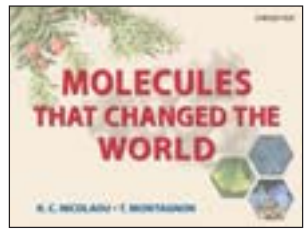
*Book review: Molecules that Changed the World*

# Marvellous Molecules

Tiny chemical compounds, such as penicillin and acetylsalicylic acid, have made a huge contribution to the quality of modern life. Others, such as strychnine, have enhanced performance in sport and, well, homicide. A new illustrated book offers a colourful investigation into three dozen compounds.




A few years ago, I reviewed a textbook on organic chemistry. This weighty tome of almost 1,200 pages, churned out by two German professors, was full of nested phrases and daunting chapter titles like *2.44.1.4 Carbene C-H insertions* and *5.20.8.4 Endohedral fullerene derivatives*. The book offered a total absence of humour, concision and descriptive examples, and the publishing house demonstrated an obvious preference for monotonous, monochrome illustrations.

In short, the book was mind-numbingly boring, sending me to sleep promptly and efficiently every time I struggled through a few pages. I was certainly well rested by the time I composed my review, concluding that the book was more detailed encyclopaedia than textbook and that it was a brilliant means of killing off even the strongest enjoyment of chemistry.

When the review was published, our editorial office swiftly received two furious letters, penned by disgusted readers. Both correspondents were senior professors of chemistry, who perceived the review as an outrageous assault on their pure and holy science. "Of course, chemistry *must* be unemotional", one of them lectured, implying that pleasure, fun, glamour and the like have nothing to do with serious chemical science. In other words, it's a law of nature that books on chemistry have to be stodgy.

## Dusty professors should avoid the book

Well, that's true of many publications. However, the newly published *Molecules that Changed the World* violates this law. This is an illustrated book that definitely won't appeal to the grave species of professor mentioned above. With its extravagant 30 x 23 cm size alone, it won't fit onto the standard academic bookshelf, and its plethora of coloured images give it a worryingly enticing air. Consequently, dusty professors of chemistry should avoid it like the plague.

For the rest of us interested in this fascinating science, though, the book is worth reading. It has been written by K.C. Nicolaou, an American chemist of Cypriot origin who works at the Scripps Research Institute in La Jolla, California. Nicolaou writes in his preface that his desire was "*to enlighten a greater appreciation in society about chemistry and to inspire young students to explore its fascinating applications*". So he picked out a number of famous chemical compounds and their celebrated discoverers and explorers. Nicolaou reports the story of each molecule's discovery and the route to its total synthesis by a celebrated (or forgotten) chemist. These stories are presented in an unusually variegated environment (lots of photos, drawings, structures and formulae crowd each page). Not a very stylish approach, but one that is easy to read and understand nevertheless.


**Strychnine was often used to enhance physical strength in sporting competitions. At the 1904 Olympic marathon in St Louis, drinking water was considered bad style. Thomas J. Hicks, an American athlete, finished second with more than a milligram of strychnine sulphate and a large glass of brandy.**

We learn about Emil Fischer's great work on sugars such as D-glucose, about Felix Hoffmann's breakthrough with the "miracle drug" Aspirin in 1897 and about Marshall Gates' total synthesis of morphine, the highly addictive drug that acts directly on the central nervous system to relieve pain. We peer over the shoulder of Elias James Corey (regarded as one of the greatest living chemists), developing numerous synthetic reagents, methodologies and classical syntheses of prostaglandins like PGE and PGF.

Over 366 pages we meet more than 500 famous researchers and hear plenty of amazing tales about legendary molecules (I didn't know, for example, that the pharmaceutical industry manufactures 2,800,000,000 Valium tablets each year, nor did I know that the first patient to be treated with penicillin was a 43-year-old policeman, who died from bacterial infection after the rare life saving drug was used up and attempts to recover penicillin from his urine had failed).

Considering the abundance of characters and compounds, Nicolaou's opus cannot be outstandingly detailed. It sticks to the essentials without claiming to be a fully-fledged textbook.

A slightly weak point is that the author omits any criticism. Vaunted drugs such as Valium, Prozac and Ritalin have dark sides that Nicolaou largely ignores.

## Strong whiff of self-glorification

However, there is another, far more unpleasant problem. With photos of Nicolaou on many pages and constant name-dropping, the whole book smacks of self-glorification. Nicolaou features himself more than twenty times, namely in chapters 20, 26, 27, 29, 31, and 32.

In contrast, world-famous scientific heroes and Nobel laureates like Linus Pauling, Bruce Merrifield, Fred Sanger and many more are pushed to the margins (if they're lucky). Nicolaou has indeed figured out the total synthesis of quite a few complex molecules found in nature such as Paclitaxel ("Taxol") and vancomycin, but he's no Lasker or Nobel prize winner. So the suspicion remains that *Molecules that Changed the World* was written to ensure its author's place in scientific history.

WEANÉE KIMBLEWOOD

K. C. Nicolaou & T. Montagnon: Molecules that Changed the World. A Brief History of the Art and Science of Synthesis and its Impact on Society. Wiley-VCH, 2008, 366 pages, €37.20.