mechanism of photochemical and thermal reactions is extensive. Although this volume alone illustrates that present understanding of the reaction mechanisms involved in the formation of atmospheric pollution is still in its infancy, those interested in photochemical smog or the gas phase reactions of atmospheric pollutants will find this a rewarding book to consult.

F. WILKINSON

Harvey Interpreted

William Harvey and the Circulation of Blood. By Gweneth Whitteridge. Pp. xiii+269+8 plates. (Macdonald: London; Elsevier: New York, April 1971.) £4.

IN recent years Harveian scholarship has flourished at all levels. For the general reader excellent brief surveys have been produced by Keele and Franklin, while Keynes has written a definitive biography and Pagel a brilliant analysis of Harvey's biological philosophy. Mrs Whitteridge has already made a substantial contribution to this enterprise with two excellent editions of Harvey's unpublished writings. This book is an interpretative study based on many years of minute investigation of Harvey's manuscripts and books. Few authors have been better equipped to pronounce on Harvey's great achievements.

Mrs Whitteridge has strong views, making for a highly distinctive contribution. On every issue determined judgments are expressed, often if not usually running counter to prevailing trends among students of Harvey. The author concentrates on a developmental account of Harvey's ideas on circulation, the topic which will appeal most to readers. His work on embryology is considered only in relation to circulation. Thus attempts at an assessment of Harvey's general scientific outlook are made without extensive reference to his most extensive published work. Harvey is presented unambiguously as an experimental physiologist of the modern type operating within a mental framework which had little regard for authority or philosophical preconceptions. Accordingly his debt to the past was limited and selective. Like the author, Harvey is thought to have had little regard for Cesalpino or other speculative writers, while taking his inspiration from such empiricists as Columbo. Of precursors, only Columbo is discussed in detail, while others are dismissed in a cursory manner.

The strongest section of this book is an accurate account of the unfolding of Harvey's views on the movement of blood. No other author has equalled this precise yet detailed description. On

the mutations of Harvey's ideas subsequent to the discovery of circulation, the author is less convincing and not particularly successful in explaining Harvey's dilemmas in terms of his empirical investigations and laboratory experience.

This otherwise scholarly book has one grave defect. Citations are given in a most inconsistent manner. In some cases footnotes are elaborate; in others page numbers are given in the text, causing slight ambiguity; while in other cases references are entirely omitted. Nevertheless Mrs Whitteridge has produced a stimulating interpretative work, which will undoubtedly appeal to a wide audience of scientists and historians. But the reader should then return to Harvey to consider whether the methodological interpretation has been dictated by evidence, or staunch adherence to prevailing opinions about the nature of modern experimental science.

C. WEBSTER

Immunology Made Clear

Antigens, Lymphoid Cells and the Immune Response. By G. J. V. Nossal and G. L. Ada. (Immunology: an International Series of Monographs and Treatises.) Pp. xix+324. (Academic: New York and London, April 1971.) \$17.50; £8.15.

ALTHOUGH a few scientists have expressed the view that immunology is played out in the sense that all the really great discoveries to be made have been made, this is a field that continues to be very exciting, with hardly a dull moment; and, perversely, it is still advancing at breathtaking speed. It is not at all surprising that most practising immunologists take good care not to be lured into writing a book: they are far too busy and a book is likely to be out of date soon after publication. As a result, postgraduate students and research workers have to rely to a great extent on the numerous proceedings of specialized conferences or on edited monographs written by a plethora of contributors. Such books tend to be bitty, to say the least, and they often give a far from balanced, let alone a unified, view of the field under discussion.

Immunologists and immunologists in the making therefore have reason to be grateful to G. J. V. Nossal and G. L. Ada for writing an integrated book on a topic that cuts across many frontiers. The main theme is concerned with the way(s) different antigens impinge on the immunological apparatus in terms of localization, antibody formation and tolerance induction, and this in turn requires an assessment of the anatomy and function of the tissues and cells that participate in the immunological res-

ponse. Whilst I regret the authors' decision not to cover delayed-type hypersensitivity and the allograft reaction—an omission which sometimes weakens the universality of the conclusions drawn and limits the argument somewhat arbitrarily—Nossal and Ada have produced a book which is characteristically lucid and immensely readable despite the complex and sometimes contradictory experimental evidence. Notwithstanding the presence of innumerable trees of all shapes and sizes, the reader is given a very fair view of the wood itself, thanks largely to the grasp the authors have of their material and partly to the excellent little summaries at the end of each chapter. If pride of place is, at times, given to their own work and that of their colleagues at the Walter and Eliza Hall Institute no one will carp at this, for they have made many vital contributions to this field.

In spite of the enormous amount of work done on antigen localization in the last decade it comes as something of a shock to realize how little we know to this day of the actual role played by antigens in both antibody formation and tolerance induction. Histocompatibility antigens apart, most workers use either serum proteins (such as BSA or HGG), *Salmonella* flagellin or sheep red blood cells. Even within this limited repertoire some important differences have been described, and one of the messages coming across clearly is that different antigens may be handled and processed differently and that it is unwarranted to draw sweeping conclusions from the study of a single antigen. Another message is that, by and large, modern immunology sustains the clonal selection hypothesis, even though it may be true that the really critical experiment has not yet been performed (and for technical reasons, perhaps never will be, though the very recent work of B. A. Askonas and A. R. Williamson on antibody-producing cell clones and their senescence may have gone some way towards it (*Nature*, 238, 337; 1972)). How appropriate, then, that the book should be dedicated to Sir Macfarlane Burnet.

This book, which should be essential reading for every serious student of immunology, is unfortunately very expensive—more a function of its high quality paper (and perhaps the publisher involved?) than the number of its illustrations. The chapter summaries are most useful, and the arguments are well sustained by full references. Proof-reading has been efficient and there are few howlers, but I enjoyed the statement that "it is confidentially expected that the numerous gaps in Table 11.1 . . . will shortly be filled. . . ." Isn't that taking confidentiality a little too far, Gus?

LESLIE BRENT