Pharmaceutics of Solids and Solid Dosage Forms. By JENS T. CARSTENSEN. Wiley, 605 Third Ave., New York, NY 10016, 1977. 256 pp. 16 × 24 cm. Price $18.50.

This book was developed by Dr. Carstensen from the material he uses for a 4th-year pharmacy course. In the Preface, the author quite rightly points out that the "area of pharmaceutical solids constitutes a fascinating field of knowledge." The book covers some of the basic physical chemistry of solid dosage forms and includes a comprehensive treatment of the more common solid dosage forms used in current practice.

At the end of each chapter, there are a short list of relevant references, some problems (calculations), and some questions.

The chapters are logically ordered, and the presentation of concepts is lucid. The numerous figures are well drawn and will greatly assist the student using this text. Furthermore, the book seems commendably free of errors (although a new word, "hepticlation," appears on p. 208), and the index is well prepared.

Of course, it is inevitable that in any book of this type, one can find statements with which one does not agree. Thus, on p. 163 the author states: "A directly compressed tablet (and most often also a slugged tablet) will disintegrate into the particles from which the original blend was made." This is a generalized assertion that this reviewer regards as unjustified. Experimental data clearly suggest that, in direct compression, both particle fracture and cold welding can occur, so the particle-size distribution can be significantly altered by the compaction process.

Some readers may feel that the rather brief chapter (19 pages) titled Biopharmaceutics of Solids might have been omitted, since the topic of Biopharmaceutics justifies a much fuller treatment (*i.e.*, a separate course) and it seems somewhat artificial to separate the biopharmaceutics of solids from other dosage forms.

The last 46 pages of the book are devoted to a description of selected laboratory experiments. Many of these are particularly interesting. This reviewer was intrigued by Carstensen's description of scheduling problems for students; it was good to know that in Wisconsin at least, some students are prepared to attend a laboratory session on Monday evenings!

This book can be recommended as providing a useful basis for those planning an undergraduate pharmacy course on dosage forms. Parts of it may also be very useful for some graduate courses.

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Synthetic Methods for Carbohydrates, ACS Symposium Series 39. Edited by HASSAN S. EL KHADEM. American Chemical Society, 1155 Sixteenth St., N. W., Washington DC 20036, 1977. 278 pp. 14 × 23 cm. Price $19.50.

The book consists of 15 separately authored chapters, each of which reviews and reports original research in an important area of carbohydrate chemistry. The invited authors have made internationally notable contributions in the areas they discuss. Some chapters are more important and sophisticated than others. However, the material in each chapter is deftly and authoritatively handled. In each chapter there is much explicit and detailed technical information. In three chapters, the authors appear to have had some problems translating into English. This is a minor flaw in view of the high competence of the authors in the important areas they present.

The advancing sophistication in synthesis of carbohydrates is impressive, as is the expanding knowledge of the biological importance of carbohydrate structure. Also, some of the synthetic procedures employed to affect specific changes in the polyfunctional carbohydrates may find direct application in the synthesis of medicinal agents not directly related to carbohydrates.

The following is a sampling of the contents of the book. Chapter 1 explores the preparation, properties, and range of utility of the *O*-ethylboron protecting group. Chapter 2 examines the use of benzylidine acetals, for example, in the synthesis of 1,2-*trans*-glycosides. Chapter 4 describes the synthesis of oxaprostaglandins and C-nucleosides and the mutational synthesis of aminoglycoside antibiotics. Chapter 5 presents valuable generalizations for predicting the Cotton effect among heterocycles linked to a sugar or hydroxyalkyl moiety. Chapter 6 describes the use of 2-deoxy-2-phthalimido-D-glucopyranosyl halides in the synthesis of 2-amino-2-deoxy-β-D-glucopyranosides.

In Chapter 7, the authors relate their experiences with the chemistry of the unsaturated sugar D-glucal, especially as that chemistry relates to the synthesis of aminoglycoside antibiotics. Chapter 8 furnishes a good review of methods of incorporation of heteroatoms other than oxygen into sugar rings. Chapter 9 describes the facile synthesis and the properties of previously inaccessible 1-*O*-acyl-α-D-glucopyranose derivatives. Chapter 10 reports the synthesis and chemical properties of levoglusenone (1,6-anhydro-3,4-dideoxy-β-D-glycerohex-3-enopyranos-2-ulose), a pyrolysis product of cellulose. Chapter 11 affords answers to longstanding questions about the mechanism of osazone formation.

Chapter 12 reviews the synthesis of polyhydroxyalkyl-substituted furans, pyrroles, 1,5,6,7-tetrahydroindol-4-ones, pyrimidines, imidazolines, and imidazoles *via* reaction of glycosides and aminoglycosides with β-dicarbonyl compounds. In Chapter 13, the authors discuss the reactions between sugars and aromatic hydrocarbons and suggest that similar reactions occur between lignin and carbohydrates when wood converts to coal. Chapter 14 reports the synthesis of Amadori-type sugar derivatives of several biogenic amines (*e.g.*, serotonin) and examines the biological properties of some of these compounds. Chapter 15 reviews the structures of some bioactive glycolipids and details sophisticated reactions leading to their synthesis.

My first impression was that, because of the highly technical nature of much of this work, its appeal would be restricted to those engaged directly in carbohydrate research. After more consideration, I feel that the work should have wide appeal among medicinal chemists. Many of the synthetic procedures are elegant, are accompanied by excellent mechanistic explanations, and appear to have synthetic potential not restricted to carbohydrates. Also, some of the areas discussed, such as glycolipids, have immediate medicinal chemical significance.

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An Introduction to Phytopharmacy. By M. S. F. ROSS and K. R. BRAIN. Pitman Medical, 42 Camden Road, Tunbridge Wells, Kent TN1 2QD, England, 1977. 305 pp. 14 × 22 cm. Price £7.00.

As stated in the introduction (Chapter 1), this book indeed provides an "integrated approach to the consideration of plants and drugs." It has very broad coverage of several aspects relating to the pharmacy disciplines such as botanical, chemical, pharmaceutical, and pharmacological.

The book is divided into two parts. The first part (Chapters 1–5) deals with general principles, and the second (Chapters 6–17) deals with specific pharmacologically active drugs of plant origin.

Chapter 2, Plants and Their Constituents, is an excellent brief account of the fundamental elements of plant biology as well as important groups of biologically active plant constituents such as the alkaloids, the glycosides, and the isoprenoids. This chapter emphasizes that plants are of importance to the pharmacist. Chapter 3, From Plant to Isolate, covers the fundamental principles and methods for the isolation of active components, including extraction and chromatographic separation techniques. Figure 3.7 showing separation of alkaloids and phenolics is neither clear nor adequate. Perhaps a more detailed flow sheet dealing with the separation of certain specific examples of alkaloidal drugs would be more impressive.

Chapter 4, Drug Variability, is concerned with the yield and quality of plant drugs. Chapter 5, The Search for Novel Plant Drugs, is well written and involves discussions of the development of new plant drugs. Chapter 6, Drugs Acting on the Central Nervous System, includes plant constituents used as analgesics, stimulants, and muscle relaxants. However, the traditional structure for tubocurarine as given in Fig. 6.2

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, antibiosis, 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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