

the trigonometric functions are too small and not accurate. One full page graph with carefully distinguished curves would be more satisfactory. In the early pages the definition of coordinates is correct, but unfortunately all notion of directed lines is abandoned in the proofs of the summation formulas for sines and cosines.

Reduction of functions to the first quadrant, which in many books is needlessly diffuse, is here given in a compact form which lacks only a good rule as a summary to be quite sufficient. The double inequality in the proof for the sines of small angles follows the usual course, and as in most of our text-books does not show that the two tangents are longer than the arc. The corresponding *S* and *T* tables have been made relatively inconspicuous and supplemented by more useful tables of functions of small angles given for each second.

In the discussion of variation of trigonometric functions double signs have been used to advantage with the zero values as well as with the infinity sign. The solid perspective figures in the latter part of the book are good, and at the end is found, what is none too common in our text-books, an index.

As a whole the book does not differ noticeably from the many text-books covering the same ground. Examples are particularly abundant while the theoretical portions might well be amplified and improved.

F. H. SAFFORD.

Wilhelm Schells Allgemeine Theorie der Kurven Doppelter Krümmung. Dritte Auflage neu bearbeitet von ERICH SALKOWSKI. Leipzig, B. G. Teubner, 1914. 196 pp. Price 8 marks.

THE first edition of this book appeared in 1859, the second in 1898. It was the purpose of the author to develop the elements of the theory of curves of double curvature by the geometric method of infinitesimals without recourse to higher analysis. Since the investigation included the study of the three surfaces generated by the tangents, principal normals, and binormals of a general curve, there appears incidentally a considerable amount of material concerning the geometry of a surface in the neighborhood of an ordinary point. Consequently a reader (who might easily be an undergraduate) could obtain from the book a very good idea of the elements of the differential geometry of curves and surfaces.

Any one familiar with Salkowski's papers in this field would recognize his fitness to prepare a third edition of the book. For a number of his papers are written from its point of view. Many sections have been rewritten and there are a number of essential additions. A notable one is the proof of the fundamental theorem concerning the determination of a curve by its intrinsic equations. A new chapter is devoted to a full discussion of skew ruled surfaces, in preparation for the study of those generated by the principal normals and binormals of a curve.

When two curves in space are in one-to-one correspondence such that corresponding tangents, principal normals, and binormals respectively are parallel, the curves are in the relation of a transformation of Combescure, to use the terminology due to Bianchi. One readily thinks of other correspondences involving parallel arrangements, as well as ones having to do with differential quantities. An investigation of these questions appears in the new edition for the first time, as do also the ideas and properties of successive evolutes.

A student reading one of the advanced treatises on differential geometry will do well to consult this little book, because of its method of attack and its richness in material.

LUTHER PFAHLER EISENHART.

Ten British Mathematicians. By ALEXANDER MACFARLANE. No. 17, Mathematical Monographs edited by Mansfield Merriman and Robert S. Woodward. New York, John Wiley and Sons, 1916. 148 pp. Price \$1.25.

THIS is somewhat of a departure from the preceding sixteen numbers of this series in subject matter, being an account of individual mathematicians and their contributions to mathematics, rather than a survey of some particular field of the subject. The ten men are George Peacock, Augustus De Morgan, Sir William Rowan Hamilton, George Boole, Arthur Cayley, William Kingdon Clifford, Henry John Stephen Smith, James Joseph Sylvester, Thomas Penyngton Kirkman, and Isaac Todhunter. The author had the advantage of personal acquaintance with a number of the men of whom he wrote, as well as the interest of having been born a fellow countryman. He has given us the life history of the man without too much detail, and yet with enough intimacy, so that we have a picture of the man as a man, as well as a scientist.