Vector Analysis. By H. B. Phillips. New York, John Wiley and Sons, 1933. viii+236 pp.

The following quotation from the preface will give some idea of the contents: "In broad outline the book consists of two parts. The first five chapters cover the fundamental operations and the more general properties of scalar and vector fields. The remaining chapters contain the detailed analysis of fields, the properties of potentials, and linear vector functions. In an elementary course the work might be restricted mainly to the first five chapters together with selected topics from the others." The first part includes, in addition to chapters on the algebra and calculus of vectors, a discussion of line, surface, and volume integrals, Stokes's theorem, the divergence theorem, and generalized coordinates. The last five chapters contain applications to electricity and hydrodynamics, an introduction to potential theory, and a chapter on dyadics. Although the material covered can hardly be classified as easy for an undergraduate, the author has succeeded in making his presentation as elementary as the nature of the subject matter allows. There are 235 problems. We believe the book contains excellent material, well presented, for a semester's work following advanced calculus.

The following comment is not to be taken in any way as a criticism of the book under review. It is our opinion that the usefulness of the Gibbs vector notation is much overrated. For most purposes the representation of a vector by a typical component, using the symmetric subscript notation and the double index summation convention, is far more efficient. For an exposition of this notation the reader is referred to the recent book, *Cartesian Tensors*, by Jeffreys, or to *Vector Analysis and Relativity*, by Murnaghan.

C. A. SHOOK

Differentialgeometrie. By L. Bieberbach. Teubner's Mathematische Leitfaden, Volume 31. Berlin, Teubner, 1932. vi+140 pp.

I quote from the preface: The purpose of this "Leitfaden" is to give an introduction to the differential geometry of real curves and surfaces of the euclidean plane and euclidean space. The endeavor is made throughout to do this with the least possible prerequisite knowledge. In general only the elements of the differential and integral calculus and of analytic geometry are necessary, the last indeed in vector form .... "Ich hoffe weiter, dass man in meinem Buche kein saloppen Gedankengänge finden wird, keine unsauberen Schlüsse von der Art wie sie auch die moderne Literatur über Differentialgeometrie leider so oft noch beherbergt—als Überreste aus der Plüschmöbelziet und als Verstandesschoner."

The book is an extraordinarily good, rigorous, and short presentation of the principal elementary results of differential geometry with the inclusion of a good deal of interesting matter not usually to be found in a first book on the subject. There are only 132 pages of text, which are divided into three chapters: 1. *Curves in the Euclidean Plane* (pp. 1–29); 2. *Curves in Euclidean Space* (pp. 30–46); 3. *Surfaces in Euclidean Space* (pp. 47–132). The last ten pages of the third chapter give an introduction to the tensor calculus.

The presentation of the subject is clear and careful; much more attention is paid to rigor than is customary in books on Differential Geometry. The treat-