

AN OUTLINE OF IMMUNITY.

By W. W. C. TOPLEY.

Edward Arnold & Co., London. 1933.

Size $9\frac{1}{2} \times 6$. pp. vi. + 415. Price, 18/-.

This valuable monograph deals with the subject of immunity or resistance to bacterial and filtrable virus diseases, and authoritatively presents the more important data dealing with the processes which underlie recovery or death in an infected host. Despite the general title, protozoal and helminthic infections are regarded as being beyond the scope of this book, though the growing tendency for the methods elaborated by the bacteriologist to be applied to this extended field is noted. From the outset emphasis is laid on the necessity for adopting statistical principles in the planning of any immunological experiment, whether laboratory or clinical.

In the early chapters the author shows that the ability to gain access to, and multiply in, the tissues is an essential attribute of any pathogenic organism, while its selective location is determined in part by its own inherent characters, and in part by the anatomy of the infected host, the biochemical reaction of different tissues and the defence mechanism brought into play. In specific antibacterial immunity the reticulo-endothelial cell system (macrophages, histocytes) and the leucocytes (microphages) play a predominant part, assisted by antibody acting on the surface antigens of the bacterium.

The unitarian hypothesis that precipitin, agglutinin, lysin, opsonin, etc. (which are all contained in the serum globulin fraction) do not constitute different antibodies, but are merely names for the same antigen doing different things is strongly supported. On the other hand the bacterial cell is now known to possess several distinct antigens located on the flagella, the surface and the interior of the organism. Specially important are the surface antigens since it is their reaction with antibody which renders the cell liable to ingestion by phagocytes or to lysis by complement.

Antiviral and antibacterial immunity are described as being very similar except that the former is more effective, a state of affairs which may be due to the greater limitations imposed on the virus by its habit of intracellular parasitism.

Anaphylaxis, hypersensitiveness and allergy receive detailed attention. It is pointed out that the anaphylactic state only develops when fixed or cellular antibody is unassociated with circulating antibody, whereas in the immune state there is sufficient antibody in the circulating blood to protect fixed antibody. Anaphylactoid reactions, on the other hand, are independent of antibody altogether, depending, as they do, on histamine shock following cellular injury.

Herd infection and immunity, and the practical application of immunity in diagnosis, prophylaxis and treatment occupy the last chapters. The author can find little favourable to say concerning vaccine therapy, and stresses the fact, evident from the literature, that antiserum treatment in man has proved somewhat disappointing in diphtheria, and unreliable in tetanus. On the other hand, antitoxic serum possesses a specific therapeutic effect on the toxic manifestation of scarlet fever, specific anti-pneumococcal serum saves the life of one-third of Type I cases, and antimeningococcal serum reduces the case mortality by one-half.

In so limited a review it is impossible to do adequate justice to this admirably documented and critical contribution to the rapidly developing science of immunology. Its importance is incontrovertible and few of those who read the original will fail to agree with the thesis expressed in the preface that as many of the fundamental phenomena are direct and natural extensions from chemistry, biology and physiology, great benefit would accrue were certain aspects of the subject taught to students during their pre-clinical years.