

- ² An update on this disturbing side of science, which at first sight concerns mainly genetic research but of course involves chemistry as an all-important “accomplice”, can be found in: “The politics of genes”, *The Economist*, April 14th 2001, p. 19ff.

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Communicating Chemistry. Textbooks and their Audiences, 1789-1939, ed. by ANDERS LUNDGREN & BERNADETTE BENSAUDE-VINCENT, Science History Publications, Canton, MA, 2000, vii + 465 pp. (ISBN 0-88135-274-8)

“Boring, dogmatic, conservative [...] textbooks have a bad reputation, at least in science studies. They are considered to be useful only insofar as they provide a window on the ‘normal science’ of a specific period. [...] How did textbooks differ from other forms of chemical literature? Under what conditions did they become established as a genre?” Thus the editors introduce this collection of 18 essays by a wide variety of authors from many different countries but all now rendered into English.

It would indeed have been tedious if the reader had been confronted simply with lists of successive editions of textbooks from different European countries, together with a detailed description of their contents. Happily most of the authors manage to provide much more than this. But how should the contents of a chemistry textbook of the early 1800s have been arranged? Apart from a few obviously similar substances, like chlorine, bromine, and iodine, there was no obvious order in which to present inorganic chemistry before Mendeleev (1869). With the Russian chemist, however, the importance of the textbook is clear, since it is well known that it was above all the problem of organizing his textbook that helped lead Mendeleev to the Periodic Table. Perhaps his innovation takes us beyond the ‘normal science’ mentioned by the editors, but it is certainly an illustration that the textbook may be a useful focus for study. For some, like the impoverished Mendeleev, writing a textbook was a way to earn money. For others, as in the French and German systems, it was a path to a professorship. But it was also a means of consolidating the authority of the professor, whose views came to in-

fluence a wider readership than his immediate students.

Several authors wrestle with a possible definition of a textbook. It is neither a technical manual nor a broadly based work of popularization but something lying between these two extremes. Fortunately some authors were prepared to survey the whole spectrum, since it would indeed have been rather limiting to look exclusively at books intended to prepare students for examinations. Even here, however, there is the pedagogical issue of the level at which information and ideas are presented. BERNADETTE BENSUAUDE-VINCENT presents the interesting spectacle of a variety of 19th-century textbooks targeted at different readerships from the most elementary to the most advanced, although sometimes it was basically the same material that would be drawn upon.

DAVID KNIGHT, in his informative analysis of textbooks in early 19th-century Britain, mentions Thomas Thomson's *System of Chemistry* (1st edn. 1802, 7th edn. 1831) as one of "the first really successful English chemistry textbooks", which was actually translated into French, thus reversing a tradition that goes back to the 17th century. Despite the editors' stated interest in studying how textbooks became established as a genre, there is no mention of the succession of 17th-century French textbooks culminating in the *Cours de chimie* of Lemery (1st edn. 1675, last edn. 1756). Although illustrations are mentioned in Knight's article and elsewhere, a full discussion of illustrations for the novice wishing to perform experiments would have been useful. This brings us to a valuable contribution by BRIAN DOLAN on 'The language of experiment'. He raises the fundamental question of the difficulty of learning the necessary experimental skills from the printed page. Attendance at a series of public lectures would have been invaluable to complement the information given in a book.

On the other hand, Mrs. Marcet, author of the famous *Conversations on*

Chemistry (1st edn. 1806, 11th edn. 1828) was scathing about the rapidity of demonstrations at the Royal Institution in London, criticisms which prompted her to write her book in question and answer form. In this book a governess, Mrs. B., instructs two girls, Emily and Caroline. Although mainly written for a female audience, there were no specific feminist concessions. For this we have to turn to the chapter by NATALIE PIGEARD on 'Chemistry for women in 19th-century France'. Among chemistry books written specifically for a female audience was Guillaume's *Lettre à ma nièce* (1855), which provided practical information for the housewife. Thus chlorine was introduced, not as an element, but as a bleaching agent. This contrasts with the view of chemistry as a part of a liberal education, when it might be presented within the context of natural theology.

The editors ask, "How did textbooks differ from other forms of chemical literature?" of which the most important would be journals. No one really tackles this question. Obviously journals would report the most recent research and no concession would be made for beginners. In this way journals may be compared with advanced textbooks or monographs. A run of journals would be invaluable in a library and would provide examples of the kind of problems research chemists considered important.

Whether studying books or journals, it is easy to study the strategy of the authors but very difficult to study the readership. The only exception is when a book is prescribed for a particular institution. A chapter on books used by students at the Ecole Polytechnique is able to make comparisons with lecture notes. Also there is considerable documentation available on the student body.

Readers of this journal are likely to be interested in the status of chemical theories. Yet authors of textbooks often avoided discussing theories as being too contentious. They sought to provide a solid foundation. Facts were everything

but perhaps we cannot expect any explicit discussion of positivism in this collection. Incidentally, it would have been very useful in such a diversity of treatments to have an index of subjects as well as a name index.

CATHERINE KOUNELIS examines ideas about atoms in early 19th-century France, pointing out that Dalton's theory was at first either ignored or misrepresented. However, Thenard's influential *Traité* gave increasing attention to the atomic theory in successive editions. We see the gradual replacement of equivalents by atomic weights. There is some philosophical interest in the diversity of meanings given to atomic theory. Certainly for chemists it provided a useful tool rather than a belief in the existence of atoms in the literal realist sense. This chapter, like so many others, is well documented. Some readers will only regret that the author stops her story before the arrival of Marcellin Berthelot on the scene. Another study of French textbooks by two Spanish authors also fails to go beyond the mid 19th century. One might say that a careful study of two generations is better than a superficial study of two centuries. Again there is full documentation including an alphabetical list of the many books consulted including several by little-known authors. The chapter on Spanish textbooks covers the same period and explains the importance of France for chemical education beyond the Pyrenees.

Some latitude has been allowed to the contributors. Thus a most interesting question is raised by the physicist GUNTER LIND on the relation between physics and chemistry in the late 18th and early 19th centuries. Unfortunately, taking a non-historical viewpoint, he understands these sciences with their modern meaning, overlooking the fact that, for example, heat and much of electricity were then regarded as parts of chemistry.

In a book brought out by a subsidy publisher there may not be quite the same incentive to introduce the greatest

rigor in the acceptance of papers, which in this case seem rather miscellaneous and of varying quality. In an ideal world specific topics might have been commissioned so as to produce a more definitive study of the textbook. In the real world of the 1990s the European Science Foundation kindly offered to support the study of different aspects of the history of chemistry in different European countries with special reference to the period 1789-1939 and it was a question of getting people of different nationalities together to present their interests. JOHN BROOKE makes a brave attempt at a synthesis and his introduction is worth reading, as are many of the other chapters.

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