

textbook, *Introduction to Concepts and Theories of Physical Science*, but in the present book the mathematical and conceptual material are developed more extensively, and there is more material on physical optics, electricity and magnetism, and nuclear physics. The newer book does not replace the older one but provides a differently weighted treatment. As in the older book, there is great emphasis on the basic concepts and theories, on their historical development, and on the relationship between theory and experiment. The nature of scientific thought and discovery is carefully explained and elucidated, and the material is organized according to the historical and philosophical development of physical science.

There are nine parts: "The study of motion"; "The study of forces"; "The study of planetary systems"; "On structure and method in physical science"; "The conservation principles"; "Origins of atomic theory in physics and chemistry"; "Theories of fields in electricity and magnetism"; "The quantum physics of light and matter"; and "The nucleus."

The book is excellently organized and written, and I found it a pleasure to read. It could be read with profit by physics specialists, who too often learn little about the philosophical aspects of science while they are mastering the techniques, and it could well be used to supplement the more specialized texts used in courses for physics and engineering majors. At the same time, the technical exposition is very well done; there are many good examples and problems, and students should learn a good deal of basic physics from the book.

*Physics*, by Semat and Katz, is intended for students of science and engineering; according to the authors, "it aims to develop both an understanding of the important concepts of physics and some analytical skill in the solutions of problems. The mathematical level . . . is such that it may be used by students who are taking a course in calculus concurrently." Thus, calculus and vector analysis are used throughout. The subject matter is divided into six parts—"Mechanics," "Heat," "Wave motion and sound," "Electricity and magnetism," "Optics," and "Atomics and nucleonics."

In view of the fact that Semat is one of the authors it is not surprising that the book is an excellent one. The exposition is clear; the coverage is complete and thorough; the figures and diagrams are plentiful and helpful; and there are many good problems and modern examples. As one who works in the field of Nuclear Engineering, I found the treatment of units especially appealing. In the sections on mechanics, heat, and sound, the British engineering

system and the centimeter-gram-second and meter-kilogram-second metric systems are used; in the section on electricity and magnetism, the rationalized meter-kilogram-second system is the main one used, but the unrationalized Gaussian system is also developed because of its wide use. There are very helpful tables of equations and conversion factors for the various units used in electricity and magnetism. The treatment of atomic and nuclear physics is particularly good for those students who will not go on to a separate course in these subjects.

*Physics for Engineers and Scientists*, by Fowler and Meyer, was written, according to the authors, in response to "the present-day pressure by colleges of engineering for reducing the purely engineering content of general physics as it is commonly taught and increasing the attention given to modern physics." Instead of following the traditional division of physics into mechanics, heat, wave motion and sound, and so forth—as, for example, in the book by Semat and Katz—the authors attempt a more unified treatment, in which atomic and molecular concepts are introduced, as is electricity, much earlier than in most physics textbooks. Vectors and calculus notation are used throughout, but formal calculus manipulations are presented in such a way that they may be omitted by students who have insufficient mathematics. The result is a book which has less detail and is less thorough than that by Semat and Katz (it is shorter by about 400 pages) but which is more homogeneous in its treatment. The figures are excellent, and there are many helpful examples and problems.

I do not have enough experience in the teaching of elementary physics to compare the effectiveness of this treatment with that of the traditional kind of presentation, but the treatment is certainly an interesting one, and one which should appeal to many teachers and students.

The books by French and by Blanchard *et al.* are two more attempts to meet the increasing need on the part of scientists and engineers for a mastery of the concepts and methods of modern physics. French's *Principles of Modern Physics* traces the development of the concepts and theories of modern physics; the author has tried "in the space available to trace the progress of some of our more important physical concepts with the help of a minimum of detailed information." The chapter headings indicate the scope of the book: "The atomic theory of matter," "Light and the electromagnetic field," "The atomicity of electric charge," "Thermal radiation and the quantum theory," "Quanta and atoms," "Relativity," "Wave mechan-

ics," "Some applications of quantum mechanics," and "The nucleus."

The author has succeeded very well in his aims and has produced a clear, logical, and consistent account of the basic ideas of modern physics. The interrelation between theory and experiment is clearly brought out, and enough examples are given to show how the concepts are used. The style is laconic, and there is no danger that the student will miss the forest for the trees; with some collateral reading (and there is an adequate bibliography for each chapter), French's book will provide science students with a sound introduction to modern physics.

*Introduction to Modern Physics*, by Blanchard, Burnett, Stoner, and Weber, stems from a required course in atomic and nuclear physics in the engineering curricula at Pennsylvania State University. The direction and speed of technical development in the modern world make a course of this type essential for engineering students, and this book should be a good text for such a course. The scope is somewhat broader than that of French's book, and more applications are included. In addition to the subject matter covered by French, there are chapters on "Molecules and solids," "Ranges absorption and detection," "Nuclear reactions," "Applications of nuclear physics," and "High-energy research." The treatment is less deep and less critical than that of French, but the greater breadth should serve to provide a satisfactory background in modern physics for future engineers. The book is clearly written and has a good supply of examples, problems, and references.

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**Mental Subnormality.** Biological, psychological, and cultural factors. Richard L. Masland, Seymour B. Sarason, and Thomas Gladwin. Basic Books. New York, 1958. 442 pp. \$6.75.

In the last two decades, with the decrease in incidence and urgency of the acute infectious disorders, the enormous toll exacted by the chronic disorders has been bared. Of these, the large group of conditions included under the rubric of mental subnormality (depending upon definition, 3 to 14 percent of the population are included in this group), is by far the most costly to society and the individual affected. The problems of research, prevention, and care are apparently so overwhelming that the entire area has been and is badly neglected. However, the increasing concern of governmental and private agencies, as well

as the country as a whole, promises much for the future.

Under the auspices of certain of the national, private, and public health foundations and institutes concerned with the problem, Masland, Sarason, Gladwin (neuropsychiatrist, psychologist, and anthropologist, respectively) were commissioned to review critically the past and present research and thinking in the vast field of mental subnormality. The authors were not only to examine and cull the good work from the mass of poorly conceived and conducted studies of past generations, but also to integrate their findings into a meaningful whole, and in addition, to discuss the promising leads for future research. This volume is the result of 2 years of intensive work.

Interestingly enough, Masland, who summarized the prenatal and postnatal organic causes of mental deficiency, has titled his part "The Prevention of Mental Subnormality." Sarason and Gladwin enter upon the usually disconcerting effort of defining intelligence and then go on to an intensive discussion of the relationships of psychological and sociocultural variables to intellectual functioning. In this extensive review of years of effort by thousands of individuals, the authors have managed to produce a coherent, lucid, and eminently usable account of a large number of heterogeneous conditions which are multivariably caused and which may be related or unrelated. The authors come to no single or simple conclusion. However, beginning with quite different frames of reference, they "take very different avenues to attack a single worrisome and damaging concept, that of a hereditary taint as the basis for all mental subnormality. The attempt to lay this shibboleth finally to rest is implicit in much of both reports." It was apparent to the collaborators, as the attribution of etiological factors became increasingly specific and valid, that gene-borne disorders had been frequently offered on a *post hoc* basis.

The attempt to unravel and specify established and likely causations, separately and in combination, becomes the theme of the book, and it must be acknowledged that the authors have performed exceedingly well an almost impossible task. Illustrative of the magnitude of this massive effort is the fact that each one of the over 600 references given has been used at least once and frequently many times in the structure of their argument and has not been inserted as padding—a too-common occurrence in academic work. It is, therefore, not too surprising that a number of annoying bibliographic errors are found when attempts to trace specific references are made. There are a few errors in quotation or interpretation as well as over- and underemphasis. The authors,

themselves, are aware that they have not given sufficient effort to the integration of the interplay of organic, psychological, and social factors. It would be surprising in a work occupied with every level of integration from nuclear physics to culture if some errors could not be found to criticize. These can be left to succeeding editions for correction, and there would appear to be little doubt that succeeding editions will be forthcoming in view of the obvious and critical need for the book. This is a nodal piece of work in the field of mental subnormality. Its definitiveness and its stimulating and exciting qualities make it all the more valuable. It will be widely read and discussed, and it should be the fervent hope of all who work in the area of mental health that its implications and recommendations will be widely disseminated.

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**The American Labor Force: Its Growth and Changing Composition.** Gertrude Bancroft. Wiley, New York; Chapman and Hall, London, 1958. xiv + 256 pp. Illus. \$7.50.

Following the 1950 United States census, several studies, entitled the *Census Monograph Series*, were prepared under the auspices of the Social Science Research Council in cooperation with the U.S. Bureau of the Census. These studies considered such topics as the changing population of the United States, American families, and urban and rural areas.

*The American Labor Force* is a volume in this series. By *labor force* is meant the total number of persons reported as employed, plus the unemployed—that is, persons so reported to the census enumerator at the time of the 1950 census (or at the time of the pertinent monthly sample survey of the population).

Bancroft's study is largely concerned with analyzing the statistics provided by the census of 1950 and earlier censuses supplemented by data from the Census Bureau's monthly sample surveys. She deals with selected aspects of the measurement, growth, and composition of the labor force. Chapter 1 describes the United States labor force as of 1956; some additional material about persons not in the labor force—that is, the non-workers—is included. Chapter 2 describes trends in the labor force from 1890 to 1955, giving the numbers and proportions of persons engaged in various occupations, together with brief mention of changing occupational patterns.

Chapter 3, the longest in the book, contains an exhaustive and detailed analysis of changes between 1940 and 1950—changes in labor force participation from the standpoint of age, color, marital status, and so forth.

Trends in the part-time labor force (chapter 4) and family employment patterns (chapter 5) are two topics which have been seriously neglected in past analyses of the labor force. This resulted in part from the lack of statistics which would permit study of these topics and in part from undue preoccupation with the individual worker rather than interest in the family as a working entity. Bancroft has brought together many data, most of which have become available only since the end of World War II, and has obtained some interesting findings, such as, "there is not much reason to believe that 'that interesting part time job' which is the goal of so many better educated women has become a very common feature of the present labor market" (page 107). More definitive analysis of these two interrelated topics, unfortunately, will have to await the availability of more statistics and information. The reader who is interested in these two topics should also see Paul Glick's *American Families*, another volume in the *Census Monograph Series*.

Projections of the labor force to 1975 are given in chapter 6. Four methodological appendices complete the volume.

On the whole, this is an excellent census type analysis, in line with the presentations in other volumes of the series. I feel, however, that the inclusion of more noncensus material and analyses (of which there is a considerable body available) would have given more breadth and scope to the findings and, indeed, would have strengthened them.

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**On the Magnet.** William Gilbert. A volume in the "Collector's Series in Science." Derek J. Price, Ed. Basic Books, New York, 1958. xi + 247 pp. \$8.50.

The period between the mid-16th and mid-17th centuries was one of great creative activity in the field of natural philosophy. A number of investigators took a fresh look at the world about them and sought not only to comprehend that world but to apply the newly gained understanding.

One of these men was William Gilbert, Elizabethan physician and student of the loadstone. His findings were incorporated in *De Magnete*, first published in London in 1600. Basic Books