Interpolation und genäherte Quadratur. By Dr. Gerhard Kowalewski. Leipzig, Teubner, 1932. 146 pp.

This book is a distinct addition to the theory of interpolation and approximate quadrature. The treatment is what we should expect of the author—a scholarly treatment of the theoretical side of the subjects. He lays particular stress upon the exact representation of the error term for which most books give only an estimate. The author stresses the importance of the Euler-Maclaurin formula, for which he gives a new derivation. This formula is often treated in a superficial manner in works on the calculus.

The subject is treated entirely by the calculus of differences and the results are given in a new form. The subjects treated are the following: 1. Interpolation by Polynomials. 2. Newton's Quadrature Formulas. 3. Euler-MacLaurin's and Boole's Theorems. 4. The Euler-Maclaurin's and Boole's Theorems as source of Quadrature Formulas.

The treatment is purely theoretical and will be of great value to persons investigating the subject. The author thinks the book will be of service to all who are concerned with applied mathematics, such as physicists, chemists, engineers, biologists, psychologists, and physiologists. The writer of this review is inclined to think that this will not be the case since few persons except mathematicians will be able to follow the rather abstract treatment of the author. Then, too, there is a dearth of examples (only three in the whole book), which is a great disadvantage to persons who are studying the subject more for its applications than for the theory.

In the second chapter the author considers what he terms "Newton's Favorite Formula," more commonly called "Simpson's Three-Eighths Rule" in the English books. Apparently he considers this formula to give more accurate results than Simpson's One-Third Rule—called by the author merely "Simpson's Rule." To show the comparative accuracy of the two rules he works out an example, $\int_0^\pi \sin x\,dx = 2$, by Simpson's Rule (with three ordinates), and by Newton's Favorite Formula (with four ordinates) and obtains the values $2\pi/3 = 2.09$ by the first formula and $3\pi\sqrt{3}/8 = 2.04$ by the second. However, it is evident that this is not a fair comparison. If we take seven ordinates for each formula, we should get by Simpson's Rule $\pi(4+\sqrt{3})/9 = 2.00086$ and by Newton's Favorite Formula $\pi(5+3\sqrt{3})/16 = 2.00201$, so that the error by the former rule is less than one-half that by the second.

The greater exactness of Simpson's Rule over the Three-Eighths Rule has been previously noted. See, for example my review of Scarborough's *Numerical Mathematical Analysis* (American Mathematical Monthly, vol. 38 (1931), pp. 396–402).

E. B. ESCOTT

Origine des Rayons Gamma. Structure Fine du Spectre Magnétique des Rayons Alpha. By Salomon Rosenblum. (Exposés de Physique Théorétique, No. 4.) Paris, Hermann, 1932. 37 pp.

The memoir is one of a series of theoretical physical presentations by various authors and is edited by Louis de Broglie of the Sorbonne, a Nobel Laureate.