T. S. Motzkin	Existence of Essentially Nonlinear Families Suitable for Oscillatory Approximation
I. J. Schoenberg	On Variation Diminishing Approximation Methods
M. Golomb	Approximation by Functions of Fewer Variables
J. C. P. Miller	Extremal Approximations—A Summary
R. C. Buck	Survey of Recent Russian Literature on Approximation
F. L. Bauer	The Quotient-Difference and Epsilon Algorithms
J. B. Rosser	Some Sufficient Conditions for the Existence of an Asymp totic Formula or an Asymptotic Expansion
J. W. Tukey	The Estimation of (Power) Spectra and Related Quantities
L. Collatz	Approximation in Partial Differential Equations
J. Todd	Special Polynomials in Numerical Analysis

E. I.

28[X].—RUDOLPH E. LANGER, Editor, *Frontiers of Numerical Mathematics*, The University of Wisconsin Press, Madison, 1960, xi + 132 p., 24 cm. Price $3.50.

This book contains eight papers and a discussion of these papers presented at a Symposium held at Madison, Wisconsin on October 30–31, 1959. This symposium was conducted jointly by the Mathematics Research Center, the United States Army, and the National Bureau of Standards. Its purpose "was not intended to be an occasion for the presentation of research results, but one for a survey of the future; for the identification of some mathematical problems that will have to be faced in the lines of scientific advance."

The authors and the titles of their papers are:

William Prager	Stress Analysis in the Plastic Range
Garrett Birkhoff	Some Mathematical Problems of Nuclear Reactor Theory
Zdenek Kopal	Numerical Problems of Contemporary Celestial Mechanics
Lee Arnold	Aeroelasticity
Phillip M. Morse	Operations Research
Joseph O. Hirschfelder	Mathematical Bottlenecks in Theoretical Chemistry
S. Chandrasekhar	Magnetohydrodynamics
J. Smagorinsky	On the Application of Numerical Methods to the Solution of Systems of Partial Differential Equations Arising in Meteorology

It is unfortunate that the paper by Lee Arnold was made from a tape recording and was not finally reviewed by the author. It is very difficult for a reader to follow this paper, for many statements in it seem to refer to illustrations which are not included.

The reader of this book should not expect to find a detailed discussion of numerically formulated problems arising in various branches of science. He will find, in the main, discussions and reviews of various open mathematical problems in different scientific areas. Some of the papers refer to numerical treatment of these problems. A surprising number indicate a strong preference on the author's part for analytical methods for dealing with their problems.

One can but agree with J. Smagorinsky when he states "that computing machines cannot be considered a substitute for the ingenious mathematical and laboratory techniques of analysis which have been devised. . . ." However, this reviewer is convinced that such ingenuity when properly coupled with the power of modern computers will provide greater insight than analytical methods alone.

A. H. T.

29[X].—(a) D. S. Mitrinović, "Sur les nombres de Stirling de première espèce et les polynômes de Stirling," *Publ. de la Fac. d'Électrotechnique de l'Univ. à Belgrade* (Série: Math. et Phys.), No. 23, 1959, 20 p. (Serbian with French summary. Tables by Miss Ružica S. Mitrinović.)

(b) D. S. Mitrinović & R. S. Mitrinović, "Sur les polynômes de Stirling," *Bull. Soc. Math. Phys. Serbie*, v. 10 (for 1958), p. 43–49, Belgrade. (Summary in Russian.)

(c) D. S. Mitrinović & R. S. Mitrinović, "Tableaux qui fournissent des polynômes de Stirling," *Publ. Fac. Élect. Univ. Belgrade* (Série: *Math. et Phys.*), No. 34, 1960, 24 p. (Summary in Serbian.)

These three papers are concerned with the Stirling numbers of the first kind, S_n^r, which may be defined for positive integral n by

$$x(x-1)(x-2)\cdots(x-n+1) = \sum_{r=0}^{n} S_n^r x^r.$$

Altogether the numbers S_n^{n-m} are tabulated for $m = 1(1)32$, $n = m + 1(1)N$, where $N = 200$ for $m = 1(1)5$, $N = 100$ for $m = 6$, and $N = 50$ for $m = 7(1)32$. The values for $m = 1(1)7$ are given in (a), for $m = 8(1)13$ partly in (a) and partly in (c), for $m = 14(1)20$ partly in (b) and partly in (c), and for $m = 21(1)32$ in (c). The authors found no discrepancy as a result of some checking against unpublished tables by F. L. Miksa (see *MTAC*, v. 10, 1956, p. 37).

Algebraic expressions for S_n^{n-m} in the form of binomial coefficients $\binom{n}{m+1}$ multiplied by polynomials (with factors $n(n-1)$ separated out if m is odd and not less than 3) are given for $m = 1(1)13$ in (a) and for $m = 1(1)9$ in (c).

S_n^{n-m} may also be expressed as a sum of multiples of binomial coefficients in the form

$$S_n^{n-m} = \sum_{k=0}^{m-1} C_m^k \binom{n}{2m-k}.$$

Altogether the values of the coefficients C_m^k are given for $k = 0(1)31$, $m = k + 1(1)32$, the values for $k = 0(1)19$, $m = k + 1(1)20$ being found in (b) and the remaining values in (c).

A. F.

30[Z].—Wayne C. Irwin, *Digital Computer Principles*, Van Nostrand Co.. Inc., Princeton, 1960, vi + 321 p., 24 cm., $8.00.

This book contains material presented at a training course in the Electronics Division of the National Cash Register Company. It is an extremely elementary "book for the beginner. No previous acquaintance with computers, electronics or mathematics is necessary."