Book reviews

Cellular Immunology Books 1 and 2. By MacFarlane Burnet. (Pp. ix + 726. £5 10s.) Carlton, Victoria: Melbourne University Press. London: Cambridge University Press. 1969.

The omnibus edition is an increasingly common form of literature. It has the advantage that a particular genre can be appreciated to the point of saturation. Sir MacFarlane Burnet's latest treatise provides the opportunity for devotees of cellular immunology, and particularly the clonal selection theory, thus to indulge themselves. It contains within the same cover books 1 and 2 which are designed, respectively, for beginners and advanced students. Book 1 is also issued separately under the title of 'Self and non-self'.

Right from the start Burnet makes it clear that the object of publication is to present a modernized version of clonal selection theory which, he writes, 'could form a satisfactory background for reading or investigation in immunology'. Throughout the book this is stressed. Furthermore there are many instances of selection of information which fits the general hypothesis and a cavalier treatment of less suitable material. The book is an intensely personal document, highly subjective and highly entertaining.

Despite the hopes that the activities of living materials could quickly be analysed into some summation of the properties of their molecular components, it is only in relation to the genetic apparatus that molecular biology has reached a desirable level of resolution. Even here the proviso must be made that the area of reasonable understanding is limited to microorganisms. In particular we lack any proper knowledge of the basis of differentiation among mammalian somatic cells. Thus Burnet's attempt, vigorous though it may be, to provide a rationale for differentiation within the lymphoid cell series may well lack any factual basis for some years to come, as he himself recognizes.

The special feature of lymphoid cells as a class, which has so fired the imaginations of biochemist and biologist, is their seemingly unlimited capacity for *de novo* synthesis of specific proteins. Burnet claims that, at a symposium on antibodies at Cold Spring Harbour in 1967, the central postulate of the clonal selection theory—that the immune pattern of antibody is

determined by genetic processes in the somatic cell line which produces it—was implicitly and explicitly accepted by the great majority. This seems a long way from the original statement of the clonal selection theory which was that the lymphoid cells, because of a high frequency of genetic mutation, were heterogeneous, and that during the process of antibody formation a particular sort of mutant cell was encouraged to proliferate, thereby giving rise to clones of specifically responsive cells. Part of this confusion lies in the general failure of our terminology. 'Genetic' as an adjective has come to mean pertaining to the genetic apparatus, ie, to DNA. It would be nice for the developmental biologist if genetic could retain its original meaning thus allowing that material other than DNA (in mammalian cells) can be thought of as 'pertaining to or having reference to origin' (OED). Burnet is forced to distinguish between (germinal) genetic and somatic genetic processes (p. 14), without making it clear whether there are any fundamental differences between them. He also fails seriously to consider the implications of the finding, that in at least some immune responses no less than two sorts of lymphocyte are involved; one cell seems capable of antibody production, the other, from the thymus, acts in a supportive role. Which of these two cells was 'clonally selected'?

All this said, the positive merits of the books must be considered. The chapter headings are excellent, vivid and stimulating. The treatment in two volumes of differing factual density, far from being bewildering, seems to provide a good way for the reader to build up a feeling for the subject matter without immediately becoming dismayed at its intricacy. There is an enormous amount of wisdom in the books and on many occasions Burnet, in exemplary manner, indicates what we do not know. Anybody in the least interested in immunology could profitably browse through the books for, without doubt, they represent the only extended account of modern trends in immunology. Few biological scientists have a completely consistent view of their subject, the intrinsic complexity of which has, throughout the years, spawned mystics of one kind or another. Burnet should be regarded as one of these. His book should be read not so much for the theory that it espouses but because it is a fine product of one of the greatest contemporary biologists.

A. J. S. DAVIES

Textbook of Immunopathology Edited by P. A. Miescher and H. J. Müller-Eberhard. Vol. I: General Immunopathology and Vol. II: Clinical Immunopathology. (Pp. xxiv + 384 and xxi + 385-805; illustrated. \$19.76 and \$24.75.) New York and London: Grune and Stratton Inc. 1968.

The scope of immunopathology is given as 'all immune phenomena and immune reactions which are associated with disease regardless of whether they are helpful (physiogenic), inconsequential, or harmful (pathogenic) to the host'. This immediately prompts the question of how to define disease; and further, is in practice, useful to separate out the immunologically conspicuous from the less conspicuous? to include asthma but omit lobar pneumonia? or to distinguish what is pathological in the immunity to tubercle bacilli or fungi from the usual manifestations of the disease these organisms cause?

But inevitably in a book of these dimensions there is an ample introductory section entitled 'General immunopathology' where 'pure' immunology occupies at least the first 130 pages. The only surprise here is to find 'delayed hypersensitivity' included in the section on 'pathogenic immune reactions—antibody mediated reactions' but there can be no criticism of any of the content.

The second section, 'Clinical immunopathology', which is more than two-thirds of the book, includes descriptions of all the allergic and autoimmune diseases, the immunological deficiencies and related dysfunctions, and diseases with complex immune phenomena from systemic lupus erythematosus to transplantation and tumour immunology.

These are two solid volumes packed with facts and with ample references. The editors have chosen first-class contributors and the absence of overlap or of serious contradictions of emphasis is evidence of careful editorship. Illustrations and diagrams are sparse—the chapter on amyloidosis, for example, has five figures including only two small photographs—but adequate, and the quality if mostly good even if the magnifications of photomicrographs are not always given.

The only serious misgiving concerns those sections where knowledge is rapidly advancing. For example, the chapter on 'Isoantigens of leukocytes and platelets' was written between 1966 and 1967 and already looks dated; an addendum of June 1968 does not entirely retrieve the situation. This cannot be helped and in any case, it affects only a small part of the book. The rest will certainly stand the test of time as a reference book on experimental and clinical immunology from Ehrlich to the late 1960s.

H. E. M. KAY

Hemic Cells in vitro Edited by Farnes. (Pp. 182; illustrated. £6 5s.) Baltimore: The Williams and Wilkins Company and Edinburgh: E. and Livingstone Ltd. 1969.

'Hemic cells in vitro' is the proceedings of a symposium held by the Tissue Culture Association in June 1968 together with abstracts of 160 papers on other subjects from the same meeting.

Of all the tissues of the body the haemopoietic tissues have been most refractory to study *in vitro* but some limited progress has been made and is conveniently put together in this volume. Three sections, devoted to 'Haemopoietic precursors', 'Differentiation controls', and 'Immunoactive hemic cells', comprise 10 papers, the majority of which deal with short-term culture techniques. For example, by organ culture of embryonic bone rudiments the old question of whether the stem cells rise from bone tissue or migrate there from elsewhere might be answered. The authors incline to the latter but readers will probably not be convinced by the photographic evidence.

The growth of granulocytic colonies in agar has now been achieved in several laboratories but the technique remains precarious and is dependent on elusive factors from other cells. Perhaps the chief obstacle is the formation of inhibitors or chalones by mature granulocytes, this being part of an essential feedback control mechanism *in vivo*. Erythropoietic colonies have never been claimed but valuable biochemical data can be gained from studying the final stages of erythropoietic maturation *in vitro*. Lymphocyte transformation or blastogenesis naturally gets a mention as does the more far-reaching topic of immune activity of lymphocytes in culture.

Finally there are two papers on long-term culture of leucocytes from blood, marrow, and elsewhere. These prolonged cultures of leucocyte lines have nothing to do with haemopoiesis of course. One of the main questions posed here is whether the indefinite capacity for growth is induced by EB herpes virus infection. The answer seems to be 'probably yes' but the evidence is conflicting and it is here that the absence of published discussion or of a chairman's summing up is felt. In a symposium of this sort comments, questions, or summaries help to emphasize points of significance or of uncertainty and give a valuable sense of perspective. Presumably tissue culture-mongers will read this volume anyway. Haematologists and others may find it a useful, quick guide to the subject as it was in 1968.

H. E. M. KAY

Human Trophoblast By Arthur T. Hertig (Pp. vii + 344; illustrated. \$12.00). Springfield, Illinois: Charles C. Thomas. 1969.

This publication relates many of the contributions and thoughts of the author that have resulted from a thirty-five-year study. The origin and development of the human trophoblast is described in detail and there is a helpful chapter on examination of the placenta. Although not indicated on the cover, the book deals with pathological conditions including hydatidiform mole and choriocarcinoma. To the pathologist these chapters in particular will appeal, but for full understanding of the difficulties in diagnosis the author's explanation of normal trophoblast development should be studied. Distinction between hydatidiform mole and choriocarcinoma is fully discussed; the author considers that 16% of the moles are invasive but questions the too ready link in thought between hydatidiform mole and the true neoplasm choriocarcinoma which may follow any pregnancy. He emphasizes that 'to determine by pathologic or clinical or endocrinologic means whether the lesion is a hydatidiform mole or a choriocarcinoma' may be almost impossible at times, but his text and pictures will greatly help the pathologist concerned with the task. The comprehensive term 'trophoblastic disease' rather than definitive diagnosis may be resorted to, particularly when the material to be examined has been curetted from the uterus. Modern therapy will often be employed in the absence of exact diagnosis.

The book is adequately illustrated, beautifully written, and reflects the humour and wisdom of this well-known author. It should have a wide appeal and will be welcomed, especially by embryologists, obstetricians, and pathologists.

CLAUD W. TAYLOR

Practical Bacteriology By Nuala Crowley, Jean M. Bradley, and J. H. Darrell (Pp. v + 238; illustrated. 50s.). London: Butterworth and Co., Ltd. 1969.

This book, which is concerned entirely with *medical* bacteriology, is essentially a 'teach yourself' bench manual aimed to assist candidates preparing to take the examinations for membership of the Royal College of Pathologists. Virological and certain public health bacteriological procedures are not included. The authors emphasize that the book is intended to supplement routine experience gained in a hospital laboratory. A list of books and references for additional reading is given. Considering the importance of reproducibility in performing Gram's staining technique, reference to the method described by Preston and Morrell (1962) might well have been included. The book

is likely to prove useful to those for whom it is intended.

C. E. D. TAYLOR

Reference

Preston, N. W., and Morrell, A. (1962). *J. Path. Bact.*, **84**, 241.

Review of Medical Microbiology 8th ed. By E. Jawetz, J. L. Melnick, and E. A. Adelberg. (Pp. 502. 58s 6d.) Los Altos, California: and Oxford and Edinburgh: Blackwell Scientific Publications. 1968.

The aim of this book is to provide in some 500 pages a review of those aspects of medical microbiology that are 'of particular significance in the fields of clinical infections and chemotherapy' for medical students, house officers, and practising physicians. This it certainly does not do. A relatively large part of the text is devoted to basic microbiology, and the sections on morphology, biochemistry, and genetics are admirably up to date and interestingly written. They will certainly provide valuable reading matter for the student or young graduate, but he will learn little of practical value from the rest of the book about the intelligent use of the laboratory in clinical practice or about the applications of microbiology to the prevention of disease. This is not because of a shortage of information; indeed the authors have succeeded in mentioning a surprisingly large number of facts. What is often missing is a critical assessment of their significance. For example, the unqualified statement is made that *Bordetella pertussis* may be isolated from a nasopharyngeal (ie, pernasal) swab or by means of a cough plate, but no indication of the relative efficiency of the two methods is given.

Some important topics are dealt with entirely by means of tables. There is one table entitled 'Practical chemical disinfectants' which lists agents that may be used for the treatment of inanimate objects, skin and air, but gives no indication of their activity on different classes of microorganisms. The skin disinfectants listed are soap and water, hexachlorophene soaps, anionic detergents, iodine compounds, and alcohols—in that order. Quaternary ammonium compounds are recommended for the disinfection of inanimate objects and aerosols of glycols for air disinfection.

There is little relation between the amount of space devoted to a topic and its importance in clinical practice. Thus, 53 lines are devoted to *Pseudomonas aeruginosa* and *Pseudomonas* infections—including the remarkable statement that 'involvement of the respiratory tract is uncommon'—but the reovirus group receives 182 lines. The section on sal-