

foudent read *fondent*; page 332, last line, letter missing; page 380, for *Thompson* read *Thomson*; page 449, a hyphen is missing in next to the last line, also capitalize d; page 473, for *Veierstrass* read *Weierstrass*; page 481, heading of page is wrong; page 498, 8 lines from bottom; for *snr* read *sur*.

JAMES PIERPONT.

PROJECTIVE DIFFERENTIAL GEOMETRY.

Projective Differential Geometry of Curves and Ruled Surfaces.

By E. J. WILCZYNSKI. Leipzig, B. G. Teubner, 1906.
viii + 295 pages.

THE present volume is the amplification and systematic development of the ideas originally presented in various papers by the author, published in the *American Journal*, *Transactions of the AMERICAN MATHEMATICAL SOCIETY* and *Mathematische Annalen*.

The work begins with a very brief resumé of the ideas of continuous groups, followed by a synopsis of the transformations of linear homogeneous differential equations, wherein Stäckel's theorem regarding the form of the transformations which leave such an equation invariant is generalized to apply to a simultaneous system of such equations. A fairly full discussion is given to the invariants and covariants of a single linear equation. After showing that every transformation which leaves the equation invariant is of the form

$$y = \lambda(x)\eta, \quad x = f(\xi),$$

the first transformation alone is treated at length, the functions of p_i , $p_i^{(k)}$ which remain invariant being designated as semi-invariants; those of p_i , $p_i^{(k)}$, $y^{(l)}$ being called semi-covariants. By the second transformation, a function Ω of x is said to be invariant of weight m if

$$\Omega(x) = \frac{1}{(f')^m} \Omega(\xi).$$

An early application of these ideas is the derivation of the canonical form of the equation, in which the terms containing $y^{(n-1)}$ and $y^{(n-2)}$ are absent. The Lagrange adjoints are dis-