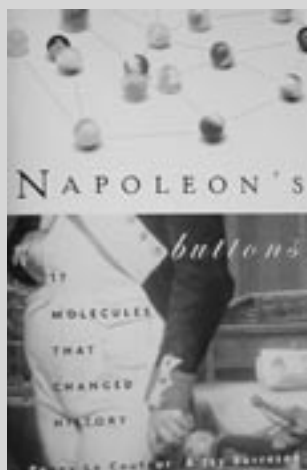


## Book Review: Napoleon's Buttons

By Penny Le Couteur & Jay Burreson



The title of this book is deceptive unless one reads the sub-title – *17 molecules that changed history*. The story about “Napoleon’s Buttons” is recorded in the introduction. It illustrates how often there can be a ‘chemical reason’ behind an event that changes the course of history. The tale is told of how Napoleon’s troops were defeated in Russia because the tin used to make the buttons on their great-coats disintegrated

in the low temperatures. This is a well used story among chemical educators the world over, even though historical evidence indicates the story is more likely apocryphal than fact. Despite this, it wonderfully illustrates how small changes in the underlying chemistry of substances can lead to changes in properties that have enormous consequences for individuals and ultimately, for society. In this book 17 ‘molecules’ (one could argue salt is not a molecule) that had a huge influence on society and world events are explored. In each case the history of the discovery and use of the molecules is discussed along with their world shaping influence.

The chemical industry as we know it today had its origins in the development of synthetic dyes in the 19<sup>th</sup> century. However, the influence of some particular molecules on world history goes back much further. This is apparent in the compounds chosen by the authors. They fall into two main groups; those from natural sources and those made in the laboratory. Valuable compounds from natural sources have been sought after in every age and have governed many aspects of history. For example, desire for glucose (sugar) and cellulose (cotton) drove and sustained the slave trade to the Americas from the 17<sup>th</sup> century. The desire for spices pushed forward the ‘Age of Discovery’ as new routes to India were sought to break the Venetian monopoly. Salt, silk and oleic acid (olive oil) are also noted for their influence on trade across the centuries. Vitamin C made a difference to the length of the journeys that sailors could undertake and so new worlds opened up.

The advance of the chemical industry in the past century and a half has given rise to compounds made in the laboratory or factory. Many, such as the dye, indigo and the vitamin, ascorbic acid are identical to those found in nature while others, like aspirin, have small variations to the natural product which gives them more useful properties. ‘Wonder drugs’ such as antibiotics, steroids, contraceptives and anesthetics are explored as are the alkaloid molecules, caffeine, morphine and nicotine. Again, small changes on the molecules that have led to new useful or controversial compounds are explored from a historical and a chemical perspective. In each case the chosen chemicals have been responsible for a key event in history or for a series of events that have transformed society.

The authors weave the stories of each compound’s discovery, use, and influence with discussions of chemical proper-

ties. They consistently make connections between chemical structures and historical episodes. Thus the book is not written in chronological order but chapters are based on connections between similar or related molecules. For example following on from the chapter on cellulose is one about nitro compounds and the link is the discovery of ‘gun cotton’ and the story of Schonberg’s exploding apron. To quote the authors ‘this book is not about the history of chemistry; rather it is about chemistry in history.’

The key to this book is the connection between chemical structures and the desirable properties of each compound. Helpful chemical structures are included in the text and the significance of any changes to the structures clearly explained. For example the position of the –OH group in the hydrocarbon chain of the molecule produced by bees helps them distinguish between a worker and a queen. A brief explanation of ‘organic chemistry’ and the structural representation of organic molecules are included in the introduction to the book. The authors cleverly minimise the complexity of some of the organic molecules by highlighting the important group under discussion and treating the rest of the molecule as something that this group hangs from.

There is much mention in current chemistry education literature of the need to make ‘real life’ connections for our students. This book is a gold mine of anecdotes, stories and everyday examples that link to many aspects of the chemistry we teach in schools and universities. As such it should be found in every school science department and school library. It is a great read for anyone with a basic understanding of chemistry and an interest in science and history. The authors have skillfully blended history, chemistry and culture in a wonderfully readable, interesting book.

Reviewed by Suzanne Boniface, Queen Margaret College