With this judgement those who have learned to use a computing machine will be apt to agree. However, the subject of graphic computation is in itself a very interesting one, and there is also the chance that certain problems in geometry and mechanics which are too complicated for arithmetic analysis may yield to some such methods as we have here. It is important that every method be as fully developed as possible whether it may compare favorably or unfavorably with other methods. This has been done for the method of graphic computation in this book with scholarly thoroughness.

D. N. LEHMER

From Determinant to Tensor. By W. F. Sheppard. New York, Oxford University Press, American Branch, 1923. 127 pp.

This is an excellent little book the aim of which is to familiarize the student with tensors and to give an idea of their applications. It is, perhaps, not sufficiently realized that tensors are not merely a part of "relativity", the fact being that they permeate almost all mathematics.

Professor Sheppard gives illustrations of the applicability of tensor algebra to statistical theory and this chapter of his book is the most novel. The fact that tensor theory would be useful in this theory is à priori evident from the prominent position given in statistics to a quadratic form.

What caught the reviewer's attention first, on reading the book, was that Professor Sheppard had a happy thought when he tried to introduce the beginner to tensors by starting with determinants. The connection between alternating tensors, which are those that occur naturally in the study of geometrical figures and their attached integrals, and determinants is a deep-lying one and it is in some respects a good plan to reverse the process and obtain the principal results on determinants from very elementary theorems of tensor algebra. A very good account of determinants and their uses is given in the first few chapters of the book.

We wish to recommend this book heartily, but we must refer briefly to a point in it which we regard as unfortunate. Reduced to ordinary vector symbolism, the writer says that we can write the scalar product idea in the form $m/\overline{A} = \overline{B}$ this being understood as equivalent to $m = (\overline{A} \cdot \overline{B})$ where m is a scalar quantity and $\overline{A}$ and $\overline{B}$ are two vectors. If we also have $n/\overline{C} = \overline{B}$ the author equates $m/\overline{A}$ to $n/\overline{C}$ and says that $m/\overline{A} = n/\overline{C}$ is a way of stating that m is the same linear function of $\overline{A}$ as n is of $\overline{C}$ (p. 75). But $\overline{B}$ is not determined by $m/\overline{A}$, as we can write $m/\overline{A} = \overline{B} + \lambda\overline{X}$ where $\overline{X}$ is any vector perpendicular to $\overline{A}$. We do not, therefore, follow the author in his discussion of the