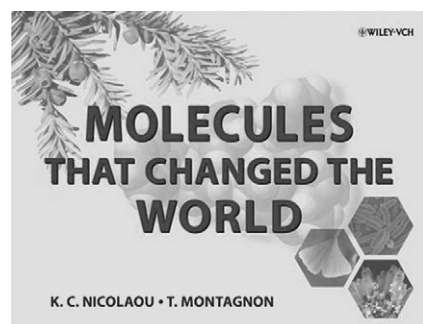


The Art and Science of Organic Synthesis

Molecules that Changed the World

By K. C. Nicolaou and T. Montagnon.

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This book is a true treasure chest of information, chemical and non-chemical alike, on the intriguing history of organic synthesis from its very beginnings in the first half of the 19th century to the level of sophistication to which this science has risen in less than 200 years—a level that would have been inconceivable to the early (and even not so early) pioneers of the field. After a very instructive introductory chapter on the historical origins and meanings of the terms 'atoms', 'molecules', and 'synthesis', the reader is taken on a fascinating 32-chapter journey through nearly 200 years of organic synthesis, with 32 selected organic molecules as individual reference points. These molecules encompass the entire range of structural and hence synthetic complexity, from simple structures such as urea and acetic acid (the former being the first organic molecule ever synthesized), to compounds like palytoxin, brevetoxin B, and taxol, the syntheses of which could only be completed within the last decade of the 20th century. In between there are molecules such as aspirin, camphor, morphine, and penicillin, to name just a few. Each of the 32 chapters recounts the history of the respective molecule's discovery, provides information on its biological activity and,

if applicable, on its medical or industrial use, and outlines the path of discovery that finally led to the successful synthesis of each compound. The crucial aspects of most of the chemical syntheses that have been developed for these molecules are outlined, and a number of specific transformations that were instrumental for the success of these syntheses are discussed in a broader context (e.g. the Diels–Alder reaction and Pd-catalyzed coupling reactions). The discussion is not confined to the specific molecules that were selected as reference points along the way, but also covers a wide range of related structures, be they naturally occurring analogues of the reference compounds or produced through synthesis. Importantly, the authors do not limit themselves to these essentially scientific questions, but also highlight how societal, political, and personal conditions impacted the evolution of organic synthesis and vice versa. Thus, the book provides much factual as well as anecdotal information on the personalities of the great chemists that have driven this science forward throughout the 19th and 20th centuries, their personal attitudes, their way of thinking, and above all, their shared passion for chemistry and new discoveries.

To highlight just one example of how societal and political conditions have influenced the course of organic synthesis and vice versa, it is interesting to learn that the effort set in motion in the United States during the Second World War to secure a sufficient supply of penicillin and to elucidate its molecular structure was second in magnitude only to the Manhattan Project, which aimed at the development of the atomic bomb. All this information, together with a well written and easily comprehensible discussion of small-molecule drugs and biologics in its two final chapters, makes this book as fascinating to non-expert readers as it is to those who practice the art and science of organic synthesis. Indeed, the authors have succeeded in

presenting scientific and nonscientific information in a highly integrated fashion, which gives this book a truly unique character. What makes it even more appealing are the beautiful illustrations that support the textual information, be this in the form of nicely designed reaction schemes and structural drawings, the pictures of all the scientists whose seminal contributions to organic synthesis are the subject of this book, or the beautiful photographs of those living organisms that produce the most fascinating molecular structures we know.

By setting out to write a book like this, the authors created a daunting task for themselves and they have clearly risen to the challenge. They have put together a well-researched book that is instructive, informative, and fascinating for a trained chemist, but also one that should be equally fascinating and (in the best sense of the word) entertaining for non-expert readers. The book reminds all of us, chemists and non-chemists alike, of the all-encompassing presence of organic synthesis in our daily lives and how this science has been instrumental in shaping our current Western societies and their enhanced standard of living. At the same time, it also serves as a resounding reminder of the fact that contemporary organic chemists do indeed stand on the shoulders of giants. It is simply awesome to be reminded of the limited tools at the disposal of those who laid the foundations of today's science of organic synthesis with their early breakthrough discoveries. In my view this marvelous book should not be missing from the personal library of any synthetic chemist with a true passion for chemical synthesis and molecular transformations, a passion that is so vividly conveyed by the authors of this book.

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