Book reviews

SCIENCE WRITING FOR BEGINNERS (1985). A.D. Farr. 117 pp. Oxford: Blackwell Scientific Publications. £5.80.

Introducing students to science writing is an annual chore for many academics. It is a time consuming and often a trying exercise. Indeed the first attempt to prepare a dissertation or thesis commonly raises a rather important question: has the student read any of the papers cited in the literature review? Of course he/she will have done so but without consciously considering the elements of a paper, Introduction, Methods and Materials, Results and Discussion, and the functions which these are intended to perform. This is not something which ought to cause surprise. Although scientists depend on journals for ideas, concepts, facts and preference, very few, if any, undergraduate courses include tuition on the preparation of a paper. The skill is expected to be acquired by some process akin to osmosis. Farr's book would undoubtedly aid this process.

After chapters on 'Writing good English' and 'Writing Essays', the author addresses the question of writing science papers for publication, 'The Body of the Paper' being considered in one chapter and 'The Peripherals' in another. Of the nine chapters in the book, these four are of particular importance to the novice. Indeed the discursive rather than prescriptive style of these chapters will encourage a student to imitate, the well-tried method of acquiring skill and style. I suspect that my copy of the book will be well used in the coming years. I would suggest also that a copy should be available in every department in which a dissertation is an essential part of assessment in the final examinations.

R.G. Board

MICROBIOLOGY. ESSENTIALS AND APPLICATIONS (1985). L. McKane & J. Kandel. 777 pp. Maidenhead: McGraw-Hill Book Company (U.K.) Ltd. £44.95.

Of several objectives noted in the Preface, two need to be singled out for comment. One relates to the authors' intentions to produce a book suitable for all students of microbiology, the other to the presentation of the material in such a manner that the reader shares the authors' 'fascination and excitement about microorganisms and the science that studies them'.

It soon became evident from a cursory study that the first objective was not attained. Indeed how could it be with a discipline as amorphous as that of microbiology? What is achieved is an adequate but elementary introduction to the attributes of pathogenic micro-organisms, particularly those that cause disease of man. If considered in this narrow perspective of medical microbiology, then the book may be recommended to students who seek careers in medical laboratories. The book could well serve also as a crammer for medical students who have displeased their examiners on more than one occasion.

With further study, the reviewer began to appreciate McKane and Kandel's 'fascination and excitement'. The text presents a concise account of the more important features of the interactions between man and pathogenic micro-organisms and it is adequately supported by tables (red or black print on a purple background), many illustrations and figures that have been composed with great care so that the reader's eye is led from one important element to the next. Indeed the visual impact of the figures is such that one is forcibly reminded of the influence of television on draughtsmanship in general. This influence may be associated with a feature which the authors term 'relevant asides'—black print on purple background—which have such provocative titles as 'dangerous ghosts of dead bacteria', 'a taxi for foreign genes', 'the cost of one rabid dog', etc. These are intended to enliven the text, to lead students to appreciate the more human aspects of microbiology or 'to realize the personal intimacy of their own relationships with microorganisms'. In other instances these asides provide an his-
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PROGRESS IN CLINICAL AND BIOLOGICAL RESEARCH Volume 178 BLUETONGUE AND RELATED ORBIVIRUSES (1985). Edited by T. Lynwood Barber, M.M. Jochim & B.I. Osburn. 746 pp. USA: Alan R. Liss, Inc. £126.00.

Volume 178 in the series entitled Progress in Clinical and Biological Research is devoted to the Proceedings of an International Symposium held in California in January 1984 specifically to address the problems presented by bluetongue and related orbiviruses. Bluetongue, an orbivirus of the family reoviridae, is an icosahedral virus with a genome consisting of ten segments of double stranded RNA enclosed in two protein coats but lacking a lipoprotein envelope. They can cause obvious economic losses in some countries in which there may be a failure of the infected animals to thrive, loss in milk production and, if infection occurs during pregnancy, abortion or malformations of fetuses. The disease is found in six continents mainly among sheep, but other ruminants such as goats, cattle, camels, etc. are known to be susceptible. There are at present 23 recognised serotypes, not all of which fortunately are found in every country where the disease is endemic. The USA, for example, has five serotypes. The main problem is to control a largely inapparent infection, transmitted mainly by midges of Culicoides spp. but also by infected semen, caused by multiple serotypes producing insufficient disease to warrant drastic action such as test and slaughter or universal vaccination, but for which the cost is economically very high because of export restriction from affected areas.

It is in discussion of these problems of epidemiology, entomology, vaccines and immunology, epizootiology, integrated disease management and international restriction that 201 contributors have produced approximately 90 research papers. The book is the most up-to-date authoritative work presently available on diseases caused by bluetongue and related viruses. The first section surveys the world-wide status of bluetongue disease. The next section profiles the disease itself and examines its effect on sheep and cattle. Section 3 describes the insect vectors responsible for transmission while the following three sections cover the morphology, immunology, epidemiology, molecular biology, diagnosis and control. The last includes recent work on vector control and current attempts to improve vaccines, both live attenuated and killed whole or subunit (synthetic peptide).

The objective of both the published proceedings and the meeting was not only to describe what is known, but also to make recommendations for the future. The final contributions therefore report the recommendations of eight WHO/FAO working teams in the areas of pathology, entomology virology, molecular virology, immunology, epizootiology, integrated disease management and international impact of these diseases. The book is a mine of information and although it will be primarily of interest to ‘orbivirologists’, it will serve as a useful reference text to veterinarians, virologists, epidemiologists, livestock producers, entomologists and public health officials.

C. SWEET

ANTIMICROBIAL DRUG RESISTANCE (1984). Edited by L.E. Bryan. 576 pp. USA: Academic Press, Inc. $79.00, £55.50.

The massive use of antibiotics has led to the development or selection of resistant strains in most species of bacteria. The topic is one that crosses the clinician, the diagnostic microbiologist, the drug firm research departments and academic microbiologists. Hence a book such as that on antimicrobial drug resistance produced by Prof. Bryan and his 25 co-authors should be ensured of a wide audience. The contents include chapters on resistance to antivirals, antifungals, antimalarial agents and metal ions. Inclusion of the latter may seem surprising, but in many ways the mechanisms of resistance parallel those of resistance to antibiotics, and indeed mercury resistance was used as a marker for antibiotic-resistant staphylococci by Richmond many years ago. All the agents in current use are considered with the exception of one
major growth area—the quinolones; not even nalidixic acid gets a mention. Any book on resistance must consider normal bacterial function as well and in this respect the chapters on intrinsic resistance and membrane active agents make interesting reading. As might be expected the \(\beta\)-lactam antibiotics fill a large part of the text—considered both from the aspects of resistance mechanisms to the actual agents and then from the resistance plasmids in various species of bacteria.

Such an approach must lead to overlap particularly among the \(\beta\)-lactams and on the topic of intrinsic resistance, but overall the text provides an advanced description of the subject as seen in 1983. While the basic concepts will remain unchanged, this is an area of intensive research (quinolones accounted for \(>25\%\) of the papers presented at the 1985 International Congress of Chemotherapy in Japan), so that it is to be hoped that Prof. Bryan will issue updates from time to time. Meanwhile this book can certainly be recommended to all those with an academic interest in the subject and as one for the departmental and drug firm library.

S. W. B. Newsom

Aspects of Microbial Metabolism and Ecology (1984). Edited by G.A. Codd. 282 pp. USA: Academic Press, Inc. $52.00, £38.00.

This volume reflects the current interest and coming of age of microbial ecology as a subject and is based on papers given at a symposium of the Society of General Microbiology on Microbial Metabolism and Ecology held at the University of Dundee in September 1982. The nine chapters which make up this book only cover a selected range of topics and the emphasis is primarily on the ecology and physiology of phototrophic and chemolithotrophic microorganisms. The reader is introduced to the ecological importance of micro-organisms in the flow of energy in natural environments by van Es, Laanbroek and Veldkamp in the opening chapter entitled ‘Microbial Ecology: an Overview’. These authors concisely review the significance of micro-organisms in decomposition processes in aerobic and anaerobic environments and the laboratory methods which have enabled these complex processes and interactions to be analysed. The next chapter by Hamilton on ‘Energy Sources for Microbial Growth: an Overview’, successfully complements the preceding review by Es et al., providing an analysis of the fundamental biochemical and bioenergetic principles underlying many of the microbial interactions which occur in natural environments. It is a welcome sign to see more emphasis being placed by microbial physiologists on the study of mixed microbial populations, which are the norm in most natural ecosystems rather than that laboratory artefact—the single pure culture! It is equally refreshing to see the review by G. Morris devoted solely to the effects of molecular \(O_2\) on the metabolism of organic carbon by microorganisms. The consequences of \(O_2\) availability on microbial metabolism are reviewed with exceptional clarity and this chapter is essential reading for any worker seeking to unravel the complex metabolic relationships existing between different physiological groups of microorganisms in natural ecosystems. In successive chapters the recent developments in the following subject areas are comprehensively reviewed: The utilization of light by micro-organisms (C.E. Gibson and D.H. Jewson); Aspects of \(CO_2\) assimilation by autotrophic prokaryotes (G.A. Codd); The ecology and adaptive strategies of benthic cyanobacteria (M. Shilo and A. Fattom); Studies on the regulation and genetics of enzymes of \textit{Alcaligenes eutrophus} (H.G. Schlegel); Ecology to the colourless sulphur bacteria (D.P. Kelly and J.G. Kuenen) and Genetics, metabolic versatility and differentiation in photosynthetic prokaryotes (V.A. Saunders).

This is a most useful volume of interest to all workers involved in microbial ecology. The overall presentation is of a high standard with few typographical errors and clear tables and figures. In summary this volume attains the same high standards as its predecessors and each review is clearly presented and well referenced. This book can be recommended to all microbiologists whose work involves the study of the ecology and physiology of microorganisms. The only drawback is the price, which at £38.00 is likely to significantly restrict sales to the individual purchaser. I suspect most workers will wait until their libraries purchase a copy.

R.A. Herbert
PROGRESS IN LEUKOCYTE BIOLOGY Volume 1 VIRAL MECHANISMS OF IMMUNOSUPPRESSION (1985). Edited by N. Gilmore & M.A. Wainberg. 284 pp. USA: Alan R. Liss, Inc. £34.00.

This volume, the first in a new series entitled Progress in Leukocyte Biology, consists of papers presented at a workshop on Viral Mechanisms of Immunosuppression held in Montreal in June 1984. Although the phenomenon of viral-induced immunosuppression has been recognized for almost 100 years, the exact mechanisms by which viruses mediate immunosuppression are not fully understood. The list of viruses capable of suppressing the host response is enlarging all the time and research in this area will probably increase markedly with the advent of the acquired immune deficiency syndrome (AIDS) and AIDS-related complex (ARC). This book is thus timely, providing a comprehensive overview of current information.

There are 20 contributions in all, the first section of seven articles examines how viruses interact with different arms of the immune and natural defence system. Primary immune-deficiency disorders in man are considered first, followed by general discussions of the immune defects produced by cytomegalovirus (a herpes virus), measles virus (a paramyxovirus), mouse hepatitis virus 3 (a coronavirus), adenovirus and human T lymphotropic virus (HTLV) types 1, 2 and 3 (retroviruses). The second section of six contributions discusses in some detail the mode of action of several herpes viruses (bovine herpes 1, Epstein-Barr, cytomegalovirus and herpes simplex types 1 and 2) in mediating immune suppression. The third section is a mixed bag including the role of natural killer cells in host defence, differential expression of human interferon genes in various cell types, the effects of interferon on the immune system, the effects of viruses upon macrophage function, attempts to restore immune function in AIDS patients and finally an overview of the meeting describing what is known of the mechanisms involved in virus induced immunosuppression.

Typographical errors are few but occasionally omissions were serious. For example Table 1, which outlines the intracellular proteins induced in cells treated with interferon, is omitted from the article of Baron et al. Other errors are less important, e.g. references are numbered in the text and it was irritating to find the same reference given several different numbers in the same article.

Overall the book is a useful and up-to-date text, drawing together most of the important viruses that cause immunosuppression and outlining the mechanisms involved. The book will be of interest to researchers and clinicians in the fields of immunology, virology, oncology and microbiology.

C. SWEET

THE SOCIETY FOR APPLIED BACTERIOLOGY Technical Series No. 19 MICROBIOLOGICAL METHODS FOR ENVIRONMENTAL BIOTECHNOLOGY (1984). Edited by J.M. Grainger & J.M. Lynch. 421 pp. London: Academic Press, Inc. $65.00, £45.00.

This volume records the proceedings of the Society of Applied Bacteriology Demonstration Meeting held at Brunel University in 1982. The 24 chapters in this volume span a diverse range of environmentally important processes ranging from the dynamics of cellulose decomposition to mutagenicity testing of drinking water using freeze-dried cell extracts. The underlying theme in each of these contributions is the application of biotechnology to the management of environmental problems such as waste treatment, pollution control, recycling of waste materials, the quality of water supplies and plant–micro-organism interactions of agricultural importance. The great strength of this series of publications lies in its emphasis on the practical application of microbiological methods to the study of specific problems, in this case environmental problems. This volume is as successful as its predecessors in this respect and experimental systems are described ranging in complexity from simple batch culture methods to sophisticated single and multi-stage fermenter assemblies controlled by micro-computers. The transfer of knowledge gained in fundamental academic research to its application in large scale operations is well illustrated particularly in the areas of ecosystem modelling, computer control of fermentation processes, immobilized cell technology and genetic manipulation of micro-organisms. The Editors have effectively and successfully assembled this wealth of disparate material to produce a volume which will...
prove invaluable as a source of up-to-date information on the application of microbiological methods to environmental biotechnology. This book is attractively produced and the standard of writing and presentation are commendably high. All together it is well presented, contains a good bibliography and few typographical errors. In summary this volume is essential reading for every microbiologist who is actively involved in the study or teaching of environmental microbiology.

R. Herbert

Scrapie Disease in Sheep (1983). H.B. Parry. Edited by D.R. Oppenheimer. 192 pp. London: Academic Press, Inc. $39.00.

At a time when considerable research is being devoted to characterization of the proteins associated with scrapie agents, it is of considerable interest to review this publication of the completed parts of 'James' Parry's planned monograph on 'Natural Scrapie of Sheep'.

In the absence of a specific simple diagnostic laboratory test, this relentless disease, first described in the 18th century, still has to be defined in terms of its clinical signs, pathologic features and transmissibility to sheep or rodents in the laboratory. Parry believed that the understanding of the bewildering epidemiological behaviour of natural scrapie inside and outside Western Europe was central to the elucidation of the true nature of the disease, and this is what he has paid especial attention to within these chapters.

Parry's hypothesis was that the natural disease was familial and caused by a recessive gene, and that field infection was rare even if it ever actually occurred, and it was on such grounds that he clashed with more orthodox opinion. The 'official' view of the disease, upon which the agricultural policy of a number of countries has been based, is that scrapie is an infection controlled partly by genetic factors. The difference between the two is more real than it first appears and is of considerable import since, if Parry's hypothesis is subsequently shown to be correct, his findings will have immediate application in scrapie control policies. Certainly Parry's recessive gene hypothesis offers accurate quantitative explanations for some of the vagaries of the clinical disease.

However, perhaps there is an acceptable scientific twist to this sheep's tale. In recent years it has been clearly demonstrated that genetic constitution can play a predisposing role in some aetiologically obscure diseases. For example, the associations of particular HLA haplotypes in man with such diseases as multiple sclerosis, Creutzfeldt–Jakob and Alzheimer's have now been documented. On such grounds it may be proposed that the gulf between Parry's hypothesis and the orthodox view of scrapie as an infection is more semantic than real, and that the 'rehabilitation' of his hypothesis by assimilation is warranted.

It is to be regretted that Parry died in 1980 before he had drafted the remaining two-thirds of his proposed monograph; it is to be applauded that his friends and colleagues have posthumously published his completed chapters on the historical, clinical, epidemiological and genetical aspects of this most enigmatic of animal diseases. Their benevolence has ensured the survival of an unusually rich source of reference to the disease for veterinarians and microbiologists alike.

L.W. Greenham