

Book Review

A Trio of Books on Molecules and Their Social Impact

Napoleon's Buttons. 17 Molecules That Changed History,

by Penny Le Couteur and Jay Burreson (Jeremy P. Tarcher/Penguin, 2004) 362 pp., ISBN 1-58542-331-9; \$14.95 paperback)

Salt. A World History,

by Mark Kurlansky (Penguin, 2002) 465 pp., ISBN 0-14-200161-9; \$15.00 paperback)

Men Of Salt. Crossing The Sahara On The Caravan Of White Gold,

by Michael Benanav (The Lyons Press, 2006) 256 pp., ISBN 1-59228-772-7; \$23.95 hardcover)

Reviewed by Dennis J. Sardella, Department of Chemistry, Merkert Chemistry Center, Boston College, Chestnut Hill, MA 02467

A couple of years ago, I received a copy of Mark Kurlansky's *Salt. A World History* as a gift and had enjoyed it so much so that when I saw the announcement for Michael Benanav's *Men Of Salt. Crossing The Sahara On The Caravan of White Gold* I was motivated to read it as a follow-up and complement. Not long afterward, a colleague returning from an ACS meeting mentioned seeing a fellow chemist reading a book with the intriguing title *Napoleon's Buttons. 17 Molecules That Changed History* and suggested that it might be a good candidate for a review in *The Nucleus*. Having finished it, I decided that the juxtaposition of this trio of books on the interplay between chemicals and human culture, written independently at two-year intervals and spanning the continuum from science to personal experience, might make for an interesting review.

Napoleon's Buttons is a scientifically (if not technically) focused presentation of the role played by chemicals in society and history, *Salt* simultaneously narrows the scientific focus to a single compound (more accurately, class of compounds, since compounds other than sodium chloride often make cameo appearances), but broadens the historical and cultural horizons, and *Men Of Salt* looks not at the compound itself, but is a personal account of the long and dangerous trek by camel caravan across the deserts of Mali in

search of salt, and the lives of the men who mine and transport it. Taken as a whole, the three books segue rather neatly into one another, reminding the reader forcefully and entertainingly that modern society is both founded on, and shaped by, chemicals, and that chemistry itself (like all good science) is built about a core of romance and adventure.

The intriguingly, yet misleadingly named, *Napoleon's Buttons* takes its title from the hypothesis (suspicion?) that one reason for the defeat of Napoleon's army in Russia was that the tin buttons on his men's uniforms crumbled due to the cold-induced phase transition from white to gray tin, leaving them susceptible to death from exposure. The authors admit forthrightly that there is no hard evidence to support this conjecture, though of course it makes an eye-catching title. Still, as someone once observed in another context, "It's such a neat story, if it isn't true, it ought to be." This shortcoming aside, though, *Napoleon's Buttons* is an enjoyable and informative book that takes seventeen compounds (more accurately, classes of compounds) and explores their impact on history and their role in contemporary society. Consistent with the fact that Le Couteur and Burreson are both chemists, *Napoleon's Buttons* is the only one of the three books to actually present chemistry, and the authors have thoughtfully included a compact introductory section on molecular structures to demystify material in subsequent chapters, helping readers to come away with an appreciation of the importance of topics like structural chemistry, intermolecular forces, stereochemistry and functional groups.

The examples Le Couteur and Burreson have chosen are overwhelmingly organic (carbohydrates, phenols, vitamins, steroids, dyes, etc.), the only inorganic compound being covered at length being salt (and, of course tin, which makes a brief cameo appearance in conjunction with the book's title).

As a chemist, one of the aspects of the book I particularly appreciated was not only that the authors did not shrink from including large numbers of molecular structures to illustrate their points, but that they actually linked the structural features with the compounds' properties and included balanced equations for reactions, albeit without going into their details (which may have been too much for even the most hardened nonscientist reader). All in all, though, the book made enjoyable reading and would certainly make an accessible introduction to the pervasive and largely positive societal role played by chemicals to give as a gift for a chemically unsophisticated acquaintance.

The third-from-last chapter of *Napoleon's Buttons* deals with salt (primarily sodium chloride), a topic that Mark Kurlansky tackles in exhaustive (though not exhausting) detail in his book-length exploration of salt's central role in world civilization. Kurlansky is not a scientist, and his focus in *Salt. A World History* is simultaneously less technical and more expansive than Le Couteur and Burreson's. This is a social history, and its range is staggering and its presentation detailed and filled with fascinating looks at

cultures ranging from ancient China and Egypt, to medieval Europe, to revolutionary France, to Civil War America, to the contemporary Middle East. Kurlansky writes fluidly and I found *Salt* to be a real page-turner, with virtually every page offering up an intriguing anecdote or fascinating connection.

Michael Benanav is neither a scientist and adventurer of the laboratory, like Le Couteur and Burreson, or an author and prospector of historical archives, like Kurlansky, but a wilderness guide, a geographical adventurer, intrigued by the romance of the hazardous trek of camel caravans across the Sahara to bring salt cakes mined in the desert wastes of Mali back to Timbuktu, the nearest outpost of civilization. Concerned that this millennia-old tradition might be facing extinction in a world where salt has become almost as cheap as dirt, he resolved to join a caravan to make the month-long trip, not as a passenger, but as a worker. *Men Of Salt* is the absorbing story of Benanav's experiences on that harrowing journey. Readers will not find any chemistry, or a great deal of historical or economic analysis. Rather they will find an insightful, and at times humorous, day-to-day account of the world of the men who unknowingly stand at the other extreme of the story told by *Napoleon's Buttons* and *Salt*, in a world linked to the prehistory of chemistry, where chemicals are obtained not by a walk to a stockroom or an email order to a corporate supplier, but are wrested from the earth and brought to consumers with great hardship and at enormous personal risk. Benanav's insights in *Salt* are not chemical, or historical, or economic, but inner and personal, not all that different from the joys, ideals and companionship of those who labor in the laboratory:

“What's perhaps more beautiful, even more important, are the truths expressed through the humble lives of the azalai, the miners and the nomads: that wealth is not a prerequisite for joy or self-respect; that commerce does not have to be founded upon greed; that each moment is ours in which to create delight, regardless of circumstances; that living in balance with the natural world is the key to long-term survival; that it's possible to embrace tradition and modernity for what they each have to offer, without forsaking either.”