present book an excellent foundation to build upon. We all owe a debt of gratitude to Chelsea for resurrecting this delightful little monograph.

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19[42-01, 42-04].—RONALD N. BRACEWELL, *The Hartley Transform*, Oxford Engineering Science Series, Vol. 19, Oxford Univ. Press, New York, 1986, vii + 160 pp., 24 cm. Price $24.95.

This book's stated purpose is to introduce and discuss applications of the Hartley transform and to compare it with the related Fourier transform.

After a brief introduction in Chapter 1, Chapter 2 defines the Hartley transform and shows how the Hartley transform coefficients relate to those of the Fourier transform. A number of examples are given pertaining to the calculation of the Hartley transform for a variety of problems. The power spectrum and the phase are shown to be readily expressible in terms of Hartley transform coefficients. Hartley and Fourier transform theorems are presented in Chapter 3, as well as relations between domains, while Chapter 4 presents a good discussion of discrete versus continuous transforms.

Much of the remainder of the book is devoted to the practical application of these transforms. Chapter 5 discusses digital filtering by convolution. Cyclic convolutions are discussed and contrasted with ordinary convolutions, and comparisons are made to Fourier convolutions. Examples are given involving low pass filtering and edge enhancement. The chapter ends with convolutions expressed in terms of matrix multiplications.

In Chapter 6, two-dimensional Hartley transforms are discussed; in Chapter 7, a description of a factorization technique is given and the transform is shown to be expressible as a matrix operation with the bulk of the chapter devoted to factorization of this matrix and the perturbation operations involved. Chapter 8 discusses details of a fast transform algorithm and various schemes to speed up all aspects of the calculation including rapid computation of trigonometric functions and methods for fast permutation. The concluding short Chapter 9 discusses optical Hartley transforms. A series of problems follows each chapter.

Appendix I gives a series of programs in BASIC for discrete Hartley transforms, while Appendix II presents an atlas of Hartley transforms.

This book presents a quite thorough discussion of Hartley transforms with special emphasis on the discrete transform. It is well written and gives the reader a number of applications of these transforms and detailed cases where computation via the Hartley transform has advantages over that done by more standard Fourier transform techniques.

There are a few minor typographical errors such as in the expression for the even part of the transform on page 11 and in the expression for the phase on page 18. In general, though, I found no errors of any consequence.

Anyone interested in Fourier and related transforms should find this book a valuable reference volume to have in his library.

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20[62Q05, 62E15, 62E99, 62G15, 62J99].—R. E. ODEH & J. M. DAVENPORT (Coeditors), N. S. PEARSON (Managing Editor), *Selected Tables in Mathematical Statistics*, Vol. 10, Amer. Math. Soc., Providence, R. I., 1986, xi + 347 pp., 26 cm. Price $39.00.

The volume contains two tables whose entries can be quite useful for statisticians in diverse applications. The opening table gives percentiles, P, of the distribution of positive definite quadratic forms in normal variables, $\Sigma_{i=1}^{k} \lambda_i x_i^2$ where x_i is $N(0,1)$ and $\lambda_i > 0$, $\Sigma_{i=1}^{k} \lambda_i = 1$. There are percentile entries corresponding to $P = 0.001$, 0.005, 0.01 (0.01)0.19, 0.20 (0.05) 0.80, 0.81 (0.01)0.99, 0.995, 0.999; for $k = 2(1)10$, and λ's in multiples of 0.05.

The second table lists confidence limits on the correlation coefficient ρ, associated with a bivariate normal distribution. Let r_0 be the observed value of ρ, and n the sample size; then confidence limits are given for values of $r_0 = -0.98(0.02)0.98$; $n = 3(1)80(5)100(10)200(25)300(50)600(100)1000$, and for $1 - \alpha$ and $\alpha = 0.005, 0.01, 0.025, 0.05, 0.10, 0.25$.

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21[65-06, 65M50, 65N50, 65R20].—D. J. PADDON & H. HOLSTEIN (Editors), *Multigrid Methods for Integral and Differential Equations*, The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, xii + 323 pp., 24 cm. Price $36.40.

These are the proceedings of a Summer School/Workshop held at the University of Bristol, England, in September of 1983. Most of the papers were substantially revised after the meeting and reflect the state of affairs as of the effective closing date of the proceedings (July 1984). The volume opens with four contributions of the guest speakers: A. Brandt, "Introduction—Levels and scales" (10 pp.), outlines the philosophical underpinnings and the scope of the subject; W. Hackbusch, "Multigrid methods of the second kind" (73 pp.), is a substantial review of multigrid methods for integral equations; P. W. Hemker & P. M. de Zeeuw, "Some implementations of multigrid linear system solvers" (32 pp.), provides a guide to the design and implementation of programs for multigrid methods applied to general elliptic problems of the convection-diffusion type; P. Sonneveld, P. Wesseling & P. M. de Zeeuw, "Multigrid and conjugate gradient methods as convergence acceleration techniques" (51 pp.), treats multigrid and conjugate gradient methods as a means of accelerating iterative methods. The remainder of the book is devoted to