tion, but rather an ambivalent one, of the 3-dimensional rotation group. Thus, there exist tensors of the unitary group which are not found amongst the tensors of the rotation group, and these tensors, the so-called spin-tensors of the rotation group, have their physical significance; on the other hand, all tensors of the rotation group are found among the tensors of the unitary group.

F. D. MURNAGHAN

68 [K].—E. D. BARRACLOUGH & E. S. PAGE, "Tables for Wald tests for the mean of a normal distribution," *Biometrika*, v. 46, 1959, p. 169–177.

Let x be normally distributed with unknown mean θ and known variance σ^2. The Wald sequential test for $\theta = \theta_0$ against the alternative $\theta = \theta_1(\theta_1 > \theta_0)$ consists in taking observation x_{n+1} as long as $a < (\theta_1 - \theta_0)/\sum_{i=1}^{n} x_i/\sigma^2 + n(\theta_0^2 - \theta_1^2)/2\sigma^2 < b$; sampling stopping when this relation first fails, with $\theta = \theta_0$ accepted if the left-hand inequality fails and $\theta = \theta_1$ accepted if the right-hand inequality fails. Let $Z = -a\sigma/(\theta_1 - \theta_0)$, $h = (b - a)\sigma/(\theta_1 - \theta_0)$, $P_- =$ probability of accepting $\theta = \theta_0$ when true, $P_+ =$ probability of accepting $\theta = \theta_0$ when $\theta = \theta_1$, $N_- =$ average sample number when $\theta = \theta_0$, $N_+ =$ average sample number when $\theta = \theta_1$, and $\mu = (\theta_1 - \theta_0)/2$. Table 1 of the Appendix contains 2D values of h and Z for $P_+ = .05$, $.10(.10)\ .70$, $P_- = .95, .99, .995, .999$, and $\mu = .25(.25)1.00$. The values of a and b are determined by h and z. For Table 2 of the Appendix (the same combination of values for P_+, P_-, μ occur as for Table 1), 2D values are given for N_+ and N_-. Charts I–IV of the Appendix contain curves of P_+ and P_- as functions of h and Z for given μ. These charts are obtained directly from Table 1 and can be used to determine the operating characteristics of the test for given a, b, σ, θ_0, and θ_1. Also, a comparison is made between Wald's approximations (to the operating characteristics and the average sample numbers) and the true values, for ten combinations of values for h, Z, μ (Text-Table 1). The conclusion reached is that Wald's approximations are not acceptably accurate for many applications when $\mu \geqq .25$.

J. E. WALSH

System Development Corporation
Santa Monica, California

69 [K].—A. T. BHARUCHA-REID, *Elements of the Theory of Markov Processes and their Applications*, McGraw-Hill Book Co., Inc., New York, 1960, xi + 468 p., 24 cm. Price \$11.50.

In recent years the notions of probability have become increasingly important in the building of models of the world around us. This is true, for example, in certain of the physical sciences, social sciences, and in the simulation of military and other operations. Sometimes probabilistic notions appear directly as basic ingredients of the model, sometimes indirectly as the result of applying Monte Carlo methods to the solution of certain types of functional equations.

The mathematical abstraction of an empirical process whose development is governed by probabilistic laws is known as a stochastic process. A special class of these processes are Markov processes in which the development subsequent to a time t depends (probabilistically) only upon the state of the process at t and not