

longer apply in the present circumstances. It is also worth recalling that there is a recurrence relation for the evaluation of a polynomial. But the detailed coding of such problems is of little interest save to the veriest beginner.

JOHN TODD

BRIEF MENTION

Programmgesteuerte digitale Rechengerate (elektronische Rechenmaschinen). By H. Ruthishauser, A. Speiser, and E. Stiefel. (Mitteilungen aus dem Institut für angewandte Mathematik, no. 2.) Basel, Birkhäuser, 1951. 102 pp. 8.50 Swiss fr.

This booklet has been written after visits by the authors to various centers of high speed automatic digital computing in 1948-9. It is the first at all comprehensive report on its subject in the German language, and constitutes a very readable introduction. In addition to sections on history and bibliography there are careful discussions of the organization of machines, the representation of numbers, the handling of the elementary operations, possible address-systems, flow-diagrams, multiple-precision operations, checks. The concluding section discusses the physical realization of various components.

JOHN TODD

Colloque de topologie (Espaces fibrés). Centre Belge de Recherches Mathématiques. Liège, Georges Thone, and Paris, Masson, 1951. 129 pp. 1225 fr.

This booklet is a report of a colloquium on fibre spaces and fibre bundles held in Brussels in June, 1950. It contains the following papers: *Introduction à la théorie des espaces fibrés*, by H. Hopf; *Notions d'algèbre différentielle; applications aux groupes de Lie et aux variétés où opère un groupe de Lie*, by H. Cartan; *Les connexions infinitésimales dans un espace fibré différentiable*, by C. Ehresmann; *La transgression dans un groupe de Lie et dans un espace fibré principal*, by H. Cartan; *Sur un type d'algèbres différentielles en rapport avec la transgression*, by J. L. Koszul; *Espaces fibrés et homotopie*, by B. Eckmann; *Sur l'homologie des groupes de Lie, des espaces homogènes, et des espaces fibrés principaux*, by J. Leray; *Sur un formule de la théorie des espaces fibrés*, by H. Hopf; *Quelques relations entre l'homologie dans les espaces fibrés et les classes caractéristiques relative à un groupe de structure*, by G. Hirsch.

The first paper by Hopf is of an expository nature; it furnishes an

introduction to the general theory of fibre spaces, giving examples of some of the problems treated and results obtained. The paper of Eckmann gives an excellent summary of the relationships and connections between homotopy theory and the theory of fibre spaces. The remaining papers are of a much more specialized nature, and are mainly concerned with announcing new methods and results which have not been published as yet. In many of them, the exposition is so condensed as to make reading difficult or impossible for all but those who are particularly familiar with the recent work of the author in question. To make matters even more difficult, some of the authors make their exposition depend heavily on results which, if published at all, have appeared only in the form of brief announcements, with no proofs or elaboration.

W. S. MASSEY

Tables of the error function and of its first twenty derivatives. By the Staff of the Computation Laboratory. Harvard University Press, 1952. 28+276 pp. \$8.00.

With $\phi(x) = (2\pi)^{-1/2} \exp(-t^2/2)$, these tables give the integral of $\phi(x)$, $\phi(x)$ itself, and its first four derivatives at intervals of 0.004 from 0 to 6.468; the fifth through the tenth derivatives at intervals of 0.004 from 0 to 8.236; the eleventh through fifteenth derivatives at intervals of 0.002 from 0 to 9.610; the sixteenth through twentieth derivatives at intervals of 0.002 from 0 to 10.902.

Tables of $n!$ and $\Gamma(n+1/2)$ for the first thousand values of n . By H. E. Salzer. (National Bureau of Standards, Applied Mathematics Series, no. 16.) Washington, United States Government Printing Office, 1951. 6+10 pp. 15 cents.

The tables give $n!$ to 16 significant figures and $\Gamma(n+1/2)$ to eight.

Table of arctangents of rational numbers. By John Todd. (National Bureau of Standards, Applied Mathematics Series, no. 11.) Washington, United States Government Printing Office, 1951. 11+105 pp. \$1.50.

The volume includes two tables: The first gives m^2+n^2 , the principal value of $\tan^{-1}m/n$ and $\cot^{-1}m/n$ (in radians to 12 decimals) for $0 < m < n \leq 100$, and the complete reductions of $\tan^{-1}m/n$; the second gives the complete reductions of $\tan^{-1}n$ for those integers less than 2090 which are reducible. A reduction is a representation of the