ber of minor errors slipped through in proofreading.

Two cautionary comments are in order. First, as the authors emphasize, the properties of the molecule-ion M^+, not those of M, are directly obtainable from a photoelectron spectrum. Comparisons with ground-state properties of M are therefore subject to the qualifications given by Koopmans' Theorem. Second, the utility of photoelectron spectroscopy in elucidating detailed properties of larger molecules is, in this reviewer's opinion, not yet well established. Within these limitations the technique can provide new information about any molecular species that can be brought into the gaseous phase. It should accordingly be of interest to anyone concerned with the chemistry or physics of small molecules.

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Thermophysics

By W. H. Giedt
594 pp. Van Nostrand Reinhold, New York, 1971. $13.95

This book is intended as a text for undergraduate students of engineering. The title *Thermophysics* was "selected to stress that this study embraces practically all branches of science and technology."

In the last ten years approximately 100 undergraduate thermodynamics books have been published in English (my count). The various pedagogical approaches in this rich collection are roughly as follows: classical or macroscopic; combination of classical and statistical; statistical alone, and emphasizing the connection between entropy and information theory. W. H. Giedt takes the now popular second approach in *Thermophysics,* stating that (the elaboration of) $S = k \log W$ provides a "physically reasonable explanation and definition of entropy as an equilibrium state property."

The book starts off ardently—the head for Chapter 1 ("Energy") runs:

"We are approaching the end of countdown.
All systems are go!
The ignition system is started.
All engines are running.
LIFT OFF! WE HAVE LIFT OFF!"

A short motivational discussion of rocket propulsion follows, focused on energy. The rest of the chapter outlines classical thermodynamics in an historical framework.

The first five chapters build up ideas such as internal energy, work, heat, equilibrium state and temperature more by accretion of examples than by formal development. Chapter 6 brings an abrupt change with the introduction of Schrödinger's equation in full bloom, followed by the elementary particle-in-box solution and cursory discussion of concepts such as phase space. Entropy is introduced as $S = k \log W$ in Chapter 7, and the statistical mechanics of ideal gases is discussed in the following chapter. Entropy change is treated in Chapter 9, the Gibbs equation suddenly appearing for the first time under "Gas Tables" on page 283. The remainder of the book may loosely be described as a wide variety of applications, including energy-conversion cycles, availability, Maxwell relations, chemical equilibrium in ideal gases, adiabatic flame temperature, and so on, each topic being rather briefly treated.

This is a serious effort to deal with a difficult and beautiful subject. There are many examples and exercises, primarily numerical. The historical annotation is often interesting (for example, according to the author the now cumbersome Fahrenheit temperature scale was originally pegged at 0 deg as the freezing point of a saturated salt solution and 100 deg as the temperature of the human body). The book is reasonably clear and accurate in its details. Unfortunately, the author has a distressing tendency to omit mentioning what are the basic irreducible principles and fundamental assumptions in his development. This leaves the student with a collection of material that needs to be taken somewhat on faith, but the articles of faith are unspecified.

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Lasers

By B. A. Lengyel
2nd ed. 386 pp. Wiley, New York, 1971. $14.95

Lasers, 2nd edition, is the third in a sequence of approximations by Bela Lengyel to the ideal introductory laser text. The first edition (1962—125 pages) was the first book on the market in which the uninitiated could get a realistic but comprehensible glimpse of laser theory and technique. It was followed three years later by *Introduction to Laser Physics* (1965—311 pages) which includes a chapter on the interaction of laser light with matter (nonlinear optics) as well as much more information on the theory of operation of various types of lasers. In his latest version, Lengyel has dropped the chapters on applications and nonlinear optics and returned to the earlier title.

The new *Lasers* shares with the earlier