22[F, K, X, Z].—BIRGER JANSSON, *Random Number Generators*, Almqvist and Wiksell, Stockholm, 1966, 205 pp., 24 cm. Price Sw. kr. 42.

The most commonly used method of generating pseudo-random numbers with a digital computer is the congruential method. In this method, which was introduced by D. H. Lehmer in 1951, one begins with a number x_1 between 0 and 1, and the next number x_2 is computed as the fractional part of $Nx_1 + \theta$, where N is an integer > 1 and $0 \leqq \theta < 1$. Now x_3 is computed as the fractional part of $Nx_2 + \theta$, etc. The congruential method has been analyzed by many authors. In Chapters 5 and 6 of Birger Jansson's book, he presents a profound study of this method. One wishes to know the serial correlation of such a sequence. If x_1 and θ are rational, as they must be in digital computation, the determination of the serial correlation is a problem in number theory. Beginning with results of Dedekind, Rademacher, and Whiteman, Jansson obtains a practical algorithm for computing the correlation, and he presents extensive tables of exact values of the correlation. This achievement alone will make Jansson's book an indispensable reference in the continuing study of deterministic methods by which we seek to simulate random processes.

The book contains many other topics. There is a survey of statistical tests which have been applied to pseudo-random numbers. There is a collection of special algorithms for computing pseudo-random numbers belonging to distributions other than the uniform distribution. And there is a brief review of the existing theory of what we should *mean* when we call a perfectly well-determined sequence "random."

There is little mention of the *algebraic* theories of random numbers. There is a reference to Zierler's work, but there is no mention of the beautiful and important work of Golomb, Tausworthe, and others on the *P-N* sequences which are used in digital tele-communications. The application of the theory of Galois fields to finite pseudo-random binary sequences has received too little attention by analysts. This theory is particularly challenging because it involves concepts of randomness different from those used in analytical studies.

In summary, Jansson's book is excellent. It is the newest and the most complete guide to the analytical theory of pseudo-random numbers.

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23[G, S].—SHIGETOSHI KATSURA, *Tables of Representations of Permutation Groups for the Many Electron Problem*, Department of Chemistry, University of Oregon, Eugene, Oregon, 1962, unbound report of 326 pp., 28 cm. One copy deposited as Document No. 7567 with the ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington, D. C. Photoprint $42.00; microfilm copy $14.55 (payable in advance to Chief, Photoduplication Service, Library of Congress).

These tables give to 8D (with a purported maximum error of 5 units in the final decimal places) the elements of those matrices of irreducible unitary representations of the symmetric group on N letters (which are the associates of the representations