merical analysis is already considerable and promises to intensify greatly.

The present book is a valuable contribution to the development and presentation of mathematical theory and methodology, designed to take advantage of the new and powerful computing machines. The main body of the text presents a systematic and thorough analysis of the most important finite difference approximations to ordinary differential equations. Discretization (or "truncation") error and round-off error are given equal attention. Both analytical and statistical methods are employed in the analysis of round-off error. Many computer experiments are included to illustrate and support the theory.

As a result of the systematic organization of the main results and the 170 problems to be solved, the volume will serve well as an advanced text. In fact, the problems contain many interesting special results and augment the main content of the book. The practising mathematicians will find over 200 references, mostly to literature written in the last decade. The references are made especially useful by bibliographical notes at the end of each chapter.

There is so much current activity in this field that the future will certainly see more publications and new results. In spite of this, the present work is and will remain a valuable addition to the library of any serious student of numerical analysis.

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Plant, Animal, Soil Sciences

Growth in Living Systems. M. X. Zarrow, Ed. Basic Books, New York, 1961. xv + 759 pp. Illus. $15.

Growth in Living Systems represents the published proceedings of an international symposium on growth held at Purdue University in June 1960. The symposium, organized in conjunction with the dedication of Purdue's new Life Science Building, was intended to be interdisciplinary in approach, paralleling the concept which led to the construction of the Life Science Building as a huge, single structure aimed at uniting physically such diverse departments in plant, animal, and soil sciences as, for example, biophysics, soil conservation, nutrition, crop production, and microbiology.

The first two days were devoted to general sessions planned for the entire audience of several thousand people. The list of speakers was impressive indeed and included F. H. C. Crick, M. B. Hoagland, Daniel Mazia, T. T. Puck, Aron Moscona, M. Sussman, J. Brachet, C. W. Wardlaw, Armin Brau, M. Singer, and James Bonner. An equally distinguished group was invited to present papers at the several concurrent sessions comprising the third day of the symposium.

It is not possible to review here the merits of individual papers. Some are speculative, some are technical, some are reviews; some are directed at experts in the field, others assume total ignorance on the part of the reader; some attempt to attain depth in coverage and insight, others are clearly intended to be classed as superficial generalizations; some are superbly presented essays, others would fail to pass most editorial review boards.

Two unfortunate aspects of the volume need to be emphasized. First, most of those papers presenting new data have been preceded in the published record by scientific reports that appeared between the time the symposium was held and the present. By the same token, many of the review papers are almost direct duplications of reviews published elsewhere by the same authors.

The second aspect is perhaps more serious. The volume attempts to do too many things for too many people at the same time. It is difficult to visualize the same person appreciating a detailed, careful analysis of recombination in bacteria, and yet being satisfied with a suggestion that a hormone may prevent the genetic "count-down" of cells programmed to die. Similarly, a reader who has the sophistication required for understanding the kinetics of enzyme induction can hardly be the same reader for whose benefit the editor feels compelled to include a glossary of terms in which mutagenesis is defined as "the process of mutation," zygote is classified as "the cell resulting from the union of the male and female gametes," and DNA is equated with deoxyribonucleic acid.

It is difficult to argue with the goal of interdisciplinary understanding; one can only question whether the symposium achieved its goal. For those who attended the meetings, the answer is probably a qualified yes. For those who have to rely on the published proceedings, I suspect the majority will have to answer no.

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Living Matter

The Biosynthesis of Proteins. H. Chantrenne. Pergamon, New York, 1961. ix + 220 pp. Illus. Plates. $6.50.

This volume represents a noteworthy integration of knowledge and theories in the highly important and rapidly developing field of protein biosynthesis. Chantrenne has published extensively in several of the areas concerned and has been able to bring together contributions represented by over a thousand publications in such fields as biochemistry, genetics, cytology, cellular physiology, immunology, and microbiology. He divided the subject into five chapters representing, respectively, genetic control, the sites of protein synthesis, the relative significance of ribonucleic and deoxyribonucleic acids (RNA and DNA), the chemical pathway and the chemistry of intermediates between amino acids and protein, and the mechanisms of regulation.

In the first chapter basic observations on hereditary abnormalities in man—for example, in alcaptonuria and congenital galactosemia—provide an introduction to the subject of genetic control of metabolic processes and to the formulation of the one-gene-one-enzyme hypothesis, which is elaborated with recent studies of microbial mutants and varieties of human hemoglobin. The second chapter reviews the ability of isolated cellular fractions like ribosomes, mitochondria, chloroplasts, and cell nuclei to synthesize proteins. The respective roles of DNA and RNA in protein synthesis are discussed in the third chapter, with emphasis on the heterogeneity of the latter and on the importance of its structural integrity for protein synthesis.

In the chapter on chemical pathways the energy requirement for protein biosynthesis is considered on thermodynamic grounds, and various experiments which describe the respective functions of adenosine triphosphate, amino acid