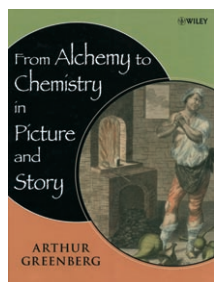


From Alchemy to Chemistry in Picture and Story



By Arthur Greenberg. Wiley-Interscience, New York 2007. 637 pp., hardcover
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This new book by Arthur Greenberg is like a matroschka, a type of doll that is most highly valued when the painting of the smaller (inner) dolls corresponds most exactly to that of the larger (outer) dolls—which is to say that within this new book on the history of chemistry by the well-known author one finds not only the contents of his previous work *The Art of Chemistry* (2003) but also those of that work's predecessor *A Chemical History Tour* (2000). The author calls the process “consolidation”, and the new work may in fact be the result of a process of maturation and consolidation. Nevertheless, there is no hiding the fact that it contains a considerable number of chapters that are identical to the corresponding parts of the previous work, in both text and figures, and have thus survived the condensation process unchanged. Therefore, someone who is coming to the series for the first time can be advised to buy only this latest update, as it makes the earlier versions obsolete. That may seem a cheap criticism, but it is a fair comment on the book. A review of *The Art of Chemistry* appeared in this journal in 2003 (H. Hopf, *Angew. Chem.* **2003**, *115*, 4257–4258; *Angew. Chem. Int. Ed.* **2003**, *42*, 4126–4128), and that could now be simply reprinted here. Nevertheless, here I will describe the structure

and contents of this new and enlarged version.

Compared with its predecessor, the work has increased by 280 pages, almost doubling its size. Greenberg divides it into ten sections, which outline the rise of chemistry from an initial area of activity that was, on one hand, very practical (ore extraction, metallurgy, weapons of war), and on the other hand also secretive and mystical (alchemy, the art of the Mannerism period, the occult, paranormal pseudo-science). The influence of these two aspects on early medicine is also discussed. A recurring theme that runs throughout the book (and continues to the present day) is that of questions about the bonding between substances—what drives them to come together?—what causes them to separate? Accordingly, the book discusses the most important of the early theories of bonding, such as Geoffroy's concept of affinities or Bergman's elective affinities among the older theories, and those of Pauling and Lewis in more recent times.

In accordance with the importance of the topic, the longest section of the book is devoted to the transformation that is characterized briefly as the Lavoisier chemical revolution. But of course, the earlier studies of the phlogiston period and of pneumatic chemistry that led up to that turning point are also fully described. After that change of paradigm (a fashionable word that fits exactly in this case), everything became different and chemistry began to specialize; it became a more systematic and exact science, and its practical importance in both industrial and agricultural production increased rapidly. Greenberg treats all this in his usual style, with exciting descriptions and lavish illustrations. In fact, the figures have been greatly improved: the black-and-white ones, which are mostly photographs of old copperplate or wood

engravings, are richer in contrast, and the color illustrations, many of which are full-page, are brighter than before (some of them are perhaps even “better” than the originals). One marvels at the treasures that the author has managed to unearth from old archives and libraries.

Writing history is not possible without setting oneself some limits. Here again, I noticed this especially in the modern parts of the book. The examples from modern chemistry that are cited (such as catenanes or the rather ominous nanocar molecule) are true to their historical models, insofar as it is not always clear whether they are curiosities that future generations will just shake their heads over, or innovations leading to entirely new areas of chemistry. The author clearly has a fascination with the constructive aspects of chemistry. However, especially in this area, many other good examples could have been included (such as Müller's giant rings), and the text does not sufficiently reflect the international nature of chemistry as in its historic phase of development. Evidently the consolidation of recent history has not yet taken place far enough.

In his preface, Greenberg asks whether it is such a bad thing that one should occasionally laugh about chemistry or enjoy a joke, even when it concerns a bad pun. “Of course not” is the answer, and Greenberg himself gives it in the last chapter, which is about chemical humor.

My advice to everyone who is interested in the history of chemistry: give your old versions of Greenberg's books away and buy the new one.

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