The essential fruit of the theory of internal conversion appears as a number (the "internal conversion coefficient") which gives the relative probability that an electron from a given sub-shell or a γ-ray will be emitted when a nucleus makes a transition from one state to a lower one. The present volume gives, in about 140 pages of tables, internal conversion coefficients for the K shell and the L subshells, for both electric and magnetic type transitions of orders 1 . . . 5 (dipole, quadrupole, etc), for 10 values of the transition energy and for each Z between 25–95. A smaller table gives coefficients, calculated less precisely, for the M subshells. As one who, several years ago, calculated three internal conversion coefficients, the reviewer can attest to the enormity of the project which produces the 30,000 coefficients of the present volume.

As Dr. Rose points out, the computation spanning a period of 10 years has gone through several stages of sophistication beginning with a model using a point-charge nucleus and no atomic screening and then removing the restrictions. The K and L tables give coefficients in which screening and the static nuclear effects are considered and as such may almost be regarded as complete and final. In some cases, as shown not long ago by Sliv, a dynamical nuclear effect (involving the current density in the nucleus, not simply the charge density) could modify the coefficients. These effects depend on the detailed model and as such cannot be tabulated. Even so, Rose does give some auxiliary tables which would be useful in considering them.

The present volume extremely well satisfies the needs of those who use internal conversion as a research tool, and the reviewer has only one quarrel with it. It does seem a pity that only 10 pages are given to a discussion of the theory. It would have been reasonable to accommodate the reader not concerned with measurements by giving in detail the theory of the process, discussing the subtle features (even the name "internal conversion" derives from an early misunderstanding) and perhaps even describing the recent work done by Sliv, Rose and others in studying explicit nuclear structure effects by means of internal conversion.

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Proceedings of the International Symposium on Transport Processes in Statistical Mechanics, held in Brussels, August 27–31, 1956. Sponsored by The International Union of Pure and Applied Physics, Instituts Solvay (Université Libre, Brussels) and European Office, Air Research and Development Command, United States Air Force (Brussels). Edited by I. PRIGOGINE, Professor of Physical Chemistry and of Theoretical Physics, Université Libre, Brussels, Belgium. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N.Y. 1958. x + 436 pp. 16 × 23.5 cm. Price, $10.00.

The symposium reported in this book was held in August, 1956. In the foreword, dated October, 1957, Editor Prigogine comments: "As Professor Uhlenbeck once observed, statistical mechanics is a slowly growing subject in which short periods of rapid development are followed by longer periods of stagnation. Today, it seems as though we are in one of the periods of rapid development." The book appeared in December, 1958.

The volume contains 48 articles by 58 authors. To my knowledge, about 30 of the articles contain material which has been reported in other places (much of this since 1956). Eight articles deal with experimental studies of transport phenomena: the remainder are entirely theoretical. The derivation of the Boltzmann equation is discussed in five articles, and about ten articles are devoted to irreversible thermodynamics and the Onsager reciprocal relations.

The longest, and perhaps the most interesting, article is "Molecular Dynamics by Electronic Computers," by B. J. Alder and T. Wainwright. Although this work has been discussed far and wide at meetings and colloquia, this is its first appearance in print. Alder and Wainwright used fast electronic computers to solve exactly the simultaneous equations of motion of about 100 particles which interact either as rigid spheres or with square-well potentials. Their article contains the most detailed information yet published on molecular dynamics in many-body systems.

The article "Theory of the Vibrational Relaxation of Diatomic Molecules" by E. W. Montroll will be of particular interest to physical chemists. This is a lucid summary of the mathematical treatment, due to Montroll, Shuler and others, of the statistical aspects of vibrational relaxation processes. It also contains some comments on the theory of chemical kinetics—a branch of the theory of transport processes which has otherwise been neglected in this volume.

All through the symposium, fundamental questions received the major emphasis. One can, apparently, derive the Boltzmann equation and the Onsager reciprocal relations in many ways. But, as Professor Uhlenbeck observed (on page 24), ". . . the real test of these developments will come if they are extended to . . . systems where we *do not* know the answer. . . . At present, as Ehrenfest would say, nothing certain is known." Prigogine's period of "rapid development" should be considered in this light. In the two and a half years since the symposium was held, no one has succeeded in computing a transport coefficient in a real gas at densities where the Boltzmann equation no longer holds. There has been virtually no discussion of the limits of validity of the Onsager relations. The applicability of the Boltzmann equation to low density plasmas is being hotly disputed. There have been substantial advances in the theory of superfluidity and superconductivity, but curiously enough these advances have come from equilibrium rather than transport considerations.

This book contains an excellent summary of the state of our knowledge (or ignorance) about the statistical theory of transport processes in 1956. It is not yet out of date.

NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C. ROBERT ZWANZIG

Annual Review of Physical Chemistry. Volume 9. H. EYRING, Editor, University of Utah, C. J. CHRISTENSEN, Associate Editor, University of Utah, and H. S. JOHNSTON, Associate Editor, University of California. Annual Reviews, Inc., Grant Avenue, Palo Alto, California. 1958. vii + 511 pp. 16 × 23 cm. Price, $7.00 (U.S.A.); $7.50 (elsewhere).

Another year has brought with it another volume of the "Annual Review of Physical Chemistry." The general form of these publications must be so familar to physical chemists by now that it only seems appropriate to note differences from the volume of the year before. The 1958 edition does not have articles on Electrode Processes, Combustion and Flames, Physical Chemistry of Proteins, and Bond Energies, all of which appeared in 1957; it has added articles on Statistical Mechanics, High Pressure Developments, Optical Rotatory Power, and Colloid and Surface Chemistry. The quality of the reviews is very similar to that in previous years.

Because of the inevitable time lags inherent in publication, no reference is significantly less than a year old by the time the Annual Review appears. A research specialist cannot afford to wait this long to learn which papers he should look at in his field, and he can only use the article on his specialty to see whether the reviewer turned up something important that he himself missed. The value of the reviews must be more to people who can afford to follow the literature at a more leisurely pace or who want to learn of significant developments in fields they are not actively working. It is for these that the reviews serve a real and useful purpose.

As usual, each reviewer in the volume is guided by one of two different philosophies. Some try to be as complete as possible in their coverage of the annual mountain of literature on their subject. Others select a few topics for really critical discussion and let large sub-topics pass unmentioned. A few years ago I myself perpetrated a review in the "complete" style. As I look at the various reviews in this volume, I am impressed with how much more valuable are the reviews that cover only a few topics in a critical and readable style. They must also be much harder to write.

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