and related areas (with a subappendix on periodicals devoted to certain plant crops such as coffee, cotton, and sugar); terms describing the properties and therapeutic uses of drugs and pesticides; diagrams of inflorescence and flower types; taxonomic classification schemes for organisms; and a list of plants yielding rubber. At the beginning of the volume, in addition to the "Preface" and "Explanatory Foreword", there are sections entitled "Abbreviations", "Geographical Abbreviations", "Symbols Used in Pharmacognosy and Economic Botany", "Greek Alphabet", and "Plan of Definitions". The overall slant of the information provided is very definitely toward terrestrial plant drugs rather than products from marine organisms and is biological in its major focus as opposed to chemical. It is perhaps not unfair to comment that some of the information contained in this volume is of historical rather than contemporary interest. The book appears to be relatively free of typographical errors, and has a very attractive dust cover featuring photographs of *Aconitum napellus*, *Allium sativum*, and *Artemisia argyi*.

As the modern professional curricula of pharmacy schools in the United States and other countries become more and more oriented to clinical matters as opposed to the basic pharmaceutical sciences, there will be few people left with the type of broad knowledge embraced by the various entries in *A Dictionary of Natural Products* once the present generation of pharmacognosist faculty members retires. Therefore, the value of this book will become more evident as time goes on, especially with an ever-increasing interest in phytopharmaceuticals (herbal remedies). This volume will be extremely useful as a reference tool to those entering pharmacognosy and natural products research and, accordingly, can be highly recommended for institutional library purchase. It can also be recommended for purchase by those involved in the industrial production of medicinal plants and botanical drugs. In addition, individuals interested in medicinal and economic plants but without a formal scientific or medical training will find much valuable information explained in a clear manner in this dictionary.

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**Downstream Processing of Natural Products: A Practical Handbook.** By Michael Verrall, SmithKline Beecham Pharmaceuticals, Surrey, U.K. John Wiley & Sons, West Sussex, England. 1996. xviii + 354 pp. 15 × 22.5 cm. $84.95. ISBN 0-471-96326-7.

This book contains 21 chapters written by specialists in the production of natural products derived from fermentation. While no substitute for a chemical engineer, the book provides a wealth of details and considerations that must be made during scale-up. Valuable descriptions are provided of specialized manufacturing equipment, including the pros and cons of alternate equipment and the tests used to select between them. Interesting techniques and examples of actual processes are included that one would be wise to consider during process identification.

Most chapters in the book are appropriate, well written, and correctly focused. They provide important insights and considerations to ensure that a bench process merges well with the necessities of the pilot and manufacturing scales. In particular, we appreciated the discussion of Good Manufacturing Practice (GMP), a topic not normally included in the training of process identification chemists.

The book stresses topics important to the isolation of pharmaceutical molecules derived from fermentations. Subjects of utility to other areas of natural products isolation such as biomass handling and drying, grinding, and liquid/solid extraction are often not included. We were disappointed not to find discussions of large-scale crystallizations, techniques for the drying of temperature-sensitive solids, and formulation. In addition, we would have appreciated information, including economic implications, for topics such as (a) techniques appropriate for the isolation of molecules with lower market value than pharmaceuticals, (b) strategies for reducing the number of solvents used in isolation processes, and (c) large-scale water-removal techniques other than lyophilization.

This book will be a valuable reference for those who take natural product isolations from the bench to larger scale. We hope that the editors will consider a sequel that addresses additional topics more appropriate for the processing of non-fermentation-derived natural products.

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