Several of the tables in *S.F.* are also given in *Zb.* II and/or III. With unimportant exceptions, the tables in *S.F.*, when not identical, are fuller than those in *Zb.* Among many tables (some small) in *Zb.*, one may mention (excluding any also given in *S.F.*) the following, where numbers in brackets are page numbers: sums of the kth powers of the first n natural numbers, even numbers, and odd numbers, for $n = 1(1)12$, $k = 1(1)12$, in *Zb.* I_1 (216), I_2 (292), preceded by general expressions; some exact Stirling numbers in *Zb.* I_1 (230), I_2 (309); the first 36 Bernoulli numbers as exact fractions in *Zb.* I_2 (348), I_3 (500); error integral and ordinate, in the $\exp(-\frac{1}{2}z^2)$ form, in *Zb.* II_1 (329); values, zeros, etc. of Kelvin functions in *Zb.* III_1 (314); exact binomial coefficients up to $n = 60$ in *Zb.* III_1 (319); and exact powers n^p for $n = 2(1)83$, $p = 1(1)10$ in *Zb.* III_1 (325). One may also note, as rather unusual, that the years of birth and death of more than 170 mathematicians are listed in *Zb.* I_2 (xv), I_3 (501).

A. F.

109[F].—ALBERT H. BEILER, *Recreations in the Theory of Numbers—The Queen of Mathematics Entertains*, Dover Publications, Inc., New York, 1964, xvi + 349 pp., 22 cm. Price $2.00 (paperbound).

This book addresses itself primarily to the amateur, and its tone, as indicated, is one of recreation. It deals in perfect and amicable numbers, Fermat's theorem and its converse, Wilson's theorem, digit properties, repeating decimals, primitive roots, Pythagorean numbers, Pell's equation, primes, etc. The author was clearly fond of his task, since he has lovingly and industriously compiled long bibliographies after each chapter, 103 tables, 33 pages of answers to the problems, and an 11-page index. There is little, or no attempt to give proofs, and when these are sketched, they are almost never rigourous. In at least one case there is outright fallacy: on page 16 it is stated that if $p \mid a^n - 1$, with p prime and $n < p$, then $n \mid p - 1$. Not so, since $31 \mid 2^{20} - 1$. There are also scattered errors in terminology, judgment, or fact: Uhler's "perfect numbers" on p. 18; an assessment of Wilson's theorem on p. 49; and the claim, on p. 292, that Gauss was unassuming, gentle and naïve. But these blemishes do little harm to the author's main purpose.

The author's style is exceedingly rich. Chapter XX begins: "Inseparably woven into the fabric of number theory, nay, the very weft of the cloth, are the ubiquitous primes. Almost every investigation includes them; they are the elementary building blocks of our number edifice. From the humble 2, the only even prime, and 1, the smallest of the odd primes, they rise in an unending succession aloof and irrefrangible." Chapter XV begins: "There is something about a square! Note its perfection and symmetry. All its sides are equal, its angles are neither stupidly obtuse nor dangerously acute. They are just right. The square has many beautiful geometric properties." It is not clear here whether the author merely means to thus convey his enthusiasm, or whether this is intended to add to the book's recreational value.

For an amateur the book is a real grab-bag, but even a professional may derive some information from the many tables, bibliographies, and occasional curiosities and odds-and-ends that he may not have previously encountered.

D. S.