Consciousness: Confessions of a Romantic Reductionist

Christof Koch

Consciousness: Confessions of a Romantic Reductionist

Christof Koch

Consciousness: Confessions of a Romantic Reductionist Christof Koch
In which a scientist searches for an empirical explanation for phenomenal experience, spurred by his instinctual belief that life is meaningful.

What links conscious experience of pain, joy, color, and smell to bioelectrical activity in the brain? How can anything physical give rise to nonphysical, subjective, conscious states? Christof Koch has devoted much of his career to bridging the seemingly unbridgeable gap between the physics of the brain and phenomenal experience. This engaging book--part scientific overview, part memoir, part futurist speculation--describes Koch's search for an empirical explanation for consciousness. Koch recounts not only the birth of the modern science of consciousness but also the subterranean motivation for his quest--his instinctual (if "romantic") belief that life is meaningful.

Koch describes his own groundbreaking work with Francis Crick in the 1990s and 2000s and the gradual emergence of consciousness (once considered a "fringy" subject) as a legitimate topic for scientific investigation. Present at this paradigm shift were Koch and a handful of colleagues, including Ned Block, David Chalmers, Stanislas Dehaene, Giulio Tononi, Wolf Singer, and others. Aiding and abetting it were new techniques to listen in on the activity of individual nerve cells, clinical studies, and brain-imaging technologies that allowed safe and noninvasive study of the human brain in action.

Koch gives us stories from the front lines of modern research into the neurobiology of consciousness as well as his own reflections on a variety of topics, including the distinction between attention and awareness, the unconscious, how neurons respond to Homer Simpson, the physics and biology of free will, dogs, *Der Ring des Nibelungen*, sentient machines, the loss of his belief in a personal God, and sadness. All of them are signposts in the pursuit of his life's work--to uncover the roots of consciousness.

Consciousness: Confessions of a Romantic Reductionist Details

Date	:	Published March 9th 2012 by The MIT Press
ISBN	:	9780262017497
Author	:	Christof Koch
Format	:	Hardcover 184 pages
Genre	:	Science, Biology, Neuroscience, Philosophy, Nonfiction, Psychology

From Reader Review Consciousness: Confessions of a Romantic Reductionist for online ebook

Antonia says

I liked it very much. Some of it was very entertaining. In a few places, I just felt lost. An excellent discussion of free will, however, and that's a difficult topic. I'll probably reread that chapter.

My favorite paragraph:

"If we honestly seek a single, rational, and intellectually consistent view of the cosmos and everything iin it, we must abandon the classical view of the immortal soul. It is a view that is deeply embedded in our culture; it suffuses our songs, novels, movies, great buildings, public discourse, and our myths. Science has brought us to the end of our childhood. Growing up is unsettling to many people, and unbearable to a few, but we must learn to see the world as it is and not as we want it to be. Once we free ourselves of magical thinking we have a chance of comprehending how we fit into this unfolding universe." - p. 152.

And this should be a poster:

"No matter, never mind."

Maria says

After receiving the Nobel prize along with James Watson and Maurice Wilkins in 1962 for the elegant description of the structure of our helical molecule, Francis Crick dedicated his life towards the studying of the mind. Although I knew this true genius dedicated his life on this, I haven't got the opportunity to read about his work on consciousness before, so I was really excited when I found this book the other day.

Consciousness is a fascinating memoir, written by Christof Koch, about his research work along with Francis Crick on their quest on understanding what the mind is....on what is consciousness and makes us "human". Koch, also a physicist like Crick and with a minor in philosophy, will give you a fascinating approach on this topic as well as on free will. Can we truly act freely or are we just the result of the predispositions and circumstances of our environment or the culture we were raised by? What does physics have to say about this? Can the computational theory of mind help us to understand our "qualia"? Do animals have consciousness? Does the cortico-thalamic system has the answer? You will find a little of this along your reading.

Many of us, rely on science and philosophy in order to look for answers of the many questions our curiosity can give us, and this is what this memoir is about. So I really enjoy when I find a scientist that tries to give answers from many different approaches. In this case, our consciousness from a physics, philosophical and neurobiological perspective for only one true answer. I found Koch as an honest writer, who besides talking about his research talks openly about his loss in religious belief due to a maturity in seeing the world as it is along with being incompatible with scientific explanations. A naturalist scientific in whom I also noticed a touch of existentialism and a great sense of wonder. I like and agree with Koch expressing: "There is no

reason why we should not ultimately understand how the phenomenal mind fits into the physical world".

Well, even if we find a reductionist molecular answer to this great riddle of the mind, will humans ever settle with this explanations or will we always be in the need something more?

I also perceived the same Crick that I've read many times and that James Watson also describes, open to new and radical explanations but always consistent with established and verifiable facts. It was funny to see that he referred to automatisms as zombie agents! It was a true delight for me to read about the research of this pair of geniuses and their friendship all the way to Crick's death.

I'll close with my favorite Francis Crick quote: “There is no scientific study more vital to man than the study of his own brain. Our entire view of the universe depends on it.”

A short memoir, that I really liked!

Daniel says

I started reading this book because of my connection to the Allen Institute. This is more of an autobiography and memoir than actual details about his integrated information theory and his vision for the future. Koch admits he has a flamboyant personality and that certainly shows in his writing, which makes the book interesting to read, but sometimes hard to decode. He covers many popular neuroscience discoveries (like Jennifer Aniston neurons and the Libet experiments) that may be a boring review for people already familiar with neuroscience & philosophy. If you've already Sam Harris's brief book Free Will, or read How to Create a Mind by Ray Kurzweil, many of the ideas of determinism vs. libertarian compatibilism and panpsychism are echoed. The meat of the book is towards the last few chapters where he briefly discusses integrated information theory, free will, and religion. I would recommend this book more for a lay audience that is less familiar with neuroscience and also interested Christof's autobiography.

Joseph Siegel says

Chapters 6,7,8 are five-star material. The book is too full of things like this: "in 1995, Francis and I published a manuscript in the international journal Nature...(Having your article appear in Nature is like having the premier gallery in New York or Paris display your art; it's a big deal.)" In the chapters not numbered 6,7, or 8, these punchable offenses so outweigh anything of note that I only can selectively recommend the book. I was looking for Ernst Mayr, and I got a middle-aged dude still trying to impress everyone by his career, his mountain climbing, his friends, and his ability to turn "clever" phrases. He does refer once each to Heraclitus and Thales, however, so I would definitely treat him to a reasonable lunch.

Nia Nymue says

The writer is a passionate empiricist who strongly believes that the Hard Problem of Consciousness can be resolved through scientific means. He doesn't actually say how in this book, but he emphasises this belief several times.

The text is very easy to read and is peppered with the right amount of geeky humour that most people would appreciate. It's also well-structured and can be read even by those without any background knowledge in philosophy. One possible drawback to the book is the inclusion of some sentimental parts. The last chapter is entirely unnecessary for anyone reading this book purely for academic purposes.

A new thing I did learn from this book was Giulio Tononi's Integrated Information Theory and how it can be used to detect consciousness. The writer then justified panpsychism on empirical grounds.

Ian says

Philosophers, theologians, and scientists have debated the questions of human consciousness for a very long time. What is the difference between my brain and my mind? Are my thoughts simply epiphenomena arising glibly from the chemical soup of the grey matter behind my skull walls, or do they spring divinely from my eternal soul or from some sort of ethereal akashic records?

These are daunting issues, but Christof Koch is well-qualified to tackle them as a scientist who worked alongside one of the biggest names in neurology and consciousness studies--indeed all of biology--Francis Crick of DNA double-helix fame.

Koch's approach is very readable, almost conversational. Although much of the scientific nitty-gritty was above my crude, rudimentary level of biochemical and neurological understanding, his book takes an approach, as the subtitle indicates, as a confessional of a romantic reductionist. Born into a devout Catholic household, he struggled at times to put aside the romantic notions of mind and soul from the hard-data and empirical results that the reductionist scientific community was building upon after the middle of the 20th Century. The book makes for a read that is part autobiography, part history, part philosophy, and part scientific journal; an eclectic mix for sure, but one that worked well for me.

Although I would have really liked to also see some discussion around puzzles such as out-of-body and near death experiences, which I believe stretch the connection between brain material and consciousness to the maximum, I feel that Koch puts together a pretty good argument that science is slowly but surely getting us closer to a more accurate understanding of what consciousness is and how it works. Let's face it, though...we have a long, long way to go, as science has only just started assembling the edge pieces of this puzzle.

The parts about information theory, information integration, and optogenetics were really interesting. I've always been skeptical of engineers and scientists who simply tout the speed and large memory of a computer switchbox as something approaching artificial intelligence and ultimately the "singularity of consciousness". Well, size is not everything. Koch explains the work of Giulio Tononi, which centers around the idea that the degree of consciousness (of a human, or a dog, or mouse, or even a computer network) depends upon the interlinking integration of the information itself.

> ...the *quantity of conscious experience* generated by any physical system in a particular state is equal to the amount of integrated information generated by the system in that state above and beyond the information generated by its parts. The system must discriminate among a large repertoire of states (differentiation), and it must do so as part of a unified whole, one that can't be decomposed into a collection of causally independent parts (integration).

I heartily recommend this for readers with a reasonable background in basic science interested in the ancient

puzzle of mind over matter and who don't mind dipping into personal anecdote and thoughtful commentary. They should find this an interesting and entertaining read in a daunting subject.

Anagh says

The reading of all good books is like a conversation with the finest minds of past centuries.
-Rene Descartes

The subject of the book is an age old conundrum that has preoccupied scientists,philosophers and mystics alike for over many millenia- How does the water of biological tissue become the wine of conscious perception? How can the inanimate rumblings of neurons cause feelings as diverse as love, fear, anger or existential angst? Do lower life forms possess that same apparatus as us to perceive love, loss and suffering? If so(if we are to believe Koch), what are the implications on our conduct towards them ?

Early on in the book, Koch desists from overemphasising a rigid definition of consciousness, arguing in favour of a loose interpretation derived from commonplace and clinical experience. Along the way he takes great care in pointing out the distinction between attention and consciousness- a frequent bone of contention in academic circles. The authors love for philosophy is not lost on the reader as he masterfully traces the philosophical underpinnings of consciousness from Aristotle to Nietzsche and Wittgenstein. Koch gives a blueprint for a rigorous theory based on the solid foundations of Shannon’s information theory- the so called Integrated information theory. To quote Koch 'Even if it(IIT) turns out to be wrong, it will be wrong in interesting ways that illuminate the problem.'

Despite the ancient origins of the problem, most serious progress has occurred only in the recent past. Armed with gizmos like fMRIs, EEG and much recent still-optogenetics, neuroscientists are taking definitive steps in the right direction. The book is replete with topical case studies as well as classic experiments like the famous *readiness potential* experiments pioneered by Benjamin Libet. As such, the book is worth a dekko for the serious practitioner as well.

Koch does well in firmly extricating the study of consciousness from the realm of new age charlatans(Deepak Chopra ?) and cults and places it squarely in the domain of science- so that serious researchers can take a whack at it without losing credibility. Ever since the grand success of quantum mechanics and evolutionary biology, religion has been in constant retreat. In some ways, the mystery of consciousness is the last bastion where religions of all shapes and stripes have sought refuge from the onslaught of science.

Along the way the book provides the reader with interesting snippets about the life of a scientist working at the forefronts. It paints a charming picture of the relationship between a celebrated mentor and his famous acolyte. Koch poignantly captures the trials and tribulations concomitant with a crisis of faith. What stands out throughout the book is the extraordinary courage the pursual of a problem exacts from the scientist. Written in the finest traditions of modern science writing, it gets my unequivocal approval !

---

jennifer says

Wow. What a rich, heady read! I appreciated how humble and down-to-earth Koch was throughout, emphasizing that we don't have all the answers (yet!). The most meaningful revelation was in the final chapter, which reminded me that having the capacity to contemplate humanity does not spare me from being one.

Safat says

I was interested in this book because the title seemed appealing. I basically wanted to know the author's take on the 'Hard problem' of consciousness. Here, I was satisfied. Although a through reductionist, Koch admits the 'limit of reductionism' and claims that consciousness is something fundamentally different from matter and can never be fully reduced to matter. His attempt to gap the bridge between mind and matter is 'Integrated information theory', which is sort of a metaphysical theory with sufficient mathematical formulation, but still has a long way to go.

A major part of the book was a memoir. Koch worked with Francis Crick, who seemed like an amazing character to me. All in all, I enjoyed the book very much.

Kelly Head says

Christoph Koch is one of the leading scientists studying consciousness at a fundamental level. He has studied under the brilliant Francis Crick, is the lead scientist at the Allen Brain Institute in Seattle, and teaches at Cal Tech. A large portion of the book deals with the theory of a colleague of Koch's named Guilio Tononi. Tononi holds that consciousness is integrated information, a measurable property of causal systems that may exist in both biological and non-biological systems, e.g. computers. This view is interesting for a variety of reasons, but I think two of the things that stood out to me about it were its similarity to panpsychism and its invocation of Platonism. Oddly enough, Koch is very dismissive of philosophers throughout the book, despite being well-versed in the tradition and a huge fan of Descartes. He thinks Chalmer's skepticism about ever being able to resolve the Hard Problem of Consciousness is typical of philosophers overstepping their bounds and limiting science's abilities. There are many interesting autobiographical elements to this book, including some heavy-duty existential reflection. Koch's willingness to speak to issues of religion and his personal faith history were welcome alternatives to most scientists' summary dismissal of all things spiritual. My biggest beefs with this book were his failure to articulate HOW integrated information JUST IS consciousness (i.e. how does it bridge the first-person/third-person divide?) and his sometimes scattered and incoherent thoughts on religion. Overall, one of the best books about consciousness I have encountered, and sure to be a classic.

Jafar says

Here's a neuroscientist who wrote *The Quest for Consciousness: A Neurobiological Approach*, trying to explain how brain can give rise to consciousness. It doesn't look like he's even managed to convince himself. While you can always find a "neural correlate" for any sensory or mental or emotional experience, it's still a puzzle how neural and synaptic activities result in subjective conscious experiences. It's what philosophers refer to as the *Hard Problem*. Invoking an ethereal soul to explain this is not only unscientific, it actually creates more problems than it solves.

Koch spends the first half of the book summarizing the present state of research on consciousness. He then proceeds to propose a solution for the Hard Problem, admitting that he's throwing caution to the wind. He postulates that consciousness is a fundamental and elementary property of organized matter. It doesn't *rise* from anything, in the same manner that the electric charge of a particle is its intrinsic property and doesn't emerge from anything else. There's nothing special about human brain. Anyone would agree that although dogs can't compose symphonies or play chess, they're sentient beings. As you go down the complexity ladder, there's no clear point where to stop and proclaim the absence of consciousness. Nor is there anything especial with organic matter and what we call living systems. Consciousness is the property of any systems with interacting parts. The larger and more highly networked the system, the greater the degree of consciousness. Is the Internet conscious? Who knows! Is the universe, in its entirety, a self-conscious being? Who knows! Koch tries to provide some justification for this solution based on the *integrated information theory* and even proposes ways of how his hypothesis can be tested.

Basically, instead of providing a solution for the Hard Problem, it seems to me that Koch is cleverly erasing the problem. Can't explain how matter gives rise to consciousness? Say it's its intrinsic property. He may well be right. Who knows. But we're still far away from solving this problem.

India Clamp says

One cannot mention Koch without including Francis Crick---as they go together like Matzo and ball. Though too many to name here, the accolades of this author would fill a twelve-page CV. In brief, Koch taught at California Institute of Technology and elegantly vibrates our silvery web like tangle of the mind with the question, what is consciousness? He equates the brain to a psychic experience having a plus or minus one charge.

“Midway in the journey of our life
I came to myself in a dark wood,
For the straight way was lost.”
---Dante Alighieri

Consciousness: Confessions of a Romantic Reductionist is a velvety warm read. Understanding “from nothing comes nothing” is something familiar to our senses. Koch jumps with us into the “schwarz” void and we probe the riddle of our existence. For example, in a brain existing without a cerebellum, why are there so few cognitive defects like: ataxia, unsteady gait or slurred speech? Should there be more?

Engaging read, imparting a latte art cappuccino-like experience feeling superb as the caffeine slowly permeated my being and injected bright color into my “bête noire” microcosm. Life in its complexity we may come to find is an unrelenting quest of survival acting as an engine propelling evolution forward. Must read for erudition hungry physics, medical and philosophy devotees. Read, ponder and deduce!

Alison says

It's very hard to categorise or summarise this book. It works as an introduction to the field of neuroscience - particularly to the concepts involved, as opposed to this-bit-of-brain-then-that-bit-of-brain - it also has

elements of speculative science; memoir and philosophy. Perhaps most affectingly, however, it is a surprisingly emotional grappling from a man who knows than almost everyone about how the brain works, yet loses himself in grief and guilt just the same. A man who understands how far we are from understanding why we do what we do, and how this rich internal life of ours, well, *is*.
Which is not to be confused with a religious or spiritual approach that says this is unknowable. If Koch's book is a hero's journey towards specific knowledge, it doesn't conclude with defeat, but with the optimistic note that gradual enquiry reveals truths and understandings, even if it falls short of "Life, the Universe and Everything" answers. (Koch provides a splendid side-swipe at M-Theory here, managing to make it look petty and small - the attempt to have a solution at any cost, when we just aren't there yet).
It's very short this book, but in the end it packed a real punch and will be one of those which come back and cycle around in my head.

Kevin says

This is a powerful book brimming with fascinating insights into the author's quest to understand consciousness. Brilliant stuff, well-written and captivating. Loved it.

Tapio says

A pleasant read. Koch makes clear that what he is writing is also something like a memoir, and indeed he is not always very informative. Flows easily and is somewhat rewarding, which makes for 4/5.
