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## Book Reviews

**Laboratory Course in Organic Chemistry. 2nd Edition.** By David Hirsch Rosenblatt and George Thomas Davis. Allyn and Bacon, Boston, Mass. 1973. xxvii + 452 pp. 28 × 21 cm. \$7.95.

This manual is a companion to the Morrison and Boyd textbook of organic chemistry, and the text makes frequent references to page citations in "M & B." The student is presented with much material to read and digest, in addition to the experimental directions, *per se*. The manual is written in a rather informal, conversational style. The preparation of organic compounds is stressed and is used to introduce ir, uv, nmr, and chromatographic methods. However, mass spectroscopy is not mentioned, and the authors have made no attempt to provide electronic rationalizations for the reactions which the students perform in the laboratory. The equation for each reaction is shown in its simplest terms, and the student is referred to pages in Morrison and Boyd for the "nature of the reaction." The authors have made liberal use of footnotes, which are frequently separated from the textual material by several pages. This format may be undesirable in a manual for undergraduates. Each experiment concludes with a set of questions based on the experiment and/or the textual material accompanying it. This reviewer questions the value of inclusion of these, since "canned" questions generally generate "canned" answers.

Extensive (perhaps too much) space is devoted to simple laboratory apparatus; pictures of a beaker, an iron ring, and a graduated cylinder seem unnecessary, as do many of the diagrams of simple equipment set-ups. In contrast, discussions of some of the more esoteric topics are not always easy to follow. A terse exposition of the Hansch approach to biological activity seemed out of place and is likely to baffle a beginning organic chemistry student.

The chapter on the library was not satisfying and will perhaps not be maximally helpful to the student. The authors' list of primary source journals in organic chemistry was mystifying for its omissions as well as for some of the journals listed. The authors omitted mention of Theilheimer's series in their rather extensive compilation of reference works for synthetic organic chemistry.

The flexible binding of the manual seems somewhat flimsy; a hard cover might be more suitable for a book which will obviously receive hard usage, both in the laboratory and as a text.

Overall, the manual seems to be a good one, and it is worth considering for use in a beginning organic chemistry laboratory, although this reviewer is not certain that it is the best one available.

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**Computer-Assisted Instruction in Chemistry. Parts A and B (Computers in Chemistry and Instrumentation. Volume 4).** Edited by J. S. Mattson, H. B. Mark, Jr., and H. C. MacDonald, Jr. Marcel Dekker, New York, N. Y. 1974. 23.5 × 16 cm. Part A: xi + 271 pp. \$24.50. Part B: xv + 258 pp. \$26.50.

This two-part set is an attempt by the editors to fulfill a need for a comprehensive treatise on the "state of the art" of computer-assisted instruction (CAI). The work has been divided into two parts, with Part A presenting general approaches and Part B treating specific applications. CAI, like computer programming in general, is not a subject which is easily put into a book, especially one written for those who are unfamiliar to the field. In this respect, the authors and editors have done a respectable job of communicating the essence of the subject, although some phases of the work are stronger than others.

Much of Part A consists of material which perhaps has somewhat questionable application to the field of education. Chapter 1 is a concise introduction to the subject and briefly (7 pages) discusses some possible uses of CAI and problems which can occur. Chapter 2 attempts to present the reader with the picture of a complete and well-integrated system of CAI, allowing him to appreciate the really sophisticated projects which can be accomplished under ideal circumstances (in this case, at the University of Pittsburgh). It does in fact do this, although one is left with the feeling that such a system is well beyond the level of anyone who may find the use of such a system desirable. The third chapter is a rather detailed discussion of the use of analog and hybrid computers. The editors attempt to justify its inclusion on the basis of its future potential, and there is probably some merit in this. One might also suggest that such a topic would be more timely in a more advanced volume. Chapter 4 presents some interesting uses of interactive computing during actual classroom sessions through the projection of teletype output. A portion of the chapter is devoted to design description and listings of some actual programs, mostly for freshman chemistry use. Chapter 5 is another one which has questionable value in a book such as this, although the topic is an important one. It is a survey of information storage and retrieval by computerized systems. Such a topic is again justified by the editors as being potentially important to both students and instructors. Chapter 6, the final chapter in Part A, is probably the most important and useful chapter in the book. It is a brief but very informative discussion of practical considerations—primarily, "does it work?" and "how much will it cost?"

Part B is devoted to the more practical considerations of computers in education and would seem to be somewhat more valuable to those working in the field or contemplating it. Chapter 1 of this second part illustrates the laboratory and classroom use of the APL language, as applied to a general chemistry course. Although APL is an IBM language, it has now become more generally avail-

able at other installations, and because it is such an extremely powerful interactive language, it richly deserves the coverage it receives in this chapter. It is also commendable that the contributors of this chapter have included examples and an abbreviated listing of a program. While such a listing is not always practical, it seems to add an extra measure of usefulness and understanding to the discussion. The second chapter is concerned with the instruction of organic chemistry on the University of Illinois based PLATO IV system. This system is perhaps the most sophisticated and versatile CAI system in use today and is elegantly illustrated in this chapter. Unfortunately, the necessarily specialized (and quite expensive) equipment and programs are not available to most installations. Hopefully, this will change in the future. Chapter 3 consists of a concise discussion of physical chemistry instructional applications and again benefits from the liberal use of examples, illustrations, and a very useful bibliography. Chapter 4 is a very clear and interesting chapter on the use of the computer to generate repeatable tests in chemistry, while Chapter 5 is a further discussion of the application of computing activity to classroom demonstrations. This chapter again is enhanced by a section devoted to descriptions of actual programs which are available from standard sources. Chapter 6 and part of Chapter 7 are devoted to the concepts and techniques of simulation, both of unknown analyses and chemical spectra. The final chapter is concerned with the computerized generation and grading of homework and is extensively described, with examples and instructions for those who may wish to use it.

After finishing this two-volume set, one is left with the accurate impression that the area of CAI is still very much an individualized discipline, due mostly to the uniqueness of each instructional environment and each attendant computer center. Transportability of programs between institutions is still a serious problem, although the situation is improving. Each person reading these texts will find that some sections will appeal more than others, depending on one's objectives. Overall, I would judge the second volume better and more useful than the first, for the reasons mentioned above. All the CAI techniques which have been applied to chemistry can just as easily be applied to medicinal chemistry by anyone willing to make the effort. The books are both photo typeset, which should aid rapid publication and reduce their cost. There are, however, few references later than 1971, and the moderately high cost of each volume makes one somewhat suspicious. Given these high costs, I would not suggest that the set belongs on every bookshelf. For those who may work in the field of CAI, however, the books make interesting reading, particularly the second volume.

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#### **Pineal Chemistry in Cellular and Physiological Mechanisms.**

Edited by W. B. Quay. Charles C Thomas, Springfield, Ill. 1974. xv + 430 pp. 16 × 23.5 cm. \$24.75.

The pineal gland or epiphysis cerebri is located in the brain of vertebrates in a median region at the posterior end of the diencephalon and just anterior to the posterior commissure. Its internal cellular organization in man and many other mammals assures its interpretation as a gland with endocrine activity. The most dominant and metabolically most active pineal cell type is the pinealocyte which synthesizes and secretes (mostly, if not wholly, into the blood stream) specific indoles, peptides, or proteins. The best known of the indole derivatives is melatonin. The pinealocytes exert several control mechanisms of which the most interesting involve  $\alpha$ - and  $\beta$ -adrenergic receptors. These cells also display vesicles containing indoleethylamines and others containing a tryptophan-rich, pineal-specific protein. The gland's metabolism is regulated spectacularly by its circadian rhythmicity with triggering mechanisms activated by light and dark signals at particular times of the day. During darkness the pineal content of norepinephrine comes to a peak near the onset of light. During hours of light the gland synthesizes and then stores 5-HT and 5-HIAA as well as protein. With the exception of vasoconstriction at the onset

of light which releases NE, sudden rate changes occur at or following the onset of darkness. Thus, the gland may play a prominent role in the body's circadian rhythms. This has been proved better for birds than for mammals. In addition, the circadian changes in pineal hydroxyindole *O*-methyltransferase have intrigued many investigators.

In Quay's book, all types of metabolites are considered: inorganic, lipids, carbohydrates and their metabolites, amino acids, indoleethylamines, catecholamines, nucleotides, nucleic acids, enzymes, other proteins, vitamins, pigments, and products of mitochondrial reactions. The beautifully printed volume has 1103 references and a good index.

Perhaps because only few pathologies have been associated with pineal activities, and because of great experimental difficulties experienced in the past, the pineal gland has not been studied as thoroughly as the hypothalamus and the pituitary. The possible role of the pineal in rhythmic or behavioral abnormalities has never been tested in humans. The present book comes at an opportune time since it will aid to heighten the contemporary interest in CNS physiology and its role in mental disease.

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**Practical Fluorescence: Theory, Methods, and Techniques.** By G. G. Guilbault. Marcel Dekker, New York, N.Y. 1973. xi + 664 pp. \$29.50.

As Professor Guilbault states in his preface, "attempts are made to introduce the reader to the entire field of luminescence spectroscopy. This volume starts with an introduction to luminescence and then proceeds to a discussion of luminescent instrumentation, structural and environmental effects on luminescence and phosphorescence. Finally, the use of luminescence in determination of inorganic ions and organic compounds, and the use of fluorescence in enzymology, in photosynthesis and for the assay of proteins are discussed. Special chapters on chemiluminescence, atomic fluorescence, solid surface monitoring, fluorescence indicators, and forensic and environmental analysis complete the presentation," this represents a coverage of topics which is indeed extensive. Inclusion of such a wide spectrum of topics and their discussion (although in some cases quite abbreviated) will make the book a useful starting point for researchers interested in utilizing fluorescence techniques to solve particular analytical problems as well as researchers interested in determining what information per se fluorescence or phosphorescence will furnish them about chemical and biological phenomena. The inclusion of a chapter on instrumentation is useful but in the opinion of this reviewer the picturing, discussion, etc., of commercial instruments adds little to the book—development of analytical instrumentation moves too fast so that this portion of the book may soon be out of date. Typographical errors are at a minimum although the art work on many of the graphs clearly suffers due to the use of photo-offset printing. The table of contents is quite abbreviated but adequate while the indices (author and subject) seem well done and quite complete.

The overall presentation of the book is well organized including smooth integration of the chapters written by invited authors (Chapters 3, 12, and 13). Some topics are handled very briefly, *i.e.*, Drugs—one short paragraph plus an extensive table, while others are quite extensively discussed, *i.e.*, a complete chapter on chlorophyll and photosynthesis. These apparent inconsistencies are resolved by extensive referencing (both the original literature and pertinent reviews) so that the work becomes a useful reference as well as introductory text. The style of writing is quite concise so that wordiness is kept to a minimum, in places almost too much so, so that some passages need rereading, particularly in the introductory chapter. The major drawback to the book is its high cost, \$29.50, which will clearly price it out of the reach of many of its intended users.

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