entirely dismembered, a view supported "by a surprising number of observers." The book is symptomatic of what often happens to intelligent people when they start studying what appears to be a narrow aspect of the atom. The subject tends to grow.

One "final and further observation" of this reviewer is that the footnotes should not be ignored. They are a great deal more than citations and are often lively extensions of the text.

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Virology

Interferons. N. B. FINTER, Ed. Saunders, Philadelphia, 1966. 358 pp. $15.

The work of the last few years has established beyond doubt the biological significance of nonimmune factors such as interferon in control of infection. Success in using such a mechanism to control virus infection in humans has been elusive, but it seems to be becoming more of a real possibility with the availability of nonviral inducers of interferon production. The group of authorities who have contributed to this volume is well chosen and diversified, presenting information on interferon ranging from its molecular nature and its intimate mechanism of action to its biological significance and the prospects for its use in man. Recent studies with purified materials have allowed new realization of the extremely high biological activity of interferon, its species-specific action on cells, its broad antiviral spectrum, and its lack of effect on the uninfected cell. The results of current investigation seem to agree in indicating that interferon acts at a point somewhere between the transcription and the translation of the viral messenger RNA. Interferon would appear to play a major role in recovery from virus infection, whereas immune defenses prevent reinfection. It can block several species of oncogenic viruses and thereby inhibit the malignant transformation of cells and the development of certain tumors. Thus the information presented in this volume will be of interest to a wide scientific audience.

This is the first volume wholly devoted to this rapidly growing area of animal virology. During the past few years several promising chemical agents, including iododeoxyuridine and *N*-methyl isatin β-thiosemicarbazone, have been developed for the control of certain virus infections in man. Interferon was thought from the time of its discovery to have great promise for this use. At the end of the decade following its discovery it is quite appropriate to assess our progress toward this goal, as well as our progress in understanding of the role of interferon in the cell-virus relationship. The book has a common set of some 600 references at the end, rather than a set with each author's chapter. Instead of the hastily presented and uncoordinated set of papers one often finds in such a volume, this book is well planned and presents an integrated, comprehensive, and authoritative review of the work in the area. Appropriately, the introduction was written by Alick Isaacs, who first recognized interferon in 1957 at the National Institute of Medical Research in London while working with a Swiss colleague, J. Lindemann. Isaacs' recent death saddens all who have followed his creative genius and his quite original contributions to virology. All whose work is described in this volume will readily acknowledge a debt to him for his exciting ideas, always derived from fundamentally simple experiments.

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Optimizers and Computers

Recent Advances in Optimization Techniques. Proceedings of a symposium held in Pittsburgh, April 1965. ABRAHAM LAVI and THOMAS P. VOGL, Eds. Wiley, New York, 1966. 670 pp., illus. $12.50.

The symposium of which this volume is the proceedings was arranged with the object of "providing an opportunity to the practitioners in nonlinear optimization to exchange ideas and to gain familiarity with the concepts and methods of others in different technological areas." In particular, the organizers had as their aim "the breaching of the nomenclature and notation barrier which tends to isolate those who are working on a specific class of problems in a specific field from their counterparts in other areas."

The papers in the volume fall more or less into two basic categories: the optimization of static systems such as nonlinear and integer programing and search techniques; and trajectory optimization, controller synthesis, and performance optimization of dynamic systems with deterministic or stochastic inputs. To comment on the technical contents would require a team of reviewers. Suffice it to note that the reader interested in optimization techniques, especially the computational aspects, will certainly find this a worthwhile reference.

The symposium was successful in that it did bring together workers from the many diverse fields in which optimization problems abound. This very diversity, however—the volume includes papers on control of a space vehicle, on communications systems, and on lens design, for example—may lead some to wonder whether the organizers' aim was not quite impractical. As one attempts to read almost any paper in the volume one is immediately faced with new terminology and peculiar and esoteric notation, and the going can be slow. Strange acronyms pass before the eyes—one sees GROPE, AID, MASS, VARMIT, STEP, LOOK, PARTAN, BEST UNIVAR, SUMT. Have the optimizers compounded the situation by a new and strange terminology? Quite the contrary. It would appear that digital computers (in spite of the strange names of their programs) acting as a catalyst will be the basic means by which optimizers (and others) will be able to communicate. I am sure that all who attended the symposium understood and appreciated (as will readers) A. Leon's paper "A comparison among eight known [sic] optimizing procedures" and other papers describing specific digital computer codes. Optimization implies computation, for the potentialities of numerical techniques cannot be realized without the aid of the computer. One can only hope that the designers of computer programs recognize that their programs are used in many fields and that they can ease the transition between these fields by explicit and complete documentation of their procedures. The establishment of notational and other standards to be used by program designers might be an achievable and worthwhile goal.

The editors have done an excellent job of gathering and arranging the material. The diagrams and figures are many and excellent. A classified bibliography on optimization is included.

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