No one will hold it against Dr. Kowalewski that his very original 156 page booklet does not try to cover "the fundamentals and basic laws of higher mathematics" implied by the title. But it may be well to warn budding engineers and naturalists that this is no beginner's textbook.

Of the three chapters—"Vector Calculus and the Theory of Determinants," "Theory of Limits," "Differential and Integral Calculus"—the contents and the spirit of the last one came nearest to what one finds in the average textbook. The first chapter (an authoritative treatment of the relations between vectors and determinants) and the second one (Weierstrass' law and some of its conclusions) will be appreciated most by advanced students, and the place of these subjects in a condensed curriculum appears a little doubtful.

American readers will be tempted to compare Dr. Kowalewski's little volume with *Higher Mathematics for Engineers and Physicists* by I. S. and E. S. Sokolnikoff. Taking into account a 3 to 1 ratio in size in favor of the Sokolnikoffs, this reviewer believes that engineers will prefer the American work because of its excellent selection of important material and its "engineering approach."

Dr. Kowalewski's work, expert as it is, misses this appeal.

R. P. KROON

Your Chance to Win. The Laws of Chance and Probability. By H. C. Levinson. New York and Toronto, Farrar and Rinehart, 1939. 343 pp.

According to the advertisement of this book, the author "has taught mathematics at Ohio State University and has devoted more than eleven years to business statistics and to executive work in business." After reading the book, one wonders also how much time the author has spent at such places as Monte Carlo and Canfield's.

This book is written for the layman, so the mathematics involved is just an application of the laws of probability that are found in any college algebra. The topics covered by the book include such titles as luck, chance, statistics, the world of superstition, fallacies, heads or tails, poker chances, roulette, lotteries, craps, bridge, fallacies in statistics, statistics and science, and so on.

This book is more interesting for its practical psychology and common sense than for its mathematics. Everyone is superstitious and a "gambler at heart" (according to an old saying), so perhaps everyone should read this book. Again, mathematics is said to be just "organized common sense," so perhaps mathematicians should take also a scientific interest in this book.

At any rate, undergraduate mathematics clubs would find this book excellent for at least one meeting, if we may judge from the sudden and great interest shown by freshmen when the topic of probability is reached in the course in college algebra. The reviewer enjoyed immensely reading this book and was especially interested to find worked out why it is so hard to "fill the inside of a straight" in poker. However, a word of warning should be given at this point. The fundamental assumption of this book is that all the activities discussed therein are conducted honestly. As we all know, this assumption is so often not satisfied in practice.

ALAN D. CAMPBELL

Elementary Theory of Operational Mathematics. By Eugene Stephens. New York, McGraw-Hill, 1937. 11+313 pp.

This book is concerned primarily with the theory of symbolic operators and their application to the solution of differential equations. The book, as stated in the preface, "is an outgrowth of an attempt (1) to search out the history of these [operational] methods; (2) to codify the set of theorems found; (3) to connect them with the work of the rigorists; and (4) to extend the theorems by all possible means." It seems to the reviewer that the author has succeeded well in his attempt.

The nature of the book is indicated by the chapter headings: I, Introduction and Definitions (8 pages); II, The Operator $D \equiv d/dx$ (47 pages); III, Applications to Ordinary Linear Differential Equations with Constant Coefficients (14 pages); IV, Algebraic Theorems (determinants, 18 pages); V, Matrices (12 pages); VI, Systems of Ordinary Linear Differential Equations with Constant Coefficients (26 pages); VII, The Operators $d_1 \equiv \partial/\partial x$, $d_2 \equiv \partial/\partial y$ (30 pages); VIII, Applications to Partial Linear Differential Equations with Constant Coefficients (18 pages); IX, The Operator $d_i \equiv \partial/\partial x_i$ (6 pages); X, The Noncommutative Operator $xD \equiv \theta$ (8 pages); XI, Solutions in Series (41 pages); XII, The Differential Equation in Mathematical Physics (9 pages); XIII, Initial or Terminal Conditions (10 pages).

The last two chapters belong more properly in a text on differential equations and are so excellent that they should form the introduction to every beginning course in that subject. The first explains the nature of a differential equation and its solution, and gives the most illuminating discussion of these matters that the reviewer has seen in any book. The second shows the meaning of the constants of integration and how to determine them in a wide variety of problems.

The book concludes with three appendices and an index. The third appendix gives the history of operational mathematics and a complete bibliography of the subject from 1765 to the present time.

J. B. SCARBOROUGH

An Introduction to the Theory of Numbers. By G. H. Hardy and E. M. Wright. Oxford, Clarendon, 1938. 16+403 pp.

As the authors have taken pains to describe—too modestly—the nature of their work, we quote from their preface.

"This book has developed gradually from lectures delivered in a number of universities during the last ten years, and, like many books which have grown out of lectures, it has no very definite plan.

"It is not in any sense (as an expert can see by reading the table of contents) a systematic treatise on the theory of numbers. It does not even contain a fully reasoned account of any one side of that many-sided theory, but is an introduction, or a series of introductions, to almost all of these sides in turn. . . . There is plenty of variety in our programme, but very little depth; it is impossible, in 400 pages, to treat any of these many topics at all profoundly."

Those who had the pleasure of hearing the senior author's lectures when he was in the United States ten years ago, will have pleasurable anticipations of what to expect; nor will they be disappointed. The book is like no other that was ever written on the theory of numbers, as an introduction or as a treatise; although Edouard Lucas might have written something like it had he been primarily interested in the analytic theory and were he living today. Some of the topics treated have been frequently discussed in the English and German journals of about the past decade. As might be anticipated from the authors' interests, analysis dominates much of the material. The treatment throughout, even of old things, is fresh and individual.

Owing to the widely varied character of the matter, it is impossible to give a brief summary of the scope of the book, and the following sample must suffice to indicate the contents. The theory of quadratic forms is omitted. Chapters 1, 2 treat the series of primes and the fundamental theorems on divisibility for the rational integers.