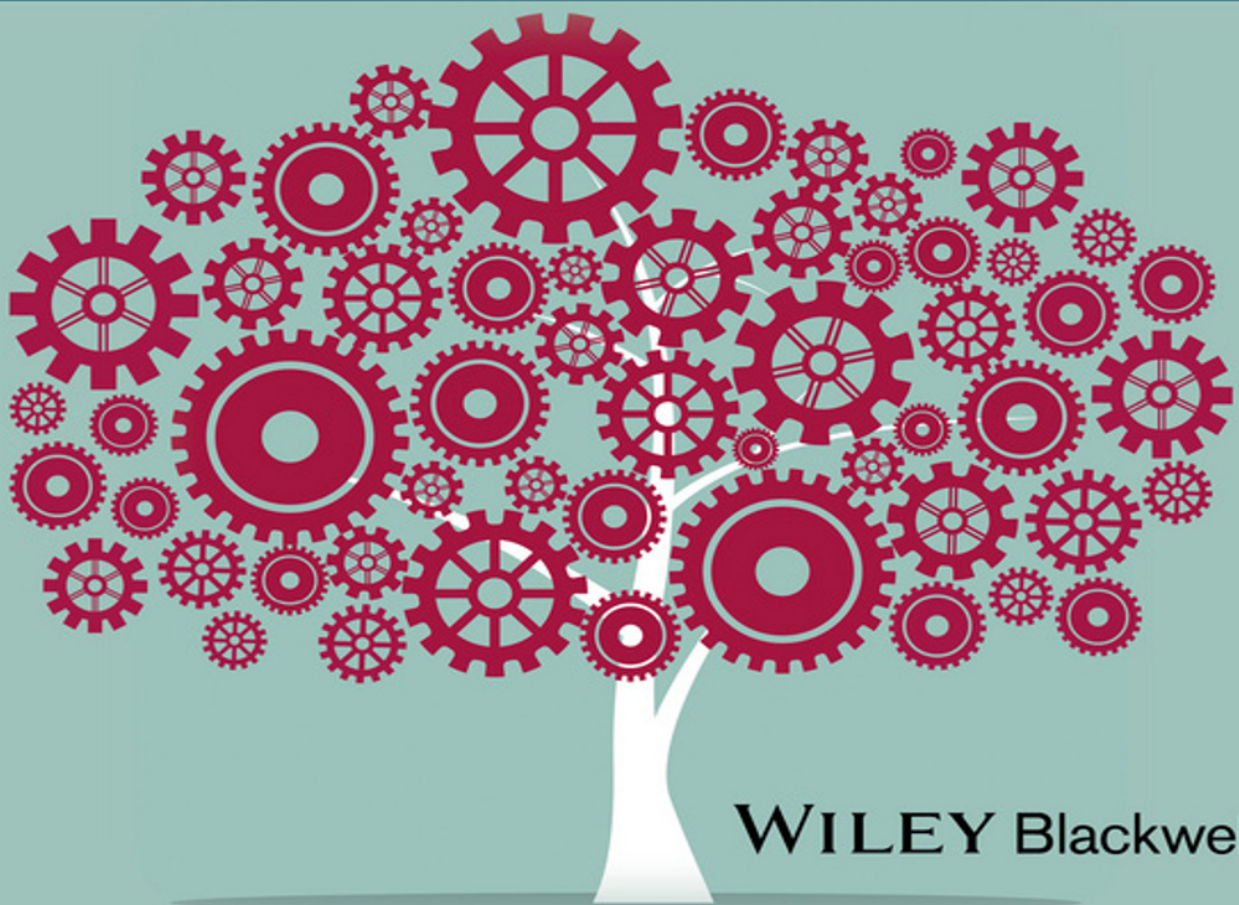
FOOD INDUSTRY R&D

A New Approach

HELMUT TRAITLER, BIRGIT COLEMAN & ADAM BURBIDGE



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About the Authors

Helmut Traitler has a PhD in Organic Chemistry from the University of Vienna–Austria. He was an Assistant Professor and Group Leader of a Research Team for Westvaco in Charleston, South Carolina, USA, working in Vienna, Austria. He joined Nestlé Research in 1981 and later became a member of the Editorial Board of the *Journal of the American Oil Chemistry Society*. At Nestlé, his roles have included Head of the Department of Food Technology; Head of the Combined Science and Technology Department; Head of Nestlé Global Confectionery Research and Development, York, United Kingdom; Director of Nestlé USA Corporate Packaging in Glendale, California; Head of Nestlé Global Packaging and Design, Nestec Ltd., in Vevey; and Vice Preseident of Innovation Partnerships at Nestec Ltd., working in Glendale, California, as well as Vevey, Switzerland. In August 2010, he cofounded Life2Years, Inc., a start-up company in the area of healthy beverages for the 50+. Helmut is the Senior Innovation Connector for Swissnex San Francisco, a public–private partnership organization sponsored by the Swiss government with offices in Beijing; Bangalore; Rio de Janeiro; Cambridge, Massachusetts; and San Francisco,. He is actively involved in technology spin-offs of mission-noncritical know-how for the Jet Propulsion Laboratory (JPL) in Pasadena. He has most recently been involved in codeveloping food products in the area of sports and is the author of more than 60, mostly peer-reviewed, scientific publications, 26 international patents, book chapters and 2 books.

Birgit Coleman is a strategic thinker and Connections Explorer in her current role at Swissnex San Francisco. Her expertise includes recipes for growth through internal innovation and external strategic partnerships with the goal of building a disruptive innovation pipeline for the clients of Swissnex San Francisco. Before Swissnex San Francisco, Birgit worked for the energy drink company Redbull North America, and IBM in Vienna, Austria—her home country. She holds a Masters Degree in Business from the University of Vienna.

Adam Burbidge obtained a BEng and later a PhD in Chemical Engineering from the University of Birmingham in the United Kingdom. Subsequently he worked as a postdoctoral research at IFP (Lyon, France) and the University of Cambridge before taking up a lectureship in Chemical Engineering at the University of Nottingham, United Kingdom. After a couple of years at Nottingham he returned to University of Birmingham as a member of the academic staff. During his time in academia he supervised a number of PhD students and ran a research group with interests in rheology and particle technology, which was funded by a combination of grants from government and industry. After several years in academia, he left this field to take up a post at the Nestlé Research Center, near Lausanne in Switzerland. At Nestlé he has headed various groups in the foods science and technology department with a general focus on applying soft matter physics approaches to food. Adam has published more than 45 research articles with over 900 citations; he reviews for more than 20 journals and several government and industrial granting agencies. He is a member of the Society of Rheology and lives in the canton of Vaud in Switzerland with his wife, two daughters, and three cats.

Foreword

The ancient Greek philosopher Heraclitus tells us: "war is the father of all things." When it comes to the history of modern industrial research and development (R&D) organizations, he is spot on. The gigantic science and engineering projects during World War II (e.g., the Manhattan Project, to name a prominent one) provided versatile models for big technical companies to organize their R&D after the war. Bringing together basic research and advanced engineering under one roof seemed the best way to concentrate the R&D efforts for novel technological developments.

The need of innovations was not the basis for those ideas, but the view that "basic research is the pacemaker of technological progress," so eloquently expressed in 1945 by MIT professor Vannevar Bush' s report "The Endless Frontier.[1] He predicted that pursuing new basic scientific concepts would lead to novel products and services.

However, the last 30 years saw the rise of the age of innovation. The wide availability of creative tools, like personal computers and the Internet, has leveled the playfield between companies. The belief that basic research alone while performed in-house will drive growth has lost its adherents. However, innovations carry risk of failure; a fact leading straight to restrictive countermeasures and the epidemic application of processes and procedures in R&D. This has generated the lamented tunnel vision of contemporary industrial R&D.

Against this background, Helmut Traitler together with his coauthors tells us his story and views about industrial food R&D. His findings are based on his personal observations, experiences, victories, and failures. Traitler does not waste his time in anecdotic nostalgia. He has crystallized general insights and new ideas from his years in R&D of Nestlé and beyond. These ideas comprise new means for a revival of creative R&D organizations. It is fascinating for me to follow his analysis having together worked on innovations in Nestlé for many years.

His critical review rightly focuses on people and structures. It is in these two areas where the unforgivable management sins are occurring. Importantly, Traitler documents that people and structures are not independent. They form a self-enforcing feedback loop where mediocrity supported by management structures stifles creativity and kills innovations.

The actionable outcomes of Traitler's analysis are collected in the second part of his book that presents "possible futures" of food R&D. He provokes the reader to change perspectives on consumer insights, external innovations (universities and other solution providers), and the future development of the food industry. He tops his analysis with "disruptive outlooks" describing new ways of organizing R&D based on testable business models. Traitler belongs to the few who make their advice personal, having it grounded in lively experience. I hope that innovation managers will heed his advice.

Heribert Watzke
Lausanne,
September 2015

[1] http://www.nsf.gov/about/history/vbush1945.htm

Preface

Research and development (R&D) not only represent a vast area of topics and heated debate but it also is a playground for much controversy of the most different kind. In academia, such controversy is often based on interpretations of data and subsequent conclusions and often debates the question of who was first to discover a particular finding and whether or not the said finding is of any value to the scientific community. R&D in corporate environments follows different rules and judgment patterns and is mostly defined and driven by costs and consumer relevant targets, or so one may believe. There is, however common ground among these two worlds: both strive to maximize knowledge, although for different reasons and in different ways. Equipment and scientific rigor may be similar or identical, however their usage, approach, and interpretation are different. This book discusses history and background of today's food industry as seen by consumers, academia, and the industry itself, and several chapters are especially dedicated to new and disruptive approaches to R&D. Is your company presently restructuring its R&D organization? I bet it is! Then this book is definitely a must-read for all professionals in the packaged goods industry as well as students who aspire to contribute to this new type of industry forcefully driven by R&D!

Acknowledgment

This was not an easy book to write. Let me explain why. During my professional life I had worked most of the time in research and development (R&D) and only shorter periods of time in other parts of my former company such as packaging operations or open innovation and partnership management. Here's the dilemma: because of my deep insight into R&D organizations of food companies I can easily see their inefficiencies and flaws; however, I also feel a deep loyalty and constructive understanding for R&D and everyone who works in this minefield of a food company and probably other companies as well. On the one hand I can understand how people in the food R&D act, and react and on the other hand I can also understand those who criticize those actions and reactions and ask for change. However, change is always expected to start elsewhere and fingers are pointed so easily.

My first thanks go to all those former colleagues in the various R&D organizations whose paths I have crossed and who have taught me everything I know today, parts of which I had the great opportunity to write down in this book. And I also thank all those unknown, competent, loyal, and creative R&D people who were and are responsible for what is happening in R&D today, good or bad, because the learning from them was tremendous.

My special thanks go to my two co-authors Birgit and Adam who at the end had regretted having encouraged me to nag them. Birgit was already an extremely capable and innovation driven co-author of my first book, so it was almost easy to convince her to become part of this endeavor too.

This being my third book on a food industry–related topic in a fairly short period of time required a lot of patience and especially understanding in my direct vicinity. A special thanks goes to my wife Thérèse; she was the one who brainstormed with me on chapter outlines and contents, and all this from an unsuspected and untainted, just pragmatic and reader-oriented position. She also had to endure my status reports and ups and downs in the progress of this book project.

My son Nik Traitler helped me design all figures, as he did for my first two books. I believe you will appreciate the simplicity and clarity of all figures. I would also like to thank my dear friend and colleague Heribert Watzke, who has been kind enough to write the foreword to this book, a fitting yet very concise introduction.

Last but not least I would like to express my sincere gratitude to my publisher, Wiley Blackwell, and the entire team behind for their continued trust in the ability of my coauthors and myself of not running out of ideas, which we believe are worth sharing with you, the readers. For this I want to send you the readers my very special thanks!

Part 1

What we have today and how we got here

1 A typical food R&D organization: Personal observations

I know that our R&D probably costs twice of what it could cost but I don't know which half to cut.
Helmut Maucher

1.1 INTRODUCTION

Let us play a game. I like playing games. Research and Development is typically abbreviated to "R&D," and that's good, because otherwise books, publications, presentations, discussions, and such would become too long, always repeating "Research and Development" instead of using the short, catchy, and dynamic sounding "R&D." The game is easy: find as many other meanings for R&D as you possibly can and list your favorite ones. Let me give you a few examples: rich and dumb, raw and delicious, real and daunting, rooster and duck, ready and done, ruined and defunct, researched and developed. Ooops! The last one is almost the same as research and development, however, there is an important difference: research and development means that everything—or almost everything—is still ahead of you, while researched and developed means: done, ticked off, executed, found, and made. I can tell you from deep and longstanding personal experience that the past tense R&D (the "Red & Ded") is the real dream of every company executive in just about any company in any area that you can imagine, while the "R&D" is a real headache for them.

Figure 1.1 illustrates our "find-other-meanings-for-R&D" game.

This book is mostly about this headache and how to heal it. It's not about "pills" that can help the headache go away but rather a change of lifestyle, or more correctly a new approach to R&D, especially in the food industry so that the headache goes away by "natural" means or doesn't even come up in the first place. This is not an easy feat, yet it is worthwhile, no, essential to undertake, otherwise R&D in the food industry will cease to exist because in case of doubt which half to cut, CEOs and executives of the food industry will simply cut it entirely, partly out of frustration and partly out of simply not knowing better. Members of the business and commercial community and even those of the manufacturing and procurement community

Food Industry R&D: A New Approach, First Edition. Helmut Traitler, Birgit Coleman and Adam Burbidge.

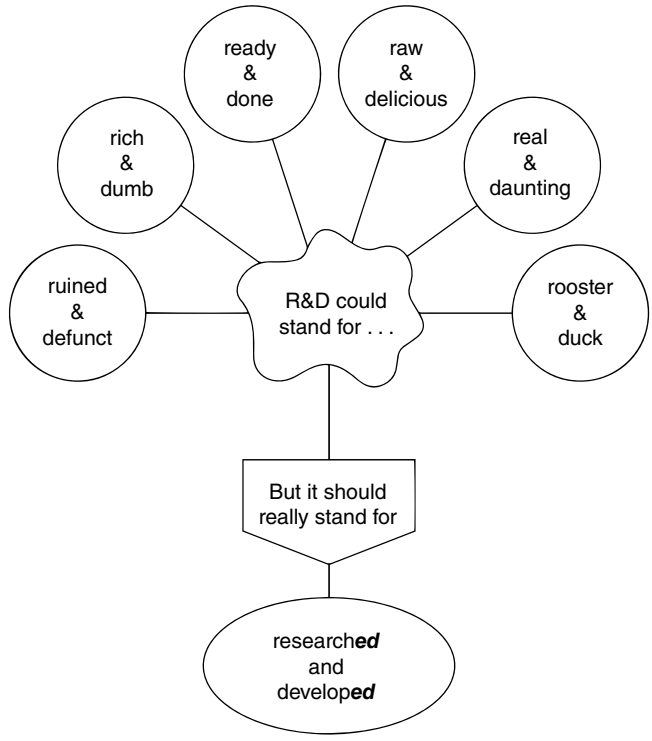

Figure 1.1 R&D could stand for ….

seem to have little understanding for anything that is R&D "tainted" and a bit more basic and difficult to understand. This is unfortunate but it's a reality, which cannot be neglected easily or even discussed away. Chapter 10 will in much detail discuss the scenario of an R&D-centric food industry organization in which scientists and engineers "call the shots" and hold the reins of the company. I can already hear business and commercial leaders shout out in unmistakable ways what they think of such a scenario. Their discontent will even be bigger when the following hypothesis will be discussed and analyzed.

1.1.1 Business people always know better

Commercial experts mostly know all about their field of action and because science is not easy to understand, let alone being learned in evening school, they don't even attempt to understand scientific and technical or engineering details. On the other hand, there are oodles of scientists and engineers who have ventured out to get an MBA degree in addition to their technical degree. What I want to say here is simply that scientists can fairly easily acquire expertise in business, whereas commercial and business people hardly ever, or better *never* go back to college and do a science degree; it's simply too time consuming and not an easy undertaking. At least that's true for the food industry. The situation is different in the pharmaceutical and