

The Violinist's Thumb: and Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code.

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Pearls among the Peas

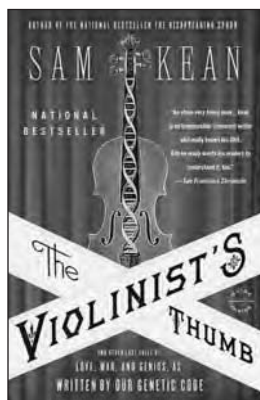
The Violinist's Thumb: And Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code. Sam Kean. Little, Brown, 2012. 416 pp., illus. \$25.99 (ISBN 9780316182317 cloth).

I introduce my first-year course in genetics at University College London by telling the students that “this course sets out to make sex boring.” They look a little baffled, but after 24 lectures, they know exactly what I mean. Even so, in the compulsory questionnaire at the course’s end, common complaints include “too many jokes” and “fewer silly stories, please.” Despite its real strengths, *The Violinist's Thumb: And Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code* is in danger of getting the same response.

To nonbiologists, a certain mystique often accompanies the term *genetics*, as if the concept itself is the path to understanding our individual fate when it comes to differences in sex, age and death, mood, faith, intellect, and more. A Google search for “scientists find the gene for” delivers thousands of hits—for musicality, health, wealth, life, liberty, and the pursuit of happiness—which is surprising, given that almost no success has been found in tracking down the genetic differences responsible for even that highly inheritable characteristic, human height. Sam Kean, author of *The Violinist's Thumb*, is a much more dependable source of information, because he is willing to discount the many absurd claims that surround the subject. However, he—as have most modern authors—has over-Googleed some of his *dramatis personae* to come up with ever more arcane tales to decorate—and sometimes even to obscure—his narrative.

From its earliest days, the study of inheritance has attracted eccentric characters. As a result, it is easy to accessorize its history with colorful protagonists and outrageous tales (I do it all the

time). Kean succumbs to this temptation (perhaps because his parents were called Jean and Gene; I, myself, do not blame my interest in the subject on the fact that my mother was an identical twin). The book’s title comes from his own clumsiness, which was revealed when he found himself too ham-fisted to learn the clarinet, in stark contrast to Paganini’s extraordinary abilities on the violin—due not to a pact with the devil, as many believed, but to an inherited condition called Ehlers–Danlos syndrome, which damages collagen in the ligaments and leads to extraordinarily flexible hands, together with a host of unpleasant side effects.



Kean takes the historical tour of genetics from Mendel to Venter and beyond, and, everywhere, he finds anecdotes about the scientists, the frauds, and the charlatans who have accompanied the field from its birth. I did not know that Mendel smoked 20 cigars a day or that Venter once had a gun held to his head by his girlfriend’s angry father (although I had read that he has long segments of DNA that are more often found in chimpanzees). Along the tour, Kean does not hesitate to make startling claims—for example, that artistic talent is like “throbbing-red baboon derrières,” a sexually selected character, as is manifest in Paganini’s promiscuity and in Toulouse-Lautrec’s penchant for prostitutes. The author’s tendency

toward agonizing metaphor is repeated, like a DNA sequence, rather too often (e.g., early primates were “milque-toast midnight bug-biters”). Scientists themselves share the same weakness, shown by the relentless jocularity of those who name *Drosophila* mutations: *ken* and *barbie* mutants have no genitalia, and the *turnip* mutant is stupid, whereas the *sonic hedgehog* mutant turns out, embarrassingly for those who discovered it, to be responsible for birth disorders and cancers in humans.

Fun and games aside, Kean reveals a deep and up-to-date knowledge of modern genetics in his book, which he weaves into an engrossing account that links apparently unconnected observations together in ingenious ways. He suggests that the eccentrics who owned 689 house cats were infected with *Toxoplasma* (a parasite that causes mice, who normally avoid cat urine, to regard it as a heavenly scent) and uses this scenario to introduce the extraordinary role of viruses in the human genome, which includes the possibility that their ability to make cells stick together may have led to the origin of the placenta.

The closing pages of *The Violinist's Thumb* reveal that the poisoned relationships among the great geneticists of long ago are sometimes mirrored in their modern equivalents and that both industry and the public still have an equivocal view of the threats and promises coded into the double helix. The Human Genome Project extracted vast sums of government cash with a vague promise that to read off the genome’s message would lead to a new era of personalized medicine. In a world in which the simplicity of Mendel’s peas has turned into the pea soup of epigenetics—in which gene and environment are intimately and perhaps inextricably mixed—that promise looks increasingly hollow, and

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this book is not afraid to say so. Rather like the genome itself, among all the redundancy, there is an important and engrossing message that this book manages, with considerable effort, to get out.

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A GUIDE TO A HABITABLE PLANET

Resilience Practice: Building Capacity to Absorb Disturbance and Maintain Function. Brian Walker and David Salt. Island Press, 2012. 248 pp., illus. \$28.00 (ISBN 9781597268011 paper).

R*esilience Practice: Building Capacity to Absorb Disturbance and Maintain Function* by Brian Walker and David Salt follows their successful earlier book, *Resilience Thinking: Sustaining Ecosystems and People in a Changing World* (2006). This sequel offers a user's guide for readers who are concerned about the increasing frequency and severity of shocks and stresses that we are imposing on our planet and for those seeking ways to manage change. These thinkers, stakeholders, and decisionmakers are increasingly gravitating toward the idea of *resilience*, a concept more dynamic and multifaceted than *sustainability* or *stability*, but as the agricultural ecologist Sir Gordon Conway points out in his foreword to the book, the term *resilience* has been picked up in political rhetoric as a buzzword, and widening usage risks obscuring and discounting its meaning. Walker and Salt strive in both books to frame the term in useful, operational language for accessible discussion, and they describe general features and controls that make the concept recognizable in concrete, diverse cases. Reprising their "anyone can do it" claim from *Resilience Thinking*, the authors continue in *Resilience Practice* to show

how clearer thinking about resilience in systems can be drawn from anyone's life experience.

Born and raised in Zimbabwe, Walker was for many years the chief of Australia's Commonwealth Scientific and Industrial Research Organisation's Division of Wildlife and Ecology. He is currently the science program director of the Resilience Alliance (www.resalliance.org), a small group of eminent international ecologists, economists, and ecosystem scientists who, inspired by C. S. "Buzz" Holling and Lance Gunderson, have worked together since 1999 to develop science that can increase the resilience of social-ecological systems and to communicate that science to the public. As in the previous book, Walker partners with science writer David Salt to write plainly and eloquently—yet avoiding oversimplification—about how we can recognize and manage features of social-ecological systems that enhance their resilience to shock and stress.

The practice of resilience is presented in the book as a life- and, potentially, world-changing practice—a habit of perception, thought, and action. Despite the complex and adaptive nature of social-ecological systems, Walker and Salt recommend searching for "requisite simplicity": finding a small number (three to five) of key variables that "redefine the futures of regions and whole communities" (p. 23). The authors practice this advice by showing their readers how to describe a system in order to assess its resilience using just five specifications: system components (i.e., the entities and processes that constitute it); the scales that bound the system, players, power, and rules; the focal response variables (i.e., a resilience of what?); key causal variables (i.e., a resilience to what?); and drivers and trends (i.e., its history and its future). To develop this description is to seek simplicity, but the quest itself is neither quick nor simple. The authors explain that the description of a system for resilience analysis must be done carefully and in a comprehensive way, such that

disparate points of view of diverse stakeholders (a term they dislike but cannot avoid) are incorporated. Continuing with Alfred North Whitehead's dictum, *Resilience Practice* urges us to seek such simplicity but to mistrust it, acknowledging the need for our ongoing vigilance ("Working with resilience requires you to constantly reflect on what you're doing and why you're doing it," p. 1) and continuous adaptation to change ("It's *not* about not changing," p. 3). The capacity of systems to recover resiliently from disturbance requires that these systems have experience with disturbance.



Resilience Practice begins with an explanation of resilience thinking using rigorous, operational definitions in language nearly devoid of jargon, easily intuited case histories, and graphs. Readers are introduced to or reminded of complex adaptive systems, thresholds, hystereses, reversible and irreversible change, and the different definitions of *resilience* used in social science, psychology, physics, engineering, and ecology. Walker and Salt also emphasize the importance of considering interrelationships among scales that strongly affect resilience. To focus on only one scale, we are warned, can be a trap. Lessons can be drawn from our experience with cheap pesticides in forests, mosquito control, or agroecosystems that select for resistance in target pests and synchronize successional states of patches, causing vulnerability to megaoutbreaks in larger landscapes. Synchronizing change among system components works against resilience-conferring