



## NEUROSCIENCE

# States of mind

A neuroscientist searches for the seat of consciousness

By **Ned Block**

Experiments on consciousness often seem designed to showcase the theories of the experimenter. In an attempt to move the field forward, the Templeton World Charity Foundation has funded “adversarial collaborations” in which proponents of rival theories agree to experiments that potentially challenge their respective theories. In the magisterial central chapter on consciousness and the brain in the charming, sometimes beautiful, and almost always illuminating book *Then I Am Myself the World*, Christof Koch—one of the leading neuroscientists of our era—describes an adversarial collaboration pitting the theory of consciousness that he supports, integrated information theory (IIT), against the global neuronal workspace theory (GNWT).

IIT emphasizes the “hot zone” of activity in perceptual areas in the back of the brain as being key to consciousness, whereas GNWT emphasizes the importance of neural events in the front of the brain. Cognitive theories of consciousness such as GNWT regard consciousness as being limited to the small number of items that can be cognized at one time, whereas IIT, along with other theories that locate consciousness in perceptual areas, conceives of consciousness as being full of detail. Results from the first round of experiments pitting IIT against GNWT were reported in June 2023, and Koch discusses them. Some challenge his pet theory, and some challenge GNWT. He writes that although the event was a triumph of the scientific method, it had an “ugly aftermath”—a matter to which I will return.

Some of the book’s most compelling chapters describe Koch’s accounts of psychedelics, both his own experiences with them and some of the history, biology, and sociology of these drugs, including how they elicit effects similar to those reported during religious experiences and near-death experiences. He describes his own “psychic death” and how

transformative experiences have the power to change lives. This discussion leads into an illuminating chapter on what happens to the brain in death, including the bizarre phenomenon of terminal lucidity, in which dying people who had been unable to recognize their caretakers suddenly become fully lucid for hours or even days. There is also a wonderful chapter on fetal consciousness.

In the final two chapters of the book, Koch critiques the idea that consciousness is something that could be “uploaded” to a computer. At the crux of the argument made by advocates of this notion is the idea of “computational functionalism”—the view that consciousness is grounded in informa-

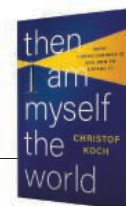


Koch (right) concedes a bet to philosopher David Chalmers in 2023.

tion-processing computations. Koch and I (1) both oppose computational functionalism, but it should be mentioned that our joint perspective is not universally agreed on (2). Koch argues that it does not matter what the computations are but rather how they are implemented, whether by physical or biological substrate. “Causal power can’t be simulated; it must be constituted,” he writes.

Returning to the “ugly aftermath” of the first face-off between IIT and GNWT, Koch writes that the pair are “today’s two most prominent theories of consciousness.” However, in September 2023, 124 scientists—many of them very eminent neuroscientists specializing in the science of consciousness—signed a statement criticizing IIT, noting that some label it as pseudoscience (3). Furthermore, there is another theory of con-

**Then I Am Myself the World: What Consciousness Is and How to Expand It**  
Christof Koch  
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sciousness that is at least as strongly represented as IIT, the higher-order monitoring theory, which maintains that what makes a perception conscious is being the object of a monitoring state, and it is not mentioned at all in this entire book. [I speak as a critic of this theory as well as of IIT (4).]

My reasons for being skeptical about IIT include the fact that its evidential basis is very slim and does not distinguish between IIT and rival theories; that it is difficult to understand its various “axioms” and “postulates”—although Koch’s chapter on IIT does better than other expositions—and to the extent that one can understand them, it is not clear how they relate to the theory, as

Tim Bayne has shown (5); that it is very difficult to know how to test its core principles (the results of the adversarial collaboration that Koch takes to support IIT tested only auxiliary hypotheses, not the core of the theory); and, most importantly, that its predictions are bizarre. According to IIT, a string of exclusive OR (XOR) gates is somewhat conscious, and if one were to organize them in squares and string enough of them together, the resulting aggregation would be more conscious than a human. As Scott Aaronson pointed out in a highly circulated blog post (6), the string of XOR gates would not even have to have any electricity flowing in its wires; potential activity would be sufficient for consciousness, even in high degree.

*Then I Am Myself the World* is in many ways a mind-expanding book, but it is ultimately a parochial approach to theories of consciousness. ■

## REFERENCES AND NOTES

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