for the approximate solution of equations. The emphasis is on the underlying ideas of the subject and, while complete in itself, the book should be of greatest value to students who have already at school had some training in technique of differentiation.

(iv) *Elementary Differential Equations and Operators* deals entirely with linear equations with constant coefficients. After an introduction to the solution of these equations by the usual elementary methods, the main part of the book is devoted to an account of the operational method of solution of such equations with given initial conditions. The illustrative examples are well chosen and worked out in great detail.

R. P. GILLESPIE

COLOMBO, S., *Les transformations de Mellin et de Hankel*, Monographies du Centre d'Études Mathématiques en vue des Applications, B. Méthodes de Calcul. (Centre National de la Recherche Scientifique, Paris, 1959), 99 pp., 15s. 6d.

The purpose of this little book is to present to physicists the essentials of integral transforms and of the transform method in applied mathematics, especially as applied to the theories of potential and of heat conduction. Its chapters, in order, deal with transforms in general, with particular reference to Fourier and Laplace transforms (32 pp.), the Mellin transform (16 pp.), the Hankel transform (12 pp.), applications to partial differential equations (16 pp.), dual integral equations (9 pp.). There is a bibliography of 35 items, chiefly books.

Proofs are omitted or merely sketched, as one would expect, and I feel that the author would have served applied mathematicians better had this policy been extended to choice of material. The relatively long first chapter deals with matter which is very well covered in several books, and would have been better confined to those theorems on the two-sided Laplace transform which can be usefully transcribed into theorems on the Mellin transform. In other chapters topics are introduced but not pursued; e.g. the short section on Poisson's summation formula would have been improved by showing how it can be used for the numerical evaluation of finite integrals.

The applications illustrate the use of Mellin and Hankel transforms in the Dirichlet problems for a wedge and for an infinite and for a finite slab, in the problem of non-steady heat conduction in an infinite slab, and in the problem of the electrified disc. In a very brief mention of axially symmetric potentials the surprising statement is made that the Hankel transform cannot be applied when the number of dimensions exceeds three.

R. D. LORD

WILLMORE, T. J., *An Introduction to Differential Geometry* (Clarendon Press: Oxford University Press, 1959), 326 pp., 35s.

In recent years there has been a regrettable tendency in British Universities for the study of differential geometry at the undergraduate level to be reduced to a minimum, or even to be cut out altogether. To do this is a great mistake, because there is much that is of interest in modern differential geometry. Now that Dr Willmore's book has appeared, there is no excuse. Even a cursory examination will reveal that the subject is both fascinating and challenging.

The book is divided into two parts. The first is concerned with curves and surfaces in three-dimensional Euclidean space. Of the four chapters in this part, the first three are devoted to the classical local differential geometry of curves and surfaces. In substance, there is no difference between this part of the book and the corresponding sections of older works. But the approach is more rigorous, and the reader is warned of the assumptions that must be made in order to ensure that the formulæ are applicable. Clearly Dr Willmore has been influenced by being in the neighbourhood of an analyst.

Chapter IV is very different, for in it we are introduced to differential geometry in the large. Here we are concerned with properties relating to whole surfaces and