Improved but indirect methods of determining distances increase the volume of observable space by a factor of 1000. The Hertzsprung-Russell diagram, originally plotted to show the relation between spectral type and absolute magnitude, now becomes a reference scale for intrinsic brightness and hence for the distances of remote stars.

A wealth of information comes from binary stars, visual, spectroscopic, and eclipsing. The mass-luminosity relation in which binaries play a critical role leads to ideas of stellar evolution. Variable stars suggest to the astrophysicist the problem of energy production, while to the cosmographer the cluster varieties map positions of the groups to which they belong. The distance of our sun from the center of the Milky Way has thus been estimated.

Then follows a delightful description of the Milky Way, most beautifully delineated in the Southern Hemisphere. The role of giant O and B stars in mapping its spiral form is confirmed by radio observations of hydrogen revealing its temperature, cloud structure, and density at various distances in the line of sight.

The universe is our goal. Clusters of galaxies embracing spirals, irregulars, and ellipsoidals are described, but for the universe of galaxies, no superstructure has as yet been noted. Interpretation of the red shift as a Doppler effect leads to the theory of an expanding universe in contrast to the theory of continuous creation. Estimates of time, earthly and stellar, appear to corroborate expansion, said to have started 20 to 25 cosmic years ago. The cosmic year, equal to 200 million years, is a convenient time unit; it is the period of revolution of the sun about the center of our galaxy, 27 000 light years away.

We are now in the realm of theory. The lifetime of a star depends on the rate at which it spends its energy. Its demise and descent into the stellar graveyard is postulated by samples in the Hertzsprung-Russell diagram. Apologies for theories and hypotheses are expressed but justified to spur investigators towards newer knowledge. This book is excellent reading; it fully justifies its announced purpose.

Statistical Physics. Vol. 5 of Course of Theoretical Physics. By L. D. Landau and E. M. Lifshitz. Translated from Russian by E. Peierls and R. F. Peierls. 484 pp. (Pergamon Press, England) Addison-Wesley Publishing Co., Inc., Reading, Mass., 1958. $12.50. *Reviewed by R. T. Beyer, Brown University.*

THE fame of this series of physics texts has already been heralded by the previous publication of a translation of the authors' nonrelativistic *Quantum Mechanics*. The appearance of this volume establishes even more firmly the reputation of the authors in the textbook field. The completed series will represent the best comprehensive instructional treatment of physics since that of Sommerfeld, and is, of course, thirty years more up to date.

The text attacks the problem of statistics from the

familiar structure of thermodynamics, working into the Gibbs distribution. The emphasis is on the microcanonical ensemble, rather than on grand canonical ensembles, so that on the average the book will appeal more to physicists than to chemists at this point.

The standard problems of gases are treated systematically, and the quantum distributions of Fermi and Bose are introduced early in the text, with a smooth transition to the modern problems of condensed systems, including superfluids.

Of more interest to chemists is the coverage of phase equilibrium, solutions, and chemical reactions, all of which fields are given careful treatments.

Fluctuation-dissipation theory is treated at some length, with applications to both thermodynamic and nonthermodynamic fluctuations.

One of the characteristics of Soviet texts in quantum mechanics is repeated here, in the concluding chapters, in the application of the concepts and consequences of group theory in discussing the symmetry of macroscopic bodies and the theory of second-order phase transitions. While this material is on a rather high level for the ordinary graduate course in statistics, it forms a most valuable addition to the text.

The book closes with a chapter on surface physics, taking up such problems as adsorption, liquid film, and creation of nuclei.

On its over-all merits (including the excellence of the translation) then, this reviewer is enthusiastic about the text, and recommends its widespread use.

Advances in Chemical Physics, Vol. 1. Edited by I. Prigogine. 414 pp. Interscience Publishers, Inc., New York, 1958. $11.50. *Reviewed by Henry Wise, Stanford Research Institute.*

PUBLICATION policies of our journal and text book editors have given rise to a new mode of review of recent scientific accomplishments. In general, it appears under a heading entitled "Advances". It seems to accommodate those scholarly contributions too large in size for a journal article or too short for a monograph. In price, however, it approaches the textbook category. As pointed out by the editor of *Advances in Chemical Physics*, this publication will be devoted to "basic problems that concern the properties of individual molecules and atoms as well as the behavior of statistical ensembles of molecules and atoms". The wide range of subjects chosen for this volume becomes apparent from the table of contents: Statistical-Mechanical Theory of Transport Processes. X. The Heat of Transport in Binary Liquid Solutions (Bearman, Kirkwood, and Fixman); Theoretical and Experimental Aspects of Isotope Effects in Chemical Kinetics (Bigeleisen and Wolfsberg); Dielectric Properties of Dilute Polymer Solutions (de Brouckère and Mandel); Some Physical Aspects of Gaseous Chemical Kinetics (Careri); Transport Processes in Liquids (Collins and Raffel); The Relation Between Structure and Chemical Reactivity of Aromatic Hydrocarbons