able at least as a starting point for treating such problems. The central thesis is that polymerization must proceed by nucleation and that specific small molecules may be important as modulators of polymerization and depolymerization. However, the theory presented is highly oversimplified and in some cases misleading. It is implied that there is a very sharp transition between monomers and helical polymers as the concentration of added monomers is increased above a critical value (fig. 3). However, the equations have a singularity at the critical concentration, and the mathematical problem is not treated explicitly. Furthermore, the authors assume that the free-energy change per bond is constant; consequently their equation 4*a* predicts that the number concentration of polymers with *i* residues decreases with increasing *i*. The interesting feature of biological systems is that long polymers are formed which often have a very narrow length distribution function. It was shown by Casper (1963) that a peak in the length distribution can arise if the free energy per bond decreases with polymer length. Although a simple theory is valuable in that it makes possible a general discussion, the more subtle aspects of the properties of biological polymers should not be overlooked.

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Stars and Plasmas

Plasma Astrophysics. Proceedings of the International School of Physics "Enrico Fermi," Course 39, Varenna, Italy, July 1966. P. A. STURROCK, Ed. Academic Press, New York, 1967. xviii + 364 pp., illus. $19.50.

P. A. Sturrock was the director of the course of which this book is the proceedings; the contributors, each of whom is distinguished in his field, were drawn from universities and institutes in the United States and Europe. The subjects of the lectures may be divided into three general categories: plasma physics, observational astrophysics, and the use of plasma-physical concepts in the interpretation of astrophysical phenomena. Plasma physics and astrophysics are, of course, relatively advanced disciplines, but the application of plasma physics to astrophysics is still at an early stage of development; therefore the appearance of a set of lectures oriented toward plasma astrophysics is welcome.

Several chapters of the book are concerned mainly with fundamental physical processes. The first chapter, an introduction to plasma physics by R. Lüst, is much like the article of the same title which Lüst contributed to course 24 of this series of proceedings; however, the material discussed is so fundamental that its inclusion in this volume is justified. Sturrock's chapter on the elementary theory of electromagnetic waves in plasma is clearly written, covers a wide range of topics, and would be suitable even for a reader not previously acquainted with the subject. Another exceptionally well-presented article is P. A. G. Scheuer's discussion of radiation mechanisms that may be important in astrophysical radio sources; Scheuer's use of simple but deep physical arguments avoids the very complicated mathematics that one often finds in discussions of this subject. Perhaps the most ambitious of the chapters on fundamental plasma physics is R. M. Kulsrud's review of a great variety of plasma instabilities. Kulsrud has succeeded in explaining most of these instabilities by fairly simple physical arguments; nevertheless, his treatment of this very complicated subject would be rather difficult reading for a novice, and would serve best as a review for readers who already have some background in the field of plasma instability.

Most of the lectures on observations and their interpretation treat one of two broad topics: stellar magnetic phenomena (mostly solar phenomena, including flares and radio bursts), and radio galaxies and quasars. H. Zirin's brief discussion of the solar atmosphere (especially the chromosphere) is clearly written, and might be rewarding reading for a beginner; in addition, there are detailed and well-referenced chapters on observations of solar magnetic fields and velocity fields and on the principal theories of stellar magnetism. There are detailed reviews of optical and radio observations of radio galaxies and quasars, and G. R. Burbidge presents a thorough, well-referenced summary of the various theories of quasars and radio galaxies that had been proposed by mid-1966.

A few of the lectures treat in detail specific applications of plasma physics to astrophysics. Sturrock discusses his closely related theories of two phenomena which have vastly different scales, solar flares and radio galaxies (and quasars). E. N. Parker describes his theoretical work on a number of astrophysical topics, including the solar wind, wave generation in the solar photosphere, and the role of the cosmic-ray gas and the galactic magnetic field in the dynamics of the galaxy.

As the editor explains in the introduction to the book, it was not possible to include in the course a set of lectures concerned with solar-terrestrial relations. This omission is unfortunate, for the application of plasma physics to "space science" will doubtless be one of the most fruitful areas of scientific investigation in the near future.

The character of the chapters varies with the authors. In some instances the printed presentation is polished; in others it is a rather telegraphic transcription of lecture notes. Some of the lectures are suitable for students not previously acquainted with the subjects; others are aimed at listeners or readers with a fairly extensive background in the field. In general, the quality of the printing is good, with occasional typographic errors. Anyone seriously interested in the application of plasma physics to the interpretation of astrophysical observations would do well to look through this collection of lectures.

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Sensory Receptor Systems

Lateral Line Detectors. Proceedings of a conference, New York, April 1966. PHYLLIS H. CAHN, Ed. Indiana University Press, Bloomington, 1967. xvi + 496 pp., illus. $18.50.

Among fish and among larval and aquatic amphibians, specialized sense organs are found on the body and head which are called lateral line organs because of their linear distribution on the sides of the animals. These organs are of two kinds: one type detects some function of water displacement at the surface of the body and the other—much rarer in its occurrence—is sensitive to electric field gradients. Historically these two distinct systems have been considered together.

This volume is based on a conference, held at Yeshiva University, which brought together many of the people