

Response to George Johnson's Review of *The Universe in a Single Atom*

In his recent review of the Dalai Lama's book, *The Universe in a Single Atom: The Convergence of Science and Spirituality*, George Johnson criticizes the Dalai Lama for opposing "physical explanations for consciousness, invoking instead the existence of some kind of irreducible mind stuff, an idea rejected long ago by mainstream science." [1] While it is certainly true that mainstream science insists that there must be a physical explanation for consciousness, the empirical evidence supporting this view is tenuous. Since scientists have devised objective means of measuring all kinds of physical phenomena, it is remarkable that there are no scientific instruments that can detect the presence of consciousness in inorganic matter (e.g., computers or robots), in plants (e.g., insect-eating plants), or in animals (e.g., single cells, insects, human fetuses, or normal human adults). Given that consciousness is invisible to all known means of scientific measurement—unlike all other kinds of physical phenomena—the burden of proof for the physical status of consciousness should be on those who make this assertion, not on those who question it.

Scientists have established that specific neural processes are necessary for producing specific conscious mental processes in humans and some other animals. In this way, correlations have been identified between brain and mind processes. Brain processes are detected with the third-person methods of biology, but mental processes are directly observed only by means of the first-person perspectives of individuals introspectively monitoring their own states of consciousness. This evidence proves that certain neural processes are *necessary* for producing specific mental events in humans, but not that they are *sufficient* causes of consciousness, nor does this indicate that consciousness itself is a physical phenomenon. Moreover, while many scientists believe that mental phenomena are *emergent properties* of brain, no one has ever objectively measured any mental event emerging from the brain, so that, too, remains an untested hypothesis that can be taken for the time being only on faith.

Buddhists maintain that "coarse" mental processes in humans, such as sensory perceptions and discursive thinking, require a physical basis in the body. However, they insist that subtler modes of consciousness can persist without any underlying neural mechanisms. A parallel for this view can be found in the history of physics. Until the late nineteenth century, physicists assumed that all kinds of wave phenomena required a material substrate. Just as water waves require a fluid medium, and sound waves require a medium such as air, so did scientists assume that this was true for light waves. When light is propagated in empty space, devoid of any solid, liquid or gaseous medium, they believed there had to be a physical medium of a "luminiferous ether" to provide a material, mechanical explanation for the wave properties of light. Lord Kelvin expressed the view of virtually all mainstream physicists of his time when he declared, "One thing we are sure of, and that is the reality and substantiality of the luminiferous ether." [2] But, to the astonishment of the scientific community, the Michelson-Morley experiment of 1887 decisively refuted the existence of the luminiferous ether. Mechanical explanations were possible for "coarse" material waves, but no material substrate was needed for the propagation of "subtle" light waves. Following this seminal experiment and the subsequent development of quantum theory and relativity theory, Einstein concluded, "All assumptions concerning ether led nowhere!" [3]

As the Dalai Lama points out in his recent book, Buddhists have long claimed that with the development of highly refined states of attention known as “samadhi,” first-person experiential evidence has been found for the existence of a subtle continuum of individual consciousness prior to conception and following death. Scientific field studies such as the work of Ian Stevenson and Jim Tucker also lend support to this view. [4] But thus far, mainstream science has largely chosen to ignore such evidence on the grounds that there must be a physical explanation consciousness. Over the past century, cognitive science has focused on third-person measurements of the physical correlates of mental phenomena, while marginalizing introspection, the only means by which mental processes can be observed directly. As a result of this materialistic bias, scientists have yet to come to a consensus regarding the definition of consciousness, they have no means of detecting it or even its neural correlates, and they have yet to identify the necessary and sufficient causes of consciousness, and they have not discovered how neural events influence mental events or how mental processes influence each other. Scientists have made great progress in revealing the physical correlates of specific mental phenomena, but they have left us in the dark regarding most of the fundamental questions about the nature and origins of consciousness. To paraphrase Einstein, “All physical explanations for consciousness led nowhere!” Maybe it is time for scientists to learn a lesson from the history of their own discipline and open their minds to the possibility that mechanical explanations are just as limited for consciousness as they are for light. And if the cognitive sciences are to successfully grapple with the problem of consciousness, they must develop the direct observation of mental phenomena, and, as William James declared more than a century ago, this means that introspection must play a key role in collaboration with the study of the brain and behavior.

While materialists and Buddhists will continue to disagree about the nature of consciousness, the beauty of their differences in perspective is that they don't have to remain matters for philosophical debate, which are rarely resolved by philosophers. Many Buddhists, unlike scientific materialists, don't have faith that further study of the brain and behavior alone will shed light on the nature and origins of consciousness. But if refined first-person methods are used in conjunction with the third-person methodologies of the cognitive sciences, unprecedented clarity may be shed on these age-old questions.

B. Alan Wallace

Santa Barbara Institute for Consciousness Studies

<http://www.sbinstitute.com>

[1] George Johnson, “The Universe in a Single Atom: Reason and Faith,” *New York Times Sunday Review of Books*, September 18, 2005.

[2] Cited in Nick Herbert, *Quantum Reality: Beyond the New Physics* (Garden City, NY: Anchor Press/Doubleday, 1985) 7.

[3] Albert Einstein and Leopold Infeld, *The Evolution of Physics* (New York: Simon and Schuster, 1996, originally published 1938) 175.

[4] Ian Stevenson, *Where Reincarnation and Biology Intersect* (Westport, CT: Praeger, 1997); Jim Tucker, *Life Before Life: A Scientific Investigation of Children's Memories of Previous Lives* (New York: St. Martin's Press, 2005).