WEIL, ANDRÉ, *Introduction à l'étude des Variétés Kählériennes*, Actualités scientifiques et industrielles 1267, Publications de l'Institut de Mathématique de l'Université de Nancago VI (Hermann, Paris), 175 pp., 2000 francs.

This is a useful presentation of the calculus of differential forms and their classification on a Kähler manifold on the basis of the theory for a general differentiable manifold as given in de Rham's book in the same series. The relation between divisors and forms of special type is given and there is a detailed application to the theory of theta functions and abelian varieties. There is no account of the applications to general algebraic varieties. D. J. SIMMS

KOPAL, Z., *Numerical Analysis* (Chapman & Hall, London, 1955), 570 pp., 63s.

This otherwise useful work is unfortunately marred by the author's style and mode of presentation, so that it is rather difficult to read. This difficulty is increased by the use of the now obsolescent astronomical notation of Δ with roman superscripts to denote all differences, central, forward or backward. Although therefore the book gives a good survey of certain branches of numerical analysis, including much that is not readily available elsewhere, it cannot be recommended to a beginner. Those with some experience in the field, however, will find it an interesting, stimulating and informative work.

After an introductory chapter mainly of a conversational nature, the subject is introduced by polynomial interpolation. Principally this covers Lagrangian and Finite Difference methods; formulæ being proved by the assumption of a polynomial expansion. The method of " throw-back " is dealt with in fair detail, but it is erroneously stated that the usual throw-back coefficients cannot be used with the Everett formula.

Differentiation of the formula for interpolation enables the standard numerical differentiation formula to be established, and one is pleased to see a discussion of the optimum interval of tabulation if derivatives are required. An application of numerical differentiation is to curve fitting, but there is no discussion of the " noise " problem.

The solution of ordinary differential equations is introduced by the solution of $y' = f(x)$ and $y'' = f(x)$ using difference formulæ with central and backward differences. The methods are extended first to the equations $y' = f(x, y)$ and $y'' = f(x, y)$, including also the use of Hermite formulæ, and then to general types of equations. A Taylor Series expansion, Picard's successive approximations, and an assumed power series expansion are used to start a solution, but the general method of solution in series due to Frobenius seems rather out of place here. The chapter concludes with descriptions of recurrence formulæ methods (including a discussion of the errors) and Runga-Kutta methods.

An extensive treatment of boundary value problems follows, first by the use of linear algebra methods. As the solution of matrix problems has been relegated to an appendix, this section necessarily treats the problems in an individual manner. There is, for example, no mention that the methods used are equivalent to those for determining the latent roots of a matrix. Other approaches to the problem, namely by the methods of variation, iteration and collation are then described.

The section on quadrature includes an exhaustive treatment of the Gaussian approach using various weight-functions. Subsequently the Newton-Cotes formulæ and the various rules are discussed and there is some treatment of formulæ for the integration of special functions as for example $\int f(x) \sin mx dx$.

A last chapter is devoted to the solution of integral and integro-differential equations principally by the same methods as for boundary value problems viz.: