The writers review current knowledge of their respective specialties and incorporate new and unpublished material of their own.

The essays range widely over topics important in physiology. There is something for the molecular, the developmental, the environmental, and the behavioral physiologist. I found the eight essays on morphogenesis and neurosecretion particularly interesting. These show that the insect is unrivaled as an experimental animal for the elucidation of the hormonal control of cellular mechanisms. The recent identification and synthesis of the growth hormones of insects will provide the molecular and developmental physiologist with a most powerful tool for rapidly gaining an insight into how a living organism is built.

The essays also provide an overview of other aspects of insect physiology such as the integument, flight, the central nervous system, the sensory organs, reproduction, behavior, and membrane permeability. I have a limited knowledge of behavioral physiology and ion and water transport. Thus it was pleasing to find the essays on these subjects to be relatively easy to read, interesting, and informative.

This volume will be useful to the researcher, the teacher, and the advanced graduate student.

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Antiviral Substances

The Interferons. A symposium, Siena, Italy, 1967. GEO RITA, Ed. Academic Press, New York, 1968. xviii + 269 pp., illus. $12.50.

This book contains the 21 papers presented at an international symposium on interferon held at the Aula Magna of the University of Siena in June 1967. Many of the scientists actively working with this natural antiviral substance participated in this symposium as well as in a Ciba Foundation symposium on interferon held two months earlier in London (*Interferon*, G. E. W. Wolstenholme and M. O'Connor, Eds., Little, Brown, Boston). Consequently there is a certain amount of duplication in the resulting publications. Indeed, some authors gave essentially the same paper at both meetings.

The first eight papers in this volume are concerned mostly with the induction or release of interferon in in vitro and in vivo systems. In the first paper, Merigan reviews his own extensive work with viral and nonviral inducers of interferon. He discusses his studies showing that mice respond with circulating interferon after injection with synthetic copolymers of maleic acid anhydride and derivatives. The point is made that nonviral inducers appear preferable to live agents for induction of endogenous interferon in man for prophylactic and therapeutic purposes, since it is difficult to rule out the presence of adventitious contaminants in biological preparations or to be sure that such preparations will behave benignly in all individuals. In this regard also, V. D. Soloviev of the Academy of Medical Sciences of the U.S.S.R. discusses in a later paper the two approaches to interferon therapy, the stimulation of endogenous interferon and the administration of purified interferon. Other workers in the early chapters review and describe various other nonviral agents which stimulate the appearance of interferon-like substances. Unfortunately, there is no mention of the exciting findings of Hilleman's group that double-stranded ribonucleic acid molecules (natural or synthetic) from a number of sources are efficient inducers of interferon and of resistance to viral infections in vivo and in vitro. Other studies are concerned with the distribution and subsequent fate of interferon in the animal and with the influence of physiologic factors and stress on the enhancement or inhibition of interferon production.

Several papers are concerned with the mechanism of action of interferon. Two papers, one by Levy and Carter and the other by Marcus and Salb, review work done by these authors which indicates that the action of interferon occurs at the ribosomal level. Ribosomes and ribosomal subunits formed in the interferon-treated cell are capable of forming apparently normal polysomes with cellular messenger RNA but bind to virus RNA poorly and translate the polysomes into protein even more poorly.

Other papers presented at this important symposium are concerned with interferon assays, purification, physicochemical properties, and treatment of viral disease with interferon.

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The State University

Higher Education: Who Pays? Who Gains? Financing Education beyond the High School. M. M. CHAMBERS. Interstate, Danville, Ill., 1968. xvi + 304 pp. $6.95.

Author of numerous monographs about higher education, and a long-time student of the subject, M. M. Chambers, who currently is attached to the School of Education at Indiana University, deserves and enjoys widespread respect among administrators of colleges and universities. Indeed, singlehandedly and with considerable success, Chambers each year collects and distributes timely data on state government appropriations in support of higher education, a task which the Office of Education in the U.S. Department of Health, Education, and Welfare has found beyond its capabilities.

The author in his epilogue describes the present volume as a "subjective essay dealing with comprehensive concepts." No reviewer could improve upon this statement. Certainly this book is highly subjective. Chambers has some definite points of view about higher education, and once again he sets them forth with his usual vigor. His impressions may and sometimes do depart from a considerable array of facts which might warrant a different opinion. This circumstance doesn't bother Chambers.

The volume serves a dual purpose. It is a convenient handbook of observations about financing colleges and universities in the United States. In this respect, the author does not explore any new ideas, but he provides a useful summary of current practice and present issues. But the book is even more, as I have suggested, a vehicle for a restatement of personal positions.

First of all, Chambers is a strong defender of the state university and of the state government role in supporting higher education. In all the furor about federal government financing of higher education, there is a tendency to forget that our state governments provide the bulk of available funds for the current operation of higher education in the United States and that state government appropriations in support of higher education have crossed the $5-billion mark in the current fiscal year. Chambers thinks state governments can and will do still more. Those of us who labor in this vineyard hope that 1969 will prove him correct.

Perhaps it is the financial plight of