ZACHAROV, B., *Digital Systems Logic and Circuits* (George Allen and Unwin Ltd., 1968) xviii + 160 pp., 20s. (paper), 30s. (cloth).

This book is intended to serve as an introduction to the basic principles of electronic digital systems including a discussion of the actual circuits themselves. In this, it admirably succeeds in its aim, and provides a readable account which should be of use to undergraduates taking a first course in the subject. It will also be of value to those who are acquainted with binary numbers and boolean algebra and wish to know how they are used in computers.

The first half of the book is devoted to the theoretical aspects of digital circuits, and begins with an introduction to number systems, including bases, representation and codes. This is followed by an account of Boolean algebra and its use in the construction of simple switching circuits, and on some methods for the simplification of Boolean expressions. The remainder of the book is devoted to the physical implementation of the principles described in the earlier chapter, and thus the various forms of electronic logic, including core logic, which are available at the present time are described in some detail, together with some discussion of the use in both static and sequential circuits. There is also a brief introduction to switching matrices (or as the author prefers to call them, switching matrixes). The book is adequately provided with references. D. C. GILLES

HARDY, G. H., *Collected Papers*, including joint papers with J. E. Littlewood and others, Vol. II. Edited by a Committee appointed by the London Mathematical Society (Oxford, Clarendon Press, 1968), 702 pp. £6.

This second volume contains Hardy's remaining papers on the theory of numbers and also his work on inequalities. Of the fifty-four papers included, nearly half were written in collaboration, mainly with J. E. Littlewood. The volume is divided into three sections. The first contains papers on multiplicative number theory, including the zeta-function. Here are to be found, for example, three papers on the zeros of $\zeta(s)$ on the line $\mathrm{Re}\, s = \frac{1}{2}$, culminating in a proof that the number of zeros of ordinate less than T exceeds KT, for some positive constant K. This estimate was improved to $KT \log T$ by A. Selberg in 1942. Hardy and Ramanujan's well known work on the normal number of prime factors of an integer is also included in this section as are the pioneering papers by Hardy and Littlewood on the approximate functional equations of $\zeta(s)$ and $\zeta^2(s)$.

The second section contains a miscellaneous collection of papers on number theory. In addition to now famous work on the circle and divisor problems, the section includes two papers on Ramanujan's function $\tau(n)$, the first of which gives the first reasonably precise order estimates while the second generalizes Wilton's Bessel function formulae for the Riesz means.

The final section on inequalities contains four papers from the long series of " Notes on some points in the integral calculus ". The first of these and the three following papers are on Hilbert's double series inequality and this provides the motivation for various generalizations in the seventh paper. Also included is the famous paper " A maximal theorem with function-theoretic applications " whose second section begins with the sentence: " The problem is most easily grasped when stated in the language of cricket . . ."

Valuable editorial comment, corrections and references to more recent work are supplied by R. Rado and the late A. E. Ingham. R. A. RANKIN