some reaction equations that do not exist. However, the enquiring reader can easily solve that problem. But unfortunately, the many-level numbering scheme for the figures, text, and equations does not make it any easier for the reader. On page 92 fate overtakes the authors again: suddenly the axes are interchanged, and the labeling of the figure corresponds to a multiple of what is actually shown. The explanation of this figure in the text leaves much to be desired. This chapter contains a varied mixture of practical aspects, different variants of methods, and many simulated voltammograms. Unfortunately numerical simulation, which nowadays has an important role in this method of investigation, is not discussed anywhere in the chapter. Nor will the reader find any information about the computer programs that are available, where to obtain them, or their advantages and disadvantages. In the bibliography one gets the impression that the copy deadline was set well before the end of 1999.

Two short chapters are devoted to special variants of voltammetry, namely pulse voltammetry (by Z. Stojek) and square-wave voltammetry (by M. Lovric). Their important advantage—improved limits of detectability—is rightly emphasized. After also mentioning some other variants, one chapter discusses in detail the behavior of adsorbed reagents. Next G. Inzelt gives a brief description of chronocoulometry with some practical hints about the method. Electrochemical impedance measurements (referred to for no obvious reason as a form of spectroscopy) are described in a good concise chapter by U. Retter and H. Lohse. After a short overview of the method and the kinds of electrochemical information that it can yield, the authors discuss methods for analyzing the experimental data; unfortunately they limit their description of the methods to the popular device of equivalent circuit diagrams, and here again there is no information about available programs and their advantages and disadvantages.

The next chapter, by A. Neudeck, F. Marken, and R. G. Compton, is devoted to spectroelectrochemistry in the UV-Vis-NIR region. A short introduction explaining the need for nonelectrochemical data is followed by a brief overview of various methods. The reasons for choosing the group of methods described here are not explained, one can only guess. The chapter discusses spectroelectrochemical measurements in static and flowing solutions, and describes simple types of measurement cells which have already been in use for several decades and can be found in the literature. The authors are so enthusiastic about these that a simple cross-sectional diagram of one appears twice (in Figs. II.6.3 and II.6.4.a). However, there are some useful examples of special forms of construction and flow cells. Detailed and careful descriptions of alternative cell designs and measurements by a reflection method have been published elsewhere, for example by Salbeck, but surprisingly there are no references to that work. The seventh chapter, by M. Lovric, deals with stripping voltammetry, with particular attention to pre-enrichment of electrodes by electrochemical deposition. Electrochemical studies of solids are described by D. A. Fiedler and F. Scholz, in a chapter which impresses by its systematic and lucid treatment of both the theoretical and practical aspects. Many examples of combinations with nonelectrochemical methods are described with practical hints. This is followed by a chapter on potentiometry, certainly a typical example of electrochemical methods of analysis, by H. Kahlert, which deals systematically with the essential aspects and also discusses some finer details.

The third part is devoted to practical aspects of electroanalytical methods, including chapters on working electrodes (S. Komorsky-Lovric), reference electrodes (H. Kahlert), electrolytes (S. Komorsky-Lovric), and experimental setups (Z. Stojek). This wide-ranging mixture of practical hints, informative diagrams, and mathematical tools for calculating transport properties will be welcomed by users of these methods as a valuable source of information.

A short final chapter gives a brief historical outline of the development of electroanalytical methods in the context of electrochemistry, and lists some relevant books, journals, and Internet sites.

The publishers have produced the book with care to a high standard. It collects together much information that has already appeared elsewhere, and presents it in a clearer and more connected form in many cases, together with some useful advice and stimulating ideas. However, newcomers to the subject, such as beginners in electrochemistry or analytical chemists without previous electrochemical experience, will not find the book very helpful, while for those working in the area most of the material will already be familiar, and they will find relatively little in the way of new ideas. The book fills a gap with regard to some methods that have previously not been adequately covered in the literature, and it also provides many practical hints. The editor has devoted some care to subdividing the material systematically, resulting in a very detailed multilevel numbering system, but this fine structuring makes it rather difficult for the reader. Fortunately the detailed subject index compensates for that to some extent. The book is probably best regarded as supplementary reading. The reader's first resource is likely to be one of the existing works, such as *Electrochemical Methods*, by A. J. Bard and L. R. Faulkner (John Wiley & Sons, New York 2001).

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Communicating Chemistry: Textbooks and Their Audiences, 1789–1939. Edited by *Anders Lundgren* and *Bernadette Bensaude-Vincent.* (Series: European Studies in Science History and the Arts, Vol. 3). Science History Publications, Canton (Massachusetts) 2000. vii + 465 pp., hardcover $ 56.00.—ISBN 0-88135-274-8

The European Science Foundation (ESF), an association of 62 major national funding agencies devoted to basic scientific research in physical and engineering sciences, life and environmental sciences, medical sciences, humanities, and social sciences in 21 countries, brings together leading scientists and funding agencies to debate, plan, and implement pan-European scientific and science policy initiatives. In 1993 the ESF sponsored a scientific program, "The Evolution of Chemistry in Europe, 1789–1939", car-

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ried out as a series of workshops, dealing with the chemical profession, communication, texts, laboratories, and chemical industry. To date no fewer than five publications have resulted from these workshops.

The first workshop, "Strategies of Chemical Industrialization from Lavoisier to Bessemer," was held in Liége, Belgium in 1994 (*Archives Internationales d'Histoire des Sciences,* **1996**, *46*; D. M. Knight, H. Kragh, Eds.: *The Making of the Chemist: The Social History of Chemistry in Europe 1789–1914*, Cambridge University Press, Cambridge/New York 1998). The second, concerned with the mutual relationship between science and industry, was held in Maastricht, The Netherlands on March 23–25, 1995 (E. Homburg, A. S. Travis, H. G. Schröter, Eds.: *The Chemical Industry in Europe, 1850–1914: Industrial Growth, Pollution, and Professionalization*, Kluwer, Dordrecht/Boston/London 1998). The third workshop, concerned primarily with the period between the two world wars, was held in Strasbourg, France in October, 1996 (A. S. Travis, H. G. Schröter, E. Homberg, P. J. T. Morris, Eds.: *Determinants in the Evolution of the European Chemical Industry, 1900–1939: New Technologies, Political Frameworks, Markets and Companies*, Kluwer, Dordrecht/Boston/London 1998). A fourth workshop, dealing with natural dyes, was held in Oxford, England (R. Fox, A. Nieto-Galan, Eds.: *Natural Dyestuffs and Industrial Culture in Europe, 1750–1880,* Watson Publishing International, Canton, MA 1999).

A fifth workshop, dealing with textbooks, was held in Uppsala, Sweden in February, 1996 and resulted in this collection of 18 chapters by 18 historians of chemistry or science from nine countries (four from France, three each from Spain and the United Kingdom, two each from Germany and the United States, and one each from Greece, Hungary, Portugal, and Sweden). A related but independent conference, held on March 20–22, 1997 at the University of California, Berkeley, resulted in another collection (J. E. Lesch, Ed.: *The German Chemical Industry in the Twentieth Century*; Kluwer, Dordrecht/Boston/London 2000; G. B. Kauffman, *Angew. Chem., Int. Ed.* **2002**, *41*, 186–187).

Textbooks have suffered from a bad reputation, at least in science studies. Regarded as boring, dogmatic, and conservative, they are generally considered useful only to provide a window on the "normal science" of a specific period. They do not deal with the creative moments in scientific innovation or the fascinating controversies through which scientific knowledge and progress evolve. Yet the contributors of *Communicating Chemistry* consider textbooks to be an interesting subject that deserves the attention of historians. They seek to place textbooks in their contexts, and they show how textbooks differ from other forms of chemical literature, under what conditions they became established as a genre and developed a specific rhetoric, and how their audiences helped shape the profile of chemistry.

In his introduction, "The Study of Chemical Textbooks" (18 pp.), John Hedley Brooke states "Textbooks can be more enthralling than their unglamorous image might suggest. The task of stabilizing a body of knowledge, when that knowledge is in a dynamic state, and the tendency in many textbooks to conceal the controversies that ultimately made them possible surely invite deeper analysis. To treat textbooks merely as a window on past theory is to short-change their authors who were often responding to, and endeavoring to reconcile, the demands of publishers on the one hand and of new institutional structures on the other."

Brooke raises a number of questions and topics, which the contributors then consider. He summarizes the contents and conclusions of the individual chapters: 1. "French Chemistry Textbooks, 1802–1852: New Books for New Readers and New Teaching Institutions" (Antonio Garcia Belmar and José Ramón Bertomeu Sánchez); 2. "Spanish Chemistry Textbooks, 1788–1845: A Sketch of the Audience for Chemistry in Early Nineteenth-Century Spain" (the same authors); 3. "Theory and Practice in Swedish Chemical Textbooks during the Nineteenth Century: Some Thoughts from a Bibliographical Survey" (Anders Lundgren); 4. "Chemistry in Physics Textbooks, 1780–1820" (Gunter Lind); 5. "The Language of Experiment in Chemical Textbooks: Some Examples from Early Nineteenth-Century Britain" (Brian Dolan); 6. "From the Workshop into Print: Berthollet, Bancroft, and Textbooks on the Art of Dyeing in the Late Eighteenth Century" (Agustí Nieto-Galan); 7. "Communicating Chemistry: The Frontier between Popular Books and Textbooks in Britain during the First Half of the Nineteenth Century" (David Knight); 8. "Atomism in France: Chemical Textbooks and Dictionaries, 1810–1835" (Catherine Kounelis); 9. "Berzelius's Textbook: In Translation and Multiple Editions, as Seen Through His Correspondence" (Marika Blondel-Mégrelis); 10. "Three Rhetorical Constructions of the Chemistry of Water" (Mercè Izquierdo); 11. "From Teaching to Writing: Lecture Notes and Textbooks at the French École Polytechnique" (Bernadette Bensaude-Vincent); 12. "Dimitrii I. Mendeleev's *Principles of Chemistry* and the Periodic Law of the Elements" (Nathan M. Brooks, at 15 pp. the shortest chapter); 13. "Chemistry for Women in Nineteenth-Century France" (Natalie Pigeard); 14. "The Chemistry of Everyday Life: Popular Chemical Writing in Germany, 1780–1939" (Barbara Orland, at 40 pp. the longest chapter); 15. "Roles and Goals of Chemical Textbooks on the Periphery: The Hungarian Case" (Gábor Palló); 16. "From Student to Teacher: Linus Pauling and the Reformulation of the Principles of Chemistry in the 1930s" (Mary Jo Nye); 17. "One Face or Many? The Role of Textbooks in Building the New Discipline of Quantum Chemistry" (Kostas Gavroglu and Ana Simões).

The book, unlike many multi-author volumes, which are often disparate collections, features closely integrated essays, because during workshop sessions the contributors discussed precirculated drafts of the chapters to elicit connections and parallels as well as differences between chemistry textbooks in the various countries. It contains a 9-page (double-column) index of names, but not subjects, and is meticulously documented. I heartily recommend it to historians of chemistry or science and to chemists concerned with the historical development of their textbooks and their science.

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