

SCHEFFERS'S THEORY OF SURFACES.

Einführung in die Theorie der Flächen. Von Dr. GEORG SCHEFFERS. Der "Anwendung der Integral- und Differential-Rechnung auf Geometrie" zweiter Band. Leipzig, Veit & Comp., 1902. Pp. x + 518.

THERE will naturally be a considerable divergence of opinion on the part of mathematicians both as to what such a volume as the one before us should contain, and, from a pedagogical standpoint, as to how the subject matter should be presented. It may be stated at once that in the opinion of the present writer the author has accomplished with marked success, on the whole, the difficult task of placing before the beginner in a clear and readable form an outline of the vast theory of surfaces and surface curves.

Among the advantages of the work which recommend it powerfully to the student taking up this branch of mathematics for the first time, is the almost entire absence of unaccustomed symbols and symbolic operators, the free use of which adds so much to the difficulty of reading Bianchi, or Stahl-Kommerell, for example. Bearing in mind that u, v are the parametric coordinates of a point on the surface, that E, F, G and L, M, N are the fundamental magnitudes, that X, Y, Z are the direction cosines of the surface normal, R_1, R_2 the principal radii of curvature, and finally that K, H represent respectively the Gaussian measure of curvature, and the mean curvature, the student will hardly be at loss to read understandingly any chapter in the book—as far at least as the symbolism is concerned.

The author has, very wisely I think, avoided presenting the theory of surfaces as the theory of invariance of two quadratic differential forms. While there are undoubtedly advantages attached to the latter method of presenting the subject, such as the brevity and elegance of most of the formulas developed, yet this method never appeals to the beginner as being a natural one; and the gain in brevity is apt to be more than compensated for by a loss in clearness. Moreover, to obtain a proper insight into the subject, the student should familiarize himself with both methods of treatment, taking the easier and more natural one first.

Another striking advantage for the beginner is that in this volume, as in the preceding one on space curves, every theorem given, pertaining to the subject, is developed in