cluding those of eukaryotic cells and those that synthesize primer RNA's for the initiation of DNA synthesis.

A careful choice of contributors has resulted in a book of high quality. After a brief and interesting historical article by S. B. Weiss about the discovery of RNA polymerase, there is an overview article by M. Chamberlin, written with the clarity and thoroughness that one has come to expect from him. It is an excellent review of the field and a stimulating preview of the rest of the book.

In a very readable article, R. R. Burgess describes various methods for the purification of bacterial RNA polymerases and discusses in detail the problems and artifacts one might encounter in isolating and studying or using the enzyme. The article closes with a summary of some chemical and physical-chemical characteristics of bacterial RNA polymerase. It will be a valuable reference for anyone entering the field.

Other review articles deal with subunit genetics, modifications and functions, mechanisms of initiation and termination, and punctuation signals. About a fifth of the book is devoted to enzymes isolated from yeast, *Drosophila*, wheat germ, and mammalian cells.

The research papers are in themselves reviews of the research currently in progress in the laboratories of the contributors. The papers constitute a rather well-balanced collection: often several discuss a common subject, such as the rho factor and the control of transcription by antitermination.

There is no mention in the book of the psi factor and the excitement and controversy it generated. There appears to have been a concerted effort by the editors to deny that such a factor was ever discussed. The lessons learned from the controversy would be useful for the uninitiated; moreover, those readers not in the field would probably like to know what psi is—or is not. They will not learn it from this book.

Overall, however, the book is well written and comprehensive. It is up to date as of 1976; the subject and author citations are complete, and a wide cross-listing of subjects in the index makes it a valuable source of references. Because of the book's clarity and organization, it would be a very useful textbook in an advanced course on nucleic acid biosynthesis. I strongly recommend that every laboratory working in this field have its own copy.

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Nonlinear Effects in Plasmas

Plasma Physics. Nonlinear Theory and Experiments. Proceedings of a symposium, Lerum, Sweden, June 1976. HANS WILHELMSSON, Ed. Plenum, New York, 1977. xiv, 514 pp., illus. $39.50. Nobel Foundation Symposium 36.

Reflecting the fact that most of the impetus for plasma research in recent years derives from attempts to achieve controlled thermonuclear fusion in order to provide a new source of energy, this book is concerned primarily with topics such as laser-plasma interactions, parametric instabilities, ponderomotive forces, strong plasma turbulence (with emphasis on solitons and cavitons), nonlinear effects in magnetically confined plasmas, and relativistic beam interactions with plasmas.

For the nonspecialist this collection has a number of attractive features. The authors have evidently been given a great deal of latitude as far as length is concerned, which makes it possible to go beyond the usual conference format. Many of the papers are of a quasi-tutorial nature and can serve as an introduction to certain aspects of nonlinear plasma physics for those not actively engaged in such research. This is especially true of a series of papers by authors such as Tsytovich, Galeev and colleagues, ter Haar, and Chen and Liu that deal with strong plasma turbulence in connection with recently developed concepts such as solitons, cavitons, and Langmuir collapse. Another agreeable feature is the interplay between theory and experiment. Though there are only a few experimental papers as such, many of the analytical papers review experimental work or are concerned with particular experimental results. This is the case with the papers on laser-plasma interactions, which discuss topics such as the relation between superthermal electrons and the x-ray spectrum, radiation forces, and the wavelength dependence of the laser-plasma coupling (Brueckner), the modification of hollow glass shells to prevent preheating due to coronal radiation (Johnson), and the effects of pellet and radiation inhomogeneities (Basov and colleagues). These papers all contain detailed comparisons of theory and experiment in laboratories in the United States and the Soviet Union. Numerical computations indicate that the absorption and polarization dependence of the scattered light are inconsistent with classical absorption mechanism but are compatible with certain collective plasma effects (Kruer and colleagues). This group of papers also contains a very readable review of experimental work on parametric instabilities in laser-plasma interactions (Chen) and a coherent discussion of the mechanisms that might be responsible for the generation of lines at 2ω and $(3/2)\omega$, where ω is the incident frequency (Bobin).

The standard theories of weak plasma turbulence use the random-phase approximation, on the assumption that unstable modes are uncorrelated. However, it is gradually being realized that this approach is open to question in the case of parametric instabilities, in which a coherent pump wave can establish phase and amplitude relations between daughter waves. Coherence effects of this kind in parametric interactions are discussed by Dubois and Bezzerides and by Wilhelmsson. Another paper in the general area of coherence effects deals with plasma diffusion due to a single wave in a magnetized plasma (Smith and Kaufman). An interesting paper by Cotsaftis entitled "Nonlinear dynamics of joule heated toroidal discharges" employs methods of group theory and dimensional analysis to obtain a rather striking correlation between the analysis and recent results in the TFR (Tokamak at Fontenay-aux-Roses) device. Another paper on a topic of great recent interest is that on the free-electron laser (Kwan and colleagues).

In general this collection, written by a group of knowledgeable authors, provides a useful survey of a number of specialized topics in contemporary nonlinear plasma physics.

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Abstracts of the Sixth International Congress of Pharmacology. Helsinki, 1975. Pergamon, New York, 1977. 694 pp. $25. *To order this book circle No. 391 on Readers' Service Card.*

Adapting Science to Social Needs. Knowledge, Institutions, People into Action. Proceedings of a conference, Rensselaerville, N.Y., May 1976. Richard A. Scribner and

(Continued on page 294)