based almost entirely on work in their own laboratories. Somlyo does describe work that has taken up a large part of the efforts of a large laboratory for many years. Narahashi, however, limits his chapter to recent work in his laboratory on agents that depolarize nerve membranes. Although it is very interesting, the chapter presents only a small part of the research in his group, a still smaller part of research on axonology in general. This book could use a substantial chapter on neural action potential mechanisms and the ways in which agents interfere with them.

Several of the chapters suffer from aging. They appear to have been written in 1973 and to be based almost entirely on material published in or before 1972. Even when a field moves rapidly, a good review may retain its value for many years. Parsons's chapter on the vertebrate motor end plate suffers, however, from the failure to discuss experiments involving the analysis of synaptic noise. Katz, Stevens, and others have used such analyses to good effect and have thereby expanded our understanding of the problems Parsons discusses.

Finally, Wit and Hoffman's chapter suffers from the presence of some confusing physiology mixed with the fine pharmacology. Cardiac action potentials in their variety and complexity are admittedly exceptionally difficult to study and describe, but this chapter handles the problems only moderately well.

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Particle Physics

Proceedings of the Sixth Hawaii Topical Conference in Particle Physics. Honolulu, Aug. 1975. P. N. DOBSON, JR., S. PAKVASA, V. Z. PETERSON, and S. F. TUAN, Eds. University Press of Hawaii, Honolulu, 1976. x, 562 pp., illus. Paper, $12.

This reasonably priced, timely book presents four in-depth reviews of areas of recent activity in particle physics.

One of the most exciting developments in high energy physics over the last several years has been the advent of experiments utilizing neutrinos as probes of particle structure. Because these experiments are so recent, the lectures on neutrino physics in this book are among the few overviews of this important work that are now available.

The theoretical basis of neutrino physics is outlined in beautifully written notes by Stephen L. Adler. Starting from scratch, Adler develops inclusive scattering theory, quark parton ideas, models of neutrino production of pions, and neutral current phenomenology in a careful pedagogical fashion. The account should prove useful to those already working in the field as well as to those attempting to learn it. A simple discussion of quark models of hadrons is also presented. These lectures are superb.

Complementary to Adler's account is an experimental review of neutrino data by the leader of one of the principal neutrino efforts—B. C. Barish of Caltech. Barish presents data primarily from his own experiment, but also from that of the Harvard-Penn-Wisconsin-Fermilab collaboration, both performed at the National Accelerator Laboratory. Barish's discussion is especially illuminating because together with the data plots it presents an account of the advantages and limitations of the experimental configurations.

The third series of lectures, by Samuel C. C. Ting, is also quite timely. Ting deals with properties of the recently (1974) discovered J(3095) resonance, the narrowness of which strongly suggests the existence of a totally new quark degree of freedom. Ting's discussion is disappointing, however, because what could have been an exciting mixture of experimental results and theoretical speculations is primarily a presentation of the raw experimental facts with little or no clarifying theoretical commentary.

Finally, gauge theory is presented by Chen Ning Yang. He emphasizes that the field tensor $F_{\mu\nu}$ underdescribes electromagnetism—as evidenced by the Bohm-Aharanov effect—and advocates a description in terms of a path-dependent, nonintegrable phase factor. This approach leads to magnetic monopoles (the possible experimental discovery of which was announced during the conference) and to the Dirac quantization condition. Finally, these results are elegantly generalized to non-Abelian groups and to a gauge theory of gravitation. The connection of such models with physics is unclear at present, but the mathematics is beautifully expounded.

None of these lectures is for the uninitiated. But for readers with a graduate level knowledge of physics they provide a useful introduction to some of the frontiers of modern physics, and they should prove especially valuable to students working in high energy physics. I am delighted to add this volume to my library.

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Physics of Instabilities

Fluctuations, Instabilities, and Phase Transitions. Proceedings of a NATO Advanced Study Institute, Geilo, Norway, Apr. 1975. TORMOD RISTE, Ed. Plenum, New York, 1975. viii, 390 pp., illus. $29.50. NATO Advanced Study Institutes Series B, vol. 11.

The physics of instabilities in equilibrium systems has been extensively studied in the past two decades. Theoretical methods and experimental techniques have been developed for studying phase transitions in various physical systems, such as magnetic crystals, fluid mixtures, liquid crystals, and in systems exhibiting structural phase transitions. As was pointed out by R. Landauer in 1961 and independently by others later, there are certain analogies between phase transitions in equilibrium systems and instabilities in nonequilibrium systems. The advanced techniques developed in the field of phase transitions might, therefore, be useful in studying instabilities in nonequilibrium systems.

In order to create an interest in and to encourage a wider use of these techniques, a summer school on Fluctuations, Instabilities, and Phase Transitions was organized. This book consists of the 19 papers presented at the summer school and deals with two main topics: dynamics of first-order phase transitions and hydrodynamic instabilities.

The first part of the book is devoted to dynamics of first-order transitions. Theories of spinoidal decomposition in unstable systems and nucleation in metastable systems are discussed, and results of some recent experiments on phase separation are presented.

The second part of the volume deals with instabilities in nonequilibrium systems. Although these instabilities occur in a variety of physical systems, such as Gunn oscillators and lasers, most of the papers deal with certain types of hydrodynamic instabilities. The only exception is the paper by R. Graham, which deals with optical instabilities as well. When a small external "force" (such as a temperature gradient or an electric field) is applied to a system initially in thermodynamic equilibrium, the system settles down into some nonequilibrium steady state. As the "force" is increased, the system is carried through a sequence of nonequilibrium steady states that differ from one another by their flow character. The hydrodynamic instabilities discussed in this volume are those that lead to clearly structured flows (Rayleigh-Benard, Taylor). Instabilities that lead to a turbulent state