BOOK REVIEW

NEUROHORMONAL TECHNIQUES IN INSECTS. 1980. T. A. Miller, Editor, Springer-Verlag, New York—Heidelberg—Berlin, 282 p., $39.80. Springer Series in Experimental Entomology.

NEUROHORMONAL TECHNIQUES IN INSECTS is a volume in the Experimental Entomology series edited by T. A. Miller. Like the other volumes, this book focuses on the methodology in a particular area of current entomological research. The choice of insect neurohormones as a topic is particularly useful at this time because research on vertebrate neurohormones has met with outstanding success in recent years, and work on insect neurohormones is now coming of age. In a sense, neuroendocrinology of insects began in 1922 when Kopeć showed that the brain was responsible for controlling metamorphosis. The "brain" hormone, now called "prothoracicotropic hormone" (PTTH) because it stimulates the prothoracic glands to secrete ecdysone, has been isolated and purified, but its structure still remains elusive. In their chapter, Ishizaki and Suzuki summarize evidence that PTTH is a polypeptide with a molecular weight of 4400. They suggest that elucidation of the structure may require new, rapid and sensitive bioassay techniques such as radioimmune assay (RIA). They also suggest that the neurohaemal organ for PTTH may turn out to be the corpora allata rather than the corpora cardiaca. Their predictions are supported by a recent publication from Gilbert's laboratory in which RIA was used to detect ecdysone secreted *in vitro* by prothoracic glands stimulated by PTTH from the corpora allata. Hopefully, we will soon learn the structure of this key neurohormone in the insect endocrine system.

Other chapters deal with a myriad of neurohormones such as bursicon, eclosion hormone, diuretic hormone, diapause hormone, and so on. The dominant themes are that progress on elucidation of structure cannot be made without a rapid and sensitive bioassay, and that while many sophisticated techniques for purifying and analyzing polypeptides are available, the small size of insects present special problems. For example, one author used 48,000 heads to obtain an extract of PTTH. In another case 2,000 mesothoracic ganglionic masses from *Rhodnius* were dissected to provide material for extracting diuretic hormone. In the face of such problems it is gratifying that this volume could begin with chapters on 2 insect neurohormones whose chemical structures have been determined.

Starett and Stede report on proctolin, and Stone and Mordue discuss adipokinetic hormone (AKH). Both chapters are excellent in terms of the clarity and detail with which the techniques used in purifying and identifying the hormones are described. The problems of scale were apparent in both cases, but did not prevent success. The authors isolated 180 μg of pure proctolin from 125,000 whole cockroaches, while the structure of AKH was determined from extracts prepared from 3,000 locust corpora cardiaca. In both cases the structure of the compounds was proven by synthesis.

One of the pioneers in the field of insect endocrinology, Professor Gottfried Fraenkel, provides a brief overview of the book and emphasizes that *Neurohormonal Techniques in Insects* is not designed to give an intergrated account of insect neuroendocrinology, but is concerned wth the im-

portant techniques needed to elucidate structure of insect neurohormones. I believe the book does this well, and will become an important reference for insect physiologists who wish to work with neurohormones, or even to appreciate the rapid progress being made in this field.—HERBERT OBERLANDER, Insect Attractants, Behavior, and Basic Biology Research Laboratory, AR/SEA, USDA, Gainesville, FL 32604 USA.

BOOK NOTICE

ANNUAL REVIEW OF GENETICS, 1980, Vol. 14, 485 p.

Contents: Reminiscences of the early days of transformation, MACLYN MCCARTY; Chromosome abnormalities in human leukemia, JANET D. ROWLEY; The conjugation system of F-like plasmids, NEIL WILLETTS AND RON SKURRAY; Genetics of the fission yeast *Schizosaccharomyces pombe*, RICHARD EGEL, JURG KOHLI, PIERRE THURIAUX, AND KLAUS WOLF; Transposable elements in *Drosophila* and other Diptera, M. M. GREEN; Molecular arrangement and evolution of heterochromatic DNA, DOUGLAS L. BRUTLAG; The molecular genetics of human hemoglobins, TOM MANIATIS, EDWARD F. FRITSCH, JOYCE LAUER, AND RICHARD M. LAWN; Phenylketonuria and other phenylalanine hydroxylation mutants in man, CHARLES R. SCRIVER AND CAROL L. CLOW; Genome organization and reorganization in *Tetrahymena*, MARTIN A. GOROVSKY; Biochemistry of the gene products from murine MHC mutants, R. NAIRN, K. YAMAGA, AND S. G. NATHENSON; The genetics of protein degradation in bacteria, DAVID W. MOUNT; Chromosome-mediated gene transfer in mammalian cells, O. WESLEY MCBRIDE AND JANE L. PETERSON; DNA replication in viruses, SANKAR MITRA; The lysis-lysogeny decision of phage λ: explicit programming and responsiveness, IRA HERSKOWITZ AND DAVID HAGEN; Boris Ephrussi, HERSHEL ROMAN; author, subject, cumulative indexes.—JEL

ANNUAL REVIEW OF ECOLOGY AND SYSTEMATICS, 1980. Vol. 11, 487 p.

Contents: Multivariate approaches in ecology: the assessment of ecologic similarity, ROGER H. GREEN; Evolution of dioecy in flowering plants, K. S. BAWA; Interactions among three trophic levels: influence of plants on interactions between insect herbivores and natural enemies, PETER W. PRICE, CARL E. BOUTON, PAUL GROSS, BRUCE A. MCPHERON, JOHN N. THOMPSON, AND ARTHUR E. WEIS; Complex life cycles, HENRY M. WILBUR; Dispersal polymorphisms in insects, RICHARD G. HARRISON; Herbivory in relation to plant nitrogen content, WILLIAM J. MATTSON, JR.; Dispersal in small mammals, MICHAEL S. GAINES AND LEROY R. MCCLENAGHAN, JR.; The evolution of monogamy: Hypotheses and evidence, JAMES F. WITTENBERGER AND RONALD L. TILSON; The mineral nutrition of wild plants, F. STUART CHAPIN, III; Selection of winter forage by subarctic browsing vertebrates: The role of plant chemistry, JOHN P. BRYANT AND PEGGY J. KUROPAT; Physiological ecology of tropical succession: a comparative review, F. A. BAZZAZ AND S. T. A. PICKETT; Individuality and selection, DAVID L. HULL; Evolutionary polarity of character states, P. F. STEVENS; Aquatic primary productivity and the ^{14}C-CO_2 method: A history of the productivity problem, BRUCE J. PETERSON; The late quaternary vegetation history of the southeastern United