eclecticism in approach, in effect by the aim of the book. The success of this augmented edition of what is now a standard text appears nonetheless to be assured, and for very solid reasons. As one of my colleagues put it, if one were exiled to Corsica for a year in order to learn quantum mechanics, and could take but a single volume, a very good case could be made for the choice of this book.

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Special Functions: A Group Theoretic Approach

By James D. Talman
(Based on lectures by Eugene P. Wigner) 260 pp. Benjamin, New York 1968. Cloth $10.00, paper $5.95

This delightful volume does for most of one's favorite special functions what arithmetic does for the exponential: It displays them not as solutions to differential equations but as matrix elements of representations of elementary Lie groups.

If you feel deeply that there is nothing more to say after pointing out the e^x is the solution of $f' = f$ (with $f(0)=1$) and do not care that it is also 2.71828. . .multiplied by itself x times, then you also might feel inclined to ignore this book. This would be a pity, because almost half is devoted to the kind of general exposition of Lie groups, Lie algebras and their representations that few mathematicians are capable of treating us to. It is an exposition that prefers words to symbols, is intuitive and does not require us to scale a mountain when we only want to peek over the garden hedge. Knowing only a little linear algebra, one can read this much with joy and enlightenment without compromising one's devotion to differential equations.

If, however, you have always suspected that there was more to Bessel functions, Gegenbauer polynomials, associated Laguerre polynomials, and Hermite polynomials than Morse and Feshbach or Watson were letting on, then you can indulge in the feast as well as the cocktails. And there, in the algebraic paté, you will come upon those higher transcendental truffles you long ago snuffled in the garden of analysis. Only a hard man could fail to be moved by this transformation, and you can see what it has done to a soft-hearted esthete like your reviewer.

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Statistical Mechanics Of Chain Molecules

By Paul J. Flory
432 pp. Interscience, New York 1969. $17.50

In polymer science it is important to know the shape of an isolated polymer molecule and quantities that characterize this shape, such as the radius of gyration and distribution of end-to-end length. Almost always the chemical structure of the repeating unit (residue) is such that rotation is allowed about at least one chemical bond in each residue.

This means that a polymer molecule that is typically composed of thousands of residues has an enormous number of available shapes and that the calculations of measures of shape and size must rely on the methods of statistical mechanics. In this book, Paul J. Flory deals with this problem; he is eminently qualified to write such a book because he has worked extensively in this field.

By far the largest amount of effort is devoted to the formalism and calculations of the rotational isomeric-state model with short-range interaction. In this model, one allows rotation about certain chemical bonds to minimize the rotational-potential function. The energy of each molecular shape is calculated by accounting for interaction between atoms that are close to one another along the chain backbone. Interaction between atoms that are physically near to each other because they close a loop is ignored if the length of the loop is greater than a certain (small) size.

Flory's development is well done. The difficulty of the text is proportionate to the subject matter; there are no extraneous difficulties introduced by the author. By use of matrix methods, pertinent quantities are derived that describe the configuration of the macromolecule. Topics discussed in the theoretical part of the book include: a description of previous more approximate models, the more accurate statistics of polymers with interdependent rotational potentials and a useful comparison of various solutions (both exact and approximate) of various polymer-chain models. The treatment of copolymers, which, however, takes up only four pages of the book, is in error. Use of the mole-fraction-weighted arithmetic mean on page 118 gives correct results only in certain limiting cases. A correct treatment of the copolymer problem has been obtained recently by G. W. Lehman and J. P. Mc Tague (J. Chem. Phys. **49**, 3170, 1968).

Flory assumes, as a working hypothesis, that one can choose a solvent for a polymer that exactly cancels the effect of excluded volume (interaction of residues separated by relatively large distances along the chain backbone). This assumption, on which the validity of the application to real systems rests, is not discussed adequately. One is therefore not convinced that the parameters of the model have a meaning outside the model.

About a third of the book is devoted to application to real systems. Symmetric chains, asymmetric chains and biological macromolecules each comprise a chapter. It is shown that the parameters of the isomeric rotational-state model can be chosen so that its various predictions are in reasonable accord with available experiments for a sizable number of polymers. In addition (where comparisons are available), the required energy parameters are about what one would expect from independent estimates based on molecular structure.

Application is made to light scattering and to strain and electric birefringence in the last chapter. This book is a worthwhile addition to the library of anyone interested in the conformational statistics of polymer molecules.

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Theoretical Elasticity

By A. E. Green, W. Zerna
(2nd edition) 457 pp. Oxford U. P., London, 1968. $16.80

Although not intended to be a treatise on the theory of elasticity, the first edition of this book in 1954 was a comprehensive presentation of the general theory of finite elastic deformations.