who exemplify, in medicine, particular aspects of intellectual history" rather than on discoverers or medical innovators. Lazar Riverius provides a baseline in Aristotelian metaphysics and Galenic medicine. The Neoplatonic and atomistic viewpoints are represented by Van Helmont and Robert Boyle, respectively. With respect to methodology, Sylvius is the iatrochemist and rationalist, Sydenham the empirically oriented clinician. "A number of minor figures reveal various degrees of critical acumen"—an attribute for which the key figures, too, are assessed. By the end of the 17th century "a synthesis began to occur and the best example of this is a little known work, of 1695, written by Friedrich Hoffmann, and embodying a new and 'modern' system," the *Fundamenta Medicinae*, King's translation of which has just appeared. A persuasive case is made for Hoffmann and the *Fundamenta* as precursors of Boerhaave and the *Institutiones*. Hoffmann, by the way, is not at all pictured as one of the rigid systematics.

A number of interesting links are developed, and some (like the juxtaposition of Van Helmont and Boyle) are unexpected. King recounts how Riverius found the moon inadequate to account for "critical days" and turned, instead, to the complex influence of the signs of the zodiac, and calls this "an interesting example of scientific method." This designation is an interesting example of King's procedure. We encounter references to such entities as "what we would call tissues" and "what we would call metabolism" more often than I would call the equivalence apparent. The lucidity of King's exposition sometimes owes more, indeed, to King himself than to the lambency of his authors' opinions. At the same time, King is a learned, well-balanced, and refreshing guide through a landscape that is not tiresomely familiar.

The "enlightenment" of the title ("it indicates a new critical acumen, a new regard for empiricism, a new approach to evidence and a new concept of validity") is at last defined as looking at things in a different light. Now and again, on *The Road to Medical Enlightenment*, a new tautology may be discerned. The development of a certain kind of empiricism is documented, however, as the central change that took place in the last half of the 17th century.

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## Invertebrate Immunology

**The Cellular Defence Reactions of Insects.** GEORGE SALT. Cambridge University Press, New York, 1970. viii, 118 pp. + plates. $7.50. Cambridge Monographs in Experimental Biology, No. 16.

Salt's monograph is an elegant model of scientific writing, especially welcome in this heyday of the multiauthored treatise. Clearly, compactly, and discerningly the author discusses the response of insect cells to the stimuli presented by infectious and noninfectious foreign elements.

Following an introduction that defines the terms used and the scope of the volume, the major cellular reactions—phagocytosis, encapsulation, and nodule formation—are presented in three chapters. In the next two chapters Salt discusses the types of objects that incite reaction and the differing responses of the blood cells, which constitute the major group of cells involved. The last two chapters inform the reader of how these cellular reactions form a part of the immune system of insects and how they differ from or approximate defense reactions in vertebrates. There is a list of over 200 carefully selected references, followed by indexes of the organisms and subjects discussed.

The author is the long-time head of a productive laboratory which leads in the study of reactions of insects to macroparasites. The information and interpretations of data found in this book are the thoughtful distillation of many years' observations made by Salt and his coworkers at Cambridge.

The immediate practical worth of this volume will be in its contribution to studies of the biological control of pest insects through the use of parasites. As Salt points out, the better our understanding of the cellular reactions mustered by a pest insect for its own protection, the greater the chance that we will find methods by which they can be manipulated to human advantage. He proposes, for example, that methods might be devised "to develop new strains of parasites able to avoid or overcome the defence reactions of particular noxious insects."

Perhaps not so immediate as the application to biological control, but fully as important, is the contribution Salt makes to our knowledge of general defense reactions of invertebrates and thus to cellular defense as it occurs throughout the animal kingdom. Basic recognition of "self-nonself" occurs in cells of all members of all the animal phyla. Even now, the immune reactions of insects and other invertebrates serve as simple and convenient models for study of, for example, acceptance or rejection of tissue and organ transplants.

Every student of biological control, invertebrate pathology, and transplantation immunity (no matter how impecunious) should purchase this pleasingly turned-out little book and keep it close at hand. The price is small, and the book is surely destined to be a classic.

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## Stasis and Coagulation

**The Haemostatic Mechanism in Man and Other Animals.** Zoological Society of London Symposium No. 27, London, Dec. 1969. R. G. MACFARLANE, Ed. Published for the Society by Academic Press, New York, 1970. xviii, 248 pp., illus. $13.50.

When animals became so large that diffusion was no longer sufficient for molecular exchange, body cavities containing fluid media were necessarily developed. In these, exchange is facilitated in simple systems by convection and flow (due to body motion and contraction) and in the most complex systems by pumped flow through closed vessels. The necessity for economizing the fluid media led to important requirements. The appearance of a wound, or opening, through which media might escape to the external environment had to trigger a mechanism which recognized the abnormal character of the opening and closed it with sufficient promptness, but which limited its effects internally to the immediate environment of the opening. In systems having a closed circulation, it became necessary also to cope with escape to the interior tissue spaces. An examination of the processes by which these fundamental requirements are met should appeal to all who have interests in regulatory mechanisms.

In all animals the means for producing stasis appear to be some combination of a few effects, which make widely different contributions in particular instances. Generally, the opening is either reduced by muscular contraction or, more frequently, closed by an adherent plug or cover. Closure may be due to the interaction of customarily free hemostatic cells or cell fragments. These may associate without obvious alteration in physical structure,