

Behind Bars

The Science of Chocolate. By *Stephen T. Beckett*. Royal Society of Chemistry, Cambridge 2000. xiv + 176 pp., paperback £ 18.95.—ISBN 0-85404-600-3

Several books on chocolate technology have appeared in recent years; this one by S. T. Beckett will certainly find a secure place among them. It is written in an easily understandable textbook style, attractively produced, and with a clear arrangement of the subject matter. The author has wisely limited the discussion to the important essentials, without omitting any relevant aspects, and the presentation is lightened here and there by a little humor. The chapters cover every facet of the subject: the history of chocolate, the raw materials, the processing of cocoa through to the final product, the rheology of chocolate, crystallization and the moulding of the fatty phase, manufacturing techniques for different chocolate products, packaging, and modern methods of analysis. Separate chapters are devoted to rheology and crystallization, which reflects the importance of these topics, not only for chocolate technology but in other fields, and at the same time reveals that the author has special expertise in these areas. Some readers may be surprised that no rheological equations are



given, but that is appropriate and an indication of the book's easily readable style. However, more detailed treatments of the aroma generating mechanism and of nutritional physiology would have been useful, as there is growing public interest and new knowledge concerning these aspects. The last chapter is unusual; it describes 18 simple experiments with chocolate to give the reader a feel for the properties of this substrate. One gets that to some extent from merely reading them, but performing the experiments should teach the reader much more. These experiments, requiring very little outlay and effort, could be used in lectures and practical classes to provide students with valuable and unusual insights. The rest of the chapters contain cross-references directing the reader to relevant experiments in the final chapter.

However, one should not be misled by the title "The Science of Chocolate". A much older publication, H. Fincke's 1960 handbook on cocoa products, collected together the scientific knowledge concerning cocoa and chocolate that existed at that time, and reviewed the literature comprehensively. That work of some 650 closely printed pages continues to be used today. Thus, considering the great developments in machinery and plants for cocoa processing and chocolate manufacture that have occurred since 1960, the increase in land areas devoted to cocoa production, changes in market conditions and food regulations, and the enormous increase in knowledge through new measurement techniques and research results, it is clear that a comprehensive work on the science of chocolate would now consist of a few thousand pages filling several volumes. Of course, the author of this textbook has neither attempted nor claimed such a degree of scientific completeness. Instead he offers an overview of modern chocolate technology and measurement methods, but has included scarcely any

literature references, and has entirely avoided tables, physical equations, and chemical formulas that would interfere with easy readability.

Altogether, the book offers a skillful selection of subject matter, including a wealth of useful and up-to-date information, and follows good textbook principles by concentrating on the fundamentals. It is especially suitable for students of the science, technology, and chemistry of food. It can also be recommended for all who work in the food industry, are interested in the scientific and technological aspects of food products, or are involved in school work on these topics, either as teachers or students. Through its user-friendly style it conveys, in an easily understandable way, much knowledge that would otherwise be gained only with considerable effort from other books on the subject. I look forward with interest to further volumes in this Royal Society of Chemistry paperback series.

Gottfried Ziegler
Fraunhofer Institut für
Verfahrenstechnik und Verpackung
Freising (Germany)

Analytical Instrumentation. Performance Characteristics and Quality. By *Graham Currell*. John Wiley & Sons Ltd., Chichester 2000. 307 pp., hardcover £ 29.95.—ISBN 0-471-99901-6

Considering the large number of newly published or recently revised major textbooks on analytical chemistry, which all contain significant parts devoted to analytical instrumentation, the need for the new book *Analytical Instrumentation—Performance Characteristics and Quality*, by Graham Currell, is not obvious at first sight. However, after reading a few pages no doubts remain: the author has succeeded with a new and

This section contains book reviews and a list of new books received by the editor. Book reviews are written by invitation from the editor. Suggestions for books to be reviewed and for book reviewers are welcome. Publishers should send brochures or (better) books to the Redaktion Angewandte Chemie, Postfach 101161, 69451 Weinheim, Germany. The editor reserves the right of selecting which books will be reviewed. Uninvited books not chosen for reviews will not be returned.

very interesting concept. This consists of an introduction and a critical discussion of the most important parameters of selected analytical methods.

In the first four chapters Currell discusses the common basic features of analytical methods, with particular focus on terminology, uncertainty of measurements, general characteristics of analytical instrumentation, and quality assurance. Chapters 5 to 12 consider the characteristics of particular analytical methods, including UV/Vis spectroscopy, atomic spectroscopy, infrared spectroscopy, liquid chromatography, gas chromatography, capillary electrophoresis, and mass spectrometry. The remaining chapters (13 to 18) are devoted to general aspects of the analytical signal (Chapters 13 to 15) and to important individual components of analytical instrumentation (monochromators, radiation sources, and radiation detectors). The book is completed by a brief list of monographs on the individual methods, tables with SI units and physical constants, a Periodic Table, and an index.

Obviously, all these analytical techniques cannot be treated comprehensively, from their theoretical background to

practical applications, within only 300 pages. The current textbooks of analytical chemistry require twice or three times the number of pages to achieve that. Therefore, Currell focuses exclusively on the instrumental aspects and avoids extensive descriptions of the chemical background. He succeeds fully in conveying to the reader an understanding of the function of analytical instruments and their major components. The text is supported by many clear and informative figures illustrating the components of analytical instrumentation. Each chapter contains a brief introduction outlining the potential applications of the method, and a discussion of the main technical features. The critical discussion of the parameters, which includes both advantages and disadvantages of the particular analytical methods, is more useful than the treatments in some common textbooks.

It should be mentioned that this book is exceptionally well suited for use by students, because all chapters are accompanied by questions. The "discussion questions" are answered by the author himself immediately after the question, while the "self-assessment questions"

are intended to be answered first by the reader. The corresponding answers are listed in the last part of the book. These questions enable the student to make his or her own evaluation of the knowledge that has been gained.

Which groups are most likely to benefit from this book? University teachers who are teaching advanced analytical courses will find it a valuable resource for the preparation of their lectures. The book will also be profitable for students who are majoring in analytical chemistry and for graduate students, as it ideally complements the existing large textbooks on analytical chemistry and assists the critical assessment of analytical methods. With its help, learning analytical chemistry is not limited to technical details, but is broadened to include problem-based learning of the possibilities and limitations of analytical instrumentation. In summary, this is a conceptionally new book which can be highly recommended, and will be used by teachers as well as by students with great success.

Uwe Karst

Anorganisch-Chemisches Institut
Universität Münster (Germany)