Book Reviews

Numerical Analysis. Proceedings of Symposia in Applied Mathematics, vol. VI. John H. Curtiss, Ed. McGraw-Hill, New York, 1956. 303 pp. $9.75.

The sixth Symposium in Applied Mathematics of the American Mathematical Society, which was cosponsored by the National Bureau of Standards, took place in Santa Monica in 1953. The delay in publication of the proceedings has not prevented this book from getting on the way to be a best-seller—a second printing was in progress before the book reached me.

Four general points are worth noting. Despite the adjective *applied,* most of the 19 papers included are written by recognized pure mathematicians. Many are genuinely concerned with actual numbers, and only a few are rather out of place. New branches of applied mathematics, for instance, those arising in economic contexts, are well represented. As the editor says in his preface, primary credit for the achievement of interesting so many competent mathematicians in the theory and art of computing must be given to the postwar federal program for the support of science.

Naturally the character of the contributions is variable. There are several research papers, some of which make really notable contributions. There are also reports on the current status of particular problems, or areas of problems, some of which are theoretical, and some practical. Among the topics discussed are systems of linear equations, partial differential equations, conformal mapping, integral equations, elementary, algebraic, and analytic number theory and combinatorial problems (such as occur in the study of geometric configurations). There are also papers on dynamic programming and on the assignment problem, on gas dynamics, and on topics in the theory of approximation, asymptotics, and the calculus of variations.

There is much of permanent value in this volume for the practicing numerical analyst. Apart from this, the volume should do much to reveal the attractions of problems in this field to those mathematicians who are not yet in contact with it. It should also reveal to those responsible for computer organizations, their need for research by highly skilled mathematicians to support the work of the programmers, so that the magnificent engineering creations are safely and fully exploited. Periodical symposia on this topic, at the high level of this one, will, in the long run, do much to draw to the field of numerical analysis mathematicians of the caliber which it must have.

The contributors are Richard Bellman, Stefan Bergman, R. H. Bruck, D. R. Clutterham and A. H. Taub, Joseph W. Fischbach, S. P. Frankel, Cecil Hastings, Jr., Jeanne Hayward, and James P. Wong, Jr., Magnus R. Hestenes, Emma Lehmer, T. S. Motzkin, P. C. Rosenbloom, Arthur Sard, Olga Taussky, C. B. Tompkins, J. L. Walsh, S. E. Warschawski, Wolfgang Wasow, Helmut Wielandt, and David Young.

JOHN TODD
National Bureau of Standards

Body Measurements and Human Nutrition. J. Brožek, Ed. Wayne University Press, Detroit, Mich., 1956. 167 pp. Illus. $3.50.

Todd and his associates took physical anthropology out of the dissecting room, the charnel house, and the museum into the world of living persons. Brožek and his associates have taken physical anthropology from the outer living man (surface sizes and contours) to the inner living man (composition of body tissues). Physical anthropology, cumulatively, is the richer, the more "dynamic," for this continuing trend. Man is more than bone, more than surface morphology and morphometry; he is an integrated, functioning biophysiological complex.

Certain minimal body measurements are recommended on adults: weight, stature, bicristal and biacromial diameter, upper arm skinfold, scapular skin fold, and upper arm circumference. In children these measurements vary according to age. Maturation stage is an important factor in interpreting dimensionality. In a study, "Physique and nutritional status of adult man," Brožek predicted body weight from height, cristal height, bicristal and biacromial breadths, humeral bicondylar breadth, upper arm circumference and tissue thicknesses, and age. The multiple $R = 0.770$. Robert M. White reported on "Body build and body weight in 25-year-old army men," relating stature and body build. Mildred Trotter, in a study "Variable factors in skeleton weight," reported that "the internal structure of the femur is more highly correlated with the weight of the skeleton than diameters." Russell Newman reported on "Skinfold measurements in young American males," finding a "racial contrast." Young Negro males were lean and deficient in subcutaneous fat over the pectoral and triceps region. There were observable geographic differences.

Pascale, Grossman, Sloane, and Frankel reported on "Correlations between thicknesses of skinfolds and body density in 88 soldiers." They derived the following multiple correlation equation: $\hat{Y} = 1.088468 - .007123X_1 - .004834X_2 - .005513X_4$. Here $\hat{Y}$ is estimated body density and X_1, X_2, and X_4 are centimeters of fold thicknesses at chest midaxillary, chest at nipple, and dorsum of upper arm. Kurlander, Abraham, and Ryan discussed "Obesity and disease," concluding "that some (or all) of the association between weight and disease may actually be due to body build rather than to obesity."

In this review I have limited myself to what seemed the salient conclusions of the majority of the authors. However, I would emphasize that I have omitted much detail by presenting essentials. I was impressed by the logical "flow" of the papers. The Committee on Nutritional Anthropometry, Food and Nutrition Board, National Research Council is to be congratulated on the material selected for the conference that is reported in this book; Brožek deserves commendation for the uniformity of writing and editorial style.

W. M. KROGMAN
Graduate School of Medicine, University of Pennsylvania

Currents, Fields, and Particles. Francis Bitter. Technology Press, Cambridge, Mass.; John Wiley, New York; Chapman & Hall, London, 1956. 599 pp. Illus. $8.50.

One consequence of the increased specialization in the average college physics curriculum is the odd fact that the unified field comprising physics as a whole is met by the student only once, during his freshman year; and at that, owing to the level of student preparation in the freshman year, this over-all