pany, and only two are members of educational institutions. Most of the authors have published extensively in their fields of specialization.

Some of the chapters are obviously companion articles for reviews in some of the earlier volumes of this series. For example, the chapter on the production of potato granules is a logical and timely follow-up of the general article in volume I on the deterioration of processed potatoes. Also, the chapter on tunnel dehydrators for fruits and vegetables extends the collected information on the spray-drying of foods that appeared in volume II of *Advances in Food Research.*

The reviews are remarkably free from errors, as determined by one reading, and all the authors appear to have covered nearly every aspect of their topics concerning which there exists any published knowledge. Thus, the volume provides an excellent source of dependable and well-documented information. Moreover, in most of the reviews the need for additional knowledge or interpretation of existing information is pointed out. Thus the articles have been written critically, and they are more than compilations of published data.

This volume should be of value to all persons who are concerned with food research and technology.

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Essays in Biochemistry. Samuel Graff, Ed. Wiley, New York; Chapman & Hall, London, 1956. 345 pp. Illus. $6.50.

These essays were written in honor of Hans Thacher Clarke on the occasion of his retirement as professor and chairman of the department of biochemistry, College of Physicians and Surgeons, Columbia University. The authors were either Clarke's former students or academic associates, and in their contributions they academically express their affection and esteem for his excellent help as well as for his generous aid and wise counsel. These scholarly essays reflect in large measure the high standards of excellence instilled in the authors by their teacher and associate.

This book is divided into 25 chapters. In the prefatory remarks it is stated that some of the chapters are critical discussions of the status of biochemical problems, whereas others are frankly speculative or deliberately provocative. A wide range of subjects is included: metabolic products of basidiomycetes (Marjorie Anchel), heterogeneity of DNA (Aaron Bendich), biosynthesis of branch-chain compounds (Konrad Bloch), lysogeny (Ernest Borek), plasma volume expander (Max Bovarnick and Marianna R. Bovarnick), conjugated proteins (Erwin Chargaff), thymine metabolism (Seymour S. Cohen), steroid hormones (Lewis L. Engel), bacterial viruses (E. A. Evans, Jr.), peptide bonds (Joseph S. Fruton), on the nature of cancer (Samuel Graff), lipide metabolism (Samuel Gurin), tetrazoles as carboxylic acid analogs (Robert M. Herbst), structural basis for the differentiation of identical groups in asymmetric reactions (Hans Hirschmann), nitrogen-sparing effect of glucose (Henry D. Hoberman), inositol in microorganisms (Boris Magasanik), ferritin (Abraham Mazur), nitrogen transfer in biosynthetic mechanisms (Sarah Ratner), bigness of enzymes (David Rittenberg), biosynthesis of porphyrins (David Shemin), role of carbohydrates in the biosynthesis of aromatic compounds (David B. Sprinson), determining chemical structure of proteins (William H. Stein), glycogen turnover (DeWitt Stetten, Jr., and Marjorie R. Stetten), veratrum alkamines (Osckar Wintersteiner), and the chemical basis of heredity determinants (Stephen Zamenhof). Herein lies a good education in molecular anatomy and molecular physiology.

Several of the statements in this book are really speculative and/or provocative, and they are couched in rather good syntax so that they could engage a person's thoughts for more than a fleeting moment. There is a vast storehouse of information as well as questions left without answers in this book. All the chapters are stimulating, and I think they will present some new ideas that the reader may wish to consider. Clarke will be pleased with the excellence of this volume, and the contributors will likewise be congratulated for the painstaking job they have performed in organizing and writing their chapters. The thought-perplexing questions raised by Clarke's former students and associates will engage the labors of a whole decade of biologists.

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Sites of Infection. Unstable areas as sources of parasitic diseases; schistosomiasis and fascioliasis. Alan Mozley. Lewis, London, 1955. x + 86 pp. Illus. 9s.

The author has attempted to make an ecological analysis of the conditions conducive to the establishment and maintenance of certain parasitic diseases of man and domestic animals in which the parasites utilize snails as intermediate hosts. He concerns himself in his discussion chiefly with liver-rot of cattle and sheep and with bilharzia (urinary schistosomiasis) of man. His emphasis is on the ecological instability of the places in which dangerous snails live.

In frontier areas it may be possible to effect control by allowing the natural forces to stabilize into a condition where parasite-carrying snails are reduced to very small numbers. In irrigation systems and other bodies of water that are created and maintained by man, these natural forces are interrupted with the result that control must then be achieved through the use of chemicals for killing the snails. It would seem that the ecological approach followed in this treatise might be profitably applied to other parasitic and tropical diseases.

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Suggestion and Hypnosis in the Light of the Concepts of I. P. Pavlov. A popular science survey. K. I. Platonov. State Publishing House of Medical Literature, Moscow, U.S.S.R., 1951. 56 pp. Illus. (In Russian).

This booklet, although described as a popular science essay, is actually limited in its appeal and comprehensibility to a college-trained and science-oriented audience. The author, K. I. Platonov, a student of I. P. Pavlov, has had extensive experience in clinical and laboratory investigations of hypnotherapy and appears well qualified to discuss this subject.

Platonov's chief thesis is that hypnosis is nothing more than partial sleep induced by factors that, under proper conditions, will also produce normal sleep. Sleep is considered as a protective inhibitory state originating in the cerebral cortex and eventually spreading to subcortical areas. The author, therefore, concludes that hypnosis, like natural sleep, cannot be considered to have harmful potentialities, certainly not when it is induced by properly trained physicians.

The exaggerated power of suggestion during hypnosis is viewed simply as one example of the use of words as conditional stimuli belonging to the so-called "secondary signal system." The author reviews briefly Pavlov's classification of conditional stimuli: (i) those belonging to the primary signal system, that is, stimuli affecting directly the sense organs (these signals are shared by man and animals); (ii) those belonging to the secondary signal system (words) which are characteristic for man alone. Since this secondary signal system exerts its effects via the primary signal system, the author

suggests that the secondary signal system must be subject to the same laws that govern the primary signal system.

The book presents a brief review of the development of hypnosis with particular emphasis on clinical and laboratory investigations conducted in Russian medical institutions.

Platonov suggests the consideration of using hypnotherapy for two purposes: (i) as a method of providing patients with the protective benefits of rest for the cerebral cortex, without necessarily using suggestion; (ii) the use of hypnosis with suggestion. The author describes numerous experiments and clinical observations on the effects of hypnosuggestion on various visceral and somatic functions. Several case histories are cited.

It is suggested that hypnotherapy shows promise of being useful in achieving painless childbirth; in treating certain cases of persistent vomiting (especially in pregnancy); in dermatology; as adjunct therapy in pulmonary tuberculosis; and possibly in some cases of hypertension and peptic ulcer.

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Progress in Biophysics and Biophysical Chemistry. vol. 6. J. A. V. Butler, Ed. Pergamon Press, London, 1956. 274 pp. $9.50.

In the preface to this volume the editor comments that this "may be a convenient point to look back to see how far the aims of this series, as stated in the original preface, have been achieved." These aims were to provide critical reviews—"excluding biochemistry on the one hand and physiology on the other, there lies between a vast and rather amorphous field of study of which the frontiers and lines of demarcation are anything but well defined"—of biophysics. With these aims one can hardly disagree, but it is a good deal easier to ask for, than it is to write, critical reviews, and few of the papers included in this volume can be considered critical. Rather, it is easier for a particular author, who has developed a theoretical framework within which he can explain many of the experimental observations in his field, to find in the literature support for such views. This is not necessarily a disadvantageous situation, since it is likely that a great deal more in the way of information will be necessary in many fields of biophysics before critical reviews will be possible.

With the necessarily broad definition of biophysics that is given in the preceding paragraph, it is not possible to criticize the topics selected for review on a subject-matter basis, but it does seem implicit in the definition that if we are to exclude biochemistry and physiology, what is left should at least be amenable to quantitative treatment: on this score, three out of seven contributions are clearly of a purely descriptive nature. This may be a reflection of the difficulty in obtaining 250-odd pages of biophysics reviews a year, surely a formidable task.

The first paper, entitled "Protamines and nucleoprotamines," by Felix, Fischer, and Krekels, is a biochemical paper with extensive treatment of the preparative aspects of the subject but with little in the way of an evaluation of the possible connection between protamines and nucleic acids. A second paper on "The structure of chromosomes," by Ambrose, is, again, a purely descriptive account of, largely, the cytological aspects of chromosome morphology, and one searches in vain for a biophysical connection.

The third contribution, "The Donnan equilibrium," by Overbeek, is a rigorous and detailed treatment of the system and leads to the conclusion that in biological systems little error is likely to result from the use of the classical approach. This paper is valuable in that it helps to clarify some of the confusion that has arisen in the measurement of Donnan potentials, and it appears very desirable to have reviews of topics in physical chemistry that are involved in explanations of biological phenomena. The next paper, "Biology and biophysical properties of transforming principles," by Zamenhof, is again a purely descriptive account of a rather mysterious (but often reviewed) phenomenon and one that does not at present lend itself to quantitative treatment.

The fifth paper, "Biophysical aspects of neuro-muscular transmission," by Del Castillo and Katz, is perhaps the most coherent and detailed account of a rather complicated phenomenon in the volume. The authors have the great advantage that transmission problems have occupied the attention of physiologists for a considerable period of time, and further, much of the recent progress in this field has been made in their own laboratories. This is not to imply that the story has been fully worked out, or even that all parts of the experimental observations are equally well explained. In particular, explanations regarding miniature end-plate potentials, resting as they do largely on pharmacological grounds, seem much less attractive than those regarding, for example, the ionic basis of the end-plate potential.

"Models for biological excitation processes" by Franck is the next paper in the volume. I can develop little enthusiasm for the view that iron wire models are at all helpful in understanding excitation processes, in spite of a serious effort by the author to show that this is so. At least three-quarters of the references cited were published prior to 1950. The last paper, "Physical aspects of the sense organs" by deVries, is an attempt to treat a variety of topics in sensory physiology; these appear to have been selected rather at random—a page on taste and smell, a detailed treatment of the labyrinth, and a few topics on vision. Many of these notes are interesting, but, in general, one might wish for a more systematic discussion.

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Some Extinct Elephants, Their Relatives and the Two Living Species. Ceylon National Museums Publication. P. E. P. Deraniyagala. Ceylon National Museum, Ceylon, 1955. 161 pp. Illus. + plates. $3.

The fascination of elephants is great and endless. Those who feel this fascination can turn to P. E. P. Deraniyagala, director of the Ceylon National Museums, for its rich gratification. Here is a remarkable miscellany of elephant lore and observation, ancient and recent.

There is solid reference value in extensive tabulations on the hitherto rather neglected and obviously difficult subject of variation in elephants: Thirty-five points of the elephant's body are illustrated, with their Sinhala names and English translations. No less than 90 "nerve centres" or *nila* are similarly illustrated; these are points where pressure by the mahout with an ankus directs and controls the elephant. The book is further replete with bits of curious and unexpected information, a rapid sampling of which includes nine ways in which elephants kill human beings, the use of elephants in arena combats, detailed descriptions of parturition, instructions for catching wild elephants, expense accounts of elephant hunts in the last century, the medieval Sinhala breeds of elephants, lucky (such as eyes like a sparrow) and unlucky (such as eyes like a cobra) characters of elephants, and a recipe for fattening baby elephants.

Detailed treatment refers mainly to the elephants of Ceylon, but all Asiatic elephants are characterized at least briefly. An introductory section gives a partial classification of the Proboscidea and a new arrangement of the Elephantidae as well as scattered observations on various fossil proboscideans and on African elephants. Some of this work is open to criticism as being more appropriate in a technical reconsideration than in this