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Introduction

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In the Introduction to volume 20 of Progress in Allergy, attention was drawn to the accelerating application of new immunologic insights and techniques in medicine, accompanied by recognition of clinical immunology as a medical subspecialty distinct from but encompassing what we have always known as allergy. The review of Zubler and Lambert in the present volume illustrates the extraordinary diversification that is taking place in laboratory techniques applied to such an apparently simple problem as the identification
and measurement of immune complexes in vivo and in vitro. The same point was well demonstrated in Dwyer’s account (volume 21) of the technology which surrounds the identification and enumeration of lymphoid cell subpopulations in living human subjects. The complexity shown in these two reviews reflects the real complexity which characterizes immunologic phenomena at the most basic level and which must inevitably characterize their clinical manifestations as well. Further examples for the complexity of immunological reactions are provided in the last review in this volume by Kazimierczak and Diamant. They analyze the molecular mechanisms of histamine release from mast cells, the basic event in immediate allergic reactions, and critically evaluate the validity of existing concepts in this field and their experimental background.

The application of immunology to new problems in the clinic and hospital is paralleled by its application to now classical medical problems. Immunology as we know it originated from studies of acquired immunity to infectious agents and its first clinical triumphs were the highly effective and very familiar vaccines against viruses such as small pox, measles, and poliomyelitis, bacteria such as pertussis, and bacterial products such as the diphtheria and tetanus toxins. The present decade has seen a sudden resurgence of interest in infectious disease produced by protozoan and metazoan parasites. Many highly trained younger immunologists have moved into this area of research and massive financial support has become available, in particular for projects which promise early solution of the vaccine problem in, for example, malaria, schistosomiasis, and trypanosomiasis [1].

Progress in Allergy has documented this change with reviews of immune responses to helminths by Ogilvie and Jones (in volume 17), of IgE responses to parasites as well as to simpler antigens by the Ishizaka’s (in volume 19), and with the detailed reviews of schistosomiasis research by Colley and Phillips and by Boros (in the present volume). In the near future, reviews are planned of immunological research in malaria by Nussenzweig and by Jayawardena.

We describe all this as simply another extension of ‘applied’ immunology. Yet no one should be deceived into ignoring the broad ramifications of research on parasites into the most basic areas of immunology and, at the same time, into other ‘applied’ fields. Thus, the two reviews on schistosomiasis provide the first real insights into the normal functions of the eosinophilic granulocyte and the general mechanisms which may underlie granuloma formation. There seems to be little question that immune regulation, i.e. feedback mechanisms whereby antibody and specific or nonspecific suppressor T cells inhibit cellmediated
immune responses and formation of particular classes of antibody, notably IgE, is an important component of the total response to parasitic antigens. Indeed, in many parasitic infections it appears that the pathogen, over millions of years of evolution, has learned to manipulate the host’s immune regulatory system to its own advantage. This being so, attempts to develop vaccines without due attention to identifying components capable of inducing a suppressor response have limited likelihood of success. At the same time, successful analysis of the pattern of regulation in one or more parasitic diseases may well provide the key which will unlock the puzzle of regulation, leading to inhibition of an effective immune response, in many forms of cancer.

The fourth review in the present volume on the subject of the Langerhans’ cell in the epidermis, by Silberberg-Sinakin et al., serves to remind us that basic immunologic problems, some relatively simple, are by no means completely worked out. Research on cell cooperation, which has made such enormous strides in the last several years, has made extensive use of the macrophage as an ‘auxiliary’ cell, interacting with T cells and antigen or with both of these and B cells. Difficulties of manipulation have in essence inhibited any attempt at comparable in vitro study of the dendritic reticulum cell of the spleen and lymph node follicles [2], the ‘interdigitating cell’ of the thymus-dependent areas [3], the ‘dendritic cell’ isolated from many lymphoid organs [4], or indeed the vascular endothelium, which is certainly the most convenient nonlymphoid ‘auxiliary’ element at the scene of triggering of cell-mediated immune reactions [5]. The macrophage must be viewed as an in vitro stand-in for at least some of these other types of cells. The Langerhans’ cell is a marvelous case in point, since it appears to share many of the very surface properties of macrophages which might fit it to serve as an ‘auxiliary’ cell and is, in fact, located at the site of entry into the body of contact-sensitizing agents.

It is clear that progress in both basic and applied immunology is steady and may be expected to continue for some time to come.

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1 WHO Newsletter: Special programme for research and training in tropical diseases, TDR/NL/77.2.

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