

addition there are very useful appendices which include detailed recipes, protocols and up-to-date restriction maps and nucleotide sequences of plasmid and phage vectors. Of course it is impossible to keep up to date completely in this rapidly changing field. However, the authors have done an admirable job. It is worth while to compare this book with the Cold Spring Harbor manual. The latter is much more comprehensive and deals more with strategies for cloning and characterizing eukaryotic genes. For example, in *Recombinant DNA Techniques* there is no description of methodology for mRNA isolation and cDNA cloning. Also, if one wanted to relate a eukaryotic gene to its corresponding polypeptide, hybrid selection of mRNA plus translation or hybrid arrest of translation would be the techniques of choice. The book by Rodriguez and Tait does not describe these techniques but describes the use of mini and maxi cells and coupled transcription-translation systems, which of course are only appropriate for the study of prokaryotic genes at present. The authors, however, state clearly that this book is designed for cloning prokaryotic genes and regulatory sequences. However, these techniques are, in the main, directly relevant for work on eukaryotic genes. The strength of the book is that there is much more emphasis on the rationale and background for the approaches taken than there is in the Cold Spring Harbor manual. This is a very useful book which complements the Cold Spring Harbor manual. I believe there is room for both on the shelves of scientists either carrying out or contemplating recombinant DNA technology.

NICK HASTIE

*MRC Clinical and Population Cytogenetics Unit
Western General Hospital,
Crewe Road, Edinburgh EH4 2XU*

The Contribution of Genetics to the Study of Parasitic Protozoa. By DAVID WALLIKER.

Published by Research Studies Press Ltd, Letchworth, Hertfordshire, England, and marketed and distributed by John Wiley, 1983. ix + 218 pages. £29.50 ISBN 0 863 80005 X

This is a clearly written and timely little book on a vital but very difficult area of applied genetics, and it deserves to be widely read. Academic geneticists by and large select problems and organisms for study which will give rapid returns on their labours, and most of them crowd into the fashionable areas of research. So the difficulties involved in advancing our knowledge of the genetics of the parasitic protozoa have been tackled by very few research workers, in spite of the great medical and ecological importance of malaria, trypanosomiasis and coccidial diseases in the tropical and subtropical lands of the world.

The need for such knowledge to help in the effective design of control measures is obvious, and Walliker describes both the difficulties and the successes that have been achieved. In the case of malaria, genetic variations have been identified in the form of naturally occurring enzyme variants detected by electrophoresis, mutational resistance to different drugs, and level of virulence. Population studies on enzyme variation have enabled the four rodent *Plasmodium* species of Africa to be distinguished (i.e. *P. berghei*, *P. yoelii*, *P. chabaudi* and *P. vinckei*), even in a multiply-infected host, and have shown regional differentiation of each of these species into subspecies which may not be reproductively isolated. The human malaria parasite, *P. falciparum*, on the other hand, probably consists of a potentially interbreeding population world-wide.

Experimental laboratory systems based on mice, a rodent malaria parasite and the corresponding vector mosquito have made strain crossing and progeny analysis possible, and have led to convincing evidence that the blood forms of the parasite are haploid, that enzyme variants and drug resistance are inherited in a Mendelian manner, and that free recombination between genes occurs. No linkage between any of the genes tested

has yet been found, probably because the number of gene differences in any test and the scale of the tests is still small. Particular enzymes show up to eleven variants in the different species, but these cannot be transferred from one species to another.

In the coccidial genera *Eimeria* and *Toxoplasma*, gene recombination has also been shown to occur, using enzyme variants and drug resistance, and the diploid stage is restricted to the early oocyst. In trypanosomes, on the other hand, the life-cycle is believed to be mainly diploid, but no morphologically recognizable gametes have been seen, and no attempt at conventional genetic analysis by crossing in the host and scoring the progeny has yet given convincing evidence.

The succession of antigens which develop during an infection by *T. brucei* enable the parasite to escape successive waves of immune response by the host, and make the design of an effective vaccine against this organism appear virtually impossible. Molecular geneticists are now analysing the nature of this sequential variation, which has been shown to involve a number of genes, only one of which can be switched on at any time. The basis of the control of this variation is not yet understood, but there is evidence that it involves imperfect duplication of the antigen gene to be switched on, and transfer of the copy to an 'expression-linked site'. Any trypanosome clearly possesses a large antigen repertoire, which can differ among clones of the same subspecies: the analysis of this major and versatile system will certainly produce surprises. The problem of antigenic variation in malaria parasites is also under study by molecular techniques. Whether these approaches will lead to the development of effective vaccines is very much a moot point.

I suspect that most geneticists will not be well informed on the subject of this book, unless they have colleagues struggling with its problems. The 300 or so papers listed in the bibliography are to be found mainly in journals they are unlikely to scan – the various parasitology, tropical medicine and protozoology journals, and even a journal entitled *Military Medicine*. But the field is at an exciting stage and Walliker's book can be recommended to those who want to get up to date with it.

ERIC REEVE

*Institute of Animal Genetics
University of Edinburgh*

Journal of Microbiological Methods. Volume 1. Amsterdam: Elsevier Biomedical Press, Journal Division. 225 D.fl. (U.S. \$90.00) for Vol. 1 (six issues).

Yet another microbiological journal but, unlike many of its competitors, it will probably fill a gap. The journal intends to publish original papers and invited reviews covering methods in all aspects of microbiology, excluding virology and immunology. In the past many of the microbiological methods papers have tended to be published in the biochemical literature – will this continue? Only time, and its availability in libraries, will tell if this journal is to be a success. I wish it well.

IAN R. POXTON

*Department of Bacteriology
University of Edinburgh Medical School*