Summer Reading

Summer, a great time for leisure reading, a great time to try something different! Cheryl Baldwin Frech joins regulars Dick Pagni, Brian Coppola, Hal Harris, and Jeff Kovac in providing plenty of suggestions to tempt you.

Dick Pagni recommends

The Fire in the Equations: Science, Religion, and the Search for God by Kitty Ferguson

Templeton Foundation: West Conshohocken, 2004. 300 pp. ISBN 01932031677 (paper). $16.95

If you are an atheist, you have to ask where the universe and the big bang come from. If you are a theist, you have to wonder where the creator, God, comes from. Science is helpless in answering the question of God's existence and His role in the world, but its successes surely change the manner in which the questions are formulated. Stephen Hawking, distinguished for his contributions into the nature of black holes, has attempted, fruitlessly in my opinion, to formulate a way in which the universe creates itself. It's the fire in the equations he has derived which makes in his mind the universe come into being. Kitty Ferguson, a graduate of the Juilliard School of Music, professional musician and latter day science writer, has taken this as the title of her fascinating, accessible book on the interrelationship of science, philosophy and God. I don't think there is a question that anyone has ever asked about God that isn't addressed in this book.

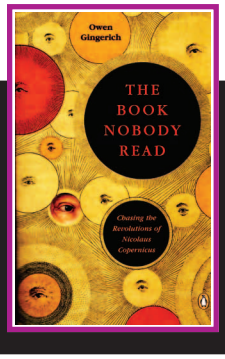
If you enjoy Kitty Ferguson's book, you will undoubtedly like Chet Raymo's paean to pantheism, *Skeptics and True Believers: The Exhilarating Connection between Science and Religion,* and Charles P. Henderson's brilliant defense of theism, *God and Science: The Death and Rebirth of Theism*.

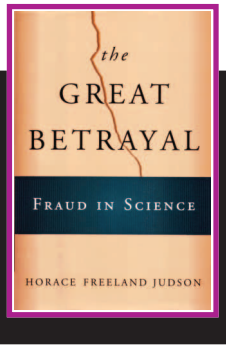
Hitler's Scientists: Science, War, and the Devil's Pact by John Cornwell

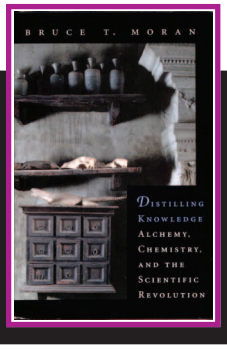
Penguin: New York, 2004. 560 pp. ISBN 0142004804 (paper). $10.88. Viking: New York, 2003. 448 pp. ISBN 06700030759 (cloth). $11.88.
[Also available as an audio CD-ROM (abridged) and as an audio download.]

Science thrived in Germany during the 19th and early 20th centuries. It was an age of innocence because the work was "pure" and potentially beneficial to humankind. This changed with the developing industrial revolution in Germany, the advent of German Nationalism, and the outbreak of World War I. The use of poison gas against enemy troops was one use of science for the benefit of the state. Fritz Haber, who discovered an efficient way to make ammonia from nitrogen and hydrogen, was instrumental in this project. When the barbarous Nazi party took control of Germany in the early 1930s, their racial science led ultimately to unbelievable horrors. Many eminent scientists, scholars, and intellectuals were forced to leave the country, which many prominent individuals such as Martin Heidegger, Philipp Lenard, and Johannes Stark applauded. Euthanasia of the maimed and mentally retarded by physicians and anthropologists was a prelude to the inhumanity of the death camps and the brutal, savage experiments performed on inmates, often in the name of the advancement of science. Slave labor was used and abused in many ways, including building V2 rockets. The guiding principle of German science seemed to be "win the war at any cost". Werner Heisenberg, the second greatest theoretical physicist of the 20th century (after Einstein), remained and directed Ger-many's development of the atomic bomb. His ambiguous role in German science during the war is still hotly debated.

Every scientist should read John Cornwell's *Hitler's Scientists: Science, War, and the Devil's Pact,* the riveting account of what I described above, and so much more. The book contains lessons for all scientists. Lest we put on airs of moral superiority, remember that scientists anywhere can make morally ambiguous decisions about the work they do. One only has to think of the Tuskegee syphilis experiments, for example, or the use of Agent Orange in Viet Nam.





Summer Reading!


Summer Reading

Dick Pagni recommends

Parallax: The Race to Measure the Cosmos
by Alan W. Hirshfeld

Owl Books: New York, 2001. 336 pp. ISBN 0805071334 (paper). $11.20.

Focus on an object on a wall with your left eye while your right eye is closed. Repeat the exercise without moving your head with your left eye closed and your right eye open. The object appears to move because the line of sight from each eye to the object is different. This is parallax on a small scale. On a grand scale parallax involves the positions of Earth and the sun's nearest neighboring stars.

When Copernicus and Kepler proposed that Earth orbited the sun, this idea was heretical because it went against the views of Aristotle, Ptolemy, and especially the Church that Earth was the center of the universe. It occurred to astronomers that these opposing theories could be differentiated by measuring a parallax to a star. Unfortunately, scientists then did not appreciate how difficult this task would be because even the closest star is very far from Earth. By measuring parallax as a function of Earth's position in its orbit, the distance to the star, in principle, can also be determined.

Parallax: The Race to Measure the Cosmos is the engrossing, marvelously told story of astronomers' attempts to measure parallax to the nearest stars. The book is a history of the scientists, some familiar, others not, who made this quest and their rivalries and collaborations and their failures and successes. *Parallax: The Race to Measure the Cosmos* is also the history of how new and improved instrumentation ultimately made this quest a reality in the 19th century. This is the best science book I have read in the past year.

Krakatoa: The Day the World Exploded: August 27, 1883
by Simon Winchester

Perennial: New York, 2004. 448 pp. ISBN 006093736X (paper). $10.46. HarperCollins: New York, 2003. 432 pp. ISBN 0066212855 (cloth). $25.95.
[Also available as an unabridged audio cassette and as an unabridged audio CD-ROM.]

Krakatoa was a small volcanic island between Java and Sumatra in what now is Indonesia. In 1883 that volcano exploded, producing the loudest sound any human had ever heard. The sound in fact could be heard three thousand miles away and the shock wave produced by the explosion went around the world six or seven times. Thousands of people were killed from the ensuing tidal waves. The weather around the world was noticeably affected by the explosion for several years. Although the island was completely obliterated by the blast, a new Krakatoa has emerged from the ocean and continues to grow today. The island, which is now part of a national park, may again undergo a cataclysmic blast in the distant future. Simon Winchester, a geologist by training and a prolific author, tells this complicated and fascinating story with verve. This is a great read for scientists and non-scientists alike.

If you get pleasure from reading *Krakatoa,* you will likely also enjoy *The Map That Changed the World: William Smith and the Birth of Modern Geology* by the same author. It is the story of William Smith, the self-educated Englishman who is generally considered the father of modern geology and the author of the first geological map. Smith's life seems like fiction: his rise in the world in his early manhood, his obscurity and poverty in middle age, and his ultimate triumph in his later years.

Summer Reading Reviewers

- Dick Pagni is in the Department of Chemistry, University of Tennessee, Knoxville, TN 37996; *rpagni@utk.edu*
- Cheryl Baldwin Frech is in the Department of Chemistry, University of Central Oklahoma, Edmond, OK 73034-5209; *cfrech@ucok.edu*
- Brian Coppola is in the Department of Chemistry, University of Michigan, Ann Arbor, MI 48109-1055; *bcoppola@umich.edu*
- Hal Harris is in the Department of Chemistry, University of Missouri-St. Louis, St. Louis, MO 63121; *hharris@umsl.edu*
- Jeff Kovac, *JCE* Book & Media Reviews Editor, is in the Department of Chemistry, University of Tennessee, Knoxville, TN 37996-1600; *jkovac@utk.edu*

Cheryl Baldwin Frech recommends

Yellowcake Towns: Uranium Mining Communities in the American West by Michael A. Amundson

University Press of Colorado: Boulder, 2004, 208 pp.
ISBN 0870817655 (paper). $19.95. ISBN 0870816624 (cloth). $24.95.

Amundson's book is based on his doctoral dissertation in history, but it's a lot more interesting than most scholarly work. "Yellowcake" is the term used to describe processed uranium oxide, U_3O_8. The mining communities of Moab, Utah; Uravan, Colorado; Grants, New Mexico; and Jeffrey City, Wyoming are the "yellowcake towns". Different forces were at work in each of these towns, depending on whether they were one-industry towns, or had a broader economic base.

The earliest radioactivity boom in the American West was radium, which was sparked by the Curies' work. Uranium-containing ores were, for a time, considered a waste product of vanadium mining in the area until the Manhattan Project changed everything. Two uranium boom and bust cycles occurred. In the 1950s, the U. S. government subsidized prospecting, mining, and milling, and bought all the uranium for national security reasons. Prospectors converged on the area seeking their fortune, and company towns sprang up almost overnight. After federal subsidies ended in 1970, a second boom and bust occurred due to international interest in uranium.

If Colorado, New Mexico, Utah, or Wyoming beckon you this summer, place this book on your reading list. After reading *Yellowcake Towns: Uranium Mining Communities in the American West*, you'll visit these states with a new appreciation of some recent history.

Teaching Within the Rhythms of the Semester (Jossey-Bass Higher and Adult Education Series) by Donna Killian Duffy and Janet Wright Jones

Jossey-Bass: San Francisco, 1995, 288 pp.
ISBN 0787900737, $37.

As a teacher, once you have mastered the content of your courses or discipline, you may realize that your semester (or term or year) has a certain periodicity. For example, in general chemistry II, many students and faculty find themselves exhausted and cranky as chapter after chapter of equilibrium topics flows on. Where are the doldrums in the courses that you teach?

Duffy and Jones's book consists of two major parts. In Part I, Prelude to the Semester, teaching styles, syllabus preparation, and engaging students in learning are considered. Early career faculty, especially, may find helpful tidbits in these chapters. Part II, Tempo of the Semester breaks down the typical semester course into three parts: The Opening Weeks (Establishing Community), The Interim Weeks (Beating the Doldrums), and The Final Weeks (Achieving Closure). More seasoned teachers will find strategies here to help reinvigorate those courses that are taught repeatedly over many years.

Throughout the book, chapters begin with an illustrative teaching vignette. You may recognize yourself or colleagues in the teachers who are described. A discussion with scholarly references follows, and the chapters end with a summative replay. If you have some free time this summer to reflect on your teaching, I highly recommend this book for its premise of examining the time dimensions of the courses you teach.

Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses by L. Dee Fink

Jossey-Bass: San Francisco, 2003. 320 pp.
ISBN 0787960551 (cloth), $35.
[Also available as a digital download using Adobe Reader.]

This book is to teaching as a multiple-course meal at a five-star restaurant is to eating: there's a lot to digest, but it's worthwhile if you take your time. Dee Fink, a geographer, has lengthy experience in the areas of faculty and instructional development at the University of Oklahoma.

Fink posits that all teaching should strive to create significant learning experiences, and presents a taxonomy for identifying what constitutes these experiences. He then asks, "How can teachers do a better job of creating significant learning experiences for students?" Several chapters focus on a model process of course design and aspects of subsequent integration into the classroom. Other chapters explore the struggles that accompany changing the way we teach, consider various levels of support for faculty endeavors, and discuss human aspects of good teaching and learning. There is a very valuable appendix that contains a decision guide for planning a course and making changes.

Individual teachers and educational administrators will find much to contemplate in Fink's book. I also recommend it for group discussions in divisions or departments, teaching support groups, or teaching circles.

Science Verse by Jon Scieszka; Lane Smith, illustrator

Viking: New York, 2004. 48 pp., ISBN 0670910570 (cloth), $16.99

I have a small collection of weird science books, and this book fits right in. While it's neither particularly scientific nor outstanding verse, it is a book of strange science poetry. Most of the poems are knock-offs of poems or songs that everyone will recognize. "Scientific Method at the Bat" needs no introduction, nor does "Astronaut Stopping by the Planet on a Snowy Evening". The book is pitched to the elementary school market, but it made little impression on my 4th and 6th grade daughters. The illustrations are bizarre and colorful. Unfortunately, the big-eyed science student who is pictured throughout the book perpetuates the scientist-as-geek motif for a new generation. Most teachers know a student or two who will appreciate the weirdness of this book and they will want to add it to their collection.

Summer Reading

Brian Coppola recommends

Endless Frontier: Vannevar Bush, Engineer of the American Century by G. Pascal Zachary

MIT Press: Cambridge, MA, 1999. 528 pp.
ISBN 0262740222 (paper). $32. Free Press

What was the most profound and long-reaching scientific policy decision ever made? I think that the choice to make college and university professors the recipients of federal public funding in order to carry out a fraction of the basic scientific research in this country at least qualifies for consideration.

An academic research scientist ought to know many things, including a historical sense of something so significant that it affects nearly every aspect of professional decision making. In this light, I recommend highly this thoughtful and well-written biography of Vannevar Bush (1890–1974).

Bush, who began his professorial career at MIT in the 1920s, helped lay the intellectual groundwork for hypermedia, computer-based information storage and retrieval (the device, called memex, was introduced in an article titled "As We May Think" published in the *Atlantic Monthly* in 1945). Bush viewed the federal government as one might see venture capitalists: people with lots of money and no skills. He co-founded the Raytheon company, which parlayed government-defense contracts into profits for decades. Perhaps above all else, Vannevar Bush should be best known as FDR's head of the Office of Scientific Research and Development (OSRD); in this capacity he organized and oversaw military research during World War II. Bush used the same strategy (funding research with public money) to support a large pool of civilian scientists, beginning with the Manhattan Project.

By the end of the war, Bush (who was an MIT Vice-President and Dean), along with Harvard's James Bryant Conant and The Johns Hopkins's Isaiah Bowman, envisioned a consortium of "research universities" that would continue to receive a generous allowance of federal funding to continue the good work of discovery by the nation's most talented scientists, who were, naturally, the ones at their elite institutions. In his 1945 report, "Science—The Endless Frontier", Bush proposed forming a National Research Foundation based on this design. Truman, who had different sensibilities from FDR, preferred to keep the locus of control in the hands of Congress rather than with the eggheads, and so these events eventually conspired to give rise to the Atomic Energy Commission and the National Science Foundation, and, as Lyndon Johnson would later opine: the entire military–industrial complex.

In many respects, the history of academic science is told through the story of Vannevar Bush. The author, a reporter for the *Wall Street Journal,* provides a well-referenced and well-researched book on a person whom he considers the "most politically powerful inventor since Benjamin Franklin". Considering that spin-offs from the decisions made in the 1940s still affect us today (and more so, I might editorialize, with the passing of the 1980 Bayh–Dole Act, which I can imagine the co-founder of Raytheon might not endorse), I think that Vannevar Bush and this book both deserve contemplation.

The Great Betrayal: Fraud in Science by Horace Freeland Judson

Harcourt: New York, 2004. 480 pp. ISBN 0151008779. $28.

These three words—"So consider fraud."—begin Judson's critique of science's claim that self-regulation is enough, and works adequately enough, to identify and rein in misconduct. Judson, a premiere American historian, examines more than a century of cases; wisely, he targets the things that might cause good and well-intentioned people to go bad. Public funding and tenure pressure could hardly have motivated Darwin and Pasteur, for instance, so there is some deeper examination into the culture and sociology of science that has been, perhaps, exaggerated in the recent times, but which is hardly new.

As the stakes have increased (some academicians now have stockholders to answer to), Judson argues that the temptation to trim and shortcut and under-report and exploit, and so on, only increases. He also argues that the relatively insular and private nature of decision-making and reviewing contributes to the ease with which misconduct can occur.

As have others, Judson takes on the twin terrors of increasing specialization and the utter inability to keep up with the vast array of interconnected science as straining the legitimacy of the traditional peer review system. He is not the first person to wonder who the peers are, particularly in dealing with so many newly emerged multidisciplinary areas. He also thinks about, and presents a case for, the growth of "open review," particularly through the wide accessibility of Internet publication. (Think of it as "open source science".)

It is an interesting argument, but simple solutions to complex problems usually fall victim to the Law of Unintended Consequences; given the significance of priority and claim to intellectual property, for instance, one cannot help wonder what happens if you reduce the trail of evidence (by eliminating editors and reviewers) between discoverers, discoveries, and the general scientific public. Public disclosure might help solve the problem of fraudulent facts but it may increase the cases of fraudulent claims of discovery.

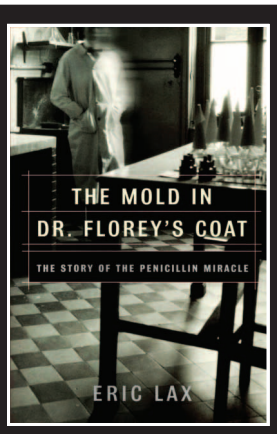
This last bit notwithstanding, Judson's book would make a terrific resource for a graduate course on research ethics.

Pattern Recognition, a novel by William Gibson

G. P. Putnam's Sons: New York, 2003. 368 pp.
ISBN 0399149864 (cloth). $25.95.
Berkley Publishing Group: New York, 2004. 368 pp.
ISBN 0425192938 (paper). $14
[Also available as an unabridged audio CD-ROM, for digital download using Adobe Reader, for digital download using Microsoft Reader, and as an audio download.)

Cayce (pronounced "Case") Pollard has an affinity, perhaps even an intuition, for the stuff of the Internet. Unlike the author's other cyberpunk novels, this one is set in the immediate present. Cayce's skill for finding meaning in patterns makes her a cyber-scientist (of sorts), and her ability to rec-







ognize popular trends is a clearly desirable talent for sellers of products in a world obsessed with marketing, branding, and high-tech advertising.

Bits and pieces of a mysterious film (called "the footage") begin appearing on the Internet, setting up the context for this story. Cayce is hired to investigate the source of these worldwide postings by someone recognizing that the attention being given to this mystery is also a masterstroke of marketing genius. The investigation takes her in and out of trouble, while giving Gibson an ideal canvas to explore contemporary cultural concepts of globalization, information management, privacy (and not), and the commodification of ideas.

The author is credited with coining the term "cyberspace" (via his cyber-cowboy named Case, interestingly enough, in *Neuromancer*), and he continues to demonstrate his reading, sometimes uncomfortably so, of the pulse of a modern life lived online. That said, there is a surprisingly comfortable humanity to the resolution that seems almost optimistic compared with most novels in this genre. I found this to be quite refreshing.

I, Lucifer: Finally, the Other Side of the Story

by Glen Duncan

Grove Press: New York, 2004. 262 pp. ISBN 0802140149 (paper). $13

Talk about guilty pleasures: I loved this book. I would kill to see a "sophisticated wit" showdown between Glen Duncan and Oscar Wilde—and I am not at all sure who would win. I will tell you that I have never read 262 pages so carefully for fear of missing something. Sorry to be hyperbolic about this, because this book is not going to be everyone's cup of hemlock (feel free to send me your hate mail).

Here's the Deal: God is about to pull the plug (on everything), and He's giving His most Fallen Angel one last chance to make good. Lucifer has one month inside the body of suicidal author Declan Gunn (author of the work who authors the work who, oh, forget it) in order to redeem himself.

The narrative bounces back and forth between The True History of Creation (as told by Lucifer through this text "written by Gunn" *now optioned for a movie B big-name stars, only, please*) as well as the wickedly biting commentary on humanity (as told by Lucifer's experiences as Gunn). The story arc is not the thing here, it's just the McGuffin; it's the author's extraordinary talent with words that you need to savor. If you know the basic source material, as well as enjoy London, I think you will find this to be a twisted B raunchy, irreverent, and heretical B treat. The book, after all, is itself Gunn's, I mean, Lucifer's redemption.

I knew right away (actually, by the middle of the first page) that I would want to share this one with you this year, so I tagged a few PG-rated passages with this review in mind.

> There's a common misconception about me. It's a slander spread by the Church, namely that if you make a deal with me, I'll cheat you. Poppycock, of course. I never cheat. Never have to. Ask Robert Johnson. Ask Jimmy Page. Humans are so deaf and blind to the ambiguities of their own languages, they concoct their wishes in terms so permeable that I can always grant them in a way they never imagined. *I want to be as wealthy as my father.* Fair enough. Nelchael crashes the markets, Dad's bankrupt, and thanks for the soul, brother. A boneheaded example, obviously, but you'd be surprised how wide open your leave yourselves. (The punters who come off best with me are smart, dirty rotten scoundrels to start with, willing to sign over their afterlife care in exchange for the chance to become even dirtier, rottener scoundrels while still rightside of the grave.)

> …Thing was: nobody was going to Heaven. I remember St. Peter getting his new uniform and ticket-punch. Time passed. He'd wished he'd brought a magazine. The turnstile booth grew… *oppressively familiar*. Whereas we were taking on extra staff downstairs. Every day a gala day. I was down to a three-and-a-half-hour week. Spent the rest of my time lying in a hot hammock and dabbing away tears of mirth. I sent Him a telegram. *Far be it from me to tell You Your Own business and all that, but…* Stony Silence. Still no sense of humour. On the other hand, it wasn't long after that regrettably indulgent quip that I noticed the goalposts were on the move. Without so much as a nod or a wink. It was the coveters first, peeling off to Purgatory when they should have been hurtling straight down to us. Then every other one-theft-only thief. The odd regretful adulterer. …

Get it. Read it. Enjoy it. Share it.

Summer Reading

Hal Harris recommends

The Book Nobody Read: Chasing the Revolutions of Nicolaus Copernicus by Owen Gingerich

Walker & Co.: New York, 2004. 256 pp. ISBN 0802714153 (cloth). $25.
Penguin: New York, 2005. 303 pp. ISBN 0143034766 (paper). $15.

In his surprise 1959 bestseller about Kepler, *The Sleepwalkers*, Arthur Koestler claimed that Nicolaus Copernicus' book, *De Revolutionibus,* had very little influence on the other astronomers of his time because it was little read. While Koestler was a captivating and persuasive writer, his history and his science (as in The Case of the Midwife Toad) was often suspect. When astrophysicist and science historian Owen Gingerich happened upon a copy of *De Revolutionibus* that was richly annotated in the hand of a Copernicus contemporary, he began to wonder whether Koestler's claim could be erroneous. Thus began his quest to locate every extant copy of the first and second editions of the famous book, this so that he could study the marginalia written by their owners—people like Johannes Kepler and Tycho Brahe. Would you believe that he located over six hundred copies that have survived the four hundred fifty years since its first publication? Gingerich tells us the personal story of how he compiled his exhaustive "census" of the book that many claim began the scientific revolution. It is a great story of science, history, and books. It starts in a courtroom, where Gingerich testifies in a case involving a stolen copy of *De Revolutionibus,* and meanders through libraries, museums, and book dealers throughout the world. This book won the AAS Education Prize for 2004. It is wonderful, and is now available in paperback.

Dr. Joe and What You Didn't Know: 177 Fascinating Questions About the Chemistry of Everyday Life by Joe Schwarcz

ECW Press Press: Toronto, 2003. 241 pp. ISBN 1550225774. $14.95

Joe Schwarcz is the director of McGill University's Office for Science and Society, and he also hosts a popular radio show in Canada in which he answers questions about science he has posed to his listeners. *Dr. Joe and What You Didn't Know* is the fourth in a series of books in which his answers are compiled. Schwarcz found that, at the time this book was being compiled, the quality of the answers his listeners were providing indicated that they had suddenly become more science-literate. This coincided with the availability of Internet search engines such as Google. Of course, he was asking his questions of the collective wisdom of the Internet, rather than his listeners. Consequently, he began to construct the questions in a way not conducive to Google searches. For example, he might ask What common metal was once more valuable than gold?, rather than Why did aluminum fall a hundred times in value during the 19th century? His books are very attractive to me, both as a chemist interested in science in everyday life and as a teacher of chemistry. Schwarcz does not limit himself exclusively to chemical topics, but his brief essays consistently bring the insights of a chemist to the question at hand, and he does not hesitate to get into the chemical details of an answer that are necessary for a proper explanation. I still wish that he would include a few molecular structures in his books; I ought to compile my own list of his essays that would enhance the courses I teach, so that I would not neglect to bring them up when they fit.

The Fabric of the Cosmos: Space, Time, and the Texture of Reality by Brian Greene

Alfred A. Knopf: New York, 2004. 576 pp.
ISBN 0375412883 (cloth). $28.95.
Vintage: New York, 2005. 592 pp. ISBN 0375727205 (paper). $15.95
[Also available as an abridged audio CD-ROM, an abridged and unabridged audio cassette, and for audio download.]

This is a terrific book. I thoroughly enjoyed every page written by distinguished string theorist Brian Greene, who also wrote the book and Nova TV series, *The Elegant Universe,* which is available in paperback. Some of the string theory in *The Fabric of the Cosmos* is repetitive of the content of the earlier book. This guy not only knows his stuff, but he also explains very difficult physics using examples and analogies that are inventive and humorous (for example, characters and situations from "The Simpsons" pop up in several different contexts). Do not get the idea that *The Fabric of the Cosmos* deals only with arcane particle phenomena that are completely irrelevant to everyday life, or that it oversimplifies to the level of cartoons. On the contrary, Greene elevates the reader's thinking to the ultimate nature of reality. Over the past couple of years I have read a number of books purporting to bring relativity, quantum mechanics, and cosmology to the nonphysicist, but this is the one that I enjoyed the most. The only criticism I have is that the black-and-white illustrations (and there aren't a lot of them) don't seem to have been reproduced very well.

Blink: The Power of Thinking Without Thinking by Malcolm Gladwell

Little, Brown & Co.: New York, 2005. 277 pp. ISBN 0316172324 (cloth). $25.95
[Also available in large print, unabridged audio cassette, and unabridged audio CD-ROM.]

We teachers of science tend to assume that students are largely rational—that they can be brought to understanding through a gradual accumulation of experiences that lead to conclusions about how the world works, and that nature can be led to disclose herself through a logical process. In *Blink,* Malcolm Gladwell describes his inquiry into the opposite kind of thought—the important conclusions on the basis of little evidence. All of us make quick decisions on the basis of a

Hal Harris recommends

glimpse or a handshake, a word or a facial expression, a phrase or a few notes of music. Sometimes life and death depend on an assessment by police, whose ability to make split-second judgements can be greatly enhanced through training. Gladwell also describes how the intentional limitation of knowledge can improve the quality of decisions, especially when the possibility of bias exists. Science calls these "blind" studies or "double-blind trials", but the same kind of approach has revolutionized the gender composition of symphony orchestras. This author has been a favorite of mine since *The Tipping Point* and especially because of his essays for the New Yorker. In *Blink,* he brings to light some of the myriad thoughts floating below the surface of our students' consciousnesses, and—more importantly—our own.

The Einstein File: J. Edgar Hoover's Secret War against the World's Most Famous Scientist by Fred Jerome

St. Martin's Press: New York, 2002. 358 pp. ISBN 0312288565 (cloth). $27.95. St. Martin's/Griffin: New York, 2003. 384 pp. ISBN 0312316097 (paper). $16.95.

Most people would be surprised to learn that, by the time of his death in 1955, the FBI had compiled a file of more than 1400 pages on the world's most famous and most revered scientist, Albert Einstein. Now often viewed as a kindly, disengaged, and possibly absent-minded professor, Einstein was actually passionate about certain political causes and skillful in using his favorable public image to further them. He was a bane of FBI Director (1924–1972) J. Edgar Hoover, whose agency systematically compiled derogatory material about Einstein from before his 1930s visits to the U.S., and culminating in a vicious "get Einstein" campaign from 1950 on. The trigger for Hoover's wrath was an interview with Einstein on an Eleanor Roosevelt radio program, in which he stated his opposition to the U.S. development of a hydrogen bomb. (Einstein had earlier opposed the use of atomic weapons against Japan, although he had urged FDR to develop them.) The FBI file on Einstein is now available on the Web, at *http://foia.fbi.gov/foiaindex/einstein.htm,* but it is difficult to read intelligently, partly because of the numerous expurgations but even more because of the lack of context. Fred Jerome of the Gene Media Forum of the Newhouse School of Journalism at Syracuse University has done an excellent service in providing the historical background for a shameful example of how secret government surveillance and propaganda can infringe the civil rights of citizens and immigrants, and distort public policy.

Summer Reading

Jeff Kovac recommends

What the Best College Teachers Do by Ken Bain

Harvard University Press: Cambridge, MA, 2004. 207 pp.
ISBN 0674013255 (cloth). $21.95.

Summer is a time for reflection, a time when many of us work on revising our courses: adding to, improving, and updating course material. It is also a time to rethink our pedagogical strategies and Ken Bain's recent book provides both ideas and inspiration for faculty interested in improving their teaching. Based on a study of outstanding college faculty in all disciplines, this concise volume is an overview of learning theory, course planning, teaching techniques, ways to build effective relationships with students, and evaluation strategies. Filled with practical wisdom, this is a book that I will regularly reread.

Distilling Knowledge: Alchemy, Chemistry, and the Scientific Revolution (New Histories of Science, Technology, and Medicine) by Bruce T. Moran

Harvard University Press: Cambridge, MA, 2005. 210 pp.
ISBN 0674014952 (cloth). $24.95.

Alchemy is a study in contrasts. Mysterious and magical, it was also a practical subject that developed techniques for producing medicines and materials. The history of alchemy is filled with colorful characters, such as Paracelsus, as well as some of the founders of modern chemistry and physics: Robert Boyle and Isaac Newton. In this delightful book, Bruce Moran surveys the history of alchemy and shows its importance in the scientific revolution. Moran argues that the "enchantment of the scientific revolution […] has much to do with the presence of impurities of various sorts—the sometimes inharmonious intellectual and social mixture of learned and artisan, of occult, spiritual, and mechanical." If you are looking for a good introduction to this fascinating precursor to chemistry, this is the book to read.

J. Robert Oppenheimer and the American Century by David Cassidy

Pi Press: New York, 2004. 462 pp.
ISBN 0131479962 (cloth). $27.95.
[Also available for digital download using Adobe Reader.]

Robert Oppenheimer casts a long and mysterious shadow over the 20th century. Brilliant, charismatic, and moody, he was one of the most important figures in the development of theoretical physics in the U.S., attracting the best students to his research group in Berkeley. Quite improbably he became the director of the Los Alamos laboratory during the Manhattan project and supervised the construction of the first fission bombs, bringing together scientists and engineers to accomplish an amazing technological feat. After World War II, he was one of the most influential advisors to the government on weapons policy, but his unorthodox intellect, left-wing political views, and opposition to the development of the hydrogen bomb led to the famous hearings in which his security clearance was removed. Although much has been written about Oppenheimer, David Cassidy's new biography takes scholarship a step further and tries to understand Oppenheimer in the context of his times. Carefully researched and engagingly written, this may be the best single volume on Oppenheimer to date.

The Mold in Dr. Florey's Coat: The Story of the Penicillin Miracle by Eric Lax

Henry Holt and Co.: New York, 2004. 320 pp.
ISBN 0805067906 (cloth). $25. Owl Books: New York, 2005.
336 pp. ISBN 0805077782 (paper). $15.

Everyone knows that penicillin was discovered serendipitously by Alexander Fleming when a mold spore appeared by accident on a discarded petri dish. This first chapter in a recent book by Eric Lax attempts to sort out the real story of how penicillin was discovered; more importantly it provides the history of how Fleming's discovery was developed into a practical drug by a team at Oxford University headed by Howard Florey and Ernst Chain. Growing enough active penicillin and turning it into a drug was a complex problem of science and engineering that was carried out under the stresses of World War II. In *The Mold in Dr. Florey's Coat: The Story of the Penicillin Miracle* Lax has written a real scientific page-turner full of quirky individuals and wartime adventure. It is also the story of the birth of big-time drug companies when it was realized that penicillin was the first effective antibiotic and the potential source of huge profits.