MR3642374 01A70

Hill, Ted [Hill, Theodore Preston] (1-GAIT-DM; Atlanta, GA)

★**Pushing limits.**

From West Point to Berkeley & beyond.

Mathematical Association of America, *Washington*, *DC*; *American Mathematical Society*, *Providence*, *RI*, 2017. *viii*+294 *pp.* *ISBN* 978-1-4704-3584-4

This book is a rare breed: the autobiography of a mathematician. To a publisher, receiving such a manuscript is almost always an easy decision. After all, who would buy such an oddity? Nevertheless, not just one publisher but two accepted the challenge. *Pushing limits* is a joint publication of the Mathematical Association of America and the American Mathematical Society. Shared risk? No! Instead, this book is a celebration of an unusual odyssey towards a mathematical career and a creative longevity therein.

Up front, Ted Hill reassures the reader that this book is not his whole autobiography and then undermines the statement's veracity for the next two hundred thousand words, elaborating on his days as a West Point cadet, a trainee Ranger, army captain in the Vietnam War, a Ph.D. candidate at Berkeley, a twenty-year itinerant professor at Georgia Tech, and an ambassador of mathematics. Fortunately, Hill is a master story-teller and will hold the interest of:

(1) Anyone interested in an adventure story: climbing mountains to pan for gold, checking Viet Cong tunnels during night patrols, scuba diving in the Bahamas fighting off shark attacks, reviving a fellow Ranger struck by lightning, driving a VW van through Cold War Eastern Europe and Russia, whistle-blowing on corrupt university-administrative practices, remodeling condemned dwellings, outrunning trains in tunnels.

(2) Potential graduate school students. Here you will find tips on studying, selecting an advisor, pacing yourself, making ends meet with respect to lodging, finances, and maintaining creativity and persistence. Hill reminds us, "Key insights are often unexpected, ... but almost never occur to anyone before they have invested huge amounts of energy and intellectual effort."

(3) Newly minted assistant professors. Here you will find tips on teaching, research, and dealing with campus politics. For the classroom, Hill adopted a no-homework-and-exam-every-other-week strategy, often earning the highest student evaluations in a 50-person department. Like page after page of his book, he reminds us that "every good lecture is a good story". To maintain creativity, Hill traveled extensively, inaugurated weekly open seminars on ergodic theory, collaborated with many on publications, and took leaves of absences at least every two years to places such as Costa Rica, the Netherlands, CIMAT at Mexico's Guanajuato, and the Bavarian forest's Oberwolfach. Why Costa Rica? Hill explains, "Three reasons: I've never been there, I know no one there, and I don't speak the language." Hill is an accomplished linguist and can give lectures in German, Dutch, and Spanish. He conducted a wedding in Russian and spoke enough Swahili to hitch-hike through East Africa.

(4) Those wanting the inside story to a theorem's origin. Hill regales us with tales of fair division, Benford's law, optimal stoppages, and how to define a kilogram without consulting Paris's kilogram bar, *Le Grand K*. Hill's "most satisfying research accomplishments in abstract probability theory" is on melding probability distributions, a result inspired by visiting an Outback sheep ranch where he learned that bales of wool are assigned value by inserting a barbed probe and assaying the ensuing sample's cleanliness.

How does one judge an autobiography? Here is George Orwell's litmus test from 1946: "Autobiography is only to be trusted when it reveals something disgraceful. A man who gives a good account of himself is probably lying, since any life when viewed from the inside is simply a series of defeats." Does Hill pass this semi-jaded yet rigorous test? Here are a few defense exhibits.

Hill writes guardedly about his relationship with his father. In large part to be free from his control, Hill sought appointment to West Point and rarely accepted gifts from him. The only exception was when his father sent him old mathematics books, a collection that grew to nearly a thousand, and which Hill eventually donated to Berkeley's Bancroft rare book library. Painfully absent from *Pushing limits* is any real closure to this open wound.

Secondly, Hill never married. He writes openly that as an officer, he enjoyed "chasing skirts", and he gives us a long list of intriguing partners, dotting most chapters of his life. In his early days as a master's student at Stanford, he relives the story of helping one of his free loves journey to a Mexican abortion clinic. Of course, mathematics is his primary paramour. Throughout his life, he enjoyed living close to campus in modest quarters, hosted many parties and guests from all over the world, and placed small value on possessions.

As a third exhibit, in his days at Berkeley, he inquired about the possibility of refurbishing a dilapidated wooden canoe, housed in a women's gymnasium. Turned down, he nevertheless "liberated the canoe" in 1976, repaired it, and used it for the next thirty years "from Lake Tahoe to the Chattahoochee River and then south into the Okefenokee Swamp and remote swamp trails in the Everglades", and further afield. Finally, in a wondrous resolution and as a tying up of the loose ends of life and the book itself, he returned the canoe fully and professionally refurbished to Berkeley. Some of the faculty who remembered the loss way back then "forgave [Hill] on the spot".

Yes, Hill is human. The reader will find highs and lows of escapades herein, but overall a love for mathematics.

In years to come, Hill's book will ever be on my office shelf with similar treasures of a self-described life devoted to mathematics: Hardy's *A mathematician's apology*, Halmos's *I want to be a mathematician*, and the more recent autobiographies Edward Frenkel's *Love and math*, and Larry Baggett's *In the dark on the sunny side*, the last of which is about a man, blind from early boyhood, who becomes chair of the mathematics department at the University of Colorado. *Andrew James Simoson*