Beyond Reductionism? An Open Letter in Response to Jerry Coyne

August 10, 2017

Dear Jerry,

I admire your writings and your decades long struggle to raise awareness about evolution among the American public. I was particularly impressed by your 2012 article in *Evolution*, "Science, Religion, and Society: The Problem of Evolution in America," in which you argue against the intellectual compromises of "accommodationism": the practice of suggesting that religion and science exist in separate domains, and therefore neither should represent a threat to the other.

Perhaps because of my respect for you, I felt disappointed to read some of the vitriol in your recent blog post dismissing my critique of Dawkins's conceptions of the "selfish gene" and "nature as machine" as "another dumb article holding Richard Dawkins responsible for all the world's wrongs." My respect for your own intellectual rigor was, quite frankly, called into question when you misstated my arguments in order to ridicule them, such as when you depict me as suggesting that "Dawkins is Satan or the anti-Christ" and dismiss my argument as "simply bullshit."

Some of the more substantive arguments you made against my article are summed up and discussed in my own follow-up "Reflections on 'The Dangerous Delusions of Richard Dawkins," which I hope you've read. For example, in response to your claim that "[the selfish gene] is just a metaphor," I've pointed out how core metaphors structure the ways in which a society thinks and acts. When you claim that my link to the extensive discrediting of Dawkins's "selfish gene" theory "doesn't go to any scientific discrediting," I point to the bottom of the page which references works by Gould, Depew & Weber, Wilson & Wilson, Goodwin, Jablonka & Lamb, Winther, and Pigliucci. I'd be happy to share more references if you're interested.

There are also specific statements and challenges you made in your article that require a direct response, which is what I will attempt here. A deeper question is why you—and others who hold a similar viewpoint—have responded so belligerently to my article, and what can be done to encourage a more dignified and generative dialogue. I'll come to this topic further down, and invite a thoughtful and respectful response back from you.

In the meantime, I've tried to distil your criticisms into higher level questions. In each case, I'll try to identify and respond to your assertions or challenges.

Is Dawkins's "selfish gene" theory a valid basis for evolutionary biology?

I notice that you made a careful statement in defense of your friend's theory: "In fact, the usefulness of the selfish-gene metaphor is alive and well, and has provided useful insights into how natural selection works." If you rest your case on the idea that the metaphor has provided useful insights into how natural selection works, then we have no disagreement. The problem is, that's not how Dawkins describes his theory in his own book. He makes a much bolder statement: "The argument of this book is that we, and all other animals, are machines created by our genes." The rest of his book goes on to demonstrate why the gene should be seen as the sole unit of selection, and its "selfish" drive to replicate as the fundamental explanatory driver of evolution.

As you are well aware, this approach to evolutionary theory has been challenged by findings in epigenetics, as well as by theories of niche construction, evolvability, and multilevel selection, and there have been repeated calls by increasing numbers of evolutionary biologists for an "extended evolutionary synthesis" integrating these and other approaches into the gene-centric modern synthesis that Dawkins used as a basis for his arguments.

In the lucid words of distinguished biologist Robert Sapolsky in his recently published *Behave*, "Different circumstances bring different levels of selection to the forefront. Sometimes the most informative level is the single gene, sometimes the genome, sometimes a single phenotypic trait, sometimes the collection of all the organism's phenotypic traits. We've just arrived at the reasonable idea of multilevel selection."[1]

You have gone on record opposing these new developments, claiming that "the idea of natural selection and mathematical population genetics" are sufficient theoretical tools for explaining everything about evolution, and have expressed your irritation at what you call "Big Idea Syndrome." As a non-biologist, I can only watch from the sidelines and I certainly don't expect to change your mind, but it seems you are doing a disservice to your field as well as to all of us who care about what biology tells us, by turning a blind eye to the new, more complex model of evolution that is emerging.[2]

Is there any linkage between Dawkins's "selfish gene" theory and justifications of modern capitalism?

You correctly point out that "people are always looking for ways for science to justify their own bad acts" and that "ideas of self-interest as underlying economics go back to Adam Smith." I agree with you that "it's clearly and self-evidently wrong to blame 'laissez-faire' capitalism on Dawkins."

However, this is not what I'm doing. I am accusing him of a playing a leading role in propagating a faulty worldview that is frequently used to justify exploitation and laissez-faire capitalism. This worldview can be traced at least as far back as Hobbes, who is referred to approvingly by Adam Smith in *The Theory of Moral Sentiments*, where he writes: "self-preservation, and the propagation of the species, are the great ends which nature seems to have proposed in the formation of all animals."[3] Similarly, in the late 19th/early 20th centuries, leading robber barons frequently used flawed interpretations of Darwinism to justify their ruthless exploitation.[4]

Dawkins merely brought this unfortunate nexus of laissez-faire rationalization and pseudo-scientific views of nature up to date. Dawkins himself has made an explicit connection between biology and economics, writing: "Within any one species of animals or plants, the individuals that survive best are the ones that can exploit the other animals and plants, bacteria and fungi that are already flourishing in the environment. As Adam Smith understood long ago, an illusion of harmony and real efficiency

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[1] Sapolsky, Robert M. *Behave: The Biology of Humans at Our Best and Worst*. Penguin Publishing Group, p. 362.

[2] Dobbs, David. "Die, selfish gene, die." *Aeon*, December 3, 2013.

[3] Smith, Adam. *The Theory of Moral Sentiments*, Anthony Finley, Philadelphia, 1817, p. 123.

[4] Bergman, Jerry. "Darwin's Influence on Ruthless Laissez-Faire Capitalism", *Impact*, 333, March 2001

will emerge in an economy dominated by self-interest at a lower level. A well balanced ecosystem is an economy, not an adaptation." Here, Dawkins describes exploitation as the driver of survival, leading to a "well-balanced ecosystem" and linking this explicitly to an economy "dominated by self-interest."[5]

You say that you'd "like to see Lent's evidence that corporations have relied on Dawkins's ideas to justify plundering the Earth." Besides Dawkins's own connection, the fact that Enron CEO Jeffrey Skilling's favorite book was *The Selfish Gene* (which I mentioned in "Reflections") is only the most egregious example. Ruy Teixera describes how the timing of the publication of *The Selfish Gene* in 1976 along with the rise of modern neo-liberal economics led to a deep conceptual linkage between the two.[6] Milton Friedman's polemic, *Free to Choose*, published in 1980, argued for self-interested individuals making "rational" decisions to create the most efficient economy. It is no coincidence that the widely-quoted speech by fictional character Gordon Gekko, in Oliver Stone's 1987 movie *The Wall Street*, uses pseudo-evolutionary theory to justify his excesses:

> The new law of evolution in corporate America seems to be survival of the unfittest. Well, in my book you either do it right or you get eliminated. ...
> The point is, ladies and gentlemen, that greed—for lack of a better word—is good.
> Greed is right.
> Greed works.
> Greed clarifies, cuts through, and captures the essence of the evolutionary spirit.
> Greed, in all of its forms—greed for life, for money, for love, knowledge—has marked the upward surge of mankind.
> And greed—you mark my words—will not only save Teldar Paper but that other malfunctioning corporation called the USA.[7]

This linkage continues unabated into the current era. Here, for example, is an excerpt from an interview conducted in 2016 with the bestselling author and social psychologist Jonathan Haidt:

> So, when I was in college, I first read Richard Dawkins' book, *The Selfish Gene*. And like many people, it just blew my mind. And Darwin's ideas are so simple. From a few principles, you can explain all the diversity of life on earth, and that was a really transformative experience for me. And then when I started reading about the history of capitalism... I had the same experience that I had reading Richard Dawkins... And so capitalism is as powerful and important as Darwinian evolution. And in fact, it's very much the same thing... The point is everybody should learn about capitalism and evolution by the time they're 18. And at present we don't. And that means we have stupid discussions about policy.[8]

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[5] Dawkins, Richard. *A Devil's Chaplain: Reflections on Hope, Lies, Science and Love*. Houghton Mifflin, Boston, 2003, pp. 225–6.

[6] Teixeira, Ruy. "The Good News About Human Nature: Most People Aren't Jerks." *Think Progress* website. March 11, 2013

[7] Cited by Turchin, Peter. "Selfish Genes Made Me Do It! (Part I)." *Social Evolution Forum* website. December 4, 2013. Note: Turchin adds "I in no way blame Richard Dawkins for the fall of Enron or for the broader cultural shift that resulted in the proliferation of corporate malfeasance." I don't blame him either, but am merely pointing out the part his ideas played in this process.

[8] "Capitalism and Moral Evolution: A Civil Provocation." *On Being with Krista Tippett*, June 2, 2016.

As I mentioned in "Reflections," I appreciate that Dawkins himself has a more humane political outlook, and I expect he may be horrified to find his ideas used by countless neo-liberal zealots. Nevertheless, the underlying linkage seems irrefutable.

How do ethics relate to the "selfish gene" hypothesis?

You, along with many others, have pointed out that Dawkins clearly disavows a simple equivalency between "selfish genes" and selfish humans, stating that "Dawkins's genetic reductionism does not come with any ethical implications." Quite right. However, as I discussed in "Reflections," Dawkins's logic leads to an antediluvian model of a divided human where morality arises from our reason overcoming the selfish drives of our genes. "Our brains," he writes, "have evolved to the point where we are capable of rebelling against our selfish genes." This split conception of humanity can be traced back to Plato and, ironically, is inherent to Christian soul/body dualism.

In fact, many evolutionary biologists have shown that a sense of fairness and compassion is an evolved human trait—something that is readily explained by multi-level selection theory.[9] We don't need to overcome our inherent drives in order to develop these faculties. This is important because it leads to different modalities for enhancing compassionate behavior within society. Sapolsky does an outstanding job of summarizing decades of findings across sub-disciplines, focusing on the crucial distinction between in-group and out-group evolved moral predispositions, leading to different ways to develop skillful responses depending on the context. This is the kind of valuable interplay between biology and morality that Dawkins's simplistic "selfish gene" model misses.[10]

What are the ontological implications of Dawkins's reductionism?

You attempt to ridicule my critique of the implications of Dawkins's reductionism by paraphrasing me as saying that "Dawkins's reductionism and naturalism have taken the joy out of life" and that "people have actually become… depressive nihilists who have no meaning in their lives, because of what Richard Dawkins has written." You continue: "I challenge Lent, or anyone, to find where in Dawkins's work he's said anything even remotely like this." In fact, as you put it, "Dawkins has repeatedly argued that embracing reality and science rather than numinous illusions makes the world *more* enjoyable and meaningful."

Ironically, Dawkins has himself given examples of precisely this kind of reaction to his ideas in his introduction to the 30th anniversary edition of *The Selfish Gene*. Among other readers disturbed by what they saw as his "cold, bleak message," he quotes an Australian reader:

> Fascinating, but at times I wish I could unread it… On one level, I can share in the sense of wonder Dawkins so evidently sees in the workings-out of such complex processes… But at the same time, I largely blame *The Selfish Gene* for a series of bouts of depression I suffered from for more than a decade… Never sure of my spiritual outlook on life, but trying to find something deeper—trying to

[9] Wilson, David Sloan. *Does Altruism Exist? Culture, Genes, and the Welfare of Others*. Yale University Press, 2015.

[10] Sapolsky, op. cit., p. 511.

> believe, but not quite being able to—I found that this book just about blew away any vague ideas I had along these lines, and prevented them from coalescing any further. This created quite a strong personal crisis for me some years ago.

Dawkins's response to this is: "If something is true, no amount of wishful thinking can undo it."

This is the classic reductionist refrain, as stated succinctly by Stephen Weinberg's aphorism: "The more the universe seems comprehensible, the more it also seems pointless." The follow-on, as you, Dawkins, Weinberg, and others contend, is that we must create our own sense of meaning, and that the sheer wonder of observing the complexity of the universe should offer enough joy for anyone.

Your proposed path to joy, however, is one that doesn't suffice for many. This is what I call the "cruel myth" that reductionists foist on thinking people everywhere: that reductionism is the only explanatory alternative to theism in making sense of the universe. While reductionism has proven to be a superbly powerful methodology for scientific investigation, it is a leap of faith to use it to make ontological claims about the universe.

Your own statement about reductionism in your rebuttal of my article shows some confusion that perhaps I can use as a starting point for clarification:

> Scientific naturalism happens to be true, and everything comes down to the laws of physics, although we also see higher-order phenomena that are "emergent" in the sense that while we don't know enough to *predict* them from the laws of physics, they must be *consistent* with the laws of physics. That is what reductionism means, and there is no "holism" completely independent of reductionism.

Here, you conflate scientific naturalism with reductionism, but I believe that is mistaken. Scientific naturalism holds that everything in the universe is part of nature and is in principle subject to scientific inquiry. This is a viewpoint I share with you, and is in contrast to transcendental claims of another "spiritual" dimension to the universe. I also agree with your statement that emergent phenomena must be "consistent with the laws of physics." However, that is not what "reductionism means" in its common usage. Reductionism is the belief that everything in nature can ultimately be understood only by reducing it to its simplest components.

Biological reductionism is exemplified by Dawkins's "selfish gene" hypothesis. The general statement of this view is summed up well by Francis Crick:

> You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules.[11]

The findings of systems theory show this view to be misguided. In self-organized systems, which includes all living systems, the complex interaction of many connected elements causes emergent behavior that could never be predicted by a study of each part alone, no matter how detailed. The reductionist view of "nothing but" is analogous to someone observing that Shakespeare's entire opus is

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[11] Crick, F. (1994). *The Astonishing Hypothesis: The Scientific Search for the Soul*. New York: Touchstone, 3.

nothing but an assembly of twenty-six letters repeated in different configurations. Whether we are evaluating Shakespeare or life itself, the patterns that connect the parts frequently contain far more valuable information than the parts themselves.[12]

That is the starting point for my investigation of meaning through my Liology framework, which you peremptorily dismiss as "wooish," saying you have "little idea of what this means except that it extols interconnectedness and holism." I invite you to explore my description of key principles that Liology shares with dynamical systems theory, if you are interested in understanding it further.

You may be surprised by how much we agree with each other. In your article, "Science, Religion, and Society," you contrast the scientific method with religious dogma:

> Science' s method of finding truth, which relies on reason, empirical investigation, criticism, doubt, predictive power, and repeatability of observations by different investigators, is incompatible with religion's methods for understanding the universe—methods based on dogma, authority, and revelation. Scientific truth changes in response to new findings about the world, while religious "truth" ... changes rarely, and most often in response to scientific advances... In science faith is a vice, in religion it is a virtue.

While not a scientist by profession, I am in full agreement with every aspect of your description of the scientific method, and I try to adhere to it in all my research and writings. As you say well, "scientific truth changes in response to new findings about the world." I ask you to consider whether new findings in recent decades in the areas of systems biology and complexity theory could possibly have expanded our scientific conception of the universe from a dogmatic reductionism.

I believe we share a commitment to a world where policy decisions are based on ethical and scientifically valid findings. In my view, a recognition of our intrinsic connectedness with others and with the natural world is both scientifically valid and a solid foundation for an ethical and political framework that could promote sustainable flourishing into the future.

Jerry, I greatly admire your decades of work battling against faith-based dogmatism and the obfuscations of proponents of "intelligent design" and other manipulations designed to undermine true scientific investigation. I wonder, however, if your continuous battle against superstition has made it more difficult for you to discern when there are scientifically valid reasons for questioning previously held positions?

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[12] Capra, Fritjof and Luisi, P.L.. *The Systems View of Life: A Unifying Vision* (New York: Cambridge University Press, 2014) 19–59; Kauffman, S. (2008). *Reinventing the Sacred: A New View of Science, Reason, and Religion*. New York: Basic Books, 15; Noble, D. (2006). *The Music of Life: Biology Beyond Genes*. Oxford: Oxford University Press, 77; Sperry, R. W. (1980). "Mind-Brain Interaction: Mentalism, Yes; Dualism, No." *Neuroscience, 5*(1980), 195-206; Woese, C. R. (2004, June). "A New Biology for a New Century." *Microbiology and Molecular Biology Reviews,* 173-186; Lewontin, R. C. (1992). "The Dream of the Human Genome." *The New York Review of Books, 39*(10).

I invite you to share your reflections back in a respectful and dignified manner. Perhaps we could better identify areas of agreement and difference, and use this as an opportunity to initiate a more generative discourse on the possibilities of making sense of the universe through scientific naturalism?

Respectfully yours,

Jeremy Lent