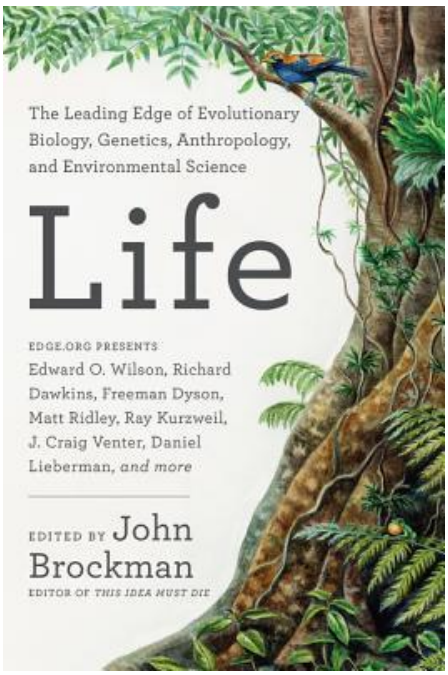

Life: The Leading Edge of Evolutionary Biology, Genetics, Anthropology, and Environmental Science

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The newest addition to John Brockman's Edge.org series explores life itself, bringing together the world's leading biologists, geneticists, and evolutionary theorists--including Richard Dawkins, Edward O. Wilson, J. Craig Venter, and Freeman Dyson.

Scientists' understanding of life is progressing more rapidly than at any point in human history, from the extraordinary decoding of DNA to the controversial emergence of biotechnology. Featuring pioneering biologists, geneticists, physicists, and science writers, Life explains just how far we've come--and takes a brilliantly educated guess at where we're heading.

Freeman Dyson borrows from science fiction to contemplate real questions about what constitutes the stuff of life. Richard Dawkins and J. Craig Venter discuss the revelatory similarity of genes to digital information. Matt Ridley argues that nature and nurture are intricately intertwined.

Steven Strogatz celebrates the spectacular mathematical synchronicity of fireflies. Edward O. Wilson reveals what ants can teach us about building a superorganism--and, in turn, about how cells build an organism. Elsewhere, David Haig reports new findings on how mothers and fathers individually influence the human genome, while Robert Trivers explores the opposing functions of the conscious and unconscious minds. And there's much more in this fascinating volume.

We may never have all the answers. But the thinkers collected in Life are asking questions that will keep us dreaming for generations.

Life: The Leading Edge of Evolutionary Biology, Genetics, Anthropology, and Environmental Science Details

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From Reader Review Life: The Leading Edge of Evolutionary Biology, Genetics, Anthropology, and Environmental Science for online ebook

Ant says

I enjoyed the lectures and discussions included in this volume (some more than others).
The variety of views (often differing) expressed made the book feel like it gave a very balanced of the state of biology a few years ago.

Zi Ying says

Overall it's a great book that compiles what and how biologists knew about living organisms on this planet, I feel excited thinking that more people could gain pleasure in contemplating life by exploring scientific data and definitive arguments. However, I feel a bit disappointed as most of the chapters are written at least 5 years back. Technology in molecular, genome, synthetic biology field has advanced way too fast that this book may not be that updated in the year of publication. Still, it's a great read to discuss, debate and challenge the future of biology, from the human perspective.

Marc Faoite says

John Brockmann is a colourful character, known to share photos of himself rubbing shoulders with the likes of Andy Warhol, Bob Dylan, or John Cage. That popular culture should include intelligent conversations about science is a given for him.

Edge.org, sometimes dubbed ‘the world's smartest website,’ was born out of an idea from Brockmann’s late friend, performance artist James Lee Byars, who suggested that rather than trying to assimilate the information contained in the six million books housed in the Harvard library it might be more productive and instructive to assemble the hundred most brilliant minds and have them ask each other questions in order to achieve what Brockmann has referred to as “a synthesis of all thought.”

Life is the fifth volume in The Best of Edge series, and as with previous books most of the featured content has already appeared on the Edge.org website. There are eighteen essays in the book. It is perhaps worth noting that not a single one of them is written by a woman, underlining the demographic generally represented (and unrepresented) on Edge.org. Some leeway may be given to the fact that science is still a male dominated field, and obviously a scientist’s gender is separate from the science, but whether Edge.org’s male-centric editorial policy is just a symptom, or part of the problem is something that bears examination.

The book starts off with an essay by Richard Dawkins, a man more coherent when expounding on his specialized subject of genetics than in his frequent rants and diatribes about his personal bug bear - religion. He revisits the basic theme of his 1990’s bestseller The Selfish Gene (again) - i.e. that genes try to maximize themselves by any means available, stopping short, or more accurately being stopped short, of undermining the viability of the organism it inhabits.

Genes seek maximum replication, whereas the organism seeks survival for at least long enough to release

copies of the genes into the world. There is a large overlap in the agendas of the gene and the organism, but occasionally they conflict. This idea is taken up by Harvard professor of organismic (yes, that's a word – I know, because I had to look it up)and evolutionary biology David Haig. He discusses the conflict between the genes of both parents as they seek expression in an embryo, but also the battle fought between the embryo and the mother. It's a tricky game of give and take where the mother's interests are not necessarily those of the foetus. For example the foetus secretes massive amounts of hormones that raise the mother's blood pressure, thereby increasing the flow of nutrients to the foetus, but also placing additional stress on the mother's body. Rober Trivers runs with this theme and explores how the mother's genes have in turn evolved to minimize the impact of these occasionally inappropriate hormonal messages. Compromises are made by both foetus and mother so that neither's viability is compromised.

The speed at which knowledge is expanding, and the access to that knowledge, is dizzying in pace. In the fields of genetics, neuroscience, and neurobiology new discoveries are being made almost every day. Just a few weeks ago it was announced that the brain has its own nervous system. This rewrites the books on what to date has been the received understanding, and is just one example of the many, many new additions to how we understand life in all its fantastic forms and myriad manifestations. With this is mind it is surprising that some of the content in this book is close to twenty years old. Of course time doesn't necessarily invalidate science. The work of ancients such as Pythagoras, or Copernicus, or Newton's observations on gravity still hold valid after centuries. But since much of this book's focus is on genetics, at times the content could have benefitted by being more up to date.

The book also occasionally suffers from an overly casual tone, this due to the content being mainly transcriptions of talks. As a result some of the arguments, theories, and discussions are a little less coherently structured than a reader might expect in book dealing with science, no matter how vulgarized. A little light editing might also have eliminated unnecessary repetition and fluffiness.
But despite these few shortcomings there is an advantage to reading the essays featured in Life, as opposed to gleaning information from random articles on the internet. On the net knowledge is dispersed, whereas this book has a structured sense of narrative, showing how research from different disciplines, and their disciples, can bolster and inform each other. Ultimately the sum of the whole is greater than the sum of the parts, perhaps an apt and fitting off-the-cuff metaphor for the subject matter - life.

Elentarri says

John Brockman has collected 18 interviews, commissioned essays, and transcribed talks from the online science salon Edge.org that deal with biology, genetics, anthropology and environmental science. The majority of the articles were well written, self-contained, covered interesting topics and will provide food for thought and extra research. Some of the articles were a bit vague, but the rest were interesting enough to make up for this defect.

The book includes articles/interviews/discussions by:
01~ Richard Dawkins - discusses evolution and the selfish gene hypothesis (2015);
02~ David Haig - discusses genomic imprinting and selective gene expression (2002);
03~ Robert Trivers - discusses deceit, self-deception and genomics (2004);
04~ Ernst Mayr - discusses what evolution is (2001);
05~ Steve Jones - general discussion/ interview on genetics over time (2000);
06~ Edward O. Wilson - discusses ants, cells and the building of super-organisms (2003);
07~ Freeman Dyson - discusses the analog or digital format of biological processes (2001);
08~ Freeman Dyson, J. Craig Venter, George Church, Dimitar Sasselov, Seth Lloyd, Robert Shapiro, and

John Brockmann - discuss the concept of life in an *Edge* Special event (2007);
09~ Richard Dawkins and Craig Venter - sketch the frontiers of genomic research, discuss genes and digital information (2008);
10~ Armand Marie Leroi - discusses mutants, defects, gene expression, and genetic differences (2005);
11~ Daniel Lieberman - discusses running and human evolution (2012);
12~ Svante Paabo - discusses mapping the neanderthal genome (2009);
13~ J. Craig Venter, Ray Kurzweil and Rodney Brooks - conversation on biocomputation, cancer, drug functioning, and new biotechnology (2005);
14~ Drew Endy - discusses engineering living organisms and the ethics of this (2008);
15~ Kary Mullis - discusses new immune treatments for various viruses (2010);
16~ Richard Plum - describes bird mating rituals and discusses the evolution of aesthetic beauty (2014);
17~ Robert Sapolsky - discusses behaviour manipulating parasites such as *Toxoplasma* (2009); and
18~ Stuart Kauffman - discusses autonomous agents and thermodynamics (2003).

I found this book to be an enjoyable and interesting reading experience, and not too complicated for my 90 year old grandmother who will be borrowing this book.

Note: Minus one star for misleading subtitle. The majority of these articles are not recent and thus no longer the "leading edge". It would have been useful for the editor (or authors) to insert a few paragraphs at the end of each older article to explain how things have changed (or not) since the articles were written. This is especially relevant for the chapter on the Neanderthal genome mapping

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Sushil says

What I most liked about this book is its format. Instead of writing eighteen books on eighteen different facets of the science of life (and requiring the readers to find time to plod through them all), put together one single book with a chapter devoted to each facet written by an expert in that area. But the execution of the format is less than perfect, with too much space given to scientists to talk about their favorite though unproven and undigested theories. In any case, some of the chapters are individually worth buying the book for - a chapter on role of aesthetics in evolution being my favorite.

Eve says

Not only are all 23 writers males, they're all white males. It's hard for me to believe there hasn't been a single person of color or woman who wrote a meaningful article about evolutionary biology.

Probably the editor wasn't even aware that he had a bias, but just picked those authors that came most readily to mind as prominent writers in the field. But I think that prominence is probably because these white male authors inadvertently benefited from cultural bias in the first place. A better editor would have noticed this and balanced the book.

What's worse is that since this book is comprised of articles from edge.org, this is a pretty damning indictment of the inclusiveness of edge.org as an online science salon.

Atila Iamarino says

Uma coletânea de textos sobre biologia, evolução e informação, do site Edge. O livro é de 2016, mas muitos dos textos são mais antigos e estão bem datados por isso. Várias discussões ficam ao redor de tecnologias de ponta e descobertas novas, que já mudaram ou estão um pouco ultrapassadas.

Gostei de alguns textos com o Craig Venter, dando uma perspectiva de como acontece a pesquisa dentro de um instituto privado. E da discussão da evolução da beleza, do Richard Prum, mas o livro dele The Evolution of Beauty: How Darwin's Forgotten Theory of Mate Choice Shapes the Animal World - And Us já está na minha lista de para ler.

Kristina says

This book was overall very interesting and I'm glad that I finally took the time to read it. However, I find it hard to believe that John Brockman was unable to find any women doing worthwhile research in any of the fields that were covered in this book...

Ross says

A large collection of thoughts and essays from scientists and engineers on the nature of life, it's origins, evolution and genetic basis. Much of the material is from Richard Dawkins and Craig Venter which is the best of the collection. Some of the other is not very good, however, and I had to skim it.
Recommended for those very interested in the science of life and how we got here.

Guillermo Paz-y-Miño-C says

It Takes A Village To Boycott A Pop Science Book

If scientists wish to boycott a book, religious scriptures could be their priority. The holy books are the foundation of the anti-evolution movement worldwide; the anti climate change rhetoric over the belief that a Protector will shield his disciples from human-induced global pollution; the source of pray healing and its conjoined meme that vaccines are heinous; the primeval justification to bigotry, homophobia and misogyny; the validation of both intolerance to any action that is perceived as offensive --above all, freedom of speech-- and the crusade to secure society's protection of the intolerant him/herself.

In such broad anti science and anti intellectualism contexts, John Brockman has edited yet another volume about science and technology for popular consumption, Life: The Leading Edge of Evolutionary Biology, Genetics, Anthropology, and Environmental Science (2016). I have read this multi-author compilation with special attention, since, upon its release, biologists active in the social media became disappointed with Brockman (and, by default, with the co-writers) for not featuring women authors. And this was legitimate criticism. If Brockman and associates wanted to educate the public about current trends in the biological sciences, they must stop ignoring the diversities of peoples contributing to this global enterprise.

But, of course, I did not agree with the subsequent call to boycott Life, without even reading it, and the

deploy of bee-workers and drones to sabotage the purchasing of the work. Boycotting books can be dangerous. It always reminds me of the "burnings of knowledge" by the Nazis, prior to and during World War II, and comparable atrocities led by the Latin American dictators in Argentina and Chile, in the 1970s-80s. I learned of the former by precisely reading about it in my father's book collection on international affairs (which included Churchill's The Second World War, and even Hitler's sickening My Struggle), and of the latter while in high school by following the news of La Guerra Sucia (The Dirty War, term coined a posteriori in the United States) that targeted the creativity of university professors, novelists, musicians and poets. Their books and records flamed, their voices and bodies vanished.

Researchers ought to be aware of the popular science-, pseudo-science-, and anti-science books that distress or seem insulting to the public. And, for modern biologists, the list includes the deceptive writings of the intelligent design (ID) movement and its Undeniable: How Biology Confirms Our Intuition That Life Is Designed (2016), Evolution: Still a Theory in Crisis (2016), Debating Darwin’s Doubt: A Scientific Controversy That Can No Longer Be Denied (2015), Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design (2013), Science and Human Origins (2012), The Nature of Nature: Examining the Role of Naturalism in Science (2011), God and Evolution (2010), Intelligent Design Uncensored: An Easy-to-Understand Guide to the Controversy (2010), Signature in the Cell (2009), Intelligent Design 101 (2008), Dissent Over Descent: Intelligent Design Challenge to Darwinism (2008), Understanding Intelligent Design (2008), The Cell's Design (2008), The Design of Life (2008), Explore Evolution: The Arguments for and Against Neo-Darwinism (2007), The Edge of Evolution (2007), Intelligent Design: The Bridge between Science and Theology (1999), Darwin's Black Box: The Biochemical Challenge to Evolution (1996), and the villainous Of Pandas And People (1989), the foremost impostor exposed --and debunked-- at the Kitzmiller versus Dover Area School District trial of 2005.

Yes, I have these narratives of pseudo truths and quasi creeds, acquired over the years via used-books sellers --precisely to minimize supporting publishers of noxious fables (a micro sabotage of my own, one that does not discourage anyone to learn about ID). But I also possess the Holy Bible, the Qur'an, the Tanakh and The History of Western Philosophy of Religion (an academic series by Oxford UP, 2009), which I consider my duty to read as a secular scientist, and become aware of the idealistic beauty, historicity, obvious rooting in unreality, and evil, injurious teachings of religion.

Next to the ID bestsellers stand the pro-religion-in-science counterparts. Also sponsored by writers with doctoral degrees and in positions of power, committed to force-marriage evolution with the belief in supernatural causation, to see the fingerprints of God in DNA and molecular processes, to satisfy the populous' hope to find the Maker, Designer, or Creator in the gaps of knowledge. Francis Collins' The Language of God (2006), Belief: Readings on the Reason for Faith (2010), and The Language of Science and Faith (2011, coauthored with fellow evangelical Christian Karl Giberson) are iconic examples. Yet, none of these books deserves boycott despite their collective effect on disrupting, distorting, delaying or stopping the proper understanding and acceptance of evidence. But they do justify vigorous disapproval by scholars, who should uncover the capricious science emptiness of "evolutionary creation."

John Brockman's edition of Life, despite its disgraceful exclusion of gender and cultural varieties among co-writers, is scientifically above --and by far-- the ID's pamphlets or the "language-sequels" by theistic evolutionists. Life could be listed among the 100 required reads for graduate students in biology, and perhaps recommended to science majors in college, of course, with the warning that the contributors --busy reflecting about themselves-- discounted Homo diversity as a crucial input in "the leading edge of evolutionary biology, genetics, anthropology, and environmental science."

Life is "...the fifth volume in The Best of Edge series [edge.org], following Mind, Culture, Thinking, and The Universe..." As a collection of essays, interviews, transcripts of panel discussions, and biographical sketches of scientists and pop-science celebrities, the book is exciting, rich in brainy remarks and first-hand information. Eighteen pieces (from 2000 to 2015) summarize the major trends in science debates, applied

DNA technologies, and bioengineering of the twentieth and twenty first centuries --the latter, superficially.

Richard Dawkins opens with Evolvability (2015), in part a recount of gene-centric evolution in the scenario in which The Selfish Gene (1976) was crafted, and the resulting discussions over replicators (genes), as units of selection, versus "vehicles" (the carriers of genes, our bodies). His classical analysis expands to "universal Darwinism" and the high probability that Darwinian selection of replicator-like molecules shall be a ubiquitous cosmic phenomenon if life exists beyond Earth.

The Dawkinsian argument, in elegant text, is followed by David Haig's Genomic Imprinting (2002), Robert Trivers' A Full-Force Storm with Gale Winds Blowing (2004), Ernst Mayr's What Evolution Is (2001), Steve Jones' Genetics Plus Time (2000), Edward O. Wilson's A United Biology (2003), and Freeman Dyson's Is Life Analog or Digital? (2001). Thus, Life relies on attractive topics, as well as familiar names in the pop-science arena, to lure readers.

Pages and reading hours elapse quickly and Brockman succeeds at grabbing one's attention. Soon, I find myself immersed in the book, joyful at times for learning material that I have missed over the years; disturbed occasionally when sensing plain egomania in the XY-only writers, who turn their texts into self-grooming bouts and testosterone excretion (an exception, not the only one, is Trivers' auto-deprecating recollections, which are humorous and brilliant); furious by the redundant broadcasting of long-ago-dismissed science concepts; but overall satisfied to have liked a book which I approached with so much skepticism.

Chapter 8 (Life: What a Concept!) is the longest, with one hundred pages, and most captivating. It transcribes a panel discussion (2007) among Dyson, J. Craig Venter, George Church, Dimitar Sasselov, Seth Lloyd, Robert Shapiro, Ting Wu (not included in the list of authors), and moderator Brockman.

As introduction to the dialogue, Dyson, a theoretical physicist, discusses the garbage-bag-model of life. The origin of life, he explains, probably started with metabolism only. "...We know modern life has both metabolism and replication, but they're carried out by separate groups of molecules. Metabolism... by proteins and all kinds of small molecules, and replication... by DNA and RNA. That may be a clue to the fact that [these processes] started out separate, rather than together... The early cells were just little bags of some kind of cell membrane, which might have been oily or... a metal oxide. And, inside, you had a more-or-less random collection of organic molecules, with the characteristic that small molecules could diffuse in through the membrane, but big molecules could not diffuse out. By converting small molecules into big molecules, you could concentrate the organic contents on the inside, thus the cells would become more concentrated and the chemistry would gradually become more efficient. So, these things could evolve without any kind of replication. It's a simple statistical inheritance. When a cell became so big that it got cut in half, or shaken in half by some rainstorm or environmental disturbance, it would then produce two cells, which would be its daughters and would inherit, more or less, but only statistically, the chemical machinery inside. Evolution could work under those conditions."

If these statements provoke in you, as bookworm, any of the emotions described earlier (i.e. joy, disturbed, furious, satisfied), your reactions are comparable to those of the panel. Dyson's garbage-bag hypothesis may be garbageous (i.e. the divide metabolism versus replication is artificial, and relying on heavy statistical randomness diminishes how natural selection operates, or did in the past, in primordial soups), but despite its teleological nature it is intellectually intriguing. Irrespective of the transcript's dryness, it happens that the sharp cuts, irony, disagreements and rescuing of the discussion by the panelists themselves grow evident while reading the fascinating exchange. And Brockman moderates it with minimal input, except for the sporadic injection of extra fuel to ignite healthy controversy.

The second half of the book proceeds with a one-on-one chat between Dawkins and Venter, refereed by Brockman, in The Gene-Centric View: A Conversation (2008), followed by Armand Marie Leroi's The

Nature of Normal Human Variety (2005), Daniel Lieberman's Brains Plus Brawn (2012), Svante Pääbo's Mapping the Neanderthal Genome (2009), and a transcript of On Biocomputation (2005), a TED event (Technology, Entertainment, Design) featuring Venter, Ray Kurzweil and Rodney Brooks.

Life closes with pieces by Drew Endy, on Engineering Biology (2008), Kary Mullis' Eat Me Before I Eat You: A New Foe for Bad Bugs (2010), Richard Prum's Duck Sex and Aesthetic Evolution (2014), Robert Sapolsky's Toxo (2009), and Stuart Kauffman's The Adjacent Possible (2003). All mix personal experiences with the authors' making and living the developments of their own fields.

Titles like Life sell fine. The scientist reader can locate in the book historical relevance and depth if he/she looks for and wants to see them. The lay reader might simply take pleasure in the journalistic ride and claim proficiency in pop-science culture at the end of the journey. The spot-the-error copy editor will never forget, nor forgive, that the cover of Life lists "Matt Ridley" as contributor, a science personality nowhere else to be found (at least in the copy I have), a regrettable carelessness in book production. Plus, there is no leading edge in the compilation of articles, the average publication date (2006) is ten years too old.

It may take a village to boycott a pop science book, but Life is not the right target, or perhaps is just an easy one. It demands much more courage, and by the entire scientific community, to individually and collectively go after the unquestionable adversaries of reason. Those who see facts and fiction indistinguishable, the ideologues and financiers of both the religion-in-science and the anti science movements.

Steven says

>"Race isn't real", "genetics shows we're all identical, and pigmentation differs because genes, but we're all the same but we're not but we are", additionally: "what is it about pigmentation that brains?"

Lots of goofy politically correct nonsense. A number of terrible people are endorsed as well. Lewontin, Gould, Jared Diamond etc. Usual suspects. Fortunately, they kinda make up for it by trashing "evolutionary" psychology.

Never mind. I actually finished it, now. A contributor near the end lied about eugenics endlessly. Pure leftist nonsense.

Marisa says

Really boring. I gave up in the 4th chapter. I was hoping to have a better insight in evolution but the first 4 chapters were a brief skim on the idea of evolution. The content were mainly transcripts edited from talks, I believe. Most of the content does not seem appealing in written form, unfortunately.

Peter Gelfan says

Like many of the books Brockman edits, this one is a collection of interviews, essays, and discussions from Edge.org, which, in its own words, assembles the thinkers—scientists, artists, philosophers, technologists, and entrepreneurs—at the center of today’s intellectual, scientific, and technological landscape. The ideas discussed in these books are emerging concepts at the forefront of their fields. They may not pan out, and if

they do, like anything that evolves, perhaps in not in the same form. Why waste time reading half-baked theories and research? Because they stretch your brain. Hey, why didn't I think of that? Good question, why didn't you?

Life is an accurate title. Discussions in this book relate to life—how to define it, how evolution really works, what is "normal," brain vs. brawn, non-organic life, how parasites affect decision making (even in humans), a new approach to antibiotics, the arms race in duck sex, and the wonderfully evocative idea of the adjacent possible. As far as I know, you can't get this stuff anywhere else unless you comb through research papers and academic journals.

The book is very readable for anyone who paid a little attention in high school science courses. It's written (sometimes transcribed from discussions) in lively, conversational language. Its stand-alone pieces make it easy to dip in and out. It's exciting and may change the way you look at the world.

Teo 2050 says

[Brockman J (ed.) (2016) (12:38) Life - The Leading Edge of Evolutionary Biology, Genetics, Anthropology, and Environmental Science

Acknowledgments
Introduction by John Brockman

01. Evolvability :: Richard Dawkins
02. Genomic Imprinting :: David Haig
03. A Full-Force Storm with Gale Winds Blowing :: Robert Trivers
04. What Evolution Is :: Ernst Mayr (with an introduction by Jared Diamond)
05. Genetics Plus Time :: Steve Jones (in conversation with Edge)
06. A United

Gy says

This is an EDGE book and Mr. Brockman brought some old and some new as well. Repeating old and already obvious matter is not that bad. There are always some new aspects we can discover.
But let alone those old things! What I appreciate in "Life" is the story about TOXO! My first ecounter with this very dangerous parazite was in "Evoulutionary psychology-political background...". Believe me, you want to know about it!
We can slam the author for any of reasons I saw in reviews, but EDGE books always carry that serendipitous value I like in them. Enjoy it!
