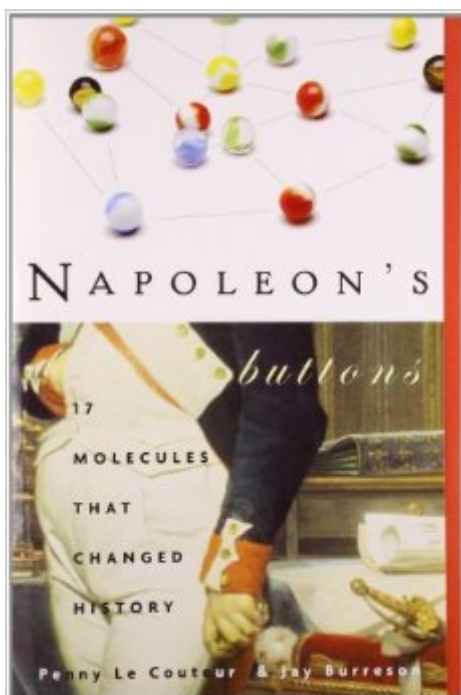


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Napoleon's Buttons: How 17 Molecules Changed History



Synopsis

Napoleon's Buttons is the fascinating account of seventeen groups of molecules that have greatly influenced the course of history. These molecules provided the impetus for early exploration, and made possible the voyages of discovery that ensued. The molecules resulted in grand feats of engineering and spurred advances in medicine and law; they determined what we now eat, drink, and wear. A change as small as the position of an atom can lead to enormous alterations in the properties of a substance-which, in turn, can result in great historical shifts. With lively prose and an eye for colorful and unusual details, Le Couteur and Burreson offer a novel way to understand the shaping of civilization and the workings of our contemporary world.

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Customer Reviews

Someone once said, "Biology names things. Chemistry tells you how they work." In Napoleon's Buttons, LeCouteur and Burreson take that premise to a much higher level. They not only tell you how the molecules work, they explain the impact these molecules have had on human history, economics, and geopolitics. They consider what might have happened if the molecules in question had been discovered, understood, or used by someone else. For example, the effects of ascorbic acid deficiency, and its treatment, were known in China as early as the fifth century. Norse explorers drank a brew made of "scurvy grass" during their voyages across the North Atlantic. However, scurvy killed more European sailors between 1470 and 1770 than all other causes, despite reports on prevention and cure as early as the mid-1500's. Magellan lost over 90% of his crew during the circumnavigation of the globe in 1519-1522. Only 18 sailors returned to Spain with the spices that

had prompted the journey. Magellan himself was killed in the Philippines during a stop necessitated by the weakened condition of his remaining crew. The authors ask the reader to imagine the present geopolitics if the Age of Discovery had included adequate stores of lemon juice. "If the Portuguese, the first European explorers to travel these long distances had understood the secret of ascorbic acid, they might have explored the Pacific Ocean centuries before James Cook." The Dutch, also, might have held claims to large portions of the South Pacific. They conclude, "The British . . . would have been left with a much smaller empire and much less influence in the world, even to this day." Even 20th century adventurers have fallen to the effects of ascorbic acid deficiency. The Amundsen/Scott race to the South Pole was decided by the Brits' lack of vitamin C. "Only eleven miles from a food and fuel depot they found themselves too exhausted to continue." Sixteen other molecules, or classes of molecules, including cellulose, morphine, isoprene, and salt, are given similar turns under the magnifying glass. The authors walk the line between chemistry and anecdote. For the former chem. majors there are formulae and descriptions--cis and trans, alpha and beta. For history buffs, the human stories stand without in-depth study of the chemical structures. The prose is lively and often amusing. The chapters are divided in such a way the book can be put down and picked up easily, if the reader can resist the temptation of "just one more molecule." Now I'm trying to decide if I should first hand off my copy to my dad or my high school-age daughter. Or--maybe my daughter's teacher As much as we humans might like to think our intellect raises us above the natural world, this book reminds us, we are our biology--and our chemistry.

Did tin buttons that crumbled in the cold stop Napoleon's army? Or was it scurvy from lack of vitamin-C? Or lack of antibiotics for the wounded? Throughout history, there have been substances that have changed the world. The authors have chosen 17 types of molecules that have altered the course of nations, societies and cultures. Each chapter centers on one of the molecules, and it's very interesting that many of the molecules are interconnected. The authors take us on a fascinating journey through history and chemistry - starting with piperine, the stuff that puts the 'hot' in peppers and ending with the molecules that have conquered malaria. Both natural and synthetic substances are studied. The impact of natural substances like salt, caffeine, and olive oil reaches far past daily life and into the fate of nations. The search for synthetic substitutes has led to diverse products such as nylon, artificial sweeteners, the Pill, and Styrofoam. The impacts of several live-saving substances like vitamin-C and antibiotics are explored. Some compounds, such as DDT and Freon, that were originally seen as near-miracles have proven to be rather disastrous to the environment.

Napoleon's Buttons explores the consequences for better and for worse, sometimes all in the same substance. The book starts with a very friendly overview of chemistry diagrams and terms. The authors provide a multitude of diagrams that show how various substances are similar and different. It's truly amazing how a tiny change in structure can completely alter the properties of a molecule. I think the diagrams are fascinating, but if you're not that interested in the actual chemistry, you can easily ignore them and concentrate on the stories that illustrate the effect of each substance. Le Couteur and Bureson entertain as well as educate with their well-chosen selection of anecdotes. Their writing is very understandable for the casual reader, but includes enough detail to satisfy someone with a stronger background in science. I don't usually comment on the look of the text, but I thought it was just outstanding in this book. Both the text and the diagrams are exceptionally clean and easy to read. The information is very well organized - it's easy to read each chapter as a self contained unit, but there's enough of a framework tying it all together to make it a coherent whole.

I enjoyed this book very much. Each chapter is devoted to a particular molecule, e.g., glucose, silk, phenol, salt, etc., and discusses both its chemical structure and its significance to civilization. To a former engineer who somehow escaped even a smattering of organic chemistry, this book explained a lot in an easy-to-follow manner. The authors illustrate each molecule schematically, and in many cases show how a subtle difference in structure can lead to dramatic differences in chemical behavior. Makes me wish I had studied organic chemistry in college. The chapter on oleic acid (olive oil) was particularly interesting. I now understand what is meant by "saturated fat", "monounsaturated fat" and "trans-fat", and why soap works. A lot of information, easily absorbed. My only quibble is that the authors thought they had to conclude each chapter with a few paragraphs about "how this molecule changed history". That got tiresome, fast.

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