

Biology, the Study of (the Good) Life:
A Biologist's Journey into Baking, Food, and the Science of Making it
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A. Edward Newton Book Collection Contest

Biology, the Study of (the Good) Life: A Biologist's Journey into Baking through Food and the Science of Making It

The word *biology* comes from the ancient Greek word *βίος* or *bios* which literally translates to “the good life”. As biology major who owns a bakery that offers workshops teaching the biology of baking, I can not think of a more fitting origin story for the word *biology* that describes my life. For me, studying biology does not stop in the classroom, learning how how life functions through the synthesis of proteins from transcribed DNA. For me, studying biology is the never-ending pursuit of “the good life” and in my case, the predominant element that makes life “good” is food. Food is not merely a source of nutritional sustenance but it is also predominant framework in which I can apply my intellectual interests in biochemistry, my professional endeavors of being a entrepreneur in the food industry, and my passion of creating culinary masterpieces, especially baked desserts. It was the intersections between biology and food that lead me to my opening of a baking business and still continues to be the ruling force that inspires me live “the good life”.

I first encountered the junction of science and food in 5th grade watching one of my favorite TV shows, *Good Eats* with Alton Brown on the Food Network. I vividly remember being mesmerized while viewing an episode called, “Dr. StrangeLoaf”. In this episode, Alton Brown creatively describes how gluten is formed in yeast doughs and how bread gets its lift. Using chicken wire and pieces of colored foam with googly eyes, Alton cleverly and clearly explains the structure of gluten as a complex of two proteins formed with the presence of water and how yeast cells are microscopic living organisms in the bread dough that feed off of the carbohydrates, or sugars, in flour to produce the carbon dioxide bubbles that gives bread its chewy interior. I was enamored with the complex biochemical phenomenons that could occur in even the most simple foods that we eat and the ubiquity of biology around us. I was hooked.

When I arrived at Swarthmore, I believed I study biology on the pre-medical track. In one of the introductory biology courses that I took called Organismal and Population Biology, I learned one of the major tenets of the field — that living things are not independent living entities that operate separately from each other. There are always a larger forces that drives organisms' behaviors and decisions whether it be a response to the environment around them or influence through the interactions with other species in the ecosystem. Humans are no exception to this rule. My desire to cook and bake all the time were not driven solely by my personal interests but it was also fueled by the two people who I wanted to it with most— my aunt and uncle, Anh and Rick Perrotta. If Alton Brown was the introduction in the world of food through lecture, Anh and Rick were the laboratory portion of a course that applied my knowledge and fortified my love for the culinary arts.

Growing up, we had a tradition every Christmas to make Rick's family's secret recipe of “soft-baked biscotti” from Naples, Italy that was made with cranberries, apricots, pistachios, and lemon zest. This chewy, fruity masterpiece was given to family, friends, colleagues, and loved ones. Without fail, every year, we would get overwhelming encouragement to start a business with our biscotti because it was so addictively delicious. However, my aunt and uncle were dedicated to their respective full-time careers and never had the chance to pursue their dreams of opening a biscotti business. Because of this, during the summer before I started college, I promised that I would try opening their biscotti business before I graduated Swarthmore.

During the summer after my sophomore year, I finally mustered up the courage to bake my family's biscotti and approached Hobbs Coffee in the Ville. Incredibly, they agreed to sell

my biscotti and thus the beginning of my baking business, Toscah Bakery. Shortly after starting Toscah, I left my aspirations into medicine behind after realizing that I created a tangible and sustainable way to pursue my love for food and biology. While my business started taking a life of its own, I also started teaching workshops at Strath Haven high school and other local classes in Philadelphia, teaching the biochemistry of my baked desserts. Currently, I am considering pursuing Toscah full-time after graduation in hopes of opening a brick-and-mortar storefront in the near future with an actual food lab where I can teach my science baking classes.

The collection of books that I acquired throughout my evolution from a curious baking biology to a full-time baker, business woman, and science educator. It is a manifestation of my obsession with food, baking, and science. These books have greatly informed my unexpected endeavors of starting and running a baking business for the past two and a half years and continues to provide insight and inspiration towards my lifelong pursuit of *βίος* — the good life.

THE INSPIRATIONS

1) Brown, Alton. *Good Eats: Volume 1, The Early Years*. 1st Ed. Harry N. Abrams, 2009. Print.

As mentioned before, my fascination with food science was sparked while watching Alton Brown's *Good Eats* during my elementary and middle school years. I believe he is one of the pioneers of mainstream science education through the medium of food. I acquired this book during high school as a Christmas gift from my stepfather after many years of requesting this cookbook on my wishlist. It holds great nostalgia for me and some fantastic recipes that are no-frills-to-the-point-simply-delicious. I re-watched his episodes on YouTube and came back to this book multiple times during the development of my Biochemistry of Baking workshops. I still used his recipe for NY cheesecake today.

2) Lebovitz, David. *The Sweet Life in Paris: Delicious Adventures in the World's Most Glorious — and Perplexing — City*. 13471st Ed. Broadway Books, 2011. Print.

My aunt, Anh, would come visit me every other weekend while I was growing up even though she lived a two hour drive away. During her visits, we would go on culinary adventures or bake up a storm in my home kitchen. Anh had a particular soft spot for French macarons, a notoriously difficult dessert to make that involved making a finicky almond flour meringue cookie that was dependent on temperature, humidity, and touch (i.e. how much you worked the mixture). For several weeks, we tested multiple recipes and different methods to obtain the perfect macaron shell. During the weeks when Anh did not visit, I practiced making them myself in hopes of finally mastering this difficult pastry and to impress Anh. One of the recipes I found online for chocolate macarons with a dark chocolate ganache filling that showed the most promise was developed by an American food writer and home baker, David Lebovitz. When I stumbled upon his website and blog, David was living in Paris and documenting his adventures in this peculiar city. I was hooked. After several months of following his journey online, I bought this book at a Barnes and Noble in my hometown to read of his experiences in Paris in print and also as a small thank you for providing a recipe for French macarons that worked (most of the time).

3) Ansel, Dominique. *Dominique Ansel: The Secret Recipes*. 1st Ed. Simon and Schuster, 2014. Print.

In May 2013, Dominique Ansel created the now world-famous Cronut, a hybrid pastry of laminated croissant-like dough that is shaped in a donut, fried in grapeseed oil, filled with a flavored cream or ganache, and glazed with icing. He gained an international following of foodies and fans after the release of the Cronut. After its debut, there was a line of over 100 people at his bakery doorstep for the Cronut. Ansel is an innovator and a culinary artist that breaks the mold of conventional European pastries and desserts. After watching several viral videos of his creations including but not limited to the Cronut, Dominique's Kouign Ammans, and his Cookie and Milk shots, I bought this book during the summer after my sophomore year when I just started Toscah Bakery in the intention reading it whenever I needed to push myself outside my comfort zone during the process of creating unconventional desserts.

4) Tosi, Christina. *Momofuku Milk Bar*. 1st Ed. Clarkson Potter, 2011. Print.

If you were to ask me who are the powerhouses of the food industry today, my answer would be Christina Tosi and David Chang, the leaders of the Momofuku empire. David Chang is the head chef and owner of Momofuku which was established in 2004. Chang started the Momofuku empire with the Noodle Bar in New York city that served contemporary Asian-American cuisine such as refined ramen, pork belly buns, and spicy oxtail. Momofuku Milk Bar is a subsidiary of the Momofuku brand that was started in 2008 by Christina Tosi, an award-winning pastry chef and inventor of cereal milk™ ice cream, compost cookies® and crack pie®. Christina Tosi is the Elon Musk of the dessert world. She is a sugar genius and my ultimate role model as a female business owner in the food industry, a culinary trendsetter, and a marketing guru. Milk Bar is a international cult sensation with locations in NYC, Washington D.C., Toronto, Las Vegas, Los Angeles, and Boston and I wish to have the same influence and following that Milk Bar has obtained during it's growth as a business and a brand. I acquired this book this past summer after years of following Milk Bar's journey online through articles, YouTube interviews, and Tosi's appearance as a judge on Masterchef Junior. I gain so much inspiration every time I read this book and the signature recipes it holds such as the blueberry and cream cookie, cake truffles, and other unexpected, playful desserts that blur the lines between salty and sweet. It is probably my go to cookbook to flip through whenever I am in need of a pick-me-up or needing something fun to bake outside of my own Toscah orders.

5) Tosi, Christina. *All About Cake*. Clarkson Potter, 2018. Print.

One of Momofuku Milk Bar's most recognizable sweet creations are their "naked" layer cakes with unfrosted sides that juxtaposes contrasting textures, flavors, and colors with combinations like their popcorn, salted caramel layer cake and their chocolate stout, pretzel, honey layer cake. In Tosi's introduction, she states four cardinal rules that dictate every layer cake she makes: "1) the cake must have a strong point of view, a flavor 'story', 2) every single layer must be amazingly delicious on its own, 3) hidden gems of texture within are key, and 4) there is no way in the H-E-double-hockey-sticks we're going to hide all that ingenuity behind a thick coat of frosting. I want to let the people IN, and so I won't frost the sides of the cake". After reading the introduction, I adopted these rules for my own cakes. This cookbook is another source of inspiration when I am developing new flavors and desserts.

6) Purkayastha, Ian and West, Kevin. *Truffle Boy: My Unexpected Journey Through the Exotic Food Underground*. Hachette Books, 2017. Print.

I acquired this the published manuscript of this book the summer I started Toscah in a used bookstore in West Philadelphia. There were two main reasons why I bought this book. One was my admiration of Ian Purkayastha as a resilient, young entrepreneur who started Regalis, premier supplier for luxury ingredients such as paddlefish roe, escargot, sea urchin, and most notably — truffle. The other reason was Anh and Rick's guilty pleasures is the truffle. Purkayastha narrates his successes, betrayals, and redemptions throughout his journey into food industry. It reminds me of harsh but beautiful reality of owning your own business and after all of the obstacles, it truly is worth it.

7) Sönmezsoy, Cenk. *The Artful Baker: Extraordinary Desserts from an Obsessive Home Baker*. Harry N. Abrams, 2017. Print.

I bought this book in San Francisco during a road trip with one of my best friends, Mariam Bahame, and my aunt Anh last winter in 2017. What drew me to buy this book was the incredibly photography and styling of the desserts Sönmezsoy photographs. His desserts and recipes scream elegance and are clearly influenced by his Turkish background which results in beautiful flavor combinations that I haven't thought of before purchasing this book. The pictures are eye candy for a food photographer like me and his style influences how I think about present my desserts. In addition, Sönmezsoy has endearing narratives of his life in San Francisco and deep love for his favorite TV show, *The Golden Girls*, which he named his blog, *Cafe Fernando*, after the one-eyed teddy bear that one of the characters, Rose Nylund had in the show.

THE BASICS

8) Sadava, David; Hillis, David; Heller, Craig; and Berenbaum, May. *Life: The Science of Biology*. 9th Ed. W.H. Freeman and Company, 2011. E-Book.

This book was acquired to be used in one of my first biology courses, *cellular and molecular biology*. Aside for using it to study for my exams, it became an essential reference for when I am trying to understand the molecular mechanisms of a recipe and a great refresher whenever I am about to teach one of my biochemistry of baking workshops. It was one of the first textbooks that I ever truly enjoyed reading and learning the material from. This textbook had some of the best diagram and figures I've seen, teaching me the importance of using art to clearly communicate scientific concepts and ideas.

9) López-Alt, Kenji J. *The Food Lab: Better Home Cooking Through Science*. W.W. Norton and Company, 2015. Print.

Mariam Bahame, the same bought this book for me during Christmas 2017 when she stayed with me for winter break in Los Angeles. She was one of the first people I told when I originally was thinking about starting Toscah Bakery and has been a consistent supporter and dear friend throughout my time at Swarthmore and through my journey as a business owner. This book holds great sentimental value for me because of Mariam and how relevant the content of the book and the author's story is to my life. Kenji López-Alt was originally an architect

educated at MIT but found his way into the kitchen working in several restaurants and as a test cook in *Cook's Illustrated* and America's Test Kitchen. He currently is the Chief Culinary Consultant of "Serious Eats", a food blog that debunks cooking techniques through the scientific method. Aside from having his unconventional career path that resonates with my own life, López-Alt is also a meticulous detail-orientated chef and I am thrilled to know that his cookbook was rightfully awarded the 2015 James Beard Foundation Award for General Cooking in 2016, one of the highest awards that a cookbook could receive.

10) McGee, Harold. *On Food and Cooking: The Science and Lore of the Kitchen*. Scribner, 2004. Print.

This was one of three books that I bought on an Amazon book binge last semester during finals week as procrastination from the actual studying I had to do at the time. (I don't regret my retail therapy decisions). It has been on my book list for years because it is one of the quintessential books for science nerds who love cooking and baking that has been recommended to me by several professors and family friends in my life. What makes this cookbook unique however is not the science but rather the anthropological, historical, and cultural origin stories behind specific ingredients, cooking technique, and peculiar presentations of foods that McGee provides that makes this book very special. It also proved itself to be extremely useful in one of the courses I took the spring semester of my junior year called *Food Engineering* through multiple assignments particularly on questions asking specific differences and uses of similar ingredients (i.e. baking soda vs. baking powder, light vs. brown sugar, buttermilk vs. whole milk etc.).

11) Nosrat, Samin. *Salt, Fat, Acid, Heat: Mastering the Elements of Good Cooking*. 4th Ed. Simon and Schuster, 2017. Print.

This was the second of three books that I acquired on my Amazon book binge. I've heard raving reviews of this cookbook after Nosrat received the honor of the 2017 James Beard General Cookbook of the Year and after the launch of her Netflix series, *Salt, Fat, Acid, Heat* and bought this book to see if it would live up to the mainstream hype. It did. One of my biology professors, Amy Vollmer, once told me in lab, "You must understand the WHY. It is not enough to know the steps, you have to understand why you are doing it". In Nosrat's cookbook, she answers that exact question throughout every recipe and every chapter giving you detailed explanations of why each step is necessary in a recipe and how ingredients interact when baked or cooked. She believes that the art of cooking can be master if you master the four elements, salt, fat, acid, and heat and I think she provides an excellent guidebook and commentary for anyone to master these elements.

12) Prueitt, Elisabeth M. and Robertson, Chad. *Tartine*. Chronicle Books, 2006. Print.

This was the final book that I bought during my Amazon book binge. I have been a steadfast follower and fan of Tartine Bakery since I tasted their *divine* lemon cream tart at their San Francisco location during my road trip to Northern California in winter 2017. While standing in the line that wrapped around the corner of the block to order, I found a couple from Paris who actually traveled to San Francisco to taste their croissants because it was so world

renown. I knew after my visit their that I would need to buy the recipe book from them to learn how they made such delicious, simple yet refined baked creations. I have yet to test out their recipe for lemon cream tart that made me fall in love with Tartine Bakery but I can't wait to do so once I have some free time as a weekend project.

13) Beranbaum, Rose Levy. *The Cake Bible*. William Morrow Cookbooks, 1988. Print

I found this cookbook in a yard sale in West Philadelphia this past summer in 2018. Tattered at the edges with dog eared pages, the recipe book contains a multitude of basic recipes for almost every kind of cake you can think of: pound cake, chiffon cake, variations of sponge cake, Genoise sponge, butter cake, and angel food cake. The text inside lighted colored with faded highlighters and marked with notes in the margin. The pages are stained with various yellow and brown colored liquids which I can only assume are vanilla extract, molasses, and/or oil, the same stains that my own recipe book has acquired. Although at this point, I've collected several dessert recipe books, I think what made me purchase this cook book was its condition gave clues to its rich past. The cook book was clearly loved and used often by its previous owner and I wanted to continue its legacy.

14) Arnold, Dave. *Liquid Intelligence: The Art and Science of the Perfect Cocktail*. W. W. Norton & Company, 2014. Print.

In addition to her love for cooking and baking, my aunt Anh is also an aspiring bartender, specializing in making martinis with fresh fruit purees with herbs. I originally bought this book for Anh as a Christmas gift last year to aid her in her bartending goals of making restaurant quality cocktails. Her main project at the time was being able to make clarified fruit concentrates that would create a smooth mouthfeel in her martinis. One of her signature martini mixes was an apple pear mint concentrate that we both tried to clarify after reading through Dave Arnold's experiments. We learned that most fruit concentrates at restaurants are clarified using pectinase, an enzyme that is designed to break down pectin, a polysaccharide or complex sugar that is found in plant cell walls. Although we weren't able to get the concentrate as clear as we wanted because we didn't have the filtration system that would remove the broken down pectin that precipitated at the bottom of our juice, I can't wait to re-try our pectinase experiment the next time Anh and I are making fruit based martinis when I'm home in Los Angeles.

15) Voet, Donald and Voet, Judith. *Fundamental of Biochemistry: Life at the Molecular Level*. 5th Ed. Wiley, 2016. Print.

This textbook was acquired for my biochemistry class that I had intended on taking this semester but ultimately dropped out because of conflicting times with my other classes. I decided to keep the textbook even though I am no longer in the course because it contains a plethora of concepts that I know I will need to reference to in the future. I am a structural biochemist by training and this book reminds me of the beautiful complexity of proteins, specifically enzymes and how they are the perfect examples of the motto in biology, "structure dictates function". Enzymes are catalysts for chemical reactions, lowering the activation energy by positioning their substrates into conformations that allow reactions to happen easier. Biological enzymes are insanely specific in their substrates, their products, and their function. They bring a whole new

meaning to specialization that highlights the nearly flawless engineering that nature achieves on a molecular level.

16) Hillman, Howard. *The New Kitchen Science: A Guide to Knows, the Hows, and Whys for Fun and Success in the Kitchen*. Mariner Books, 2003. Print.

My uncle's father, Ralph Perrotta, worked as chemist as his daytime job but was a chef and educator at heart. Throughout his life, Ralph published multiple cookbooks and had a great influence on his children including my uncle at shaping their appreciation for art of making meals and their Italian heritage through food. Ralph gifted my uncle this book and when I announced that I started my baking business, my uncle gifted this book to me. The book contains several highlights of food science in the concept of New American cuisine and how concepts were discovered, usually accidentally, in the kitchen. I used this book mostly to remind me that there are generations of scientists and food-lovers behind me, always ready to cheer me on.

THE VISION

17) Tiffany, Paul. *Business Plans for Dummies*. 1st Ed. For Dummies. 2004. Print.

Rick has told me multiple times "A dream without a plan is just a dream. A dream with a plan that you can execute successfully is a vision". Rick gave this book to me during the summer I started Toscah when I visited home and was just starting to write my business plans. As someone who has never taken a bookkeeping or finance class, creating a business plan and learning how to calculate expenses, revenue, and new profits was completely new territory. I found great use from this book during my initial tasks of financial administration and record keeping for Toscah. I still refer back to this book when I'm looking for hacks to upkeep Toscah and to make sure that I'm staying on track.

18) Grant, Adam. *Originals: How Non-Conformists Move the World*. Penguin Books, 2017. Print.

This was one of two books that I bought during some intense periods of my life when I seriously questioned whether I would be a successful entrepreneur and if I were making the right decisions abandoning medicine and the financial and professional security it would provide me for a more unconventional route that guaranteed me nothing. *Originals* is an analysis of several cases studies of businesses and their founders who broke industry conventions and how their brave endeavors changed the way we live. Grant begins the book narrating one of the worst financial decisions in his life, turning down the opportunity to invest in Warby Parker before it launched in Philadelphia 2010 by Neil Blumenthal, Andrew Hunt, David Gilboa, and Jeffrey Raider. Grant delves into the founder stories of these entrepreneurs and the key decisions that they and multiple other successful entrepreneurs made in their careers to creating an empire. *Originals* gave me the tangible evidence that there were other risk takers and innovators out there in the world who do make it and if it has been done before, it can be done again.

19) Manson, Mark. *The Subtle Art of Not Giving a F*ck: the Counterintuitive Approach to Living a Good Life*. Harper One, 2017. Print.

This was the second book I acquired during my self-help project to regain confidence in myself as a business woman and student at Swarthmore who too often falls victim to the epidemic of imposter syndrome. Manson gives refreshing advice that is not toxic positivity that paints the world and your worries in rainbows and ponies. This book gave it to me straight. It was and still is the tough love I need whenever I am doubting myself. One of the first chapters of the book, Manson states that the paradoxical idea that the pursuit of happiness while avoiding problems will make you miserable, while the pursuit of solving problems is *real happiness* because life is full of problems and it is only through the act of tackling them is what will give you true fulfillment.

20) Ton, Therese. *Toscah Bakery: Recipes and Stories from a Baking Biologist*. Random House. 2030. Print.

I started this collection with my first inspiration towards the kitchen and beginning curiosities towards biology and biochemistry with Alton Brown's *Good Eats: Volume 1, The Early Years* and I am more than excited to end this collection with my hopes for the future. This recipe book is one that I hope to publish myself in the future, documenting my journey from starting my baking business out of the communal kitchen of my college dorm to establishing a brick-and-mortar bakery fully equipped with a teaching kitchen where I can teach students from socioeconomically disadvantaged communities with little access to STEM education to allow them to experience science through baking. I hope to make science accessible and fun just as Alton Brown did for me. Through Toscah, I hope to disrupt the food industry, redefining its conventions just as the culinary pioneers, Christina Tosi, David Chang, and Dominique Ansel did in their careers. This recipe book will culmination of knowledge I have gained from the books I have collected over the years and my own lived experiences of applying what I've learned. Unlike the theoretical underpinnings and abstract frameworks of many books that I have read in the past for my courses at Swarthmore, this book collection is rooted in reality that is breathing, evolving, and tangible. It is the embodiment of my visions to create an empire that not only changes the world through reinventing how baked desserts are made and presented but also educates the communities that reside within it.

I hope you enjoy this book collection as much I as did creating it. Bon Appétit.