Principles and Cytogenetic Disorders and the other headed Genetic Disorders Involving Various Systems and containing separate papers on for example skin, connective tissue, and the gastrointestinal system. The format of the latter section is unfortunate, since multisystem diseases (and most diseases do involve more than one system) are fragmented and discussed in a brief and superficial way in various chapters. The medical geneticist, in particular, must view a disease with regard to its total influence on the patient and his family, not as it affects a particular system. As a result of this tendency for the discussions of individual clinical entities to be brief and superficial, this text will serve only as a starting point for further reading. This, however, is one of the book's major assets, every discussion being documented by an excellent and up-to-date bibliography.

Part 1, dealing with genetic principles, is in general readable and well done in the sense that it gives an accurate survey of basic genetics. It is unfortunate that cell hybridization, a new and powerful method of studying gene localization, linkage, and cell physiology, and recent advances in the study of evolution through protein structure are not mentioned.

Particularly good are the sections on the hemoglobinopathies, connective tissue, and the endocrine system. On the other hand, in view of the fact that the major application of our knowledge of human genetics to medicine lies in genetic counseling, the discussion of that subject is weak. The author does not address himself sufficiently to the power of this great advance in clinical medicine, including both pre- and postconceptional counseling. In fact, the latter is completely ignored.

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Improving Endocrine Research

Statistics in Endocrinology. Proceedings of a conference, Dedham, Mass., Dec. 1967. JANET W. MCARTHUR and THEODORE COLTON, Eds. M.I.T. Press, Cambridge, Mass., 1970. xiv, 476 pp., illus. $12.50.

The conference of which this book is the proceedings was held three years ago, but the value of the book is not lessened by the publication lag. Furthermore, in spite of the wide range of topics and details of mathematical treatment included, because of excellent cross-referencing from one chapter to another the book has more coherence and smoothness of style than might be expected. For this happy result the editors deserve praise.

The book consists of 23 chapters written by 29 authors, at least 16 of whom are specialists in applied mathematics, especially statistics. A bibliography and an index are included. The format and printing are pleasant to the eye, and the copy editing has been well done. Two chapters of general discussion contributed by many of the 37 conference participants as well as by the authors are included, and most of the individual chapters have discussions appended also. The editors have treated the discussions well, so they are interesting and pertinent (with occasional references) and give the satisfying impression that the questions forced the experts to sweat —yet the replies are to the point, competent, and clear.

This is a book about statistics addressed to problems arising out of endocrine research, with examples taken from primary endocrinology literature. Papers range from introductory but solid philosophical discussions of experimental design, problems of invalidity in bioassays, the nature of digital computers, and the use of mathematics in biology to advanced, highly specific, technical opinions from the experts about how to deal with outliers, unbalanced designs, missing values, and the choices to be made among various statistical techniques when several may seem to apply to the problem at hand. Most of the chapters present comments about particular techniques from parametric and nonparametric statistics that may be applied to classes of experiments and data common in endocrine research. The level of presentation is above that of a first course in statistics, and if the reader does not already know, and preferably already use, t and F distributions, logit or probit transformations, analysis of variance, sign tests, randomization, and models in his endocrine work he may have some difficulty in reading parts of this book with sufficient comprehension to use immediately what he has read to improve his performance in the laboratory. But for the professional endocrinologist who already uses many of the concepts and techniques discussed in this book, but who does so with diffidence and knows he may use them badly (a category that includes me and many of my friends), this book can be very valuable. Reading it made me aware of the sometimes appalling lack of care with which experimental design is chosen and data are treated in endocrine work, including my own. I couldn't help wondering what would happen if the high level of statistical competence represented by the authors of this book were brought to bear on the many routine manuscripts I and other reviewers pass upon for endocrinology journals. What would happen to the rejection rate?

Endocrinology is a branch of science in which reproducibility of experimental results is notoriously low: relevant conditions are not always adequately described or known, and the experimental design may not have been optimized to answer the question being asked (supposing, charitably, that the investigator had a question clearly in mind when he started to collect his data). For such a branch of science, a book such as this is not merely useful, but can also serve to elevate the conscience of the reader so that he will no longer settle for his past casualness in matters of experimental design and treatment of data. Thus, at least for me, the book had an almost moral effect—it made me desire to do better work, and it points the way. However, to travel far along that way a more detailed exposition of statistical theory and practice would be necessary; fortunately, the references supplied are well chosen.

If you are an endocrinologist, and more especially if you are doing radioimmunoassays or bioassays, and if you know that in statistical matters you are a slothful sinner, this book is for you. I expect it to find a large market in endocrinology. Although it may be too much to believe that preceptors will actually read it, their graduate students will—and endocrinology will profit.

Because the book is wide-ranging, a critical review of each of the chapters is inappropriate here. However, I believe it will be helpful to offer a partial list of the contents. Some of the chapters are: "Experimental design," "Analysis of variance," "Multiple comparisons," "Continuous-response assays," "Quantal-response assays," "Obtaining maximal information from bioassays," "Nonparametric statistics," "Radioimmunoassays," "Saturation assays," "Statistical quality control of radioimmunoassays," and "Dose-response curves for radioimmunoassays."

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