

With the possible exception of the coverage of Tryon's cluster analysis, most researchers will find the treatment very sketchy and elementary (for example, "Correlations do not reveal causation but the degrees of association"). In no case is the coverage sufficient to make reference to the standard methods texts unnecessary. Furthermore, specific examples are nearly always drawn from the author's own research in the rehabilitation of mental patients. A broader selection of problems, situations, and settings would have greatly enhanced the value of this work as a general reference. The book would also be enriched by more references to other traditions of action research, for example, to the classic studies of Elton Mayo and to the many which grew from the pioneering work of Kurt Lewin. There is a vast array of possible strategies for conducting social action research, and a comparison among them would have enlivened and sharpened the author's special viewpoint.

The concluding chapter, which describes the type of center ideally suited for carrying out and disseminating this research, provides some useful ideas on what kind of institutional arrangements we should be building into our society to create effective linkage between social research and social practice. It is in urging social scientists to think upon such issues that Fairweather's book makes its mark. Taken as a whole, it adds to our understanding of how to advance with rational and steady steps toward a better society.

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Insulators and Semiconductors

The Optical Properties of Solids. Course 34, International School of Physics "Enrico Fermi," 1965. J. TAUC, Ed. Academic Press, New York, 1966. 448 pp., illus. \$22.

This volume is one of a kind that is now familiar; it consists of lectures given at a summer school. Such a presentation has both advantages and defects. It cannot be the careful, orderly, and lucid presentation that characterizes the best textbooks of a more or less stable discipline. What it can do is to bring into focus a field that has been developing rapidly. The present volume does indeed concern itself

with such a field—the intrinsic optical properties of insulators and semiconductors.

Band theory has been developed in studies of the simpler semiconductors and is now being applied to the more difficult problems of compounds. In this volume rare gas solids, alkali halides, silver halides, and zinc sulfide type materials are treated along with the classic subjects of germanium and silicon.

Similarly, experimental sophistication has increased. In addition to simple transmission and absorption, there are now a large variety of photoemission,

magneto-optic, piezo-optic, and electro-optic effects that are being exploited. These are described here. When alternating fields are used and the effects observed with phase-sensitive detectors, a vastly increased sensitivity is possible.

This book provides an extensive summary of these developments and is unique in doing so. Having it will be a necessity for those working or planning to work in this field.

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The Life of the Elasmobranchs

Sharks, Skates, and Rays. A symposium, Bimini, Bahamas, January–February 1966. PERRY W. GILBERT, ROBERT F. MATHEWSON, and DAVID P. RALL, Eds. Johns Hopkins Press, Baltimore, 1967. 640 pp., illus. \$15.

Since Darwin, the comparative method has provided by far the most significant approach to biological problems, but recognizing the existence of phylogenies has made comparisons more difficult as well as rewarding. Animals are similar because they are related, and animals are related because they are similar. To avoid circular reasoning, all possible anchor points must be utilized. Paleontological data provide the best of these, but increasing the number of units to be compared also helps. This volume abundantly shows that the elasmobranchs are not just another kind of fish but a distinct type of vertebrate, nearly as different from the bony fishes as from the tetrapods, and capable of furnishing an additional dimension, so to speak, to the disciplines of comparative anatomy, physiology, and behavior. The book resulted from an interdisciplinary symposium on "Current Investigations Dealing with Elasmobranch Biology," held at the Lerner Marine Laboratory in 1966, which was noteworthy for the cross-fertilization of ideas it brought about.

The book begins with an authoritative review of the evolution of the elasmobranchs that should improve the perspective of those comparative physiologists and teachers who still insist on considering the sharks and their relatives to be the ancestors of the mammals and bony fish. The elasmobranchs became separated from the other lines

of vertebrate phylogeny 400 million years ago, at about the same time the bony fish first evolved and long before the mammals and teleosts made their appearance. Systematists and laboratory instructors who have found little of interest in the uniform-appearing exterior of dogfishes and other sharks are due for a surprise when they read the chapters describing the several types of scales, the spines, hooks, spurs, and gaffs, and the elaborate array of sensory pit organs distributed over the bodies of these fish. Other surprising aspects of the lives of sharks turn out to be the complexity of their social relations, their migrations, and the rapidity with which they regularly replace their teeth. That elasmobranchs have complex nervous systems and sense organs is hardly unexpected, but recent studies on the histology and biochemistry of the brain, the morphology and physiology of the eye, and responses to chemical stimulation are noteworthy for the variety of techniques used, some of them specially adapted for handling such awkwardly large and dangerously strong subjects. Flourishing investigations on the electric organs of the bony fishes have revealed an amazing variety of structure and function; the organs of the torpedoes and skates may not be as varied, but they, too, exhibit exceptional properties that defy present explanation while offering exciting future possibilities.

Half of the book concerns comparative physiological and biochemical studies. Elasmobranchs differ distinctly from mammals in the types of proteins and enzymes of their body fluids, respiratory response to hypoxemia, level of blood lactic acid under stress, drug