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Commentary

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Book and Media Recommendations: Food for Thought, Starting with Cheese

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ABSTRACT: This commentary offers reading recommendations for five books. *The Science of Cheese* by Michael Tunick is a comprehensive look at the components of a favorite food. *The Periodic Table: A Visual Guide to the Elements* by Paul Parsons and Gail Dixon is a basic book about the periodic table to add to your collection. Andy Weir's *The Martian* is a fictional account of a stranded astronaut's ingenious efforts to survive and be rescued from Mars. In *The Girls of Atomic City*, we are introduced to some of the unknown workers who contributed to the making of the atomic bomb in Oak Ridge, Tennessee. *A Mind for Numbers: How To Excel at Math and Science* is recommended for anyone struggling to learn how to learn.

KEYWORDS: *General Public, Elementary/Middle School Science, High School/Introductory Chemistry, First-Year Undergraduate/General, Second-Year Undergraduate, Upper-Division Undergraduate, Graduate Education/Research, Continuing Education, History/Philosophy, Interdisciplinary/Multidisciplinary*

What are you reading this summer? Here are some wide-ranging suggestions for your consideration.

THE SCIENCE OF CHEESE

As the associate editor for Book and Media Reviews for this *Journal*, much of my time in the exposition at ACS national meetings is spent visiting the publishers' booths. I ask the staff what books they suggest for reviews and look over their selection of titles. So it was that I ended up with a copy of Michael H. Tunick's book, *The Science of Cheese* (Figure 1), published by Oxford University Press.[1] Like many chemists, I am a bit of a foodie: I have a collection of cookbooks as well as books linking food and science, several of which I have reviewed in this *Journal*.[2−5]

Tunick, a food chemist at the USDA, has written a book that encompasses all aspects of cheese, from milk to mold and everything in between. He discusses the biology, biochemistry, chemistry, and even the physics and engineering of cheeses.

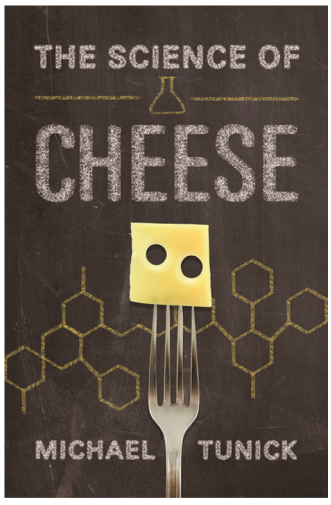

Figure 1. *The Science of Cheese*[1] cover image provided by Oxford University Press and reproduced with permission.

The first three chapters cover varieties of milk, the process of cheesemaking, and the aging of cheese. Chapters 4−13 have a common structure in which a class of cheese is considered, along with some of the major chemical compounds that are present in this category of cheeses, and followed by another topic or aspect of cheese. For example, Chapter 9 is "Interior Mold Cheeses, Ketones, and Microbial Strains", while Chapter 12 is "Cheeses with Eyes, Furans, Hydrocarbons, and Food Pairings". There are also chapters on process cheeses, nutrition, flavor components, laws and regulations, procedures to try at home, and cheese in art.

In a manner similar to textbooks, sections with more serious chemistry discussions are set aside in text boxes that the author assures us we can skip with hurting his feelings (but no chemist will). Tunick writes in a conversational style that is accessible to multiple levels of readers. Charmingly, each chapter begins with a quote about cheese from wide-ranging sources. His periodic table of cheeses is almost gratuitously thrown in after the preface.

Chemistry educators will find much inspiration in this book. *The Science of Cheese* contains enough organic chemistry around which one could build an entire organic for life sciences course. General chemistry instructors will find plenty of examples of the importance of pH and equilibrium reactions. But quite simply, this well-written book will be enjoyed by anyone who likes cheese. *The Science of Cheese* was my bedside reading companion for several weeks, and it was all I could do to keep from getting out of bed to have a midnight snack.

THE PERIODIC TABLE: A VISUAL GUIDE TO THE ELEMENTS

In addition to my collection of cookbooks and books about the science of food, I collect books about the periodic table. *The*

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Periodic Table: A Visual Guide to the Elements,[6] written by science journalists Paul Parsons and Gail Dixon, is akin to the most basic cookbook on your shelf. This inexpensive yet handsome paperback has two- to four-page entries on each element up to fermium. The entries include at least one color photograph of the element and a science-magazine-level discussion about its discovery, uses, and physical properties. The transfermium elements are presented in a table with a general discussion. There is also a glossary and an introduction.

This is not a book for chemists, but a book to share with young chemists, your parents or family members, staff in your department, and your science-interested friends. The book is not flashy and slick, nor does it have an app, but it is an excellent fundamental introduction to the beauty of the periodic table and the elements. I plan to buy some to give away.

THE MARTIAN

You haven't heard about *The Martian*[7] yet? Don't worry, full *Martian* saturation is about to hit, so read the book now and get ahead. Science fiction aficionado Andy Weir first serialized this story on his Web site. His followers clamored for a book, so he self-published the chapters as *The Martian*, and the rights were picked up by Crown Publishing and the book has become a bestseller (Figure 2). Happens all the time, right?

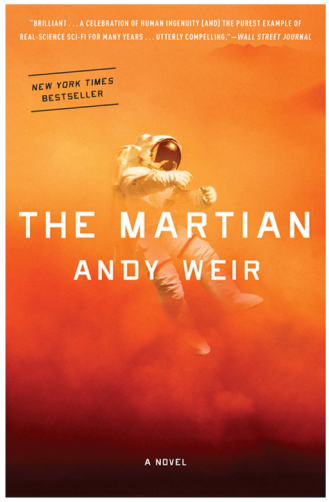

Figure 2. *The Martian*[7] cover image provided by Broadway Books, an imprint of the Crown Publishing Group, a division of Penguin Random House LLC, and reproduced with permission.

Neither does the adventure that happens to Mark Watney, the protagonist of this novel. The book opens with the infamous line, "I'm pretty much *#%$ed." Sometime in the not-too-distant future, a NASA mission to Mars experiences an accident that causes all of the astronauts to evacuate the planet, leaving behind what they think is their dead companion, Watney. Stranded on Mars, Watney survives using his skills as a botanist and mechanical engineer, along with quite a bit of chemistry. Watney's needs include a continuous and renewable supply of oxygen, water, and food. After experimentation and a few (small) explosions, Watney is able to use hydrazine to carefully produce hydrogen that he then reacts with oxygen to produce water. This Macguyver-esque survival and rescue drama is based on Watney's scientific and engineering ingenuity with the limited materials available to him on Mars. Staff at NASA eventually realize from observations of the Martian surface that Watney is alive, and a rescue is engineered.

This book made the rounds in my admittedly geeky extended family. It's a rollicking adventure tale, narrated by the sarcastic and droll Watney through entries in his mission log books. Watch for the movie version starring Matt Damon as Watney this fall.

THE GIRLS OF ATOMIC CITY: THE UNTOLD STORY OF THE WOMEN WHO HELPED WIN WORLD WAR II

In the category of books about the early years of the nuclear age, *The Girls of Atomic City*[8] is unique. The industrial complex of Oak Ridge was constructed in the mud of Tennessee in 1943 to produce the uranium and plutonium that the United States required to build nuclear weapons during World War II.

The stories of the major players of the Manhattan Project—Oppenheimer, Groves, Fermi—have been told in print and dramatized on screen. Denise Keirnan reached out to interview surviving workers, especially the women, who had come to Oak Ridge to support the war effort. We meet secretaries, statisticians, janitors, a nurse, calutron operators, and a chemist. Each did a specific job almost completely in isolation and with dire consequences for lack of secrecy or even a slip caught by a censor in a letter home. Their stories are presented in alternation with the major developments in history and science told from the perspective of lesser-known women and minorities. For example, Chapter 4, "Bull Pens and Creeps: The Project's Welcome for New Employees", introduces us to chemist Virginia Spivey. Until her military clearance papers are located, she spends time teaching basic chemistry skills to other would-be lab technicians in the "bull pen" of new hires. The second part of this chapter, set off in a different font, is titled "Tubealloy: Leona and Success in Chicago, December 1942". Leona is physicist Leona Woods, the only woman on the metallurgy lab team that created the first nuclear pile at the University of Chicago.

The book contains black-and-white photographs, an index, extensive research notes, a map of Oak Ridge, and an in-depth interview with the author. Even if you are familiar with this chapter of history, *The Girls of Atomic City* is worth reading for the new viewpoints and voices that Denise Keirnan brings to life.

A MIND FOR NUMBERS: HOW TO EXCEL AT MATH AND SCIENCE (EVEN IF YOU FLUNKED ALGEBRA)

Barbara Oakley's book, *A Mind for Numbers*[9] may be mistitled. I'd call it *A Handbook for Learning How To Learn*. Early in my teaching career, I thought my job was to elucidate chemistry for others. Over the years, as I've changed, and perhaps my students have changed, I have decided the most important thing that a student can learn in first-year chemistry is to learn how he or she learns best. This book is an excellent guide for exactly that.

Oakley uses clever diagrams, a variety of strategies, short chapters, and simple exercises to present solutions, or at least approaches to nearly every complaint you have ever heard from students, including: "I studied for 10 hours and still failed your test"; "I do really well on the homework but I'm not a good test taker"; and "I'm an introvert and don't like to study with others". If equations are mystifying and confusing, try using your creative side to write an equation poem, or imagine the

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information in a short play (Chapter 14). There is a chapter on test taking, and multiple short chapters on memory tricks. Oakley also has advice about failure: "Failures are better teachers than success because they cause you to rethink your approach."

Honestly, this book has something for everyone, even busy and successful faculty members. Chapter 8, "Tools, Tips and Tricks", about focus and confronting procrastination, gave me some new ideas to try. Need to get a lot of work done? Try "doing a pomodoro"—set a (tomato-shaped) timer for 25 minutes, work without interruption until the timer rings, acknowledge your work by ticking off the time, take a 3−5 minute break, and then set the timer again. This book will help you help your students become better learners, and you may benefit as well.

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Notes

The author declares no competing financial interest.

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