aspects of current knowledge of the clostridial neurotoxins, namely tetanus toxin and botulinum toxins A–G. The chapters are varied in content and quality but most will be of interest to the general reader.

The first chapter deals with the ecology and taxonomy of the neurotoxic clostridia. It will probably not surprise most readers to learn that *Clostridium tetani* is genetically homogeneous but that *C. botulinum* encompasses a range of genetically disparate bacteria belonging to several species, a good illustration of the hazards of classifying micro-organisms on the basis of pathogenicity. The second chapter reviews the present status of tetanus and tetanus immunisation, and the third examines the current status of botulism as a disease of man and animals.

In the fourth chapter the cellular basis of B- and T-cell responses to tetanus toxoid are reviewed. Somewhat misleadingly, the authors refer to this as tetanus neurotoxin and give the impression that these entities are antigenically interchangeable. In this context it would have been helpful to have had some discussion of the effects of toxoid on the antigenicity and molecular structure of the clostridial neurotoxins. Somewhat surprisingly, this admittedly not novel issue is not addressed at any depth in this volume.

Other chapters deal with immunodiagnosis and immunotherapy of the neurotoxins, including their preparation, molecular genetics, neurological interactions and clinical applications. Perhaps the most topical and informative chapter is the final one which discusses the subcellular and molecular basis of action of the clostridial neurotoxins. Information on basic biochemistry of neurotoxin action and their characterisation as zinc endopeptidases with highly selective substrate specificity has only recently emerged. The authors give an excellent description of the sites and mode of action of the various toxins at the subcellular level.

Although mainly of interest to the specialist, this book will also be useful to anyone who wishes to update their knowledge of the mode of action and clinical aspects of clostridial neurotoxins.

M. J. CORBEL

Antimicrobial Chemotherapy, 3rd edition

Edited by D. GREENWOOD. 1995. ISBN 0-19-854839-7. Oxford University Press. Pp. 428. Hardback £50.00, paperback £25.00

The aim of the first edition of this book was to provide an introductory textbook devoted to the basic principles of antimicrobial chemotherapy. The importance of a good textbook on this subject cannot be overestimated. Escalating levels of antibiotic resistance and an absence of new agents means in the short-term that the future of successful chemotherapy relies on minimising the selection and spread of resistance by the judicious use of existing compounds. This can be achieved only through education and it is one of the hopes of the editor that this book will go some way towards promoting sensible use of antimicrobial agents.

The book is divided into five sections covering general properties of antimicrobial agents, laboratory aspects of antimicrobial therapy, resistance to antimicrobial agents, general principles of usage of antimicrobial agents and the therapeutic use of antimicrobial agents. In general these sections provide a comprehensive introduction to the subject at a level suitable for undergraduate medical students. Despite the fact that it is a multi-authored text the chapters

are well integrated and there is little repetition of material although there are some differences in the style of certain chapters.

Although the third edition represents a thorough overhaul and extensive revision of the earlier editions, the book does have a rather old-fashioned feel about it compared to some of the more modern medical microbiology texts, and indeed CD ROMs, which are competing for the student's attention. However, appearance is not everything and there are several excellent sections in the text, in particular section III which deals with resistance to antimicrobial agents. This is an area of antimicrobial therapy where changes and new developments occur at a bewilderingly fast pace and it is pleasing to see a section in a general textbook that is so up to date. The section on genetics of resistance in particular gives a clear description of the complex events surrounding the evolution of resistance genes, including the complex mobilisation of resistance genes within transposons and integrons. In addition, the clinical problems of escalating resistance are put in context, highlighting the emergence of resistance in enterobacteria, methicillin resistance in *Staphylococcus aureus* and vancomycin resistance in enterococci. It is perhaps surprising that more of these problems are not highlighted in the Preface or Introduction, which if anything downplay the threat of resistance. Indeed, it is worth remembering that it may well be the future readers of this edition of *Antimicrobial Chemotherapy* who have to manage these potentially untreatable infections.

Overall, I think this is a useful reference textbook which undergraduate medical students will find beneficial in coming to grips with the principles of antimicrobial chemotherapy.

C. THOMSON

Invasive Fungal Infections in Cancer Patients, volume 2/number 1: Bailliere's Clinical infectious diseases

Edited by F. MEUNIER. 1995. ISBN 0-7020-1940-2. Bailliere Tindall, London. Pp. 209. £30.00.

This book boasts a host of authors who are internationally renowned in the field of medical mycology and lives up to the promise anticipated by seeing their names as contributors. The chapter on pathology concentrates mainly on *Candida* (virulence, lytic enzymes, switching mechanisms, dimorphism) with other fungi relegated to a short paragraph at the end, but this is a reflection on the work done in this area. The chapter on invasive disease puts diagnostic methods for *Candida* and *Aspergillus* in perspective and highlights cryptococcosis, histoplasmosis and coccidioidomycosis as diseases in which most success has been gained.

Several authors emphasise the requirement for the isolation of the infecting organism and its accurate identification, especially with view to its susceptibility for selection of therapy. A comprehensive chapter on laboratory diagnosis highlights the problems encountered and the hopes for the future for various diagnostic markers and PCR, with their strengths and limitations. Emerging pathogenic fungi including non-albicans *Candida* species, such as *Trichosporon*, *Malassezia*, and the agents of hyalohyphomycosis and phaeohyphomycosis are discussed along with the implications for therapy.

There follow five chapters on antifungal therapy, each concentrating on a different perspective. Amphotericin B is

discussed with respect to pharmacokinetics, nephrotoxicity dose and infusion-related adverse events and idiosyncratic toxicities and the newer modalities and combination therapy are also reviewed. The triazole drugs are covered in a similar way, discussing the mode of action, pharmacokinetics, side effects, clinical uses, sensitivity testing, combination therapy, interactions and development of resistance. There are chapters on empirical therapy, outlining the evidence for improvement in prognosis with empirical antifungal therapy, and on the so far limited but promising use of cytokines, including growth factors, interleukins and interferon, for prophylaxis in cancer patients. The poor prognosis of cancer patients with fungal infections has led to development of antifungal prophylaxis and this controversial area is well covered with unresolved questions highlighted.

The final chapter covers aspects of fungal infections in children. There has been a vast increase in survival of children with malignancy and the authors look at the risk factors and special clinical features of these patients. Diagnostic methods for fungal infections, particularly serological tests, computerised tomography, ultrasound scans, X-rays and biopsies, and bronchoscopy are put in context, as are treatment with amphotericin B and triazoles and the prevention of fungal infections.

This comprehensive a book is recommended to clinicians and scientists involved in the diagnosis and treatment of fungal infection.

G. SHANKLAND

Environmental Microbiology. A Laboratory Manual

I. L. PEPPER, C. P. GERBA and J. W. BRENDENCKE. 1995. ISBN 0-12-550655-4. Academic Press, San Diego. Pp. 175. \$29.95.

All three authors are environmental microbiologists from the USA and in the preface they inform us that it has been written for students in the 'upper division and/or graduate-level.' Indeed the preface itself is a model of clarity explaining what the manual contains and how it should be used. This is very much a 'hands-on' text and can be inserted into a ring-binder to lessen wear and tear, which is advisable, given the absence of a hard cover or strong binding. Still, it represents reasonable value at this price.

The manual is laid out in sections, e.g., soil, water etc., containing a series of experiments of increasing complexity. Each experiment or assignment includes details outlining the theory, the procedure itself with a full list of materials, and finally, some questions which enable the student to assess his or her comprehension of what has been done. The quality of the line drawings and figures, e.g., the illustration of the dilutions required to carry out algal counts, is impressive and there is a small number of black and white photographs. The margins are used to emphasise points and highlight safety issues (one of which, 'You should wear gloves when performing a gram stain', will be of interest to many!). I found the experiments on the detection of enteric viruses and parasites in water especially interesting and the explanation of the principle of the polymerase chain reaction for a student audience one of the best I have read. Finally, the appendices contain additional information such as significant figures and calculations.

I found fault with very little in this manual apart from one table where the spectrum of cephalosporins was stated to be gram-positive bacteria and *Neisseria*, and in the glossary where the results of the gram's stain are given the wrong way around (hopefully, a typographical error). However, this

book will hardly be required reading in medical schools, but sections might be of interest to those organising courses in life sciences or environmental studies. Nonetheless a lasting impression is the focused and succinct approach which could be emulated by many others preparing teaching materials.

H. HUMPHREYS

Cap-Independent Translation

Edited by P. SARNOW. 1995. ISBN 3-540-59121-4. Springer-Verlag, Berlin. Pp. 183. DM165.00 (Hardback).

This book, number 203 in the series of reviews in *Current Topics in Microbiology and Immunology*, reviews the mechanism(s) of cap-independent translation of viral and cellular mRNA molecules.

Most or all mRNA molecules in eukaryotic cells contain a 5' terminal m⁷GpppG dinucleotide cap structure which mediates their resistance to exoribonucleases, facilitates their transport from the nucleus to the cytoplasm and binds eIF-4, a necessary step in the binding of mRNA to the 43S initiation complex required for initiation of cap-dependent translation. However, some viral mRNAs, such as those of picornaviruses, lack a 5' terminal cap structure while other viral mRNAs (e.g., adenoviruses) and some host mRNAs (e.g., the immunoglobulin heavy chain binding protein, BiP) contain a cap structure but still require little or no eIF-4 for efficient translation, i.e., these mRNAs may be translated by a cap-independent mechanism. The mechanism(s) involved in cap-independent translation is the subject of this book.

In the first chapter, R. J. Jackson and colleagues give an overview of the subject outlining the methods used in such studies. The next four chapters describe cap-independent translation by internal ribosomal binding as occurs in encephalomyocarditis virus (C. U. T. Hellen and E. Wimmer), polioviruses (E. Ehrenfeld and B. L. Semler; G. J. Belsham and colleagues) and hepatitis C virus (C. Wang and A. Siddiqui). Four chapters on a similar topic necessarily leads to some repetition but this is no bad thing since it gives different perspectives on the problem. For example, after reading the chapters by Ehrenfeld and Semler and Belsham and colleagues, one realises that the predicted stem-loop structures in the poliovirus 5' NCR is a consensus on which not all authors agree.

Some capped mRNAs can still be translated in the presence of cap analogues and these are thought to require only low amounts of eIF-4. One explanation for a low requirement for eIF-4 is that these mRNAs contain unstructured 5' NCRs that can bind 43S subunits in the absence of significant amounts of eIF-4. The late leaders of adenovirus mRNAs (R. J. Schneider) and heat shock mRNAs (R. E. Rhoads and B. J. Lamphear) are discussed in this context in chapters 6 and 7. Alternatively, some cellular mRNAs may allow internal ribosome binding as discussed in the final chapter by N. Iizuka and colleagues.

While these chapters will appear primarily to specialists, they were sufficiently well written and comprehensible to someone non-expert in this area to stimulate interest and understanding. There were pleasantly few typographical errors, perhaps one benefit of IT technology. However, it is likely that this book will be purchased by libraries rather than individuals.

C. SWEET