of this type, and consequently represents a significant contribution to the related tabular literature.

J. W. W.

1. O. S. Berlyand, R. I. Gavrilova & A. P. Prudnikov, *Tables of Integral Error Functions and Hermite Polynomials*, Pergamon Press, Oxford, 1962. (See *Math. Camp.*, v. 17, 1963, pp. 470–471, RMT **80**.)

2. M. Abramowitz & I. A. Stegun, Editors, *Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables*, National Bureau of Standards, Applied Mathematics Series, No. 55, U. S. Government Printing Office, Washington, D. C., 1964, pp. 317–318, Table 7.4.

85[7].—M. Lal & W. Russell, *Table of Factorials 0! to 9999!*, Department of Mathematics, Memorial University of Newfoundland, St. John's, Newfoundland, September 1967. Ms. of 3 + 200 pp., 28 cm. Deposited in the UMT file. Price $10.00.

This attractively printed, bound table consists of 50S unrounded values of $n!$ for $n = 0(1)9999$, arranged in floating-point form. Exact values of the first 48 entries can be read from the table.

The introduction contains a statement that the underlying calculations were performed on an IBM 1620 and the tabular output was printed on an IBM 407, Model E8. Appended to the introduction is a one-page Fortran listing of the program used in the initial calculation, which extended to 23S. This program was subsequently modified to permit the handling of 100S products. The authors express the belief that their results were probably correct to at least 90S before reduction to 50S in the final printout.

Reference is made in the introduction to earlier, closely related tables by Reitwiesner [1], Salzer [2], and Reid & Montpetit [3]. To this list there should be added the tables of Giannesini & Rouits [4]. These tables are all of much lower precision than the one under review.

It seems appropriate to this reviewer to mention here the existence of extensive manuscript tables [5] of exact factorials by these same authors.

J. W. W.

1. G. W. Reitwiesner, *A Table of Factorial Numbers and their Reciprocals from 1! through 1000! to 20 Significant Digits*, Ballistic Research Laboratories, Technical Note No. 381, Aberdeen Proving Ground, Maryland, 1951. (*MTAC*, v. 6, 1952, p. 32, RMT **955**.)

2. H. E. Salzer, *Tables of n! and* $\Gamma(n + 1/2)$ *for the First Thousand Values of n*, National Bureau of Standards, AMS 16, Washington, D. C., 1951. (*MTAC*, v. 6, 1952, p. 33, RMT **957**.)

3. J. B. Reid & G. Montpetit, *Table of Factorials 0! to 9999!*, Publication 1039, National Academy of Sciences—National Research Council, Washington, D. C., 1962. (*Math. Comp.*, v. 17, 1963, p. 459, RMT **67**.)

4. F. Giannesini & J. P. Rouits, *Tables des coefficients du binôme et des factorielles*, Dunod, Paris, 1963. (*Math. Comp.*, v. 18, 1964, p. 326, RMT **40**.)

5. M. Lal, *Exact Values of Factorials 200! to 550!*; and M. Lal & W. Russell, *Exact Values of Factorials 500! to 1000!*, Department of Mathematics, Memorial University of Newfoundland, St. John's, Newfoundland; the first dated August 1967, the second undated. (*Math. Comp.*, v. 22, 1968, pp. 686–687, UMT **67, 68**.)

86[7, 9].—M. Lal & W. F. Lunnon, *Expansion of* $\sqrt{2}$ *to 100,000 Decimals*, University of Manchester, Manchester, England, December 10, 1967. Computer output deposited in the UMT file.

Continuing the computation in [1] and [2], the authors have now extended the $\sqrt{2}$ to 100,000D by the use of the Atlas Computer in Manchester. The Newton-

Raphson method was used, as in [2] and [3], and the computation required about 2 hours. The result is elegantly printed on 40 pages.

The decimal-digit frequency and a computed χ^2 is given for each block of 1000 digits. These 100 values of χ^2 were examined by the undersigned for their own distribution—theoretically, 10% should lie between 0 and 4.168, 10% between 4.168 and 5.380, etc. The actual distribution is

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
11	14	11	7	8	14	7	5	8	15

which itself has a χ^2 of 11 with 9 degrees of freedom. This is a thoroughly satisfactory test for randomness.

The authors also counted runs of like digits. These counts were made with the convention of disregarding the digits immediately before and after the counted run; thus, the eight digits 32412–32419D are 54444442 and are counted as one sextuple, two quintuples, three quadruples, and four triples. There are 1023 triplets, 105 quadruples, 11 quintuples, and two sextuples. These run counts, therefore, also satisfactorily agree with the predictions based upon an hypothesis of randomness. Compare the earlier suggestions that the $\sqrt{2}$ may not be normal that are mentioned in the review of [1].

D. S.

1. *Math. Comp.*, v. 21, 1967, pp. 258–259, UMT **17**.
2. *Math. Comp.*, v. 22, 1968, p. 226, UMT 12.
3. *Math. Comp.*, v. 22, 1968, p. 234, UMT 22.

87[7, 10].—Peter H. Roosen-Runge, *A Table of Bell Polynomials: Y_1 to Y_{16}*, Communication 212, Mental Health Research Institute, The University of Michigan, Ann Arbor, Michigan, August 1967, 23 pp., 28 cm.

The polynomials tabulated in this report were first studied by Bell [1] as a generalization of his exponential numbers [2]. They are presented here in the form

$$Y_n = \sum_{k=1}^{n} f_k A_{n,k}(g_1, \cdots, g_n) .$$

In his introductory text the author identifies Y_n with the nth derivative of a composite function $Y = f(g)$, where subscripts are used to designate the orders of the respective derivatives of f and g.

The computation of the present table was performed on an IBM 7090 system, using recurrence relations incorporated in a program written in SNOBOL. This program is appended to the explanatory text.

The author also shows the connection between the Bell polynomials and certain combinatorial problems, as revealed by the formula of Faà di Bruno [3].

Three applications of these polynomials to the evaluation of the coefficients of exponential generating functions are described; two of these are attributed to Riordan [3].

The first eight and ten polynomials, respectively, were checked against the corresponding tables in Riordan [3, p. 49] and the NBS *Handbook* [4]. The author