The reviewer feels that the appeal of this book will be to the more advanced and mature student and that it will be valued chiefly for the special topics of Chapters V–VIII now made conveniently available. Most beginning students will probably find the book too difficult and it may therefore prove unsuitable as a classroom text for a first course.

LOWELL SCHOENFELD

Ordinary non-linear differential equations in engineering and physical sciences. By N. W. McLachlan. Oxford University Press, 1950. 6+201 pp. $4.25.

In the preface to this work the author states: "owing to the absence of a concise theoretical background, and the need to limit the size of this book for economical reasons, the text is confined chiefly to the presentation of various analytical methods employed in the solution of important technical problems." It is therefore with forethought, and perhaps with malice aforethought, that the author has presented the mathematical theory in a form which is highly disorganized and which reveals ever so tellingly the inadequacy of present mathematics to explain what are now common experiences of the engineer and physicist.

The state of disorganization of the mathematics is such that one might conclude that there is no theory of differential equations and that all one can hope for in practice is that the differential equation encountered has been solved in the literature. Thus Chapter II, on *Equations readily integrable*, consists solely of the following examples: $y'=-x/y$; $y'=(x+y)/(x-y)$; $y'=2-x/y$; Bernoulli's equation; certain Riccati equations; the simultaneous equations: $y'=z+y[(y^2+z^2)^{1/2}-2a]$, $z'=-y+z[(y^2+z^2)^{1/2}-2a]$; $y''=y'^2(2y-1)\cdot(y^2+1)^{-1}$; $y''+ay'^2y^{-1}=0$; $ax^3y''=(xy'-y)^2$; $ay'''+yy''+y'^2=0$; the Lane-Emden equation. Chapter III concerns *Equations integrable by elliptic functions*. Again the choice of examples is arbitrary. The other chapters are restricted to a very few special equations and add little towards any general point of view.

Granted the deficiencies of the existing mathematical theory of differential equations, the reviewer believes that the author has exaggerated the situation. Even his list of "equations readily integrable" is a very inadequate presentation of what is known. One gains the impression that solution of a differential equation is to mean only solution in terms of elementary (or elliptic!) functions, and that only a simple analytical expression for the solution can be of use. The fact that the differential equation itself defines functions is ignored, although it is implicit in the approximate methods of solution de-