(Frenet formulae, lines of curvature, Gauss-Bonnet theorem, minimal surfaces, etc.), in which clarity of expression is obtained without that lack of rigor which is sometimes a feature of other texts—even of those written after the thunderbolts of Study's Olympus sent Scheffers reeling back to the shelter of his work room to check up on the formulation of his theorems. The author, who has taught both at Münster in Westfalen and at Ottawa in Ontario, has tried to combine his attempts at careful formulation of results and at introducing the abstractions of the tensor calculus with *Anschaulichkeit*; one of the reasons he has succeeded so well in this visualization is the presence of a considerable number of most excellent illustrations. The reader will also find a number of exercises, with the solutions at the end of the book, carefully explained (and illustrated) in no less than forty pages. A few topics not found in the standard texts (S. Bergmann's conformally invariant metric, the surfaces $W=W(x, y)$ belonging to analytic functions $f(z)=We^{i\phi}$), as well as some historical remarks contribute to the value of this book.

D. J. STRUIK

Matrix calculus. By E. Bodewig. New York, Interscience, 1956. 11+334 pp. $7.50.

This book is of primary importance to the practical computer. Its author has many years' experience in this field.

The principal problem which the computer has in matrix theory is to find the eigenvalues and eigenvectors of a given matrix. If this could be done easily, so could almost all other computational problems. Now no single method for solving this fundamental problem is the "best" one for all matrices. The practical computer is forced to use various methods for various special cases. This book contains a very useful and complete account of many familiar and of several unfamiliar computational devices, with analyses of most of them. The emphasis is usually on hand computation, but by no means exclusively so.

Subjects covered include Linear Equations (including ill-conditioned equations), Inversion of Matrices (including geodetic matrices), Eigenproblems. In all chapters, the author classifies methods as *direct* or *iterative*; the latter are usually more appropriate for mechanization.

The combination of practical and theoretical points of view make this an interesting book. By and large the notation used by the author is entirely appropriate. Although this notation is not used universally in all its details, it is standard enough.

J. L. BRENNER