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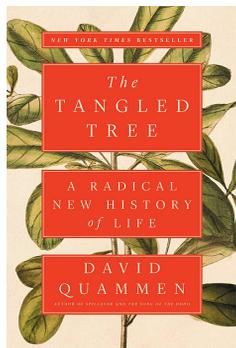
The Tangled Tree: A Radical New History of Life

By David Quammen. 2018. Simon and Schuster. 480 pages, 25.00 CAD, Paper.

The Tangled Tree is a meticulously researched work, mainly a popular science text written for the public but also part memoir, not of Quammen, but of the history of the Tree of Life itself, those scientists who brought it into being, and those who rattled it. This was my first foray into Quammen's extensive body of work, so I cannot compare this book to his other titles, but this is a book that takes its time. Re-reading the introductory material after finishing the book I can see the connections that he makes, but a first read does not offer much of a road map for the book's structure, and the rest of the work proceeds in the same unhurried way.

A hefty 480 pages and 84 chapters, *The Tangled Tree* is broken into seven main parts in addition to a short introduction, acknowledgements, extensive notes, and a detailed bibliography. Quammen lays the groundwork in Part I, Darwin's Little Sketch, providing biographies of key figures in the history of our emerging understanding of evolution. Each chapter within a section is quite short, only a few pages long, and there is some truly personable writing here. In large part, this book is a biography of key figures in the step-by-step discovery of the Tree of Life, beginning with microbial taxonomy, moving along with the discovery and acceptance of Archaea and endosymbiosis, and, eventually, horizontal gene transfer. Featured are a physical description of each researcher, their academic history, personality, relationships with others in the field, quarrels and challenges, triumphs and rejected papers. Quammen jumps around in time somewhat, and not all the characters are savoury—the criminal allegations against them are also dutifully listed. It also explores the methods of these key discoveries, describing the experimental techniques, equipment, and all the radiation and explosive compounds that they necessitated.

For me, the book really picks up steam after Chapter 51 when horizontal gene transfer jumps into the fray. From antibiotic resistance that hops from



chickens to farm workers, to new questions about the history and future of life on earth, the last third of *The Tangled Tree* rewarded my persistence. Although I found that the biographical focus made for a ponderous read at times, there is never any sense that the author is uninterested in the subject matter, and those moments where Quammen writes his own thoughts, although rarer, are quite creative and playful. For example, on the topic of over-prescribing antibiotics in the case of viral infections, against which they are useless, Quammen states: “you might just as well try to hose the dirt off of your driveway using a flashlight” (p. 232). I will absolutely be borrowing this—with attribution, of course.

A central figure throughout the book is Carl Woese, who pioneered the technique of using 16S RNA to characterize and compare microbes. The last three chapters are almost entirely dedicated to Woese's declining health, and his death ends the story at Chapter 84. This is an appropriate ending to the style of book Quammen has written. If you are a fan of biography and enjoy peeking into the sometimes petty, churlish, and fraught side of scientific discovery as well as its highlight reel, you will likely enjoy the structure of this book. If you have come for the ‘new stuff’, such as endosymbiosis and horizontal gene transfer, be aware that you will have some wading to do. This is not to say that *The Tangled Tree* doesn't teach you fascinating new things; as you would expect from the title, there is much discussion of the Tree of Life—from Darwin's small preliminary sketch scrawled in his “B notebook” to the discovery of the Archaea, and the long standing and impassioned debates around the Tree's utility as an organizing conceptual model. Quammen has collected stories and anecdotes from sources such as archived correspondences, published articles, biographies, and a multitude of in-person interviews to create a very personal history of the field of microbiology as it relates to the eventual discovery of horizontal gene transfer, but it does take its time in getting there. There are real nuggets of excellent writing and genuine interest here, but I suspect the style will not be for everyone.

HEATHER CRAY
Halifax, NS, Canada