he examined require any correction. These corrections are separately listed in this issue.

The authors have presented herein a valuable collection of numerical material apparently not available in any other single source. It is to be hoped that they will issue a revised, enlarged edition in the near future.

J. W. W.

13 [7].—MELVIN KLERER & FRED GROSSMAN, *A New Table of Computer Processed, Indefinite Integrals*, Dover Publications, Inc., New York, 1971, xiii + 198 pp., 24 cm. Price $3.00 (paperbound).

The following is quoted from the introduction to this book:

"This volume is a product of a computer science research program begun by M. Klerer at Hudson Laboratories, Columbia University and continued at the School of Engineering and Science, New York University. During 1963, M. Klerer and J. May implemented a programming system that accepted mathematical expressions typed in normal (pre-computer) textbook notation. The typing was done on a modified computer input-output typewriter terminal. Individual characters could be typed in any order and mathematical symbols, such as integral operators, could be constructed in any size. The typing did not have to be neat or symmetric, and mistakes could be erased by backspacing and over-typing or by pressing an "erase" key which produced a special code tagging the particular location for subsequent computer processing. Two-dimensional positioning of the paper to permit the typing of subscripts, superscripts, or fraction expressions was done by keyboard control using the space, backspace, sub (half-line down), and sup (half-line up) keys. Besides eliminating a good deal of the effort usually required in translating mathematical expressions into FORTRAN code, this system, since it was entirely free format, allowed easy input by unskilled typists.

"Since this new programming system was part of a long-range effort directed toward the automation of applied mathematics, it was natural to consider the feasibility of making mathematical tables accessible to this computer system."

The introduction describes in detail the process of culling integrals from known tables and processing them to produce the final table of integrals. More than seven years have passed since the project began and, no doubt, current techniques are much improved. Nonetheless, the final output is readable and pleasing to the eye.

The tables themselves differ little from several already available tables. Integrals are divided into eight basic categories which are rational, algebraic, irrational, trigonometric, inverse trigonometric, exponential, logarithmic, hyperbolic and inverse hyperbolic.

The integrals were taken from eight commonly used and well-known tables. In the culling process, the authors made a study of the reliability of these tables and the results are reported in the introduction. On the basis of the discussion given there, one might expect that the present tables should not be faulty and that they are free of errors. Such is not the case and glaring inconsistency abounds throughout. In the illustration on p. 2, there appear the entries

$$\int \frac{DX}{X} = \mathrm{LN}\,|X| \quad \text{and} \quad \int \frac{DX}{1 - X} = -\mathrm{LN}(1 - X).$$

In a table of indefinite integrals, there is no need for absolute-value signs. Further, it is unusual to assume that parameters and variables are real. The above is not an isolated instance. In some cases, when absolute value signs are not used, sufficient conditions are given, as in

$$\int \frac{DX}{X(A - BX)} = \frac{1}{2A} \mathrm{LN}\left(\frac{X}{BX^2 - A}\right),$$

if $A < 0$ and $B < 0$ and $X > (A/B)^{1/2}$.

In summary, the principal virtue of the project is that computer techniques could be used to produce the table. This is currently an important consideration in view of cost of publication. The tables are useful though they are not new. Eventually, one must forever be mindful of the possibility of human error.

Y. L. L.

14 [7,10].—H. W. Gould, *Research Bibliography of Two Special Number Sequences*, Number 12 of *Mathematica Monongaliae*, Department of Mathematics, West Virginia University, Morgantown, West Virginia, May 1971, iv + 25 pp. One copy deposited in the UMT file.

Herein are presented two definite bibliographies: the first, of 137 items, relates to the Bell (or exponential) numbers; the second, of 243 items, to the Catalan numbers (also studied originally by Euler, Fuss, and Segner, as noted by the author).

An introduction of four pages includes the various definitions of these two integer sequences, their generating functions, recurrence relations, and their relations to other numbers such as binomial coefficients and Stirling numbers of the second kind. This is supplemented by pertinent historical information and references to the numerous combinatorial interpretations of these numbers.

The present work supersedes earlier, related bibliographies, of which the most extensive are included in expository papers by Rota [1] and Brown [2] cited by the author. The most extensive table of Bell numbers appears to be that in a paper by Levine & Dalton [3], also included in the present bibliography.

This scholarly report should be of special value to researchers in such fields as combinatorial analysis and graph theory.

J. W. W.

1. Gian-Carlo Rota, "The number of partitions of a set," *Amer. Math. Monthly*, v. 71, 1964, pp. 498–504.

2. W. G. Brown, "Historical note on a recurrent combinatorial problem," *Amer. Math. Monthly*, v. 72, 1965, pp. 973–977.

3. Jack Levine & R. E. Dalton, "Minimum periods, modulo p, of first-order Bell exponential integers," *Math. Comp.*, v. 16, 1962, pp. 416–423.

15 [9].—Hideo Wada, "A table of fundamental units of purely cubic fields," *Proc. Japan Acad.*, v. 46, 1970, pp. 1135–1140.

The table gives the fundamental unit ϵ of the cubic field $Q(m^{1/3})$ for all such fields with $m < 250$ in the form

$$\epsilon = (A + B\alpha + C\alpha^2)/n \qquad (1)$$