

## New Series in Genetics

**Annual Review of Genetics.** Vol. 1. HERSCHEL L. ROMAN, LAURENCE M. SANDLER, and GUNTHER S. STENT, Eds. Annual Reviews, Palo Alto, Calif., 1967. xii + 334 pp., illus. \$8.50.

The appearance of *Annual Review of Genetics* is welcome. The editors have included 13 reviews, averaging 25 pages in length. Remarkably, most of these reviews are critical, briefly provide background for the immediate problems, avoid duplication, and offer some leads to the future direction of the fields discussed. Geneticists will be pleased at the range of topics; molecular, cytological, human, and organismic genetics are covered. The reviews "Bacterial conjugation and extrachromosomal elements" by Falkow, Johnson, and Baron and "Structural relationships between gene and protein" by Yanofsky will be especially valuable to the teacher of introductory genetics who wishes to be informed about the present contributions of molecular biology to the study of heredity. More specialized subjects in need of a contemporary review are also treated, including population (Lewontin), development (Ursprung), fungi (Emerson), and immunogenetics (Shreffler). Additional technical papers, on *Drosophila* biochemistry (Mitchell), nonrandom disjunction in *Drosophila* (Novitski), human genetics (Sutton), plant biochemistry (Nelson), and the breeding of plants (Sprague) and animals (Robertson), complete the first volume. Wolff's essay "Radiation genetics" may be singled out as a model of clarity and organization for such short technical reviews. Indeed, the overall quality of the contributions should encourage geneticists to make it a habit to read the *Annual Review of Genetics*. The only disappointment I felt was in the publisher's production of the volume, which has small print, somewhat crude illustrations, and a cheaper grade of paper than most technical books. Such trivial detractors, however, should not prevent the specialist from being absorbed in a few of these thoroughly competent reviews. The general geneticist, while finding some articles too difficult for his background, nevertheless will be enlightened about many remarkable articles he may have missed in the immense literature on genetics, which no single person can hope to read. There is obviously more to the contents of journal articles than their

titles reveal, and reading the *Annual Review of Genetics* is a good way to compile a selection to suit one's own interests.

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## Enzyme Specificity

**Design of Active-Site-Directed Irreversible Enzyme Inhibitors.** The Organic Chemistry of the Enzymic Active-Site. B. R. BAKER. Wiley, New York, 1967. xvi + 325 pp., illus. \$13.50.

In 1959 Baker suggested the use of active-site-directed irreversible inhibitors for enzymes. The idea, like most germinal ideas, is basically simple. Since substrates and reversible inhibitors are attracted to the active site by non-covalent bonds, it seemed possible to synthesize a new compound similar to the substrate but containing a group capable of reacting chemically with an amino acid residue in the protein. The substrate-like features of the compound would guide it to the active site, and the reactive group would form a covalent link "gluing" the inhibitor to the site. The irreversible complex would then prevent any other catalytic action and thus irreversibly inactivate the enzyme. Baker's idea was influenced by the pioneering studies of Buchanan on azaserine, and "active-site-directed" or "affinity" labels have since been used for studying active sites of pure proteins in a number of laboratories, most notably those of Shaw, Singer, Westheimer, and Lawson. Baker, however, has from the beginning been interested primarily in the development of this method for chemotherapy, and in this book he examines the theory and practice of the method for that purpose.

The rational design of site-directed reagents requires an understanding of chemical modification techniques and of enzyme specificity. Baker wisely leaves the detailed organic chemistry to the ample references which are provided and devotes most of the text to the discussion of enzyme specificity and the principles of reagent design and testing. To design a reagent it is necessary to know what parts of the substrate are not essential to the binding so that their position may be used for the introduction of the potential

linking group. For example, the tolerance of the enzyme to bulky substituents at certain positions of the substrate may be a helpful clue for the addition of a linking group at one of these positions. Moreover, for chemotherapy it is important to design a compound which will react with only one of a large number of similar enzymes. These problems are discussed theoretically and in relation to individual enzymes.

To date the primary object of Baker's studies, that is, the successful treatment of a disease by the inactivation of an enzyme in the midst of a large number of similar enzymes, has not been achieved. When one considers the complexity of the task and the relatively small amount of information yet available on metabolic diseases, this failure is not surprising. What is presented is a description of those cases in which this type of approach has been pursued and an analysis of the results in terms of their probability of success, the reasons for failure, and the logic in experimental design. The book is not a general text and its organization is at times less than ideal, but it covers the subject in a comprehensive and interesting manner. It serves as a stimulus to a new field rather than as the final report on a mature one.

To those scientists who are interested in general in the specificity of enzymes and the extensive probing of active sites this book will be both stimulating and informative. To those interested in pursuing this exciting new approach to chemotherapy the book will be indispensable.

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## Temperature and Organism

**Thermobiology.** ANTHONY H. ROSE, Ed. Academic Press, New York, 1967. xiv + 653 pp., illus. \$25.

The editor of this volume states that the rapid advances of molecular biology and ecology during the past decade warrant the publication of a new compendium on all aspects of thermobiology. The authors of the articles have indeed stressed these two areas. Their scope covers water structure through medical applications of thermobiology, certainly a wide-ranging review. It is

somewhat difficult to follow closely every article, since each specialist tends to write in the unique language of his field.

Several introductory chapters are devoted to physical chemistry: temperature effects on water, proteins, DNA, and lipids. The major portion of the volume then follows the phylogenetic tree from viruses to man. Final chapters concern thermobiology of the soil, polar regions, and medical applications. Most notable are the thorough and well-written chapters concerning microorganisms, insects, mammals, and polar regions. Most regrettable are the labored chapters on higher plants and invertebrates. The latter suffers from long, often incomprehensible sentences. The authors of the chapters on lipids, animal viruses, and soil biology are to be commended for their clarity and brevity.

I noted only two major errors. In the chapter on microorganisms, the discussion of thermal inactivation curves (pp. 187-89) is incorrect. The author of the article concerning polar-region biology errs in relating maximum order with minimum information content (p. 580).

It is clear that the collection fulfills the stated aims of the editor, and the quality of the individual articles is good. Graduate students and faculty will find advantages in having access to this book, but it is difficult to imagine many individuals who will find interest in more than one-third of the articles.

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## Crystallography

**Crystal Growth.** Proceedings of an international conference, Boston, Mass., June 1966, sponsored by the Air Force Cambridge Research Laboratories and the Solid State Commission of the International Union of Pure and Applied Physics. H. STEFFEN PEISER, Ed. Pergamon, New York, 1967. xx + 856 pp., illus. \$45. Also issued as Supplement No. 1, 1967, of *Physics and Chemistry of Solids*.

Most proceedings of conferences will be purchased almost entirely by libraries. They do not exhibit the systematic, progressive development of a textbook or give the detailed instruction of a manual or the comprehensive

survey of a handbook. This generalization applies to the book under review. Having said that much, one must also say that students will find useful reviews and outlines of many portions of crystal-growth theory, experimentalists will find useful, specific details on many techniques, and research workers will make contact with many of the important directions and directors of crystal growth research within its covers. The distribution of the 136 papers among 11 subject categories (various growth techniques and aspects of the growth process and its results), plus the four-page subject index and the index of authors (of these papers only, not of the cited references), will be of some help in the use of the book as a reference. Probably its greatest value, however, is as news of recent progress. The editor and the subject chairmen whose assistance he acknowledges deserve warm commendation for having published this high-quality volume less than eight months after the conference. The uniformity in the few noticeable points of British style, such as "colour centre," over all the papers by U.S. authors testifies to editorial care and firmness. Work done abroad is represented by a sizable minority of the papers, all in English except for one in German, two in French, and two in Russian.

The volume is labeled a supplement to the journal *Physics and Chemistry of Solids*. According to the preface, this form of publication was chosen so that each paper could be given the full, prompt refereeing, editing, indexing, and abstracting accorded a journal publication. The collection is certainly far more useful than the alternative scatter of papers through a number of journal volumes. It probably contains more information of current interest to workers in the art and science of crystal growth than any other single volume. Both the artists and the scientists in this field should look it over carefully.

More international conferences on crystal growth will undoubtedly be held. It is to be hoped that they can be jointly sponsored by the IUPAP and the International Union of Crystallography, so that those interested in this field will not again be torn between two major meetings close in time and distant in space, as happened in 1966.

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## Books Received

**Action of Ionizing Radiation on Ion-Exchange Materials.** E. V. Egorov and P. D. Novikov. Translated from the Russian edition (Moscow, 1965) by J. Schmorak. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1967. x + 251 pp., illus. \$16.50.

**Advances in Experimental Social Psychology.** Vol. 3. Leonard Berkowitz, Ed. Academic Press, New York, 1967. xiv + 333 pp., illus. \$10.50.

**Advances in Pharmacology.** Vol. 5. Silvio Garattini and Parkhurst A. Shore, Eds. Academic Press, New York, 1967. xvi + 318 pp., illus. \$15.

**Agriculture and the Quality of Our Environment.** A symposium presented at the 133rd meeting of the American Association for the Advancement of Science, Washington, D.C., December 1966. Nyle C. Brady, Ed. AAAS, Washington, D.C., 1967. xvi + 460 pp., illus. \$13.50; members of AAAS, \$11.50. AAAS Publication 85.

**Algebraic Numbers.** L. E. Dickson *et al.* Chelsea, New York, 1967. iv + 212 pp. \$4.95. Originally published as report of the Committee on Algebraic Numbers of the National Research Council, No. 28 (February 1923) and No. 62 (February 1928).

**Annual Review of Phytopathology.** Vol. 5. James G. Horsfall and Kenneth F. Baker, Eds. Annual Reviews, Palo Alto, Calif., 1967. x + 470 pp., illus. \$8.50.

**Antioquia's Corridor to the Sea.** An Historical Geography of the Settlement of Urabá. James J. Parsons. University of California Press, Berkeley, 1967. x + 132 pp., illus. Paper, \$4. Iber-Americana: 49.

**Appalachian Tectonics.** Thomas H. Clark, Ed. University of Toronto Press in cooperation with the Royal Society of Canada, Toronto, 1967. x + 99 pp., illus. \$6.50. Royal Society of Canada Special Publications, No. 10.

**Ärztliche Massnahmen bei aussergewöhnlicher Strahlenbelastung.** Informationstagung der Gesellschaft für Strahlenforschung m. b. H. und der Vereinigung Deutscher Strahlenschutzärzte e. V., Freiburg, October 1966. T. M. Fliedner and W. Hauger, Eds. Thieme, Stuttgart, 1967. viii + 143 pp., illus. Paper, \$4.95.

**Atlas der klinischen Enzymologie.** Einführung in die Beurteilung von Enzymbildern sowie Methoden und Arbeitsvorschriften. H. Weber and T. Wegmann. Thieme, Stuttgart, 1968. viii + 231 pp., illus. \$9.75.

**A Biographical Directory of Librarians in the Field of Slavic and East European Studies.** Compiled and edited by Peter A. Goy and Laurence H. Miller. American Library Association, Chicago, 1967. xvi + 80 pp. Paper, \$3.25.

**The Code Breakers.** The Story of Secret Writing. David Kahn. Weidenfeld and Nicolson, London, 1967. xvii + 1164 pp., illus. \$14.95.

**The Cosmos of Arthur Holly Compton.** Marjorie Johnston, Ed. Knopf, New York, 1967. xxii + 480 pp. \$10.

**CRC Handbook of Laboratory Safety.** Norman V. Steere, Ed. Chemical Rubber (Continued on page 1166)