carefully derives from nonlinear three-dimensional elasticity several of the nonlinear theories of rods, plates, shells, taking pains to show that the special hypotheses used are consistent to the degree of approximation considered. The reader not already familiar with this subject, where in the past outright inconsistent assumptions have often been made, may not realize that the author's treatment deserves the description "simple but profound."

C. TRUESDELL

The higher arithmetic. By H. Davenport. London, Hutchinson's University Library, 1952. Text ed. \$1.80, Trade ed. \$2.25.

This book is an introduction to the theory of numbers which is suitable for a very wide class of readers. On the one hand, no extensive mathematical knowledge is required of the reader; in fact, a good high-school training in mathematics would be sufficient. On the other hand, the author discusses subjects of real mathematical interest and treats them in a very readable way, so that a person of considerable mathematical maturity would find much enjoyable and profitable reading in this work.

The titles of the seven chapters are as follows: Factorization and the primes, Congruences, Quadratic residues, Continued fractions, Sums of squares, Quadratic forms, Some Diophantine equations. As can be seen from the list, a fairly wide range of material is covered. No attempt is made to treat each topic exhaustively, but the author goes far enough to enable the reader to get some appreciation of the main ideas and problems in each area. A few of the more noteworthy things to be found in the book are as follows: (1) a good presentation of the method of mathematical induction and a proof of the unique factorization theorem by this method, (2) a proof of Chevalley's theorem that an algebraic congruence in several unknowns to a prime modulus always has a nontrivial solution if the constant term is zero and the degree is less than the number of unknowns, (3) a proof of the theorem on the number of positive integers n between 1 and $p-2$ (inclusive) for which n and $n+1$ have prescribed quadratic character modulo the odd prime p, (4) a rather thorough treatment of the continued fractions of quadratic irrationals, (5) a presentation of various constructions for the two squares into which a prime of the form $4k+1$ can be decomposed, (6) a discussion (without proof) of Dirich-

dissertation (1943) [Trans. Amer. Math. Soc. vol. 58 (1945) pp. 96–166], and W. Z. Chien has asserted in a letter that the similar material in his paper [Sci. Rep. Tsing Hua Univ. vol. A 5 (1948) pp. 240–251] derives from his Toronto Thesis (1942). The idea does not appear to have taken hold in this country.

let's class-number formula, and (7) an exposition (without proof) of the Thue-Siegel theorem.

Although this book is not written as a textbook but rather as a work for the general reader, it could certainly be used as a textbook for an undergraduate course in number theory and, in the reviewer's opinion, is far superior for this purpose to any other book in English. Admittedly there are no formal lists of problems, but there are plenty of problems implicit in the text in the form of easy proofs and calculations left to the reader; also there are many hints for further discussion or further reading. Students will certainly like the author's facility in presenting new concepts and proofs clearly without introducing elaborate notations.

Finally the reviewer believes that this book should be in every college library worthy of the name, regardless of whether or not there is a course in number theory in the curriculum. It is hard to think of a better book to suggest to an interested undergraduate for independent reading.

P. T. BATEMAN

Éléments de mathématique. By N. Bourbaki. Book II, *Algebra.* Chaps. I–VII. (Actualités Scientifiques et Industrielles, nos. 934, 1032, 1044, 1102, 1179.) Paris, Hermann, 1942, 1947, 1948, 1950, 1952.

Our time is witnessing the creation of a monumental work: an exposition of the whole of present day mathematics. Moreover this exposition is done in such a way that the common bond between the various branches of mathematics becomes clearly visible, that the framework which supports the whole structure is not apt to become obsolete in a very short time, and that it can easily absorb new ideas. Bourbaki achieves this aim by trying to present each concept in the greatest possible generality and abstraction. The terminology and notations are carefully planned and are being accepted by an increasing number of mathematicians. Upon completion of the work a standard encyclopedia will be at our disposal. The volume on *Topologie générale* which is complete is already being used enthusiastically, especially by the younger generation. A comparison with the "Encyclopädie der mathematischen Wissenschaften" should not be made. The aim was different; proofs were omitted and each article was written by a different author.

I hope that this work will continue in the same spirit and with the same vigor. I would suggest an English translation.

The volumes on algebra that have appeared show the same general features as the rest of Bourbaki. Numerous exercises, many of them