Book Reviews

Photochemistry and Photobiology, Vols. 1 and 2

edited by A. H. Zewail; published by Harwood Academic Publishers, New York, 1984; 1410 pp.; price, U.S. $175.00; ISBN 3-7186-0205-9

These are intriguing books, for both positive and negative reasons. Proceedings of international conferences, particularly when the contributions have been especially written (or re-written) for printed publication, can provide the reader who has not attended with at least one beneficial aspect of the meeting, namely an exposure to chemistry from many fields allied to his own speciality. My own selection of highlights includes short reviews of photon echoes, molecular-beam studies, advances in femtosecond spectroscopy techniques, developments in laser dyes, recent ideas of the primary photochemical events in the photocycle of bacteriorhodopsin, non-linear photochemical synthesis by powerful UV picosecond pulses and photochemically induced dissipative structures. Your choice of especially interesting papers would be different, but the standard and the clarity of presentation by the authors of the many such reviews seem to be consistently very good.

My adverse comments begin with the title of the book, which is also the title of the international conference (held at the University of Alexandria, Egypt, in January 1983) at which the papers were presented. I was conditioned to expect a coverage of material similar to that found in the well-established journal of the same title. However, very few of the studies centre on biological material, and I suspect that few of the authors would call themselves photobiologists. In fact the dominant emphasis is on photophysics and photophysical chemistry; in no section is there a major interest in what are the chemical products of a photochemical reaction. This is not to detract from my comments in the first paragraph, but is to point out the narrower (though still broad) scope than implied by the title. Of greater concern with regard to whether or not the book can be recommended for purchase is that most of the papers have already been published elsewhere. The whole of Vol. 1, which is the longer of the two volumes, has appeared in issues of the journal *Laser Chemistry*; the two keynote addresses, given by Nobel Laureates Sir George Porter and Nicolaas Bloembergen, are treated in a different way, and because they are available in other publications they are not reproduced in these volumes. It is difficult to justify on academic grounds the production of conference proceedings in both journal and hardcover book formats by the same publisher.

In summary, I have valued the opportunity to read these books, and I expect that you will find something of interest if you have access to them; however, in deciding about a recommendation for library purchase, you

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should take into account the balance of contents, the availability of many individual papers elsewhere and the necessarily high price.

JOHN COYLE

Transfer Theory for Trapped Electromagnetic Radiation

by Georges Lucas; published by Wiley, New York, 1985, 3rd edn.; 96 pp.; price, £9.00

Judging by the cover, the author of this book is evidently a highly-respected chemical engineer and the book itself is in its third edition. To this reviewer, both circumstances are surprising. The basic premise of the book is contained in the first sentence of the foreword, namely: "The laser cavity is transparent to electromagnetic radiation, but remains closed to matter, as there is no transport of absorbing particles from the irradiated cavity to the outside."

This sentence amounts to a fundamental departure from reality, being contradicted by innumerable experiments with flowing gas lasers, jet-stream dye lasers and chemical lasers.

The second sentence of the foreword reads: "It appeared interesting to me to invert this situation and, to investigate the behaviour of an optical cavity closed by a low transparency reflecting grid, which could trap the continuously injected electromagnetic energy corresponding to the absorption band of the particles, the irradiated space remaining completely open to the continuous flow of incoming and outgoing material particles."

Such a grid could probably be constructed, by making the grid's apertures much smaller than the wavelength of the radiation, but why bother? Matter can be allowed to enter or leave freely in directions away from the optical axis of the cavity.

The rest of the book is concerned with the imagined effects, on matter inside the cavity, of compressing the trapped photon gas by moving the ends of the cavity closer together.

One can only conclude that this is an elaborate practical joke, directed at the reader and probably also at the publisher. Unfortunately, it is not even funny.

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