very strongly the views of the author himself. Burnet attempts to present both sides of arguments. He was not able, unfortunately, to include some very pertinent recent work. For example, in connection with the problem of whether or not antigen persists during the period of antibody production, as required by the template theory, he was not able to include the very important work of Garvey and Campbell[2] which indicated that immunologically active fractions of proteins containing S^{35}-labeled azobenzene sulfonate groups persist in the liver of injected animals for several weeks. This is contrary to the work in the same system quoted by Burnet, namely, that of Ingraham,[3] who was not able to find such active components.

The author presents a great deal of information on the important and currently popular phenomenon of tissue tolerance. Although the recognition unit concept as described by Burnet is an appealing one, it is difficult to see how all the component substances of an organism could have a certain self-marker unit which would be recognized by the cells. It is known that slight chemical alteration of an individual's own proteins will render them antigenic to the same individual, and it does not seem possible that any such slight alteration would always affect the recognition unit.

Burnet concludes with the statement that "the generalizations that are needed for the technical control of biological processes will not come from the elaboration either of structural chemistry or of information theory in its conventional sense. These can only provide a background against which effective working concepts can be oriented and rendered more intellectually appealing. The handling of biological material will always be the business of scientists using their own working concepts based essentially on a not very deeply analyzed concept of specific pattern with which we have been concerned."

Since many chemists require sound basis and deep structural analysis for their effective function and do not consider these factors as mere "intellectual appeal," they may be dismayed at the loose use of the term "Specific Pattern," without concern about the actual nature and configuration of the pattern.

Instead of adopting an open mind to the possible contribution of all fields to the study of living processes, *Burnet openly minimizes the past contributions of chemistry and he is pessimistic about future contributions from chemistry* as shown by the following quotations which are typical: "Without ever being able to state the precise point at which technique must break down, we can yet be quite certain that no conceivable development of organic chemistry will provide us with the detailed structure of trypsin or of the particular nucleic acid that can transfer a new antigenic quality from one pneumococcus to another." "The attempt to press the structural, physical and chemical approach to the understanding of living process seems to have reached the phase of diminishing return for the effort involved. We are approaching an asymptotic barrier and it may be that some modification in the outlook and approach of theoretical biology will soon be needed."

(2) J. S. Garvey and D. H. Campbell, *J. Immunol.*, **76**, 36 (1956).
(3) J. A. Ingraham, *J. Infect. Dis.*, **89**, 117 (1951).

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The Calculation of Atomic Structures. Based on lectures given under the auspices of the William Pyle Philips Fund of Haverford College, 1955. Structure of Matter Series. Maria Goeppert Mayer, Advisory Editor. By DOUGLAS R. HARTREE, John Humphrey Plummer, Professor of Mathematical Physics in the University of Cambridge, England, and Philips Visitor at Haverford College. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1957. xiii + 181 pp. 15.5 × 23.5 cm. Price, $5.00.

Calculation of accurate wave functions for atoms is an important undertaking, but it has proved to be very frustrating because of the tedious numerical work involved. Renewed interest in the problem has been stimulated recently by development of large digital computing machines, and we soon hope for improved functions for the normal and more important excited states of atoms, from which transition probabilities and energies may be derived. Methods developed and tested for atoms are also of obvious importance in the problem of molecular structure calculations.

It is fortunate that we have now, for the first time, a very detailed and complete account of methods used by Professor Hartree and others in the self-consistent field treatments of atomic structure, especially for atoms with many electrons. The present book is based on a series of lectures delivered at Haverford College and repeated later in Princeton University. The emphasis is on technical rather than on descriptive aspects of the problem, but one may obtain a general view of what has been done and see how calculations may be improved without working through the numerous mathematical results. However the book is especially valuable for the specialist who plans similar or improved computations. In this connection, Chapter 10, on "Better Approximations," is particularly important, and might well have been amplified.

The Appendix contains tables of new (and recalculated) results, and it is very convenient to have this material collected in one book. The numerous references appear to be complete and extend into 1956.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF ROCHESTER A. B. F. DUNCAN
ROCHESTER, NEW YORK

Textbook of Polymer Chemistry. By FRED W. BILLMEYER, JR., University of Delaware and Polychemicals Department, E. I. du Pont de Nemours and Co., Inc. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1957. viii + 518 pp. 16 × 23.5 cm. Price, $10.50.

This book, according to its author, was written as a text in the physical and organic chemistry of high polymers at the senior or graduate student level. It is intended that the text be expanded by lectures and supplementary reading.

The first third of the book deals with the physical chemistry of high polymers, including their physical and chemical structure, thermodynamic properties in solution, a discussion of molecular weight methods, and ends with a section on rheology and viscoelastic properties. The kinetics of polymerization occupies the next fifth of the text and includes such topics as linear condensation polymerization, addition polymerization, copolymerization kinetics and the reactivity of monomers and radicals. A short section on molecular weight distributions, and chapters on emulsion polymerization, ionic polymerization and polymer degradation follow.

The properties of plastics are next dealt with, starting with a section on polymer processing, including injection and compression molding, plasticization and reinforcement. This is followed by a series of chapters on polymers from polystyrene, the acrylates, vinyl polymers, halogen-containing polymers, linear and cross-linked condensates, cellulose and the silicone polymers. This is essentially the organic polymers section of the text, occupying about 20% of its space.

Chapters on the properties of fibers are concerned with the physical and chemical properties of synthetic and natural fibers, fiber fabrication, and after-treatment. The subject of elastomers completes the text with chapters on vulcanization and reinforcement, as well as ones on natural rubber, GRS and other synthetic elastomers. The book concludes with a complete list of symbols giving their dimensions, units, definitions and chapter where used, and an appendix of trade names and manufacturers.

The field of the physics and chemistry of polymers is so extensive in terms of fundamental work as well as applied work that no text of manageable size could possibly cover it completely. Since this text treats almost every aspect of the field, the author has been forced to present only its essentials. In this his achievements have been truly remarkable. Each of the many chapters (57 in all) had to be necessarily short (they average 8 pages), but they are all authoritative and written in an extraordinarily clear manner. This was made particularly difficult because many of the derivations depend upon a sophisticated knowledge of theory, particularly statistical thermodynamics. The bases of the derivations are explained and the important intermediate and final expressions alone presented; this is as it should be.

This text is extremely readable. The material is well organized, making it easy to locate topics. The appendices