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Reviews

What Remains to Be Written?

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"Of making many books there is no end, and much study is a weariness of the flesh," wrote the author of the book of Ecclesiastes 2,300 years ago. Benjamin Disraeli, novelist and two-time prime minister of Britain, was even more scathing: "Nine-tenths of existing books are nonsense," he said, "and the clever books are the refutation of that nonsense." As Discover celebrates its 25th anniversary, we ask: Are there any science books that remain to be written? What uncharted territory would they cover and why? And do we really need any more books? A group of eminent scientists share their vision of the must-reads of the future.

The books that I would most like to read are the ones that can't yet be written: a biochemistry book that covers life on several planets and a comparative zoology of the Milky Way galaxy. These may be in print somewhere, but when they will become available on Earth is anyone's guess. One I do expect to see in my lifetime is a book on comparative planetology that incorporates knowledge of dozens of solar systems, putting our own in proper perspective. You could try to write this now, but it would have to be completely revised in a few years. We are uncovering the demographics of planets in our galaxy at an astonishing rate, and it won't be long before this includes worlds in Earth's size range.

DAVID GRINSPON, Principal Scientist, Department of Space Studies, Southwest Research Institute, Boulder, Colorado; author of *Lonely Planets: The Natural Philosophy Of Alien Life* (Harpercollins, 2003).

My unwritten book would ask, "Why has psychoanalysis been declared dead when so many of the best ideas that we use to think about our intimate lives are taken from the Freudian playbook, then melted down for popular consumption?" A 19th century mind, Sigmund Freud had many notions that do not hold up to 21st-century scrutiny, but a good number were so robust that we use them every day. We argue ferociously with our spouse over things that remind us most of things in ourselves; we recognize that our reaction to the death of our mother is to become more like her; we respond to our children and hear the echoes of our own childhoods; we shape disturbing mirror images in the personae we create on the Internet. At all of these times we unconsciously turn to powerful ideas from the psychoanalytic culture that have become part of the culture at large. Or we turn to counselors, self-help books, and TV-talk gurus, many of whom put forth ideas that plumb the Freudian legacy. They may debunk Freud, or think him irrelevant, but in their own way, they're Freudian plagiarists. It is time to pay our debts. The culture has told itself a story that has turned psychoanalysis into history. In fact, by sustaining its relevance into the digital age, it is psychoanalysis that has made history.

SHERRY TURKLE, Director, MIT Initiative on Technology and Self; author of *The*

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Second Self: Computers and the Human Spirit (MIT Press, 20th Anniversary Edition, 2005).

I would like to see a multilevel book, written for toddlers/schoolchildren/college students/adults, that would look at the world around us and answer questions that youngsters may or may not ask, as a day progresses. How does the sunlight get through my window? Where did my clothes come from? How do we get our food? Where do numbers come from? Why can you read? Why do things fall if you let go of them? Can animals understand us? What is a star? Each page of a tall book might have four sections, top to bottom, with the first answer being for the child, that plus the next for those a little older, the third a "scientific explanation," and the final one a philosophical discussion of pertinent concepts like forces or brains or animals. Alternatively, there could be four pages per question, each page hidden behind the first. It should be attractive, clever, and scientifically sound. If we don't attract the young students, who will be left to read the most complicated science books?

VERA RUBIN, Astronomer and Senior Fellow in The Department of Terrestrial Magnetism at The Carnegie Institution of Washington, D.C.; author of *Bright Galaxies, Dark Matters* (American Institute of Physics, 1997).

The world needs a book called **The Beauty of Science**. The existing book that comes closest is Richard Feynman's **Lectures on Physics**. Those lectures are unique masterpieces because, like all true scientists (who are scarce on the ground), Feynman knows all of science and is guided by his sense of beauty—which he isn't ashamed to talk about. The first point is important: a true scientist knows all of science—not to the same depth and detail; but he feels at home anywhere in the scientific world.

The Beauty of Science might start with a sine wave. It could trace the sine wave through dozens of scientific and technological phenomena—from merry-go-rounds through electromagnetism, surveying, shapes found in nature, and statistics—and wind up where it started. I included a miniature version of this tour at the end of my book **Machine Beauty**. I've been waiting ever since for someone to steal the idea and write a book-length version.

DAVID GELERNTER, Professor of Computer Science at Yale and Senior Fellow in Jewish Thought at The Shalem Center, Jerusalem; author of *Machine Beauty: Elegance and the Heart of Technology* (Basic Books, 1999).

I'd like to see a book that discusses objectively all possible, currently known energy sources. Given our debilitating dependence on foreign oil, the future uncertainty of present-day energy sources, and the gathering evidence for global climate change, this is a timely subject. The book would tell us how much energy we can hope to get from various fuel sources and how we can most efficiently convert each fuel source into energy. Finally, it would address the potential environmental downsides and dangers of each source and ask which promising research directions could address those problems. This might not be the most exotic book imaginable, but I think it would be an important one.

LISA RANDALL, Professor of Physics, Harvard University; author of *Warped Passages: Unraveling the Mysteries of the Universe's Hidden Dimensions* (Ecco Books, 2005).

Here is a book I want someone to write: A medical science book that covers ecology and evolution in their medical applications. That is, a textbook of Darwinian medicine. This subject is discussed by population biologists in popular books such as **Why We Get Sick** by Randolph M. Nesse and George C. Williams. However, students in medical schools need to learn more about the ecology and evolution of diseases like AIDS, malaria, tuberculosis, even the common cold. If they do, they will prescribe drugs, perform surgeries, and administer treatments more effectively, and lives will be saved.

MICHAEL R. ROSE, Professor of Ecology and Evolutionary Biology, University of

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California, Irvine; author of *The Long Tomorrow: How Advances in Evolutionary Biology Can Help Us Postpone Aging* (Oxford University Press, 2005).

I have a suspicion—and this will strike many as heretical—that a future best seller will be a popular account of the new theory of physics that takes over from superstring theory, which generations to come will look on as an exercise in pure mathematics. I'm not saying string theory is a mistake. Science is about getting our best understanding of the universe, and right now, the string theorists are the best game in town. But physics books will be small fry compared to books on the new sciences of life, mind, emotions, consciousness, and complex systems.

KEITH DEVLIN, Executive Director, The Center for the Study of Language and Information, Stanford University; author of *The Math Instinct: Why You're a Mathematical Genius (Along With Lobsters, Birds, Cats, and Dogs)* (Thunder's Mouth Press, 2005).

More books? Absolutely! Science is a transaction: between scientists and the natural world, among scientists themselves, and between scientists and the public. People pay for our work and deserve to know what they are getting in return. Even more important, they need accurate yet understandable information, especially in today's political environment, with know-nothing, fundamentalist ignoramus substituting ideology for scientific accuracy.

Here are two projects I am currently working on. One is titled **The Buddha in the Woods,** showing how ancient Eastern wisdom and modern Western biology are remarkably convergent. For example, ecologists are in some ways indistinguishable from Zen masters. Both emphasize not only the importance of natural environments but their literal interpenetrability: the fact that you cannot separate bison from prairie, whale from ocean, or indeed, human beings from the rest of the natural world. The other is titled **Darwinian Mysteries,** a evolutionary look at how much we don't know about the female body. For example: Why do women, unlike most other mammals, conceal their ovulation? Why do they menstruate? Why do they have breasts? (No other mammal has prominent nonlactating mammarys.) Why menopause? (No other mammals experience it.) And why does female orgasm occur?

DAVID BARASH, Professor of Psychology, University of Washington, Seattle; author (With Daughter Nanelle) of *Madame Bovary's Ovaries: A Darwinian Look at Literature* (Delacorte Press, 2005).

A book that doesn't exist, but should, would explain scientifically how people perceive each other. What has science learned about variations in facial expression or changes in skin tone or vocal quality? Can you tell if someone is focused on you by noticing the degree of curvature in the world reflected by their eyes? More is known than most people realize, and some of it is spooky, in that science has revealed aspects of our interpersonal connections that surpass our intuitions—for example, that slight changes in face muscle tone indicate sincerity.

A dubious cliché holds that female readers are more interested in "relationships" than "technology." This would be a book about relationships and an alternative to forbidding books about "The Brain" as an entry point to exploring cognition. Whether male or female, readers who are more interested in gadgets would also be delighted. Why is it that some interpersonal technologies work and others don't? Telephones, televisions, and e-mail services are ubiquitous, but live visual connections at a distance have remained minor league even after 75 years of attempts. This book would explain why that is so.

JARON LANIER, Computer Scientist, Composer, and Visual Artist; External Fellow at The International Computer Science Institute at the University of California at Berkeley.

The most important book that has not yet been written is *Life in the Universe*. This book would survey all of the places in the universe where life exists, the

diversity among life forms, and the many hypotheses concerning the unique or multiple origins of life. This book has not yet been written because the science of exploring life both within and outside of our solar system is still in its infancy. The question of whether life is unique to Earth is in fact one of science's great unanswered questions. But I can think of no topic that would more profoundly affect our perspective of our place in the Universe. Over the first 500 years of science, humanity's purported place at the center of the Universe has been progressively stripped away, by astronomy, geology, and biology. Should we find ourselves to be the inhabitants of but one of many, or a great many, places where life exists, this would shake the foundations of human thought.

SEAN B. CARROLL, Investigator, Howard Hughes Medical Institute and Professor of Genetics, University of Wisconsin-Madison; author, *Endless Forms Most Beautiful: The New Science of Evo Devo* (W. W. Norton, 2005.)



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