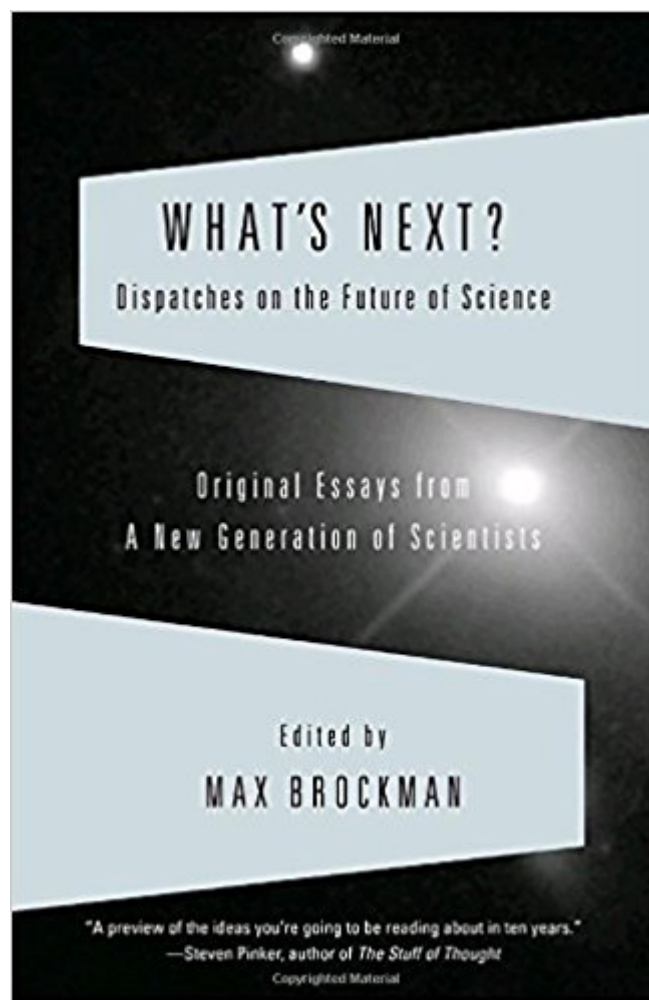




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# What's Next? Dispatches On The Future Of Science: Original Essays From A New Generation Of Scientists (Vintage)



## Synopsis

Will climate change force a massive human migration to the Northern Rim? How does our sense of morality arise from the structure of the brain? What does the latest research in language acquisition tell us about the role of culture in the way we think? What does current neurological research tell us about the nature of time? This wide-ranging collection of never-before-published essays offers the very latest insights into the daunting scientific questions of our time. Its contributors—some of the most brilliant young scientists working today—provide not only an introduction to their cutting-edge research, but discuss the social, ethical, and philosophical ramifications of their work. With essays covering fields as diverse as astrophysics, paleoanthropology, climatology, and neuroscience, *What's Next?* is a lucid and informed guide to the new frontiers of science.

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## Customer Reviews

Editor Brockman, an agent at a "literary and software agency," approached some of the world's rising science stars in a disciplines to explain how they're "tackling some of science's toughest questions and raising new ones." The 18 new essays that resulted evoke a fantastic cross-section of societal concerns, focusing largely on issues of ethics and the human mind. German neuroscientist Christian Keysers explains how mirror neurons, located in the brain's center of voluntary action and body-control, allow us to have vicarious experiences and use them to choose "good and not evil" when dealing with others. Psychologist Jason Mitchell expands this idea to "social thought," in which humans achieve sophisticated coordination with the actions of others in order to, for instance, "design, construct, and operate an airplane." Biologist Vanessa Woods and

anthropologist Brian Hare team up to explain how dogs evolved an ability to read human minds superior to even our closest primate relatives. Other articles cover quantum field theory, climate change, the ecological niche of viruses, social insects and interdisciplinary science. This absorbing collection makes easy-to-read but thought-provoking material for even casual science buffs. Copyright © Reed Business Information, a division of Reed Elsevier Inc. All rights reserved.

âœCaptivating. . . . Diverse. . . . While each essay is its own gem, together they form a remarkable dialogue about what it is to be human now, and what it will be in the future. . . .

Fascinating.âœLike reading a set of interesting blog posts, but on paper. And most of these folks donâ™t have blogs!âœDiscover Magazineâ™s âœThings Going OnâœblogâœEngrossing. . . . Offers a youthful spin on some of the most pressing scientific issues of todayâand tomorrow. . . . Super smart and interesting.âœNew York Observerâ™s âœVery Short ListâœA fantastic cross-section of societal concerns, focusing largely on issues of ethics and the human mind. . . . This absorbing collection makes easy-to-read but thought-provoking material for even casual science buffs.âœPublishers WeeklyâœCapaciously accessible, these writings project a curiosity to which followers of science news will gravitate.âœBooklistâœIf these authors are the future of science, then the science of the future will be one exciting ride! Find out what the best minds of the new generation are thinking before the Nobel Committee does. A fascinating chronicle of the big, new ideas that are keeping young scientists up at night.âœDaniel Gilbert, author of *Stumbling on Happiness*âœA preview of the ideas you're going to be reading about in ten years.âœSteven Pinker, author of *The Stuff of Thought*

The main difference between this and other science anthologies that I have read is 1) the essays are original, written especially for this volume; and 2) the scientists are relatively young not yet at the pinnacle of their careers. Max Brockman believes that "it's important to engage with the thinking of the next generation, to better understand not just what is going on in our own time but what issues society will face in the future. This exercise is especially valuable in science, where so many of the important discoveries are made by those in emerging generations." (p. xiii) Consequently he "approached some of today's leading scientists and asked them to name some of the rising stars in their respective disciplines: those who, in their research, are tackling some of science's toughest questions and raising new ones." (pp. xii-xiv) The result is this book with essays from 18 scientists in fields ranging from cosmology to microbiology. In the first essay UCLA climatologist Laurence C. Smith asks "Will We Decamp for the Northern Rim?" His answer is that he does "not advise buying

acreage in Labrador," but "maybe in Michigan." What is clear is that the north is warming up and making "land that is hardly livable [in]to land that is somewhat livable." He sees the US and Canada as the two countries "best positioned for expansion" into what has been known as the lands of the "minus-forty" degrees. Central to his piece is the prediction that north of the 45th parallel "temperatures will rise at nearly double the global average...and precipitation will increase sharply as well." In the second essay neuroscientist Christian Keysers argues that "mirror neurons" in our brain that enable us to mimic and feel what others are doing and feeling merely by watching--something we do automatically--strongly suggests that humans are ethical by nature. He believes that our brain circuits "lay the foundation for an intuitive altruism." Philosopher Nick Bostrom looks at enhancing human beings so that we might be better acclimated to the modern world instead of the savannas of Africa on which we evolved. Physicist Sean Carroll explores entropy and the arrow of time in the cosmos while physicist Stephon H.S. Alexander grapples with dark energy. There are essays on the social development of the brain in adolescence by Sarah-Jayne Blakemore; on using brain imaging to explore social thought (Jason P. Mitchell); how language shapes the way we think (Lera Broditsky); on memory enhancement (Sam Cooke); and so on to whether specialization in science is making it impossible for scientists in different fields to communicate (Gavin Schmidt, who says that the last person able to keep up with all the sciences lived in the eighteenth century). Of particular interest to me are the essays by David M. Eagleman on "Brain Time," and by Vanessa Woods and Brian Hare on how humans came "down from the trees" and why no one followed. In the former, Eagleman addresses the familiar phenomenon that "time 'slows down' during brief, dangerous events such as car accidents and robberies." (p. 159) I've had that experience myself and have tried to account for it. What Eagleman discovered is that because of the emergency situation we take in much more information about what is happening than we usually do and this "higher density of data" makes the event appear to last longer. (p. 161) This is similar to the sense that for a child the day is long and for the old person the day is short. The day seems longer for the child because so much of what the child is experiencing is new and requires close attention, whereas for a person of senior years much of what happens has been seen before and requires only the most cursory attention. In the latter essay, Woods and Hare explore the canine-human relationship and show how dogs are better able to read humans than are our closer relatives, chimpanzees. Dogs were able to find hidden objects in an experiment when humans would gaze at or point to the hiding place or even tap on the hiding place. But chimps have not the habit of paying that much attention to humans and would just miss the clues. Woods and Hare ask why this should be and answer: "One idea is that dogs live with us, so over thousands of hours of interacting with us, they learn to read our body

language. Another idea is that the pack lifestyle and cooperative hunting of wolves, the canids from which all dogs evolved, made all canids, dogs included, more in tune with social cues." (p. 177) Woods and Hare also report on an experiment by the Russian scientist Dmitri Belyaev who raised some forty generations of foxes, selecting those most friendly to humans in each generation. The foxes "became incredibly friendly toward humans. Whenever they saw people, they barked, wagged their tails, sniffed the people, and licked their faces. But even stranger were the physical changes...." Their ears "became floppy" and their "tails turned curly." "In short, they looked and behaved remarkably like their close relative the domestic dog." (pp. 178-179) Incidentally Max Brockman is the son of John Brockman who has edited a number of first class science anthologies. "What's Next" continues that excellent tradition. (Note: Thirteen of my books are now available at including "Hard Science and the Unknowable.")

The title of this book seriously overreaches. "Dispatches from the Future of neuroscience" would be more accurate, as 12 of the 18 essays deal with neuroscientific research. One article is about climate change, two are in the area of cosmology, two deal with evolutionary biology, and the final essay in the collection addresses the question "Why hasn't specialization resulted in the balkanization of science?" In commenting on the neuroscience essays, I should acknowledge an upfront prejudice. I don't find it particularly surprising that more sophisticated imaging methods allow specific functions to be mapped precisely to particular regions of the brain, so I didn't find the three essays which do little more than report this kind of result particularly notable. Among the remaining essays, that by Deena Skolnick Weisberg, arguing that imagination is central to what makes us human, was little more than a statement of the obvious. Nick Bostrom's "How to Enhance Human Beings" was muddled, with no clear point, the essay by Sam Cooke on the process of memory formation was incoherent, made no mention of recent work related to the placement of "false memory", and had a Huxleyan focus on possible pharmaceutical enhancement that I found disturbing. Essays by Joshua Greene on the organization of the brain along moral and cognitive dimensions and by David Eagleman on the way the brain perceives time were clear, but unexceptional. The good news: Christian Keysers' lucid account of the link between mirror neurons and our ethical sensibility, Matthew Lieberman's thought-provoking discussion of the thesis that "big ideas are influential and enduring because they fit with the structure and function of the human brain" and - what was for me the best essay in the book - Lera Boroditsky's "How does our language shape the way we think", summarizing recent work related to the Sapir-Whorf hypothesis. So I found about half the neuroscience essays worthwhile. Unfortunately, I found both

cosmology essays completely incomprehensible (as I do most writing in this field). So that overall, I can't really justify more than three stars for this book.

good

For a more comprehensive review of this book I refer the reader to the review on this site written by Dennis Littrell. My review will focus on two of the articles only. Sean Carroll's article on 'Our Place in An Unnatural Universe' was a survey of current cosmological research. The Universe is not a small warm cuddly place but one mysterious and problematic. The seemingly unhappy news that the galaxies are accelerating in their movement away from each other, seems to promise an End to all in total entropy. But Speculation never seems to be in short supply when it comes to Cosmology and he also reports about there being efforts to imagine a pre- Big Bang Universe. Apparently the rule is the less data one has the more need to send in the Armies of the Imagination, in. In any case the 'picture we have of the Universe' today on the macro- scale is a very uneasy and uneven one. In another area the essay by Katerina Harvati analyzes the whole process of species extinction, and focuses on the extinction of Paranthropus one million years ago and Neanderthal thirty- thousand years ago. Mankind according to Harvati made it through for a number of reasons including our generalist diet, ability to survive in a wide range of environments, shorter birth intervals than other 'great apes' longer maturity times, longer life spans. Harvati does not discuss the wide- range of challenges to human continuity presented today, but focuses on what has been until now.

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