developed and then considered in the light of the available experimental evidence which supports or contradicts the theory. Terms, which are all too often loosely used, are here rigorously defined. Absolute statements are generally avoided. The entire volume is detailed and documented with over 1000 references. It is recommended as a valuable book which may well become a classic in the field of pharmacology.

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Physics

Introduction to Advanced Field Theory. G. Barton. Interscience (Wiley), New York, 1963. x + 163 pp. Illus. $6.50.

There are several approaches to a relativistic quantum theory of elementary particles. When the covariant perturbation method of the Lagrangian field theory met with difficulties, notably in strong (nuclear) interactions, attempts were made, beginning about 10 years ago, to study the essence of field theory independent of a perturbation approach, or even independent of a Lagrangian. This book is an introduction to what has been achieved along that line of inquiry. The fundamental concept is still that of a *field* through which the interactions of fundamental particles are expressed, contrasted to, for example, the pure S matrix approach, which uses directly observable particle properties, momenta, spin projections, and the like to define an S matrix. The very indirect and unobservable nature of a *field* becomes clear in the first two brief chapters when Barton, starting from the particle properties ("Everyone knows that in no experiment is a field ever observed directly"), introduces free fields by definition, and, later on, using an asymptotic condition, defines the so-called interpolating fields in describing the interactions of particles. The interpolating fields go over in the limit, when the particles are widely separated from each other, to the free fields. Despite the fact that the field concept is definitely a mathematical abstraction, carried over from classical physics, we do not understand the quantum theory of fields well enough to see its limitations. In this sense one would like to see what can and what cannot be done by starting with some general and reasonable postulates about the fields. Unfortunately, it is outside the scope of this little book to connect these general principles with the actual physics of fundamental particles; not even some very general results such as the CPT-theorem and the connection between spin and statistics could be included. On the other hand, the book provides a very clear and readable introduction to these general aspects of quantum field theory. An index and a more detailed bibliography would have been useful.

The connection to the conventional field theory is discussed in chapters 3, 4, 5, and 6 (Green's functions and inhomogeneous wave equation) and in chapters 7 and 8. These chapters are followed by a discussion of the general properties of the simplest diagrams, the so-called two- and three-point functions, and by a lengthy discussion of the Lee model. This is a simple soluble, perhaps not too realistic model, on which however some of the properties of field theories can be studied explicitely. The next chapter deals with special problems created by the systems with an infinite number of degrees of freedom. Finally, in the last chapter, Wightman functions and Haag's theorem are briefly discussed. Here one comes to the limitations, or better to a decision, about some of the seemingly reasonable assumptions about the fields. For the assumption of canonical equal time commutation relations and the absence of inequivalent representations of these rules lead to the unphysical result that only free fields can exist. No final solution to this dilemma is presented.

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Psychology

Motivation: Theory and Research. C. N. Cofer and M. H. Appley, Wiley, New York, 1964, xii + 958 pp. Illus. $12.50.

Thirty-five years ago, while I was enrolled in a course entitled Motivation, a professor-friend of my instructor seriously asked me if there was enough factual material on motivation to justify the title or, for that matter, the course. The answer given was a hesitant, "I suppose so." Today the answer would be a quick affirmative followed by a suggestion that the enquirer have a look at Cofer and Appley's *Motivation: Theory and Research.* Although the authors of this volume modestly say that ". . . a comprehensive, definitive psychology of motivation does not yet exist," they actually have a production that has little in common with the texts and research materials of yesteryear. A notion of the enormity of the changes in this field may be gained from the book's 96 pages of bibliography, a spot check of which indicates that 70 percent of the entries are research reports. Furthermore, in this new book one does not find enumerated for memorization such past fantasies as Overstreet's six ways of capturing attention, McDougall's ten principal instincts, Dunlap's nine fundamental desires, Allport's six prepotent reflexes, Tolman's eight appetites, and other similar circularities. Instead, in eight chapters are presented extensive experimental findings arranged under such headings as bodily conditions, activity, emotion, stress, and reinforcement. Five chapters summerize numerous case records and naturalistic observations under rubrics like instinct, self-actualization, and psychoanalysis. The other three chapters are introductory, historical, and summary.

The organization of the book is really achieved in connection with three current views or theories of causes of, and factors that control, behavior—namely, instinct, homeostasis, and hedonism. A portion is concerned with ethologists' work directed toward discovering energy releasers for fixed behavior called instinct. Next comes the major part of the work, which bears on the notion that living organisms, especially mammals, possess a disposition to achieve and maintain a balanced or homeostatic equilibrium. The remaining material is that which is traditionally regarded as affective or hedonistic. The authors view the homeostatic or equilibratory concept as having widespread utility for motivation, but their own preference for a motivational theory is a variant that they call sensitization- and anticipation-invigoration mechanisms. Thus, invigoration is the key, and it occurs when bodily states or conditions deviate from previous ones. In such states, an organism