providing the conceptual framework for much of this work.

When the book first appeared, it received a quite critical review by S. O. Mast in *Science* [**93**, 619 (1941)]. In their preface to the Dover edition, the authors gracefully acknowledge both the justice of some of his factual comments and the extent of Mast's influence on their thinking. However, Mast was also concerned about anthropomorphic analysis of behavior and about the pernicious use of categories as causal agents ("Negative phototaxis takes it [*Littorina*] inward. . ."). As a general admonition to students of animal behavior, these concerns are as relevant now as they were at any time in the past. However, they are not appropriate comments on this monograph. Despite the fact that the quotation is drawn from their book (page 298), the sense and spirit of Fraenkel and Gunn's analysis seem wholly on the side of the angels in these matters.

The combination of wartime circumstances that made this a rare book as soon as it was published is explained by the authors. Dover is to be congratulated for rescuing an excellent monograph and for making it available at a price that should place it where it belongs—on the bookshelf of every biologist.

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Methods and Techniques

Clinical Research Design and Analysis in the Behavioral Sciences. Eugene E. Levitt. Thomas, Springfield, Ill., 1961. xxii + 199 pp. $8.50.

This book is quite frankly addressed to practitioners and clinicians who need to understand some aspects of research methodology and some of the statistical devices for dealing with research data. The term *behavioral sciences* in the title is somewhat misleading, for the book is really an attempt to discuss, in a general way, some problems in research design and some problems in the philosophy of science. It deals also with methodological considerations and with elementary statistics. The behavioral sciences are involved only in the sense that many examples are taken from areas of the behavioral sciences—and because the author seems to think that clinical research is related somewhat exclusively to areas of the behavioral sciences. As a matter of fact, his general statements about philosophy of science, methodology, and basic statistical techniques apply to many endeavors in the biological sciences, which are also of interest to some clinicians. It becomes, therefore, an effort to inculcate some rigor into the methods of defining research problems and a discussion of several related details—some techniques used in conducting an experiment, the conclusions one can draw from the experiment, and ways of reporting the results of research.

The author, Eugene Levitt, stresses in his preface that the book is a pragmatically oriented document; he calls it a "how-to-do-it-yourself cookbook," a fairly accurate description. Therefore he develops a somewhat arbitrarily concatenated sequence that includes the bits of knowledge and wisdom one accumulates from formal training in statistics, from courses in the philosophy of science, from designing and conducting research, and from efforts to accomplish a research objective. I feel that the accumulation of information presented is fairly extensive and essentially correct but that it is unlikely to provide a great deal of help for a person who has not struggled through some of the experiences described above. Anyone who has given serious thought to the problems discussed in the book and who, because his training has not been systematic and thorough, finds that he has lacunae of fact or understanding may well find that this book helps to fill in some parts of the jigsaw puzzle. However, it is not likely to be very useful to those with little sophistication or prior interest in the quantitative treatment of data, in the formulation of hypotheses, or in the rigorous conduct and interpretation of research.

The first eight chapters are an attempt to introduce some concepts of scientific inquiry, and they contain some information on statistical procedures as well. Chapter 9, a very simplified description of statistics, is limited to material that today is considered extremely elementary and does not go beyond zero order correlations and some tests of the significance of differences. After the discussion of statistics there is a short chapter on drawing inferences and conclusions and another on the mechanics of preparing a research report, which I feel is a bit superfluous.

One can offer no serious criticism of the book in terms of the correctness of its material, but one is a little disenchanted by the simplicity and the elementary nature of much of the discussion. At the same time the superficial handling of some fairly complex problems is disturbing. As I have already indicated, the self-made statistician and the student of behavior who has almost achieved an adequate proficiency in the use of such materials may find the book helpful; the real neophyte or the uninitiated may be somewhat bewildered, or even led to a false sense of confidence.

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Fiber Plants

The Wild Species of Gossypium and Their Evolutionary History. J. H. Saunders. Oxford University Press, New York, 1961. viii + 62 pp. Illus. $2.40.

Botanists familiar with *The Evolution of Gossypium and the Differentiation of the Cultivated Cottons* [Hutchinson, Silow, and Stephens (1947)] will welcome this new book, and they will find it a most useful supplement to the earlier work.

Part 1 consists primarily of drawings of the genus' 19 wild species that have 13 chromosomes. These drawings were made from living material under cultivation at Shambat in the Sudan. The fact that one artist is responsible for 18 of the illustrations makes them more useful for comparative purposes.

Short notes are also included on each of the sections into which the genus is divided cytogenetically. The genome classification of Beasley is followed.

The A genome is represented only by the *africanum* race of *Gossypium herbaceum*. Two African species comprise genome B. The three endemic Australian species make up genome C. The D genome is the largest and most valuable, with eight species and one variety found in Western, Middle, and South America. Five species of southwestern Asia and eastern Africa are assigned to genome E.

Part 2 presents a short but adequate and up-to-date summary of the world distribution and evolutionary history of the genus, including the New World cultivated cottons and the single wild tetraploid, *G. tomentosum*, of Hawaii.

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Cytogenetics and Embryology

Theodor Boveri. Leben und Werk. Fritz Baltzer. Wissenschaftlicher Verlag, Stuttgart, Germany, 1962. 194 pp. Illus.

Historical perspective is in danger of getting lost under the impact and the tempo of modern scientific production, and little is being done to keep the memory of the founding fathers of modern science alive. For this reason, the German series of short biographies of great scientists, to which Baltzer has contributed this volume on Boveri, deserves credit and emulation. Following the design of this series, the first part is biographical, and the second part gives an outline, in nontechnical language, of Boveri's scientific achievements. Baltzer, a student and friend of Boveri, and himself one of the leaders of European embryology, speaks with the authority that only an intimate personal acquaintance with the man and his work can give. His presentation, interwoven with personal reminiscences, does full justice to Boveri's complex and not easily approachable personality, in which ingenious imagination and penetrating clarity of thought were combined with artistic sensibility. Special chapters give a vivid picture of the life in the small Zoological Institute of Würzburg, where Spemann and Baltzer himself grew up, and of the congenial atmosphere at the Zoological Station at Naples, where Boveri's famous investigations on sea urchin eggs originated.

The contributions of Boveri to cytogenetics and embryology are of such a fundamental nature that they are almost lost in anonymity. Nowadays one is hardly aware that the persistence of chromosome individuality during interphase and the qualitative differences of chromosomes as carriers of genetic material were once highly controversial issues and that these concepts had to be given rigorous proof before the edifice of modern cytogenetics could be built. And it is probable that few embryologists will associate the name of Boveri with the foundation of gradient theories or with the basic concept that the cytoplasm determines nuclear and specifically chromosomal activities. Boveri's theoretical acumen, his mastery of microscopic observation, and the ingenuity and elegance of his experimental designs, in short, the very spirit of his creativity, is recaptured in Baltzer's straightforward, yet eloquent, presentation.

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New Books

Mathematics, Physical Sciences and Engineering

Introduction to Probability and Statistics. Henry L. Alder and Edward B. Roessler. Freeman, San Francisco, Calif., ed. 2, 1962. 301 pp. Illus. $5.50.

Lectures in Theoretical Physics. vol. 1. The Brandeis Summer Institute, 1961. R. S. Eden, J. C. Polkinghorne, G. Källén, and J. J. Sakurai. Benjamin, New York, 1962. 397 pp. Illus. Paper, $4.

Mathematics in Everyday Things. William C. Vergara. New American Library, New York, 1962 (© 1959). 304 pp. Illus. Paper, $0.75.

Modern Algebra and Trigonometry. Elbridge P. Vance. Addison-Wesley, Reading, Mass., 1962. 384 pp. Illus. $5.50.

Molecular Structure and the Properties of Liquid Crystals. G. W. Gray. Academic Press, New York, 1962. 321 pp. Illus. 63s.

The Nomographic Computation of Complicated and Highly Saturated Magnetic Circuits. Otto Benedikt. Pergamon, New York, 1962. 283 pp. Illus. $15.

Non-Destructive Testing of Concrete. R. Jones. Cambridge Univ. Press, New York, 1962. 113 pp. Illus. $4.75.

Polarized Light, Production and Use. William A. Shurcliff. Harvard Univ. Press, Cambridge, Mass., 1962. 216 pp. Illus. $6.25.

Principles of Self-Organization. Heinz Von Foerster and George W. Zopf, Jr., Eds. Pergamon, New York, 1962. 559 pp. Illus. Plates. $15. Transactions of a symposium, sponsored by the Informations System Branch of the Office of Naval Research, held at the University of Illinois, 8–9 June 1961.

Progress in Polarography. vol. 1. P. Zuman and I. M. Kolthoff, Eds. Interscience, New York, 1962. 369 pp. Illus. Plates. $12.

The Real Number System in an Algebraic Setting. J. B. Roberts. Freeman, San Francisco, Calif.. 1962. 154 pp. Illus. Paper, $1.75.

Regular Solutions. Joel H. Hildebrand and Robert L. Scott. Prentice-Hall, Englewood Cliffs, N.J., 1962. 190 pp. Illus. $7.

Reliability: Management, Methods, and Mathematics. David K. Lloyd and Myron Lipow. Prentice-Hall, Englewood Cliffs, N.J., 1962. 550 pp. Illus. Trade ed., $15; text ed., $11.25. A volume in the Space Technology Series edited by C. W. Besserer and Floyd E. Nixon.

Semimicro Laboratory Exercises in General Chemistry. J. Austin Burrows, Paul Arthur, Otto M. Smith. Macmillan, New York, ed. 3, 1962. 329 pp. Illus. Paper, $4.

Space Research. vol. 2. Proceedings of the 2nd International Space Science Symposium, Florence, 1961. H. C. van de Hulst, C. de Jager, and A. F. Moore, Eds. North-Holland, Amsterdam; Interscience, New York, 1961. 1256 pp. Illus. Plates. $29.50.

Structure and Properties of Organic Compounds. A brief survey. Carl R. Noller. Saunders, Philadelphia, Pa., 1962. 260 pp. Illus.

Successful Mineral Collecting and Prospecting. Richard M. Pearl. New American Library, New York, 1961. 164 pp. Illus. Paper, $2.95.

Systems Philosophy. An introduction. David O. Ellis and Fred J. Ludwig. Prentice-Hall, Englewood Cliffs, N.J., 1962. 398 pp. Illus. Plates. Trade ed., $13; text ed., $9.75. A volume in the International Series in Engineering.

The Morphology of the Earth. A study and synthesis of world scenery. Lester C. King. Hafner, New York, 1962. 711 pp. Illus. Plates. $13.50.

The Nature of Atoms and Molecules. A general chemistry. Ewing C. Scott and Frank A. Kanda. Harper, New York, 1962. 777 pp. Illus. $8.

The New Mathematics. Irving Adler. New American Library, New York, 1962 (© 1958). 192 pp. Illus. Paper, $0.60.

New Perspectives in Physics. Louis de Broglie. Basic Books, New York, 1962. 303 pp. $6.

Thermal Environmental Engineering. J. L. Threlkeld. Prentice-Hall, Englewood Cliffs, N.J., 1962. 527 pp. Illus. Plates. Trade ed., $16; text ed., $12.

Ultra-violet and Infra-red Engineering. W. Summer. Interscience, New York, 1962. 320 pp. Illus. Plates. $7.50.

Unified Organic Chemistry. Charles A. MacKenzie. Harper, New York, 1962. 593 pp. Illus. $8.50.

Use and Abuse of Statistics. W. J. Reichmann. Oxford Univ. Press, New York, 1962. 336 pp. Illus. $5.

Vector Mechanics for Engineers. pt. 2, *Dynamics.* Harry R. Nara, Ed. Wiley, New York, 1962. 443 pp. Illus. $6.50.

Vocabulary of Mechanics in Five Languages: English, German, French, Polish, Russian. Based on the work of M. T. Huber, revised by the Board of Terminology for Mechanics, Polish Standards Committee, A. T. Trokolanski, chairman. Pergamon, New York, 1962. 198 pp. $15.

World Dictionary of Mathematicians, 1961. International Mathematical Union and Tata Institute of Fundamental Research, Bombay, India. 250 pp. Paper.

The World of Ice. James L. Dyson. Knopf, New York, 1962. 422 pp. Plates. $6.95.