression of the immune response during protozoal infections, which deal in particular with experiments on murine malaria and with tests of the immune competence of patients with malaria or trypanosomiasis. Soluble antigens are released during malarial and other protozoan infections, and the various ways in which these could interfere with the immune response are considered. A detailed account is given of concomitant immunity in schistosome infections and of the host-like antigenic determinants expressed on the surface membranes of the adult flukes, and there is also a description of observations indicating two types of specific suppression of immunopathological changes in schistosomiasis that reduce the harmful effects of infection. Finally, there are two chapters dealing with survival of the intracellular parasites Toxoplasma and Leishmania, which are found within macrophages of the host.

The last chapter is a summary of the conclusions of the symposium on the ways in which parasites appear to escape the host response, and the implications of this for prophylaxis. Altogether this is a most useful book. Immunological texts on parasitic infections are all too often rather diffuse because they attempt to cover too many aspects of the subject. It is pleasing, therefore, to have a text produced to a very high standard which deals in detail with one (fascinating) aspect of immunity to worm and protozoan parasites. The book is recommended without reservation because there is much here to stimulate both the specialist and the reader with only a general interest in this subject.

G. A. T. TARGETT

Mononuclear phagocytes in immunity, infection and pathology


The publication of the proceedings of a symposium approximately 2 years afterwards and at a cost of £1 for every 33 pages raises questions about the objectives and methods of scientific communication. The present book on the proceedings of the Second Conference on Mononuclear Phagocytes held at Leiden gives a good account of the knowledge of macrophages in 1973. There are sections on structure, origin, phagocytosis, cell-surface characteristics, biochemistry, phagosome-lysosome interaction, cell-mediated immunity and resistance to infection, antibody formation, tumour immunity and granuloma formation.
It is useful to be reminded that the malignant cell in reticulum-cell sarcoma and Hodgkin's disease is probably a macrophage. Attention is drawn to the fact that many cells other than macrophages adhere to glass and that it is not yet clear which glass-adherent cell is required for in-vitro antibody production. The observation that collagenase is required to obtain a good recovery of macrophages from mouse spleen reminds one that selective cell loss may occur when cell suspensions are made. There are interesting articles elaborating earlier work showing that inflammation gives rise to monocytosis and that a humoral factor is involved.

There are several articles of special interest to microbiologists. Klebanoff reviews work, for which he is largely responsible, on the mechanism whereby macrophages kill bacteria and, in particular, the role of hydrogen peroxide. Ginsburg draws attention to the problem of defining the enzyme and other systems that destroy the cell walls of dead bacteria. Allison and Davies emphasise that there are several different ways in which macrophages can be activated and that the term activation should not be employed without specifying the procedures used. They also describe the way in which macrophages liberate hydrolytic enzymes when exposed to immune complexes. Hahn suggests that dextran sulphate may be useful for selectively inhibiting macrophage function.

There is a section devoted to granuloma. Spector and Mariano demonstrate that giant-cell formation in granuloma is due to cell fusion and not to division without separation. Unanue shows how delayed hypersensitivity favours granuloma formation around particulate antigen, while Warren summarises his work on the role of delayed hypersensitivity in the formation of schistosome granuloma.

Draper and D'Arcy Hart describe the lipid that is produced around *Mycobacterium leprae* in macrophages and protects the organism. The fusion of phagocytic vesicles containing *M. tuberculosis* with secondary lysosomes to form phagolysosomes is secondary to death of the organism and not the cause of death. Jones provides similar data about *Toxoplasma*. There is interesting work by Evans showing that macrophages can be armed by T-cell products for specific and non-specific killing of tumours but there is no analogous mechanism known as yet in the handling of micro-organisms by macrophages.

This volume appearing at a third of the price and in a third of the time actually taken for publication would have been excellent value for money.

G. L. Asherson

**Bacteriophages**


In the preface, the author points out that he is providing an introduction to bacteriophages for those about to study them for the first time. Indeed, the book describes in simple outline the structure and properties of bacteriophages. There are, however, some incongruities which probably reflect the conflict in the author's mind about his readers. He emphasises the importance of the electron microscope in this field, giving the impression that work with bacteriophage ought to be carried out in the larger, well-equipped institutions, and yet he finds it necessary to warn that a Home Office licence is required for preparing antisera in rabbits. One has the feeling at times of an attempt to produce an aura of "sensationalism" about the field that tends to mar an otherwise useful book.

The book has nine chapters. After an historical introduction, always helpful to provide the necessary feeling for any subject, there is an account of lysis in solid and liquid media. This mentions the unusual organism *Bdellovibrio* but bacteriocins are not referred to until the chapter on lysogeny. Then follows an account of the structure of and mode of infection by bacteriophage, including techniques of preparation by ultracentrifugation and observation by electron microscopy. Figure 3.12 has an error; the graph and the photograph are not correctly related to the legends. Chapters on the latent and eclipse periods, lysogeny, and survival of bacteriophages are followed by one on the place of bacteriophages in the study of genetics. Remembering that the object of the book is to give a summary, this chapter is done reasonably well, although with at least one mistake and some omissions. In the