Plane Algebraic Curves. By Harold Hilton, M.A., D.Sc. Oxford, The Clarendon Press, 1920. 16 + 388 pp.

This is the first treatise on plane algebraic curves to appear in English since Salmon's famous treatise which was published over forty years ago. During the last four decades many new theorems have appeared in the various mathematical journals and thus it is fitting that a new English treatise should be written.

In dealing with such an extensive subject it is of course impossible to include all the known material, and one must expect to find omissions of certain topics. The most striking omission in this text is the modern algebraic-geometric development as set forth by Castelnuovo, Severi, Segre and others. In fact, the whole topic of geometric transformations and the derivation of properties of algebraic curves by means of these transformations has been omitted except for two cases of the quadratic transformations. Thus one is impressed by the fact that this treatise follows to a great extent the same general course as Salmon's, except that topics are more fully discussed and are brought up to date. However, many excellent collections of exercises are scattered throughout the book, and these alone are well worth the price of the text. The great majority of the results have been derived by algebraic methods. In many places the work could be shortened if synthetic methods were used.

The main topics discussed are: coordinate systems, projection, singular points, curve tracing, tangential equations and polar reciprocals, foci, superlinear branches, polar curves, Hessian, Steinerian, Cayleyan, Jacobian of three curves, Plücker's numbers, deficiency, higher singularities, two types of quadratic transformations, unicursal curves, derived curves, intersection of curves, unicursal cubics, non-singular cubics, cubics as Jacobians, use of parameter for non-singular cubics, unicursal quartics, quartics of deficiency one and two, non-singular quartics, ovals and circuits, corresponding ranges and pencils.

This book should be found in every mathematical library, for the topics discussed are most admirably treated. As a text for a first course it is superior to anything that has appeared as yet in any language because of the excellent collection of exercises.

F. M. MORGAN.

Vector Calculus. By Durgaprasanna Bhattacharyya. Calcutta, University of Calcutta, 1920. 90 pp.

In order to present the essential features of vector analysis for use in mathematical physics, the author develops the differential and integral calculus of vectors and functions of vectors directly. He scorns the use of coordinates very properly with much the feeling of Tait that one "should not violate the spirit of the Order." However, he does not overlook the great practical advantage that accrues from the study of ordinary vectors.

The author defines line, surface, and volume integrals of vectors and of vector functions. He then defines gradient of a scalar function F substantially as the vector F in the expression $d\rho \cdot F$. After considering the linear vector function of a vector, he proceeds to the differential calculus