

# Preface to the second edition

Every year, more than a million visitors travel to Washington, DC end of March/early April to celebrate the National Cherry Blossom Festival (Fig. 0.1). Are you surprised that the roots of this spectacular event are closely linked to a discovery in natural products chemistry? You can find out more about this topic in Chapter 6.3.



**0.1** *In March 1912, Tokyo Mayor Yukio Ozaki gave the gift of 3,020 Japanese cherry trees to the city of Washington. They symbolize friendship between nations, the renewal of spring, and the ephemeral nature of life.*

During my career in the chemical industry, I was always fascinated by natural products for two reasons:

1. They are a crucial factor in securing and enriching our livelihood not only with food and medicine, but also by stimulating our senses with colour, scent and flavour.
2. When industrial chemistry was called upon to satisfy an ever growing demand for such products, this became a challenging incentive for developing efficient and scalable processes to generate often rather complex molecules. Here, the ingenuity and creativity of chemists in academia and industry is displayed most prominently with admirable achievements.

My curiosity and my excitement for natural products from an industrial perspective led to questions about their discovery, early application and production, their economic and sometimes social ramifications. When asked to prepare a lecture course on “Natural Products in the Chemical Industry” at the University of Heidelberg, I intended to share this multifaceted view on the subject with my students, instead of conveying only the bare bones of chemical technology. Over

the past 12 years, the course has indeed sustained remarkable interest and subsequently resulted in a German print edition of “Naturstoffe der chemischen Industrie”. The current English version is based on its largely revised German counterpart and aims at addressing a wider audience.

This is not a classical textbook, and even less a reference work. Whether you are a teacher or a scholar, an undergraduate or graduate student, a professional chemist in industry or academia, or someone just interested in natural sciences, you will find plenty of food for thought – facts and information along with enjoyable anecdotes, historical, political, biological and social considerations.

Of course, a large portion of this book is dedicated to the art of natural products synthesis. Among many other conditions, it requires conceptual vision, as well as profound knowledge of highly diverse compound classes and reaction mechanisms, but also persistence and often good luck to design a successful route and construct the target molecules. Interdisciplinary know-how is necessary to find adequate solutions, *e.g.* by embarking on biosynthetic strategies Nature itself has employed or by using enzymatic transformations. Insight into physiology and pharmacology may lead the way to simpler structures with the same or even superior effects than its natural prototype.

The task to adopt a small-scale reaction to an economically viable and ecologically responsible manufacturing process, which yields large quantities of pure material, poses particular challenges to chemists, engineers and experts from many other disciplines. In this regard it is as well intriguing to witness the advancements and elegance of modern chemical technologies.

Do you have to read this book to advance your professional career? Probably not. But if you are looking for fun with science, you may want to consider placing it on your night stand.

Most of the reaction schemes are presented in colour, which should facilitate the easy recognition of building block fragments in the final products. From the colour of the bonds, however, it is not always possible to draw conclusions on the reaction mechanism. While this is in many cases rather complex, the reader is therefore referred to the primary literature sources. A comprehensive index section will assist in navigating through this book when searching for specific topics, and the rich illustrations – many of them in colour – are meant to familiarise with the origin and application of natural products, but also as a tool to make a somewhat “arid subject” better digestible.

I am in particular grateful to three colleagues and friends of mine for their assistance in this book project: Dr. Richard Riggs, Dr. David Smith and Dr. Bernd Janssen. Without their commitment and their sound knowledge of the subject, this book would not have found its way into print.

Richard Riggs helped me to identify a freelance translator of my manuscript and he read carefully the entire book. My warm thanks go to him for many valuable suggestions and improvements.

David Smith, a chemist from Saint Andrews University and Richard's former PhD supervisor actually accepted the burden and challenges to provide a drafted translation of my revised German textbook. I'm very grateful for David's hard work over some 18 months.

Last but not least I would like to express my deep gratitude to Bernd Janssen, owner of the Massachusetts based Science&Management Consulting operation, former colleague at BASF Pharma and friend for many years. Bernd had already supported the earlier German edition of my book, and his unique diligence, accuracy, perseverance and enthusiasm proved invaluable in compiling its current English version. His careful proof-reading, suggestions for enhancements and translation of parts of this book are especially acknowledged.

I warmly thank my editor Mrs. Elizabeth Hawkins of Springer Verlag, Heidelberg for her patience as well as the enjoyable and productive collaboration. Mrs. Hawkins has supported the concept of this book from its early stages, and has helpfully guided the development process through all phases.

My thanks go in particular to Fotosatz-Service Köhler GmbH in Würzburg, Germany for their excellent design of the layout. They incorporated my numerous requests for changing texts and illustrations in a very professional and diligent way. This was a marvellous collaboration.

I owe particular thanks to all those, who have made available to me excellent illustration material, mostly even free of charge. I am delighted about such a "worldwide" backing of my endeavour, which I would like to recognise by specifically naming the corresponding individuals and companies in the directory of illustrations.

My final and most heartfelt thanks I want to give to my wife Wilgard, who has encouraged and supported me wonderfully in so many ways during those countless evenings and weekends I had been engaged in this book project.

**Bernd Schaefer**

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