

years. Dr. Kinsey has had the able cooperation of the two specially trained co-authors, who have developed the requisite technique and skill required to obtain the basic data, and also of an excellent staff of assistants; the statistical computations employed in the presentation of the materials have been enormous.

The research "is a fact-finding survey in which an attempt is being made to discover what people do sexually and what factors account for differences in sexual behavior among individuals, and among various segments of the population." It was approached in a commendable and necessary attitude of absolute unconcern with, or lack of any preconception of, what is rare or common, what is normal or abnormal, or what is morally or socially significant. The aim has been to accumulate facts and to attempt to understand the principal factors involved in a motivation of the different behaviors. The accumulated data are magnificently documented in 173 graphic illustrations and 151 tables, followed by a final chapter containing 48 pages of clinical tables with explanations for their use, and an appendix of 27 pages of tables and computations on sample size; a bibliography of more than 600 titles is included. To suggest but a very small number of the topics among those discussed, one finds data relating to early sexual growth, total sexual outlet, premarital, marital and extramarital intercourse, masturbation, nocturnal emissions, homosexuality, and the relations of age, social level, religious backgrounds, and other factors to the various facets of the general problem.

The procedures involved in the investigation are carried out by direct questions in a personal interview during which the sexual history is recorded in an essentially unbreakable code form; no written questionnaire has been employed. The strictest confidence has been maintained invariably, and the successful rapport established between interviewer and subject is nothing short of phenomenal, eliciting information which would in many instances be measurably condemnatory of the individual. The 12,000 histories already in hand come from every state in the Union, from individuals representing an age range of 5-90 years, and from all social levels—inmates of penal institutions, the underworld in general, laborers, clerks, farmers, business executives, grade schools, high schools, colleges and universities, and such professional levels as lawyers, physicians, clergymen, college professors, psychiatrists, and others. Adequate samples of histories from all social levels and geographical areas are included and will be further sought among the 100,000 histories estimated to be required to complete a final adequate assay of the total population. The present volume is based upon approximately 5,300 histories of white males. Succeeding volumes will include behavior studies in the human female comparable to the present volume on the male, sex factors in marital adjustment, legal aspects of the sexual problem, heterosexual-homosexual balance, and others.

A review of a book frequently carries criticisms of its shortcomings perhaps relative to an ideal. However, one is so thoroughly impressed with the courage demonstrated in the pursuit of this most difficult problem, with the extensiveness of the materials, with the adequate statistical treatments, with the openmindedness with which the entire project has been carried on, with the consummate artistry required to gain the basic information, and with the tenacity exhibited in the collection and presentation of the facts revealing such an unappreciated variation in human behavior, that criticism

seems out of place. Some shortcomings and unfilled gaps do exist, but the authors themselves have pointed out many of them. The entire 800 pages are replete with data; what use will be made of these data remains for the acumen of the populace to demonstrate. The facts are now available, and in so effectively presenting them the authors are due the gratitude of all intelligent peoples interested in the advancement of knowledge.

CARL R. MOORE

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Vector and tensor analysis. Louis Brand. New York: John Wiley; London: Chapman & Hall, 1947. Pp. xvi + 439. \$5.50.

This book develops the algebra and calculus of vectors, motors, dyadics, tensors, and quaternions. There are extensive applications to geometry, including a chapter on the differential geometry of surfaces, to analytical mechanics, and to hydrodynamics. A tensorial treatment of electrodynamics, rotating electric machines, and relativity is reserved for a projected second volume. The range of subjects is so extensive that it is easier to point out a surprising omission, such as the representation of an arbitrary vector field in terms of its divergence and curl, than to detail the contents. The book emphasizes the main ideas rather than details of rigor; the treatment is clear, concise, and formal. A principle merit is the careful interrelation of the five disciplines presented. For example, covariant and contravariant components of vectors are introduced in the first chapter on vectors; base vectors are used throughout the chapter on tensors, and a tensor is defined as an invariant under arbitrary change of base vectors; homogeneous coordinates are introduced in the chapter on vector analysis and employed also in the development of motors; the development of vector analysis from quaternions and the alternate interpretation of three-term quaternions as real plane vectors or complex numbers is explained.

There are numerous excellent illustrations and applications set as problems. The reviewer feels that this book satisfies the needs of a serious student of mathematical physics in the five disciplines included and differential geometry as well.

C. A. TRUESDELL

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Differential and integral calculus: functions of one variable. Francis D. Murnaghan. Brooklyn, N. Y.: Remsen Press, 1947. Pp. x + 502. (Illustrated.)

This represents an attempt on the part of a front-rank mathematician to present the calculus as the mathematician always dreams it might be taught. The book fully justifies the author's statement that "the method used is radically different from that of the currently popular texts." The ϵ , δ process, nested sequences, the finite covering theorem, all the machinery which one usually associates with courses in advanced calculus, mathematical analysis, functions of a real variable are used throughout to build a genuine theory of the calculus. That the result is pretty formidable is fully realized by the author, who frequently admonishes the student to read hastily over the theory and start working the exercises. Of these there are over 1,200, many with hints for the student, for the author says experience has taught him that calculus can be

learned only by a judicious mixture of theory and practice. This does not mean that the theory is to be neglected or subordinated, for the student "must return at occasion permits and study over and over and thoroughly digest" the theoretical foundation on which the work stands. To do otherwise would be to miss the entire spirit of the book.

The book does excellently so many things the reviewer has long wanted to see done that he would like to recommend it unreservedly. If he cannot do so, it is because the author has aimed too high. The book will delight the mathematician; it will dismay the teacher of the calculus. For a second course it would be excellent, but for the beginner for whom it is intended it is too heavy a dose. There are rare occasions when the mathematician, against his will, is forced to yield to the professor of pedagogy; this, the reviewer feels, is one of them.

FRANCIS E. JOHNSTON

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Proceedings of the Society for Experimental Stress Analysis. (Vol. IV, No. 2.) C. Lipson and W. M. Murray. (Eds.) Cambridge, Mass.: Addison-Wesley Press, 1947. Pp. xxv + 121. (Illustrated.) \$6.00.

This eighth volume of the series is a collection of 12 papers presented before the Society on subjects in the fields of static and dynamic testing of models and full-scale components, with emphasis on the electrical gaging methods and developments in the attendant circuit and telemetering techniques. All of the authors have been exceptionally careful in describing equipment and methods clearly.

Full-scale dynamic or fatigue testing is treated in six of the papers, "Fatigue Tests of Major Aircraft Structural Components," W. G. Pierpont; "A Method of Detecting Incipient Fatigue Failure," H. W. Foster; "A Machine for Fatigue Testing Full-Size Parts," A. F. Underwood and C. B. Griffin; "Some Repeated Load Investigations on Aircraft Components," S. A. Gordon; "Stress Analysis Utilization in Dynamic Testing," R. W. Brown; and "Device for Maintaining Continuous Electrical Connections With Reciprocating Engine Parts," W. A. Wallace and W. A. Casler. All of the above authors mention the inadequacy of static testing and of small model testing when the prototype is subjected to dynamic loads, and emphasize the desirability of full-scale dynamic tests.

Two of the papers, "Reluctance Gages for Telemetering Strain Data," by W. H. Pickering, and "Aircraft Instruments for Radio-Telemetering and Television-Telemetering," by C. L. Frederick, deal with problems and methods arising from the need for transmitting test data over some distance.

The remaining four papers are best described by their titles: "Precision Determination of Stress-Strain Curves in the Plastic Range," J. R. Low, Jr., and F. Garofalo; "Evaluation of Various Methods of Rotor-Blade Analysis by Means of a Structural Model," R. Mayne; "The Linear Variable Differential Transformer," H. Schaevitz; and "Design and Application of accelerometers," D. E. Weiss.

All 12 articles are worth careful study by workers in the field. The volume as a whole maintains the high quality record of the Experimental Stress Analysis series, with excellent editing and reproduction of illustrations.

D. K. WRIGHT, JR.

Case Institute of Technology

Scientific Book Register

BALLENGER, WILLIAM LINCOLN, and BALLENGER, HOWARD CHARLES. *Diseases of the nose, throat and ear.* (9th ed.) Philadelphia: Lea & Febiger, 1947. Pp. 993. (Illustrated.) \$12.50.

BENTLEY, JOHN EDWARD. *General psychology: principles and practice.* Philadelphia-London-Montreal: J. B. Lippincott, 1947. Pp. xvi + 389. (Illustrated.) \$3.50.

DAVIS, HALLOWELL. (Ed.) *Hearing and deafness: a guide for laymen.* New York-Toronto: Murray Hill, 1947. Pp. xv + 496. (Illustrated.) \$5.00.

GOLDBERGER, EMANUEL. *Unipolar lead electrocardiography.* Philadelphia: Lea & Febiger, 1947. Pp. 182. (Illustrated.) \$4.00.

HALDANE, J. B. S. *What is life?* New York: Boni and Gaer, 1947. Pp. x + 241. \$3.00.

HALL, JAMES D. *Industrial applications of infrared.* New York-London: McGraw-Hill, 1947. Pp. x + 201. (Illustrated.) \$3.50.

HALL, JOHN S. (Ed.) *Radar aids to navigation.* (Massachusetts Institute of Technology, Radiation Laboratory Series.) New York-London: McGraw-Hill, 1947. Pp. xiii + 389. (Illustrated.) \$5.00.

HARVARD UNIVERSITY COMMISSION REPORT. *The place of psychology in an ideal university.* Cambridge: Harvard Univ. Press, 1947. Pp. x + 42. \$1.50.

MCDONALD, ELLICE. (Director.) *Neutron effects on animals.* Baltimore: Williams & Wilkins, 1947. Pp. vii + 198. (Illustrated.)

MATHEMATICAL TABLES PROJECT, NATIONAL BUREAU OF STANDARDS. *Tables of spherical Bessel functions.* (Vol. II.) New York: Columbia Univ. Press, 1947. Pp. xx + 328. \$7.50.

SANBORN, COLIN CAMPBELL. *Catalogue of type specimens of mammals in Chicago Natural History Museum.* (Fieldiana: Zoology, Vol. 32, No. 4.) Chicago: Natural History Museum, 1947. Pp. 209-293. \$1.00.

SAUL, LEON J. *Emotional maturity: the development and dynamics of personality.* Philadelphia-London-Montreal: J. B. Lippincott, 1947. Pp. xii + 338. \$5.00.

SEELYE, ELWYN E. *Field practice: data book for civil engineers.* (Vol. III.) New York: John Wiley; London: Chapman & Hall, 1947. Pp. xiv + 306. (Illustrated.) \$4.50.

SHRYOCK, RICHARD H. *American medical research, past and present.* (Studies of the New York Academy of Medicine Committee on Medicine and the Changing Order.) New York: Commonwealth Fund, 1947. Pp. xiv + 350. \$2.50.

SPENCELEY, G. W. and R. M. *Smithsonian elliptic functions tables.* (Miscellaneous Collections, Vol. 109, Publ. 3863.) Washington, D. C.: Smithsonian Institution, 1947. Pp. iv + 366. \$4.50.

WARTH, ALBIN H. *The chemistry and technology of waxes.* New York: Reinhold, 1947. Pp. viii + 519. (Illustrated.) \$10.00.

WASIUTYNSKI, JEREMI. *Studies in hydrodynamics and structure of stars and planets.* (Astrophysica Norvegica, Vol. 4.) Oslo, Norway: A. W. Brøgggers Boktrykkeri A/S, 1946. Pp. xvi + 497. (Illustrated.) Kr. 50.00.