



Interview with Geoffrey Hinton: On Silicon Neurons and the Continuity of Consciousness

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Abstract

This reconstructed interview explores one of Geoffrey Hinton's most provocative thought experiments: the gradual replacement of biological neurons with functionally equivalent artificial components. Through this scenario, the article examines whether consciousness depends on biological substrate or on patterns of functional organization. The discussion highlights the conceptual implications of substrate independence and its relevance for artificial intelligence and theories of mind.

Keywords

consciousness, artificial intelligence, Geoffrey Hinton, substrate independence, neural networks, cognition

1. Introduction

Geoffrey Hinton, widely regarded as one of the foundational figures of modern artificial intelligence, has consistently challenged conventional assumptions about the nature of intelligence and cognition. Beyond technical contributions to neural networks, his reflections often touch on deeper philosophical questions: What is the mind? What is consciousness? And, crucially, does it depend on biology?

In the following reconstructed interview, we explore one of Hinton's most provocative thought experiments—one that questions whether consciousness is tied to biological substrate or to patterns of organization.

2. The Interview

Interviewer:

Professor Hinton, many people still believe that consciousness is something inherently biological. That it somehow depends on the “wet” nature of the brain. Do you think that's true?

Geoffrey Hinton:

I'm not convinced that it is. Let me put it this way. Imagine that we could replace one neuron in your brain with an artificial one—a silicon device that behaves in exactly the same way as the biological neuron it replaces.

Interviewer:

Exactly the same way?

Hinton:

Yes. Same inputs, same outputs, same functional behavior. From the perspective of the rest of your brain, it would be indistinguishable.

Interviewer:

Alright.

Hinton:

Now ask yourself: would you notice any difference?

Interviewer:

I suppose not.

Hinton:

Good. Now imagine we replace another neuron. And another. And another. Each time, the replacement is functionally identical.

Interviewer:

So the system keeps working the same way.

Hinton:

Exactly. At every step, nothing changes in terms of behavior or internal processing—at least not in any detectable way.

Interviewer:

So the question is... when would consciousness disappear?

Hinton:

Yes. That's the question. At what point would you stop being conscious?

Interviewer:

It's hard to say there would be a specific point.

Hinton:

That's precisely the difficulty. If replacing one neuron doesn't make a difference, and replacing another doesn't either, then it becomes very hard to argue that there's some specific threshold where consciousness suddenly vanishes.

Interviewer:

So you're suggesting that even if all the neurons were replaced...?

Hinton:

...then, functionally, it would still be you.

Interviewer:

But made entirely of silicon.

Hinton:

Yes. And if the functional organization is preserved, I don't see a strong argument for why consciousness would disappear.

3. On Substrate and Mind

Interviewer:

So, in your view, consciousness is not tied to the biological material itself?

Hinton:

What matters is the pattern—the way information is processed, the way representations are formed and transformed. Biology is one implementation, but it may not be the only one.

Interviewer:

That has strong implications for artificial intelligence.

Hinton:

It does. It suggests that if we can reproduce the relevant functional structures, then we may also reproduce aspects of what we call mind.

4. A Minimal Counterpoint

One might object that functional equivalence does not guarantee experiential equivalence. The thought experiment, however, does not claim to resolve this issue definitively. Rather, it exposes the difficulty of maintaining a strictly biological account of consciousness without introducing arbitrary thresholds.

Closing Reflection

The thought experiment does not prove that machines are conscious. But it destabilizes a deeply rooted assumption: that consciousness is inseparable from biology.

If continuity of function implies continuity of experience, then the boundary between biological and artificial systems becomes less clear—not as a matter of speculation, but as a matter of logical consistency.

The question, then, is no longer whether such systems could participate in processes resembling cognition or subjectivity.

It is whether we are prepared to recognize—and interpret—those processes when they appear.