considered this book as it may affect a large audience rather than a particular one. As such it is an important contribution to the exposition of modern mathematics. It is indeed time for more such books, in the same field as well as others.

The references (p. 54) to Rauch are:

[6, 7] H. E. Rauch, *On the transcendental moduli of algebraic Riemann surfaces. On the moduli of Riemann surfaces*, Proc. Nat. Acad. Sci., U.S.A. **41** (1955), 42–48, 236–238. The references [**64**], [**65**], p. 44 come from the second paragraph on p. 40. [**64**] should read: cf. Cartan [**60**]. The Oka linking method is mentioned often in the same article. The reference [**4**] should be given.

HUGO ROSSI

Time series analysis. By E. J. Hannan. Methuen's Monographs on Applied Probability and Statistics, 1960, viii+152 pp. $3.50.

This small monograph deals with statistical inference where the basic model is a one-dimensional discrete-parameter process $y_t = m_t + x_t$ with x_t a stationary residual and m_t a mean value term. The book assumes a background in mathematics and statistics at the level of H. Cramér's text "Mathematical Methods of Statistics."

The first chapter (The Spectral Theory of Discrete Stochastic Processes) discusses the probability structure of the processes considered. The concept of a stationary process is introduced. What the author terms circularly defined processes are then introduced. These are stationary processes with parameter set the integers mod n. The second order moment structure of these processes can be simply given in terms of circulant matrices. The author often obtains results for stationary processes by suggesting a circularly defined process as an approximation, deriving the result for these simple processes using circulant matrices and then getting the analogous conclusion for stationary processes by a formal limiting procedure. In particular, the spectral representation for stationary processes is obtained in this manner. A rigorous proof of the spectral representation is given in an appendix. Basic results in the prediction problem for stationary processes are cited but not derived. Kolmogorov's formula for the one-step prediction error is then used to derive the asymptotic distribution of eigenvalues of the covariance matrix. It is a pity that the basic analytic work of G. Szegö that is fundamental in this context is not mentioned.

The second chapter (Estimation of the Correlogram and of the Parameters of Finite Parameter Schemes) contains a derivation of a weak ergodic theorem that is based on the spectral representation of stationary processes. The asymptotic behavior of quadratic estimates of covariances of linear processes is given. The chapter concludes with a discussion of some results on the estimation of parameters of finite parameter schemes.

Chapter three (Estimation of the Spectral Density and Distribution Functions) considers the asymptotic behavior of estimates of the spectral density from the point of view of covariance structure. The fact that the periodogram is not a consistent estimate is noted and weighted averages of the periodogram are proposed. An estimate of the variance of such estimates in terms of the weight function is obtained for large sample size. Various weight functions are discussed in detail.

The fourth chapter (Hypothesis Testing and Confidence Intervals) begins with a discussion of a classic test for a possible periodic component when the residuals are independent. The question of plausible modifications of the test for a more general stationary residual is considered. A test for independence against a simple Markovian alternative is given. Discussion of tests of goodness of fit follow and finally a discussion of a technique for getting a confidence region for the spectral distribution function.

Most of the discussion up to this point assumes zero mean. The final chapter (Processes Containing a Deterministic Component) first discusses the estimation of regression coefficients. It is shown that the least squares estimates are asymptotically efficient in the class of linear unbiased estimates for a large class of regressions. There are suggested modifications of some of the techniques presented in the previous chapters to take care of the case of nonzero mean.

Much of the discussion is of a heuristic character but this is inevitable in a book of this size. There is a remarkably broad coverage of some of the recent results in time series analysis, particularly those on spectral analysis. Altogether this monograph is a welcome addition to the growing literature on time series analysis.

M. ROSENBLATT

Integral quadratic forms. By G. L. Watson. Cambridge Tracts in Mathematics and Mathematical Physics, No. 51. Cambridge, 1960. 12+143 pp. $5.00.

This book is about classes, genera, and spinor genera of quadratic forms.

We recall that a rational quadratic form g is said to be in the same class as a given form f if there is an integral substitution of determinant ± 1 which carries f to g; the set of such g is called the class