

Alan Lightman's Response to "Imagining the Future of Medicine" Commentary

Alan Lightman

Massachusetts Institute of Technology (MIT), Cambridge, MA, United States of America

Alan Lightman, is a novelist, essayist, physicist and educator, who from an early age, was entranced by both science and the arts. Lightman received his AB degree in physics from Princeton University in 1970, Phi Beta Kappa and magna cum laude, and his PhD in theoretical physics from the California Institute of Technology in 1974. Lightman's essays, short fiction and reviews have appeared in the *American Scholar*, the *Atlantic Monthly*, *Boston Review*, *Harper's Magazine*, *Harvard Magazine*, *Nature*, the *New Yorker*, the *New York Review of Books*, the *New York Times* and many more publications. He has lectured at more than 100 universities nationwide about the similarities and differences in the ways that scientists and artists view the world. In his scientific work, Lightman has made fundamental contributions to the theory of astrophysical processes under conditions of extreme temperatures and densities. In particular, his research has focused on relativistic gravitation theory, the structure and behavior of accretion disks, stellar dynamics, radiative processes and relativistic plasmas. He was the first professor at MIT to receive a joint appointment in the sciences and the humanities. Lightman is currently Professor of the Practice of the Humanities at the Massachusetts Institute of Technology (MIT).

Online address: www.bioelecmed.org

doi: [10.15424/bioelectronmed.2015.00007](https://doi.org/10.15424/bioelectronmed.2015.00007)

I will briefly take up the most profound question implied in Dr. Czura's statement, which is the mind-body duality, first articulated by Descartes. I don't think any modern scientists still believe in a mind-body split. With the advances of neuroscience in the last 40 years, as emotionally disturbing as they may be, we now must accept that the "mind" is not some nonmaterial and mysterious essence, but it is in fact nothing more than the 4 pounds of material neurons in our skull and the chemical and electrical communication between them. In my view, consciousness, "I-ness" and the "self" are all *illusions*—particular sensations created by the electrical and chemical activity in our brains. We can use drugs (chemicals) to enhance or diminish the synap-

tic connections between neurons and, by doing so, we are able to alter memory, emotion, awareness and many other properties we associate with conscious being. Even at the level of individual neurons, biologists have demonstrated how a single sensory neuron becomes "habituated" to a stimulus repeated too many times and stops passing on the signal to a motor neuron. I recently interviewed Professor Robert Desimone, director of the McGovern Institute for Brain Research at the Massachusetts Institute of Technology and a leading brain scientist, and he and his team have discovered that the act of "paying attention" (that is, noticing some stimuli and ignoring others), a fundamental part of what we call "consciousness," is physically manifested by the synchro-

nized firing of a group of neurons. The rhythmic electrical activity of these neurons rises above the background chatter of the vast neuronal crowd. Undoubtedly, such synchrony and its converse will someday be controllable by drugs and external electrical signals. We are totally material.

Given the perhaps depressing thought that all of the mental sensations we experience as consciousness and self are purely material consequences of our material neurons and their material chemical and electrical activities, where does that leave us? How should we live? We still feel pleasure and pain, whatever its source and whatever its reasons. I know when something makes me feel good and when something makes me feel bad. And by pleasure and pain, I do not mean merely physical pleasure and pain. I include the intellectual, the artistic and the emotional. Personally, I have come to the same conclusion reached by the philosopher Jeremy Bentham two centuries ago. I want to live in such a way to maximize my pleasure and minimize my pain. I cannot do anything

Address correspondence to the Journal: editor@bioelecmed.org.

Submitted February 12, 2015; Accepted for publication February 12, 2015; Published Online (www.bioelecmed.org) August 17, 2015.

The Feinstein Institute
for Medical Research 

Empowering Imagination. Pioneering Discovery.®

RESPONSE TO COMMENTARY

about the fact that I am nothing but a bunch of atoms and molecules. But I can act in such a way to maximize the well-being and happiness of those atoms.

DISCLOSURE

The author declares that he has no competing interests as defined by *Bioelectronic Medicine*, or other interests that might be perceived to influence the results and discussion reported in this paper.

Cite this article as: Lightman A. (2015) Alan Lightman's response to "Imagining the Future of Medicine" commentary. *Bioelectron. Med.* 2:51-2.