Book Reviews

Les Dislocations et la Croissance des Cristaux. Willy Dekeyser and Severin Amelinckx. Masson, Paris, 1955. 184 pp. Illus. F. 2000.

This book is a simple and excellent account of the recent fundamental advances in the field of crystal growth, since the recognition by F. C. Frank of the preponderant role of dislocations in it. The beginning of this development occurred nearly 10 years ago at the University of Bristol, in England. I had the privilege to watch and become associated with the nucleation and growth of this idea, today so simple that it appears obvious, although it was clearly not so at the time. The further contributions to the field of solid state from its author, F. C. Frank, are certainly of paramount importance, but his foresight and bold imagination are nowhere as apparent as in his prediction that dislocations should control the growth of crystals.

The theory of dislocations, as well as their role in most of the aspects of solid-state physics, has been covered recently in several books and reviews. Among the books one should mention are those by Read, where the geometric aspects of dislocations are developed, and the book by Cottrell, where their importance in the plastic flow of crystals is emphasized. The review by Seeger, in the *Encyclopedia of Physics,* treats the more recent developments of the general theory of dislocations.

None of these, however, covers properly the application of dislocation theory to crystal growth. There exist reviews by Frank and Forty, and also the book by Verma, but no attempt had previously been made to put together the entire field. This is very properly done by the work under review, in a very simple style particularly suitable for beginners. The book, no doubt, will help in filling the gap separating crystallographers from solid-state physicists.

The experimental development of the work has been carried out mainly by two groups, one working in England under the guidance of Frank himself and including Forty and Verma. The book under review was written by the second group, working at the University of Gand, Belgium, under the direction of W. Dekeyser and S. Amelinckx. Their contributions have been outstanding, and it is therefore entirely proper that they should have written a book on the entire subject.

The first chapter in the book concerns itself with an elementary introduction to dislocation theory. This chapter does not compare, of course, with Read's account, the intention being to give the necessary background to understand the role of dislocations in crystal growth.

In the initial sections of Chapter II, an account is given of the multiple attempts to interpret the form of crystals in terms of a more or less empirical theory of their growth. It is astonishing what a tremendous amount of work has been done on this apparently simple question, without a simple answer having been found. This part of the book is useful in that it gives most of the earlier references pertaining to the subject; it is, however, disappointing in not giving a critical account of them. It is true that, even today, the question is still a puzzling one; however, it is so, not because we are missing some fundamental idea, but because it is an exceedingly complicated question. The other sections of this chapter give a lucid and short account of the paper by Burton, Cabrera, and Frank, where the theory was first presented.

Chapter III is very useful to anybody interested in this type of work, because it gives a résumé of the modern optical methods (phase contrast, and so forth) that have contributed so much to the testing of the predictions of dislocation theory.

The four following chapters form the core of the book. They describe the two more outstanding contributions of dislocation theory in relation to the growth of crystals: the explanation of the detailed spiraling configuration of steps on growing crystal faces, and the understanding of the phenomenon of polytypism. The authors have made considerable contributions to both of these questions, so it is not surprising that their discussion is excellent. These chapters are very welcome, for there is no other general account of this part.

In the final two chapters, VIII and IX, a description is given of the formation of etch pits at dislocations and of the growth of whiskers, and finally a discussion of the possible ways for dislocations to be produced in a crystal during its growth. There is considerable work going on in the former problems, and a lot of speculation is being advanced to account for the latter; hence, the book could not be expected to give a complete picture of both of these subjects.

On the whole, this book is a very valuable contribution to the field; its clarity and simple presentation will appeal to young workers who might become interested in this field. The only general criticism one might advance is that, although they discuss and criticize thoroughly their own work, the authors seem to have a tendency to limit themselves to a detailed description of that of other people without a severe criticism. It is very unfortunate that there was so much delay in the publication of this book. It would have been much more helpful if it had become available in the English-speaking countries a couple of years ago.

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Advances in Food Research. vol. VI. E. M. Mrak and G. F. Stewart, Eds. Academic Press, New York, 1955. xii + 398 pp. $9.

This volume, like the preceding volumes in the series, reviews and discusses timely and significant scientific and technologic aspects of foods. There are seven articles, and they range in length from 22 to 76 pages. These cover five commodities and three functional areas—namely, applications of research to problems of candy manufacture; bacterial spoilage of wines with special reference to California conditions; microbiological implications in the handling, slaughtering, and dressing of meat animals; microbiological problems of frozen food products; potato granules, development and technology of manufacture; the thermal destruction of vitamin B_1 in foods; and tunnel dehydrators for fruits and vegetables. Each article is well organized, accurately written, and accompanied by a comprehensive bibliography. There are approximately 1800 references, and the titles are included in six of the reviews. The effective use of the volume is enhanced by the inclusion of an author index. The subject index is rather incomplete.

There are ten authors, and six of them are connected with two of the regional research laboratories of the U.S. Department of Agriculture. Only one is employed by a food-manufacturing com-

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