educational stream and to the point where they have an impact on the education of the student is sorely needed." Following this statement he lists seven possible reasons why recommended curriculum changes were ineffective.

Part 2 includes six chapters that review the literature of research on biology teaching. The areas reviewed are books on the teaching of secondary school biology, objectives of high school biology, criteria for the selection of course content, biology textbooks, learning of biology, and instructional resources. One chapter is devoted to unresolved problems in biological education and another to problems and issues in biology teaching.

The value of the book is due largely to part 2, which presents under one cover a vast amount of otherwise scattered information. The author's analysis of the ills and problems of secondary school biology is particularly good.

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Probability

The Algebra of Probable Inference. Richard T. Cox. Johns Hopkins Press, Baltimore, Md., 1961. x + 114 pp. $5.

The answer to the common question as to what probability "really is" is the demonstration that any quantity measuring the chance of an event and having the properties we would expect must be the probability we know. These assumed properties may be the axioms of measure theory but, for the specific case of probability, simpler and more intuitive assumptions can be used.

In this book, Richard Cox begins by deriving the elementary laws of probability from nothing but the Boolean algebra of logic (which he develops convincingly on the spot) and the following two eminently reasonable axioms:

1) The probability of an inference on given evidence determines the probability of its contradictory on the same evidence;

2) The probability on given evidence that both of two inferences are true is determined by their separate probabilities, one on the given evidence, the other on this evidence with the additional assumption that the first inference is true.

Care is taken to make clear what follows willy-nilly from the axioms and what is arbitrary. The author acknowledges his indebtedness to Keynes's *A Treatise on Probability*, and he has sensibly retained some of the good features of that work—for example, the insistence that a proposition can have a probability only in relation to a given hypothesis.

In the remaining two-thirds of the book, two other concepts, whose "real meaning" is often questioned, are also developed from simple axioms. These are the concept of the entropy (in the information theory sense) of a system of propositions and the concept of expectation. The book closes with a five-page explanation of inductive argument, which could be recommended anywhere as a text for this much misunderstood basis of the scientific method.

Throughout the book the proofs, starting as they do from first principles, are unavoidably laborious, and this, combined with the pleasant but discursive style of the text, often makes it difficult for the reader to keep track of the over-all course to be sailed. The use of notation which is neither standard nor mnemonically suggestive adds to the difficulty of the reading. Nevertheless, the work is there, and the book might be read with considerable interest, not as a text (for which it was not intended) but as outside reading, by any student or professional who is working in the field of probability, statistics, or information theory and who would appreciate a different approach to the groundwork of his field. The author neither treats mathematics as a bag of tricks nor forgets the applications of the subject.

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New Books

General

Advances in Documentation and Library Science. vol. 3, part 2, *Information Retrieval and Machine Translation.* Allen Kent, Ed. Interscience, New York, 1961. 698 pp. Illus. $25.

Air Bombardment. The story of its development. Sir Robert Saundby. Harper, New York, 1961. 271 pp. Plates. $5.

American Industrial Research Laboratories. Frederick A. White. Public Affairs Press, Washington, D.C., 1961. 239 pp. $6.

Doctors, Patients and Health Insurance. The organization and financing of medical care. Herman Miles Somers and Anne Ramsay Somers. Brookings Institution, Washington, D.C., 1961. 595 pp. $7.50.

The Philosophical Impact of Contemporary Physics. Milič Čapek. Van Nostrand, Princeton, N.J., 1961. 431 pp. $7.50.

Seeds. The yearbook of agriculture. U.S. Department of Agriculture, Washington, D.C., 1961 (order from Supt. of Documents, GPO, Washington 25). 605 pp. Illus. + plates. $2.

Springtime of the Stars. Georges Beau. Translated from the French by Hector A. Chiselsharpe. Criterion Books, New York, 1961. 149 pp. $3.95.

Teaching and Learning in Medical School. George E. Miller, Ed. Harvard Univ. Press, Cambridge, Mass., 1961. 317 pp. $5.50.

Mathematics, Physical Sciences, and Engineering

Antenna Engineering Handbook. Henry Jasik, Ed. McGraw-Hill, New York, 1961. 1060 pp. Illus. $22.

Basic Concepts in Modern Mathematics. John E. Hafstrom. Addison-Wesley, Reading, Mass., 1961. 205 pp. Illus. $5.75.

Elementary Mathematical Analysis. A. E. Labarre, Jr. Addison-Wesley, Reading, Mass., 1961. 718 pp. Illus. $7.75.

Fuel Element Fabrication. With special emphasis on cladding materials. Proceedings of a symposium held in Vienna, 10–13 May 1960. Academic Press, London, 1961. Illus. vol. 1, 549 pp., $14; vol. 2, 396 pp., $10.

Geologie Von Bayern. Adolf Wurm. Gebruder Borntraeger, Berlin, 1961. 572 pp. Illus. DM. 96.

An Introduction to the Analysis of Spin-Spin Splitting in High-Resolution Nuclear Magnetic Resonance Spectra. John D. Roberts. Benjamin, New York, 1961. 122 pp. Illus. $4.95.

Introduction to Nuclear Engineering. Raymond L. Murray. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1961. 397 pp. Illus. Trade edition, $12; text edition, $9.

Introduction to the Theory and Applications of Dispersion Relations. M. L. Goldberger. Wiley, New York, 1960. 671 pp. Illus.

Meteor Science and Engineering. D. W. R. McKinley. McGraw-Hill, New York, 1961. 318 pp. Illus. $12.50.

Progress in Very High Pressure Research. Proceedings of an international conference held 13–14 June 1960. F. P. Bundy, W. R. Hibbard, Jr., and H. M. Strong, Eds. Wiley, New York, 1961. 333 pp. Illus. + plates. $12.

The Quantum Mechanics of Many-Body Systems. D. J. Thouless. Academic Press, New York, 1961. 184 pp. Illus. $5.50.

Radioisotope Applications Engineering. Jerome Kohn, René D. Zentner, and Herbert R. Lukens. Van Nostrand, Princeton, N.J., 1961. 576 pp. Illus. $16.50.

Satellite Environment Handbook. Francis S. Johnson, Ed. Stanford Univ. Press, Stanford, Calif., 1961. 167 pp. Illus. $5.50.

Topology. John G. Hocking and Gail S. Young. Addison-Wesley, Reading, Mass., 1961. 383 pp. Illus. $8.75.