

The last two chapters of the book, on cyclifying surfaces and evolutoids, have not undergone much change.

The work seems to be unusually free from serious misprints or inaccuracies. The following corrections might perhaps be worth mentioning : p. 16, footnote : Dr. Kneser's first paper appeared in Vol. XXXI (not XXI). the second will be found in Vol. XXXIV, at p. 204 (not XXIV, p. 506), of the *Mathematische Annalen* ; p. 61, end of § 2 : the last expression for  $\tan \mu$  is obviously wrong, the last but one should have in the denominator  $ds$  instead of  $d\sigma$  ; p. 91: the proof of the relation  $A' = B + (\frac{1}{2}\pi - \alpha)$  seems unduly long, as the triangle  $APB$  (Fig. 34), all of whose sides are infinitesimal of the same order while  $P$  is a right angle, gives at once  $\frac{1}{2}\pi + B$  for the exterior angle  $\alpha + A'$  at  $A$  ; p. 110, l. 11 from foot of page : read  $= 1$  for  $-1$ , and in the numerator of  $a$  read  $-1/r$  for  $1/r$  ; p. 137, l. 15 from top : for Hauptnormalen read Binormalen.

The concluding remarks of the work give an interesting outlook on problems awaiting solution in the geometrical theory of tortuous curves. Coming as they do from one who has made a special study of the subject they will be read with great interest by all workers in this field.

ALEXANDER ZIWET.

UNIVERSITY OF MICHIGAN,  
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## PAGE'S DIFFERENTIAL EQUATIONS.

*Ordinary Differential Equations.* An elementary text-book, with an introduction to Lie's theory of the group of one parameter. By JAMES MORRIS PAGE, PH.D., Adjunct Professor of Mathematics, University of Virginia. The Macmillan Company, New York, 1897. 12mo, xviii + 226 pp.

This little volume is what it purports to be,—an elementary text-book with an introduction to Lie's elementary methods of integration as applied to ordinary differential equations. The contents fall into twelve chapters devoted to the following subjects in order : I. Genesis of the ordinary differential equation in two variables, pp. 1-9 ; II. The simultaneous system and the equivalent linear partial differential equation, pp. 10-24 ; III. The fundamental theorems of Lie's theory of the group of one parameter, pp. 25-59 ; IV. Connection between Euler's integrating factor and Lie's infinitesimal transformation, pp. 62-97 ; V. Geometrical