

Library Journal Best Sci-Tech Books 2010 By Gregg Sapp Dec 16, 2010

Big science is the term given to those global, high-tech, multi-laboratory, billion-dollar research enterprises that tackle the very frontiers of scientific knowledge. Two of the largest Big Science initiatives ever undertaken are the Human Genome Project and the construction of the CERN nuclear research particle accelerator. While the advanced research flows from these projects into scientific journals and technical papers, the basic concepts and practical implications are finding their way into popular science literature, as my list of bests below proves.

AGRICULTURE

Despommier, Dickson. *The Vertical Farm: The New Urban Agriculture*. Dunne. 320p. ISBN9780312611392. \$25.99. Imagine high-rise greenhouses becoming new features in urban skylines. While the problems of industrial agriculture escalate, these green edifices would convert waste into energy, conserve water, preserve forests, and create healthy ecosystems in the middle of cities.

ANTHROPOLOGY

Taylor, Jeremy. *Not a Chimp: The Hunt for the Genes That Make Us Human*. Oxford. 256p. ISBN 9780199227785. \$27.95. It has often been observed that 98 percent of human and chimpanzee DNA is identical. Still, Taylor insists that two percent is huge and should never be underestimated.

Wells, Spencer. *Pandora's Seed: The Unforeseen Costs of Civilization*. Random. 256p. ISBN 9781400062157. \$26. The ancient transition from hunter/gatherer societies to those rooted in agriculture has commonly been seen as a significant milestone in cultural evolution. Maybe so, but Wells also draws upon a wealth of anthropological evidence to argue that it cost humanity in terms of disease, pollution, and even warfare.

ASTRONOMY

Finkbeiner, Ann. *The Grand and Bold Thing: An Extraordinary New Map of the Universe Ushering in a New Era of Discovery*. Free Pr: S. & S. c.240p. ISBN 9781416552161. \$27. Eight years in the making, the Sloan Digital Sky Survey created the most up-to-date map of the cosmos, as well as some of the most striking astronomical images ever seen. (*LJ* 7/10)

BIOGRAPHY

Harman, Oren. *The Price of Altruism: George Price and the Search for the Origins of Kindness*. Norton. 464p. ISBN 9780393067781. \$27.95. An academic outsider, George Price made his mark in population genetics, demonstrating with brilliant mathematical formulae how altruism can be reconciled with the theory of evolution by natural selection. Significantly, Price himself lived an altruistic life, helping the destitute of London, and for that he paid a price. (*LJ* 4/15/10)

Skloot, Rebecca. *The Immortal Life of Henrietta Lacks*. Crown. 451p. ISBN 9781400052172. \$27.95. The cell line produced by Henrietta Lacks, a poor African American farmer, is still alive today. Her "immortal" cells were used in research that led to the polio vaccine, in vitro fertilization, and anticancer drugs, making Lacks arguably the most important person in the history of biomedical research. (*LJ* 12/09)

BIOLOGY

McElheny, Victor K. *Drawing the Map of Life: Inside the Human Genome Project*. Basic. c.336p. ISBN 9780465043330. \$28. Although a decade has passed since the completion of the Human Genome Project, we are still just beginning to analyze its mysteries. This book is a history of the project, along with a survey of what has been learned so far. (*LJ* 6/15/10)

CHEMISTRY

Kean, Sam. *The Disappearing Spoon: And Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements*. Little, Brown. c.400p. ISBN 9780316051644. \$24.99. There's a story of discovery behind every element in the periodic table. Kean, an award-winning freelance news and science writer, relates the tales in flowing, interconnected essays. (*LJ* 5/15/10)

COSMOLOGY

Hawking, Stephen & Leonard Mlodinow. *The Grand Design: New Answers to the Ultimate Questions of Life*. Random. 198p. ISBN 97805553805376. \$28. M-theory is currently the best candidate for a "Theory of Everything" uniting quantum theory with relativity. In this eagerly awaited discussion, the authors expound the theory and its implications in science, philosophy, and religion.

Bojowald, Martin. *Once Before Time: A Whole Story of the Universe*. Knopf. 320p. ISBN 9780307272850. \$27.95. String theory has gotten most of the popular attention, but the rival theory of loop quantum gravity has a growing cadre of supporters. Its theories are so bold that they presume to describe the universe *before* the big bang.

EARTH SCIENCES

Goodell, Jeff. *How To Cool the Planet: Geoengineering and the Audacious Quest To Fix the Earth's Climate*. Houghton. c.272p. ISBN 9780618990610. \$26. What if global warming has already progressed beyond healing? Climate engineering has been attempted at small scales, but perhaps science and technology today are sufficiently advanced to repair damage that unaided nature cannot. (*LJ* 4/1/10)

ENVIRONMENTAL SCIENCE

Leonard, Annie. *The Story of Stuff: How Our Obsession with Stuff Is Trashing the Planet, Our Communities, and Our Health—and a Vision for Change*. Free Pr: S. & S. c.352p. ISBN 9781439125663. \$26. From the means by which it is manufactured, to the ways in which it is consumed, to the means by which we dispose of it when we're done with it, we seldom manage our "stuff" in an ecologically friendly manner. The author contends that each of us must become responsible stewards of our own possessions. (*LJ* 2/1/10)

Foster, John Bellamy & others. *Ecological Rift: Capitalism's War on Earth*. Monthly Review. 544p. ISBN 9781583672198. \$17.95. Three sociologists—Foster, Brett Clark, and Richard York—collaborate to examine how the planet's deteriorating environmental conditions directly result from the inevitable exploitation of natural resources by self-interested corporations. True sustainability must bow to the public good.

HEALTH SCIENCE

Collins, Francis S. *The Language of Life: DNA and the Revolution in Personalized Medicine*. HarperCollins. c.352p. ISBN 9780061733178. \$26.99. Genetic medicine offers the possibility of customized treatments for a variety of diseases based upon our unique DNA. This book by the director of the National Institutes of Health is both a general report on the state of the art in genetic medicine and a consumer handbook for patients. (*LJ* 1/10)

Mukherjee, Siddhartha. *The Emperor of All Maladies: A Biography of Cancer*. Scribner. 571p. ISBN 9781439107959. \$30. No disease evokes more dread than cancer. Despite tremendous advances in its treatment, cancer remains an ancient, terrifying foe that does not yield its secrets easily. This tour de force examines the history of humankind's experience living and dying with it.

Stipp, David. *The Youth Pill: Scientists at the Brink of an Anti-Aging Revolution*. Current. c.300p. ISBN 9781617230004. \$26.95. Longevity has been attributed to a variety of healthful lifestyle choices, not all of which are easy to follow. If those benefits could be distilled into a pill, though, who wouldn't want to take it? What would the existence of such a pill mean to us? (*LJ* 7/10)

HISTORY OF SCIENCE

Ferris, Timothy. *The Science of Liberty: Democracy, Reason, and the Laws of Nature*. Harper. 368p. ISBN 9780060781507. \$26.99. In the 17th century, science prospered through the adoption of the classical liberal values of free inquiry, anti-authoritarianism, and a commitment to social egalitarianism. Ferris writes with his trademark eloquence about how science and traditional liberalism are symbiotic.

MATHEMATICS

Seife, Charles. *Proofiness: The Dark Side of Mathematical Deception*. Viking. 295p. ISBN 9780670022168. \$25.95. Numbers do not lie, but liars do hide behind numbers. Whether by cherry-picking numbers to make a point or presenting valid figures out of context, willful liars can use numbers to serve their interests. Science writer Seife arms his readers against the perils of "proofiness."

NATURAL HISTORY

DeNapoli, Dyan. *The Great Penguin Rescue: 40,000 Penguins, a Devastating Oil Spill, and the Inspiring Story of the World's Largest Animal Rescue*. Free Pr: S. & S. 320p. ISBN 9781439148174. \$26. In 2003, a 1300-ton oil spill on the shores outside Capetown, South Africa, threatened the habitats of 75,000 African penguins. Saving them required selfless efforts of volunteers, scientists, and local conservationists and, to this day, ranks as the largest animal rescue effort in history. (*LJ* 11/1/10)

Vaillant, John. *The Tiger: A True Story of Vengeance and Survival*. Knopf. c.352p. ISBN 9780307268938. \$26.95. A ferocious tiger assaulted members of a remote Siberian village, and a hunting party was formed to kill it. The struggle between humans and the beast becomes an allegory for survival in the wild, in a world where all are threatened by natural forces. (*LJ* 6/15/10)

OCEANOGRAPHY

Greenberg, Paul. *Four Fish: The Future of the Last Wild Food*. Penguin. c.224p. ISBN 9781594202568. \$25.95. The four fish favored by the global fisheries industry are cod, salmon, bass, and tuna. The oceans have been overharvested, to the point where wild populations of these fish are becoming rare. (*LJ* 7/10)

PHILOSOPHY OF SCIENCE

Costa, Rebecca. *The Watchman's Rattle: Thinking Our Way Out of Extinction*. Vanguard. 346p. ISBN 9781593156053. \$26.95. There is no shortage of forces that threaten human well-being, among them economic unsustainability, environmental degradation, public health risks, and warfare. Costa uses a biopsychological perspective to illustrate how when society hits its "complexity threshold," we need to reconceptualize how we learn and use information. (*LJ* 9/15/10)

Stannard, Russell. *The End of Discovery: Are We Approaching the Boundaries of the Knowable?* Oxford. 224p. ISBN 9780199585243. \$24.95. Some aspects of nature may be inherently unknowable. First, science itself has some limits, and because of that the idea of knowing everything is unattainable. Second, the limited capabilities of the human mind suggest that some natural realities are beyond our neurological capacity to know.

PHYSICS

Aczel, Amir. *Present at Creation: The Story of CERN and the Large Hadron Collider*. Crown. 288p. ISBN 9780307591678. \$25.99. The Large Hadron Collider is the largest, most expensive, and most technologically advanced machine ever built. Capable of accelerating beams to over 99.99 percent of the speed of light, scientists hope that its detectors will confirm several previously untestable theories in physics.

Sample, Ian. *Massive: The Missing Particle That Sparked the Greatest Hunt in Science*. Basic. 272p. ISBN 9780465019472. \$25.95. This book is as much about the nature of high-stakes, Big Science as it is about the yet-to-be-discovered but theoretically important Higgs boson particle. If, when, and by whom it is eventually discovered, it will be the result of an intensely competitive and expensive global search.

Zeilinger, Anton. *Dance of the Photons: From Einstein to Quantum Teleportation*. Farrar. 320p. ISBN 9780374239664. \$26. The phenomenon called "entanglement," whereby two particles at a great distance can nonetheless influence each other, is just one of the commonsense notions deconstructed by quantum physics. Zeilinger has personally provided experimental verification of some of the strangest theories in the field.

PSYCHOLOGY

Bloom, Paul. *How Pleasure Works: The New Science of Why We Like What We Like*. Norton. 280p. ISBN 9780393066326. \$26.95. In this evolutionary psychological perspective, pleasure is as much a cognitive experience as a sensory one. Bloom argues that pleasures yield benefits other than just feeling good.

Damasio, Antonio. *Self Comes to Mind: Constructing the Conscious Brain*. Pantheon. 384p. ISBN 9780307378750. \$28.95. Brain scientist Damasio discusses two central questions: how does the brain create the mind, and how does the brain make that mind conscious? The concept of self, he argues, is conferred by evolution.

SCIENCE AND TECHNOLOGY—GENERAL

Smith, Laurence. *The World in 2050: Four Forces Shaping Civilization's Northern Future*. Dutton. 336p. ISBN 9780525951810. \$26.95. Using advanced computer modeling, Smith, a geophysicist, proposes that the four forces determining the 40-year future of the planet are as follows: human population growth, the demand for and exploitation of natural resources, globalization, and climate change. The impact of a fifth force, technology, is the big unknown. (*LJ* 12/10)

SPACE SCIENCES

Pyne, Stephen J. *Voyager: Seeking Newer Worlds in the Third Great Age of Discovery*. Viking. ISBN 9780670021833. \$29.95. The twin *Voyager* spacecrafts that were launched in the late 1970s gave us a wealth of information on our solar system and represent one of the early triumphs of what the author predicts is a new era of discovery in space exploration. (*LJ* 6/15/10)

Roach, Mary. *Packing for Mars: The Curious Science of Life in the Void*. Norton. c.224p. ISBN 9780393068474. \$25.95. Before you sign up for that space vacation, you might want to check out Roach's description of what things are actually like in a small, contained environment shared with a number of people in zero gravity. (*LJ* 7/10)

TECHNOLOGY

Kelly, Kevin. *What Technology Wants*. Viking. 416p. ISBN 9780670022151. \$27.95. The "technium," which is what Kelly calls the global, interconnected technological medium, can be seen as an evolutionary entity that is autonomous and self-interested. Understanding technology as a force of nature is necessary to people seeking to use it wisely and beneficially.

ZOOLOGY

Grice, Gordon. *Deadly Kingdom: The Book of Dangerous Animals*. Dial. 352p. ISBN 9780385335621. \$27. Let's not forget that animals are wild, and many other than lions, tigers, and bears can be dangerous to humans. Nature writer Grice provides an entertaining overview of animal predatory behaviors, beginning with those of the domestic dog.

French, Thomas. *Zoo Story: Life in the Garden of Captives*. Hyperion. c.288p. ISBN 9781401323462. \$24.99. Zoos are at the forefront of species conservation efforts, but they are also susceptible to political, economic, and other human-centered pressures. French tells the story of the revival of Tampa's Lowry Park Zoo as a case study in modern zoo management. (*LJ* 6/1/10)