Book reviews


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, i.e., 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.

Biological scientists have a completely consistent view of their subject, the intrinsic complexity of which has, throughout the years, spawned mysteries 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.

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The scope of immunopathology is given as 'all immune phenomena and immune reactions which are associated with a disease regardless of whether they are helpful (physiogenic), consequential, or harmful (pathogenic) to the host'. This immediately suggests the question of how to define disease; and further, is it feasible in practice, useful to separate out those 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 fungus 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 1968 and already looks dated; an addendum dated 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.

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