

20 broad classes of chromophoric systems ranging from the alkanes to biological molecules are covered with frequent appropriate references to Vols. I and II. Attention is focused on excitations beyond  $50\,000\text{ cm}^{-1}$  (6.2 eV) in molecules containing four or more atoms. The  $50\,000\text{ cm}^{-1}$  limit is a natural barrier between the much-studied and well-understood valence transitions ( $n \rightarrow \pi^*$ ,  $\pi \rightarrow \pi^*$ ,  $d \rightarrow d$ , ligand  $\rightarrow$  metal etc.) and the higher excited states involving both Rydberg excitations and those to  $\sigma^*$  molecular orbitals about which there is so much confusion. The goals pursued are (i) to assign the various transitions on the basis of their orbital characteristics and (ii) to demonstrate the relatedness of transitions in otherwise unrelated systems. This work thus contains thorough compilations of spectroscopic data. It then goes beyond the literature in an attempt at the synthesis of a coherent explanation of what is found there.

The usefulness of the monograph is enhanced by the definition of terms (Chapter I is "A Catalog of Orbitals and Excitations in Polyatomic Molecules") and by the discussion of general aspects of the newer experimental techniques (Chapter II is "New Sources of Spectral Information"). Another valuable source of spectral information, *ab initio* calculations, is exploited widely by the author. Such computations are found to be especially useful in assigning the components of Rydberg transitions and in assessing the mixing of Rydberg and valence transitions.

I highly recommend this monograph, as well as Vols. I and II, to all research workers interested in its title field.

GEORGE R. DE MARÉ

### ***Primary Photoprocesses in Biology and Medicine***

by R. V. Bensasson, G. Jori, E. J. Land and T. G. Truscott; Plenum, 1985; 478 pp.; price, \$85.00; ISBN 0-306-41930-0

This volume gives the proceedings of the NATO Advanced Study Institute held in September 16 - 28, 1984, in Bressanone, Italy.

Although approximately one third of the 65 lectures reproduced cover topics in photobiology, they are largely limited to photodamage in mammalian tissue. The emphasis in this NATO meeting, however, was laid firmly on primary photoprocesses and techniques for their elucidation, so the book will be of considerable interest to experimentalists across the whole range of photobiology. For those directly involved in research related to photomedicine, it comes as a timely and comprehensive review of recently developed techniques for the study of short-lived species involved in current and potentially useful phototherapy and photochemotherapy.

The lectures comprise a series of overviews of each field interspersed by shorter contributions on recent results on particular aspects of the field. The first part covers a wide range of time-resolved techniques available for the study of transient species, including flash photolysis, pulse radiolysis,

fluorescence, resonance Raman, nuclear magnetic resonance, electron spin resonance and photoacoustic spectroscopies. These chapters occupy more than one third of the book and are followed by a useful review, and three short accounts of processes initiated by activated oxygen.

Considerable space is then given to molecular and cellular mechanisms in photomedicine. A review of drug-DNA interactions and several lectures on furocoumarin photochemotherapy, particularly the application of a psoralen drug followed by UVA irradiation, examine photophysical and photochemical studies of singlet and triplet states and correlate photoadditions with photobiological and clinical effects. A second major group of substances relevant to photomedicine are the tetrapyrroles. A review on the photochemistry of porphyrins and bile pigments is followed by chapters relevant to both neonatal jaundice and porphyria diseases, but without doubt the most topical subject addressed in this part of the Institute's programme was the application of the photophysical properties of porphyrins to cancer phototreatment. Studies of detection of tumors by porphyrin fluorescence and of porphyrin-promoted photodynamic damage *in situ* are described at the molecular level. Cellular photosensitization by psoralens and porphyrins are contrasted, and the factors involved in the interaction of light with skin examined. The book ends with two short chapters on lasers in surgery and medicine and the action of sun filter and sun-block products.

The high density of presentation (about 500 words per page) rarely inconveniences the reader (the main irritations being equations and complex notation buried in the narrative) and allows a large amount of widely useful information to be contained in a single reasonably sized volume.

ROGER HILL

### *Advances in Luminescence Spectroscopy*

edited by L. J. Cline Love and D. Eastwood; published by The American Society for Testing and Materials, 1985; 129 pp.; member price, £21.00; list price, £26.00

This slim volume represents written versions of papers presented at a symposium sponsored by ASTM Committee E.13 on Molecular Spectroscopy at Atlantic City, NJ, in March, 1983. Its publication in May, 1985, more than two years after the event renders some of the material out-of-date, since there are many fast-moving developments in the field. The stated aim of the book is to acquaint the scientific community with some of the most recent advances in fluorescence and phosphorescence research, and certainly some of the articles will achieve this aim.

The book is divided into three sections: Probes of the Chemical Environment, Coupled Phenomena in Luminescence, and Manipulation of Luminescence Observables.

The four papers grouped under the first heading are very diverse. The first is concerned with absorption, two-photon absorption and rotational