recommend this monograph to researchers and students.

If the book is to be criticized, then one should mention that the literature citations end in the fall of 1965, three years before the book appeared. This apparent delay in publication is hard to understand. Only a few addenda are given. Thus a large body of literature that deals with new and fascinating aspects of insect endocrinology is entirely omitted. For example, discussions concerning concepts of hormonal (neurosecretory) control of metabolism or of hormone action on the cellular and subcellular levels during ecdysis are incomplete and will have to be revised. Furthermore, only a few of the leading findings from the years prior to 1958 are mentioned, and no literature is quoted for those years. Apparently space limitations necessitated this omission. The reader who is interested in these early original contributions to insect endocrinology is referred to other monographs.

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Weatherglasses

English Barometers, 1680–1860. A History of Domestic Barometers and Their Makers. NICHOLAS GOODISON. Potter, New York, 1968. xiv + 354 pp., illus. $15.

The barometer, an instrument for the measurement of the weight of air which was invented more than three centuries ago, not only has served as a tool of the scientist, but also has been applied domestically to prognosticate the alterations of the weather.

In a comprehensive work entitled *The History of the Barometer* published in 1964 (reviewed in *Science*, 8 May 1964, p. 727), W. E. K. Middleton considered the barometer as a purely scientific instrument and provided a detailed history of its evolution and technical development. Goodison, on the other hand, presents the instrument from the point of view of its design and its domestic use in England, although he includes a brief history of the mercury barometer from its invention to the advent of the aneroid barometer in the second half of the 19th century. His work deals in detail with its commercial manufacture and with the English clockmakers and mathematical instrument makers who produced mercury barometers from 1680 to 1860, and provides adequate consideration of the barometer's technological development throughout this period.

The work is divided into three parts, of which the first consists of a clear statement of the principle and functions of the mercury barometer and a survey of its production by English makers. A second section is devoted to biographical sketches of the 50 most important English makers, arranged alphabetically and illustrated with fine reproductions of trade cards and other materials and excellent, often full-page, photographs of instruments. The final section provides a briefer listing of approximately 1700 lesser makers and dealers. These last two sections in particular are useful not only to those interested in the history of the barometer but also to scholars and students concerned with the history of horology and of mathematical instruments in England.

This volume is distinguished by the many photographs of outstanding quality made expressly for it, of which several are in color, and a number of clear drawings which explain technical features. The material is clearly presented and carefully documented throughout. Goodison's work supplements Middleton's history and is in itself a most useful reference work on English mercury barometers as well as clocks and instruments for the three centuries covered.

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Functional Formulation

Statistical Continuum Theories. MARK J. BERAN. Interscience (Wiley), New York, 1968. xvi + 424 pp., illus. $17.50. Monographs in Statistical Physics and Thermodynamics, vol. 9.

As anyone who knows the subject even remotely will be aware, statistical theories have played an increasingly dominant role in continuum theory in the past few decades. An attempt to present this aspect of continuum theory in a systematic manner is therefore welcome.

The book opens with a short chapter of discussion of the type of problems one encounters in statistical theories. This is followed by a chapter of definitions and mathematical preliminaries in probability theory and the theory of functionals. In the third chapter, functional equations for various physical problems are derived, and moment equations are obtained from them. These moment equations are also derived directly from the governing differential equations. Furthermore, perturbation techniques and the method of the cumulant neglect hypothesis are introduced in order to terminate the infinite set of moment equations, and variational principles for finding effective physical constants are presented. Next, four chapters are devoted to the theory of partial coherence, the theory of heterogeneous materials, flow through porous media, and turbulence.

This book is intended primarily to acquaint the reader with the problems one faces when one tries to formulate a continuum problem from a statistical point of view. In particular, it will enable research workers in any one of the variety of disciplines in which statistical formulations are used to learn something about the others. As the author points out in his preface, the functional formulation used in the early chapters "provides a unifying approach since if a statistical problem is formulated in terms of functionals, the basic presentation of the problem is similar in many fields." However, existing knowledge of functionals is quite limited, and hence their use "has not yet proven very fruitful in solving statistical problems." Thus once the problem to be solved is formulated, the associated hierarchy of moment equations must be derived and whatever approximate techniques are at hand must be used to solve it.

The level of the book is apparently that of advanced graduate students in engineering or physics. The topics dealt with are treated with clarity and in considerable depth.

On the debit side, this book lacks exercises for students; hence it will not be suitable for use as a standard textbook. Furthermore, some of the examples given are not well chosen. For example, the calculation of effective constants in the chapter on the theory of heterogeneous materials is presented only for the static case, and the more interesting dynamic case, abundant in literature, is neglected.

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