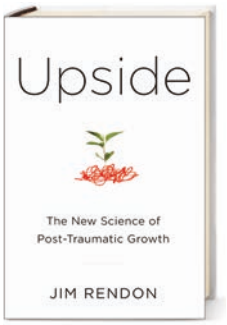
BAD IS GOOD

Upside: The New Science of Post-Traumatic Growth

by Jim Rendon. Touchstone, 2015 ($26; 288 pages)



"God let me live for a *purpose.*" So I was informed, emphatically, by a fireball of a woman named Dr. Ruth Westheimer the first time I met her—all 4'7" of her. The renowned sex therapist, author and media personality lost most of her family in the Holocaust, and she has been driven ever since to make her positive mark on the world. For years billionaire talk-show host and entrepreneur Oprah Winfrey was sexually abused by multiple male family members and friends of her mother. She not only survived her harrowing childhood, she used the pain inside her as a springboard to success.

Are these two women's experiences just flukes, or can trauma sometimes be beneficial? Opening with the story of his father's dramatic escape from a concentration camp in 1945, Rendon, a freelance journalist, answers this question in two eye-opening ways. First, he suggests that trauma may be the driving force behind the accomplishments of many influential, passionate people, and second—and this is the bigger surprise—that a wealth of recent research shows that what we usually think of as the inevitable outcome of trauma—post-traumatic stress syndrome (PTSD)—is in fact the exception to the rule. Simply put, more people *benefit* from trauma than are harmed by it.

Upside is a rich and detailed follow-up to a 2012 article Rendon wrote for the *New York Times Magazine* about trauma's "surprisingly positive flip side." It is a tapestry of poignant stories about a wide range of people who have triumphed over agonizing losses—of children, spouses, limbs, fortunes, careers, dreams—interwoven seamlessly with the results of dozens of relevant scientific studies and stories about the pioneering researchers who conducted them. The most intriguing analyses suggest a close symbiotic relation between trauma and creativity: trauma forces people to solve daunting problems (think "necessity is the mother of invention"), and the expression of creativity is itself therapeutic (Henri Matisse, Frida Kahlo and Maya Angelou were all trauma survivors).

It has been known for millennia that trauma can have positive benefits, but it wasn't until the 1980s that "post-traumatic growth" was named and first studied methodically, primarily by Richard Tedeschi and Lawrence Calhoon, two then maverick psychology professors at the University of North Carolina at Charlotte. Rendon tracks their journey—at times, a difficult one, given the overwhelming power of PTSD to grab headlines and grant support—on the road to documenting the indisputable benefits that trauma can have to strengthen relationships, spur creativity, and add meaning and deep purpose to people's lives.

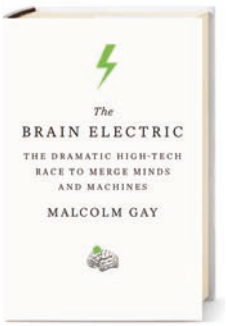
Trauma is, in Rendon's words, "transformative." It is a "dividing line," he says, but not necessarily harmful. If you are looking for inspiration, perspective and some unexpected science, *Upside* is a good choice.

—Robert Epstein

BRAIN WARS

The Brain Electric: The Dramatic High-Tech Race to Merge Minds and Machines

By Malcolm Gay. Farrar, Straus and Giroux, 2015 ($26; 288 pages)



In one of the most memorable scenes from the early *Star Trek* movies, Dr. Leonard McCoy confronts a 20th-century surgeon, who is about to drill holes in *Enterprise* navigator Pavel Chekov's head, and gives him a dressing-down, roaring about the era's primitive "butcher knives." McCoy soon repairs Chekov's badly damaged brain with a high-tech gizmo from the future that looks like an Xbox and doesn't even break the skin.

Hold that image in mind—of the extreme contrast between the primitive present and the supposedly wondrous future—and you will begin to understand why journalist Gay's *The Brain Electric* is, all at once, one of the most fascinating and exasperating books you will ever read. Why? Because it is about the almost unspeakably primitive drills and butcher knives that some of today's leading scientists are using to try to bring about the extraordinary future we so often picture in science-fiction movies.

To get to a future in which someday, maybe, people will communicate with computers, the Internet, and even one another using their thoughts alone—no more keyboards, mice, telephones or shouting at your kids down the block—you need to start somewhere, right? Gay takes us into the gritty labs of the surgeons who have been doing the hard work for the past 15 years: Andrew Schwartz of the University of Pittsburgh, Miguel Nicolelis of Duke University and others—all in cutthroat competition for the next big DARPA grant and, of course, for the brass ring: the Nobel Prize that is almost certain to be awarded to the best of the lot.

And talk about grit. Gay takes us step by gruesome step through procedure after procedure in which cocksure docs breach skulls and implant arrays of electrodes into the brains of rats, monkeys, and paralyzed and epileptic humans in brazen attempts to get neurons communicating meaningfully with computers. Occasionally there is a breakthrough: A paraplegic woman thinks a robot arm to feed herself; a monkey whose arms and hands are restrained plays a video game; the brains of two rats are linked in a way that gets the actions of one to affect the actions of the other.

So amazing, so promising—and so frustratingly primitive. The brain has 100 billion neurons, but even the most sophisticated implants can monitor only a few hundred. Within weeks or months the immune system invariably attacks the implanted electrodes, rendering many of them useless. There are no cures, no miracles—only suggestive demonstrations, foretelling—who knows, really?

The book ends with a sobering reminder of just how rudimentary present-day brain science is. Gay quotes Schwartz: "We have no idea what makes a neuron fire…, and that's at the root of everything." @sr wms f_tc rm qr_pr qm k cu fc pc* pe fr=

—Robert Epstein