technique, passive hemagglutination inhibition technique, and enzyme-linked immunosorbent assay is about 1000 times more sensitive than the widely used precipitin test. The latex agglutination test has been used with *Culicoides*. Despite their limitations "only the precipitin test methods have been consistently used and have served investigators well." In general, host selection patterns are of 2 types: (a) fixed or active and (b) opportunistic or passive.

In 13 paragraphs the authors summarize results of recent studies of host feeding or host selection in various parts of the world. A discussion of the extent and detection of mixed bloodmeals and multiple feeding relies heavily on the work of P. F. L. Boreham, et al. Pitfalls in the interpretation of results are mentioned. All in all, this review is especially valuable to anyone concerned with mosquito biology and/or the epidemiology of mosquito borne diseases.

The other review is

INTRINSIC FACTORS AFFECTNG VECTOR COMPETENCE OF MOSQUITOES FOR ARBOVIRUSES by J. L. Hardy, E. L. Houk, L. D. Kramer and W. C. Reeves, pp. 229–262 with 157 references.

The authors point out that there is a paucity of information about incompetent vectors. There are ill-defined, genetically controlled, barrier systems which affect virus transmission. This review evaluates current knowledge of factors and mechanisms that determine whether or not the virus in ingested blood can multiply and escape from the mesenteron and subsequently become established in the salivary glands and ovaries "whence it can be transmitted orally to vertebrate hosts and transovarially to progeny." Many readers will be impressed, possibly astounded, by the large number of publications reporting pertinent results in great detail. Certainly there is evidence of progress in obtaining an understanding of inter- and intraspecific mesenteronal barriers which are responsible for vector competence.—W. E. Bickley, 6516 40th Ave., University Park, MD 20782.

INSECT NEUROHORMONES. By Marie Raabe. 1982. Plenum Press, New York, NY. 352 pp. $42.50.

In our search for alternatives to chemicals, an understanding of endocrinology is essential for anyone contemplating the use of insect hormones and hormone mimics in a vector control program. In *Insect Neurohormones*, Professor Raabe has accomplished a most ambitious task in assembling and organizing a staggering amount of information, and provides an excellent overview of neurohormones and how they influence insect development, metabolism, and behavior. This is not a basic text in the field, however. Some knowledge of insect physiology and endocrinology is necessary in order to get the most out of this book.

The first chapter deals with the synthesis, storage, and release of neurohormones, and is a comprehensive survey of neurosecretory cells and their distribution in many different insect groups. The second chapter discusses the control of endocrine gland activity, and includes the secretion of ecdysteroids, brain hormone, and the control of corpus cardiacum and corpus allatum function. Subsequent chapters review the physiological effects of the hormones: diapause, reproduction, visceral muscle function, color change, behavior, osmoregulation, metabolism, and cuticular development. A chapter entitled "Concluding Remarks" attempts to put insect and vertebrate neurohormones in perspective, but would probably be more useful if it is read as an introductory chapter instead. Because insect endocrinology is such a dynamic field, the author has also assembled an Addendum that includes papers published through November, 1981. References include 2 pages of reviews and monographs on insect endocrinology, and close to 60 pages (over 1000 citations) of literature cited in the text. Both a species index and a general index are provided. Each chapter includes a "Conclusions" section that contains a summary of the chapter and often includes a critical appraisal of our knowledge in that area. Illustrations are clear and informative. Especially noteworthy are the excellent tables that summarize the literature and place it in perspective. Overall, the book is very well written and contains none of the grammatical and syntactical errors that commonly occur when texts are translated into a second language, as this one has been from French.

A particularly valuable chapter deals with the involvement of hormones in morphological and physiological color change. Much of the literature in this area is in German and French, and has not been readily available to those of us still struggling with English. However, the chapter on diapause was disappointing. It was much too concise, and the 10 pages devoted to the subject did not approach the same depth as other chapters. The mode of action of neurohormones at the cellular level is barely discussed; two sentences on page 267 hardly do this topic justice.

Mosquito physiologists will be disappointed by the minimal coverage given to those insects. The control of mosquito vitellogenesis is described without comment and much of the important work in this very controversial area has been ignored. However, in 277 pages of text, it would be difficult to cover all groups of insects in detail sufficient to satisfy every specialist.

My only hesitation in recommending this book is its certain rapid obsolescence. Insect endocrinology has taken incredible strides in recent years, and one may find it difficult to justify purchasing a book that has already been superseded by over a year's worth of literature.—Marc J. Klowden, Department of Plant, Soil and Entomological Sciences, University of Idaho, Moscow, ID 83843.