

is incorrect; it is not a bis quaternary but is rather a mono quaternary combined with a tertiary amine moiety.

Chapter 7, *Drugs Affecting the Mind*, briefly discusses psychotherapeutic drugs, hallucinogenic drugs, and cannabis and is a pleasure to read. Chapter 8, *Ophthalmic Drugs*, covers tropane, pilocarpine, arecoline, muscarine, cocaine, and related alkaloids, with emphasis on the tropane alkaloids. Chapter 9, *Drugs Acting on the Cardiovascular System*, discusses cardiac glycosides, hypotensive agents, and anticoagulants. The portion dealing with cardiac glycosides is well written and provides interesting reading. Chapter 10, *Steroid Hormones*, introduces plant sources for steroidal sapogenins that serve as starting material for the clinically useful semisynthetic steroids. Other chapters (11–17) describe GI agents, drugs affecting respiration, vitamins, antibiotics, natural toxic agents, crop protection agents, and formulation aids. As the names of these chapters imply, the authors have made a great effort to correlate plants and drugs from diversified subjects.

In general, the coverage is good and thorough, despite the fact that the literature survey is in most cases only up to 1973. The text is easy to read, although the stereochemistry of many well-known drugs included in this volume is not indicated.

The book would be a useful addition to undergraduate libraries with interests in drugs of plant origin and would be complementary to advanced undergraduate courses in natural product chemistry.

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Experimental Pharmaceutics, 4th Ed. By EUGENE L. PARROTT and WITOLD SASKI. Burgess, 7108 Ohms Lane, Minneapolis, MN 55435, 1977. vi + 338 pp. 21 × 28 cm. Price \$10.95.

This laboratory manual, composed of 31 chapters and an appendix, is divided into five sections: metrology, solids, solutions, polyphasic systems, and plastic systems.

The authors have presented the material in a manner that relates pharmacy to a mathematical, scientific basis without presupposing a background in calculus or physical chemistry. The manual is different from many in the same field in that pharmaceutical preparations or dosage forms as such are not emphasized. They are, however, considered within their general classification by physical state to point out their relationships and similarities.

Solids can be used as an example of the method of presenting the material. The authors first consider the characteristics of particles and the means of reducing particle size. The blending of solids and some properties of solids are then presented. Methods of combining powdered materials to produce dosage forms of larger size such as granules, tablet triturates, and compressed tablets follow. Experiments on solids include also the coating of tablets and means of evaluating the solid dosage forms by *in vitro* and *in vivo* tests. The *in vivo* test is a urinary recovery test. In this series of experiments with solids, the student is taught techniques and skills in manipulating solids with various types of hand and mechanized equipment, specifications of solid dosage forms, physical testing by *in vitro* procedures, and bioavailability testing and evaluation by *in vivo* procedures.

Students are asked to complete tables and fill in blanks in the manual with information that they have gathered from their experiments and from assigned readings. Adequate space and graphs are provided for these purposes.

"Experimental Pharmaceutics" is not a complete textbook in itself. Use of the manual requires the guidance of an instructor willing to provide or point out references for the student to read. Several lists of references are strategically located in the manual. The publication is flexible in that each section is complete in itself, so that certain sections could be used without using the others. In fact, parts of a section could be utilized to reduce laboratory or discussion time.

The authors have provided, in the appendix, certain valuable data such as dissociation constants, freezing-point depressions, sodium chloride equivalents, ophthalmic buffer systems, and hydrophile-lipophile balance values. The authors have pointed out the importance of presenting data in a clear, concise manner and have included an outline of how to present experimental data.

In this manual, the authors have put together a logical outline of pharmaceutical systems, each supported with an adequate number of pharmaceutical preparations for the student to make and evaluate. The physical science concepts of pharmacy are integrated nicely into the preparation and evaluation of pharmaceutical dosage forms. "Experimental Pharmaceutics" is highly recommended for use as a laboratory manual in beginning courses in pharmaceutics.

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Physical Chemistry for the Life Sciences. By JAMES R. BARRANTE. Prentice-Hall, Englewood Cliffs, NJ 07632, 1977. 337 pp. 14 × 22.5 cm. Price \$14.95.

The book is designed as a text in basic physical chemistry for students majoring in biochemistry, biology, medicine, and dentistry. It is intended for a one-semester course and includes those areas of physical chemistry important to the life sciences. The level of mathematics is lower than that usually found in a physical chemistry text. At the end of each chapter, under Special Topics, there are on the average three pages of material that require an adequate mathematical background. There are problems and selected answers at the end of each chapter.

The chapters are: Properties of Gases, First Law of Thermodynamics, Second and Third Laws of Thermodynamics, Free Energy and Equilibrium, Solutions, Chemical Equilibrium, Ionic Equilibria, Reaction Kinetics, Electrochemistry, Selected Properties of Macromolecules, and Photochemistry. Although the author states that, when feasible, biological examples are used to illustrate physical-chemical principles, most of the presentation centers about very simple systems for which biological examples are not available.

The book is attractive and is well written for those interested in a concise exposure to the concepts of physical chemistry. For the pharmacy student, the text is too elementary and is not significantly different from other physical chemistry texts written for nonchemistry majors. For the pharmaceutical scientist, the book may serve as a review; however, it probably is not broad enough in scope or great enough in depth to be recommended as an addition to his or her library.

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