BOOK REVIEWS

Einführung in die Differentialgeometrie. By W. Blaschke. Berlin, Springer, 1950. 8+146 pp. 16 DM.

This new book of Blaschke's is a text covering the metric differential geometry of curves and surfaces lying in ordinary Euclidean space. It covers roughly the same material as the first volume of his *Vorlesungen über Differentialgeometrie,* Berlin, Springer, 3d ed., 1930, but the two books are remarkably different both in content and approach.

The most striking innovation in the present work is the systematic use of E. Cartan's exterior differential forms to which Blaschke is a fairly recent convert. The adoption of this technique has caused him to rewrite large portions of his older book completely. There is more on minimal surfaces here than there was earlier, but the former sections on differential geometry in the large have been condensed or omitted and the earlier treatment of line geometry is omitted entirely. On the whole these changes are for the better, and this book is an excellent introduction to the subject with appropriate emphasis on its classical and modern aspects.

The book is compactly written and contains more information than one would anticipate from so small a number of pages. To a large extent this is made possible by the author's familiar custom of presenting as "exercises" brief outlines of numerous theorems together with appropriate references. These "exercises" are one of the most valuable features of the book. It is unlikely that universities in the United States could use such a book as a classroom text (even if it were in English), but it would serve as an excellent supplement to more usable texts such as the recent outstanding one by D. J. Struik, *Differential geometry,* Addison-Wesley, 1950.

After an initial chapter on vector and matrix algebra, the author turns to a treatment of strips and curves. His emphasis on strips rather than on curves is quite unorthodox and will not find universal favor. Indeed it is surprising (to say the least) to find that the Frenet formulas for a curve are introduced as a lemma preparatory to the Four-Vertex Theorem. The exercises include references to curves of constant width, helices, and the isoperimetric property of the circle (seven proofs).

The third chapter considers the calculus of exterior differential forms. Although the treatment is clearer than those in Cartan's books, there is still an air of mystery about this beautiful technique. An ele-