

Darwin's Revolution In Thought

by Stephen Jay Gould

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http://www2.umt.edu/Geology/faculty/stanley/g106/g106_notes.htm

INTRODUCTION - Why Has Darwin Been So Misunderstood?

Geneticist H.J. Muller may have been the first to point to this dilemma. In 1959, 100 years after the publication of *The Origin of the Species*, Muller wrote an address entitled "100 Years Without Darwin Is Enough". He wanted to know why even those accepting evolution didn't understand what the theory of natural selection actually entailed.

Darwin had been clear in that he was attempting to do two things; to prove that evolution was occurring, and to propose a mechanism for how it worked. While evolution has been generally accepted the theory of natural selection has been generally misunderstood. Therein lies the dilemma.

Gould dismisses the possibility that this might be because natural selection is difficult to grasp. Natural selection follows almost syllogistically, Gould notes, three irrefutable assumptions; all species produce more offspring that can survive (over-reproduction), there is variation within a species, and there is at least some principle of inheritance.

From the video:

"Take those three facts - over-reproduction, variation and inheritance of some of that variation and natural selection follows almost as a syllogistic inference. If all organisms produce more offspring than can possibly survive, on average as a statistical phenomenon...those organisms that fortuitously are better adapted to changing local environments will tend to survive better and produce more offspring and the average of the population will shift in their direction."

Since the mechanics of the theory are simple the misunderstanding of natural selection must be understood as a phenomenon of human biases and traditional social hopes clashing with, and denying, the philosophical implications of natural selection.

Question: From what three inferences does the theory of natural selection follow?

Question: Can one hold evolution beliefs without accepting natural selection?

Note: Yes and this points to a key distinction: between evolution as a description of change (observed by evolutionary traditions prior to, and since Darwin), and natural selection as the theory of how evolution occurs.

Note: The distinction can be made clearer by keeping in mind that "evolution" is now commonly

used to describe two things: adaptation to local environments (which natural selection accounts for) and a process of progressive complexification (which natural selection does not entail). So when Gould quotes Muller in saying that "evolution" has been generally accepted, this refers to the acceptance of adaptation in nature, while the misunderstanding of natural selection refers to the notion of progress persistently read into the theory.

2. THE PARADOX

In his first paradox Gould asks how Darwin might be considered a revolutionary thinker if, as history has painted him, he was simply a bumbling naturalist of unexceptional intelligence. Gould quickly refutes this portrait of Darwin, demonstrating the enormous breadth of Darwin's inquiry into the philosophers, literature and the economists. The mis-characterization of Darwin is at least partly attributable to his own writings where he attribute his success to a panoply of Victorian virtues, namely patience, industry, invention and common sense.

Darwin wrote:

"I have no great quickness of apprehension or wit. My power to follow along in a purely abstract train of thought is very limited."

Question: Discuss the influence of Victorian values on the popular conception of Darwin as an unexceptional thinker.

Note: Gould later discusses how Victorian virtues, specifically of human and cultural progress, are also at the core of why the theory of natural selection came to be called "evolution."

THE SECOND RIDDLE

Gould's second riddle asks why Darwin never used the word "evolution". In short, it is because "evolution" means progress and Darwin's theory was uniquely non-progressive. Darwin was well aware that natural selection as a mechanism describes only adaptation within local environments. He wrote a marginal note to himself "Never say higher or lower in referring to organisms".

So why do we call the process evolution? Herbert Spencer, an eminent Victorian, was tremendously influential in Darwin's age. His writings were explicitly progressive, not only with regard to biological change, but economic, artistic, human, ad infinitum.

Gould notes "Since 19th century thinkers wouldn't accept Darwin's radicalism anymore than we would today, they were very comfortable with Spencer's notion that you ought to use a word that means inherent progress...because that's how they wanted to see it."

Question: Why did Darwin never use the word evolution?

Question: In both historical and contemporary contexts discuss the philosophical radicalism of Darwin's non-progressivism

Note: In revealing how Victorian virtues and ideology were responsible for the reading of a principle of progress into natural selection, Gould illustrates the basic human biases at the core of why we continue to obscure natural selection with teleological of "evolutionary" progress.

Question: Gould mentions several other evolutionary theories following natural selection. Discuss one or more of these other theories, what they share in common, and how they all differ from the theory of natural selection. (Extended version only.)

ICONS OF EVOLUTION IN POP-CULTURE AND SCIENTIFIC TEXT

The primary significance of Gould's slide presentation is to demonstrate the incorrect metaphor of progress at the core of how we think about evolution. This metaphor is primarily represented in the form of an evolutionary icon where some person, product, animal, or idea, "progresses" through stages, traditionally illustrated from left to right. In popular culture these depiction's work almost subconsciously because at the core of our culture is the idea of an evolutionary line from ancestral man on the left to modern man on the right. Such depiction's are not only incorrect but often carry racist connotations (such as a lightening of skin color from left to right).

Question: What is the primary modern icon of evolution?

Question: What is wrong with that icon?

Question: Give examples of how different disciplines and theories (academic and social) have been influenced by this misconception.

THE THIRD RIDDLE

The third riddle asks why Darwin waited over 20 years to publish his findings. He was afraid; but not of revealing his belief in evolution. Evolutionary thought was already common, and acceptable. Instead it was the materialistic nature of the theory of natural selection which was radical.

Natural selection "ran contrary to the deep tradition of dualism in which you have material stuff or matter and mental stuff or spirit constituting the universe; in which the spirit, being of God at least initially, is the higher of the two forms. Instead materialism claims that there is only matter and that all those things we consider spirit and divine are really just manifestations of properties of matter arranged in complex ways, and what we call mind is a product of the material sub-strait of the neurology of the brain. And that's a radical notion in 19th century terms."

Summarizing the radicalism's of the three riddles, Gould notes that we can see the theory's naturalism and purposelessness in the first, its non-progressivism in the second, and its materialism in the third.

Question: What does Gould identify as the philosophical position implicit within natural selection?

Question: How does natural selection fundamentally challenge traditional Western philosophy?

Question: Summarize the three radicalism's revealed by Gould's riddles, and discuss their relationship to the continued resistance to, and misunderstanding of Darwin.

CONCLUSION: A PLEA FOR RECONCILIATION

Gould warns that the humanist resistance to the implications of natural selection is dangerous on many levels. Hoping nature will reveal moral truth is passive and dangerous in that it tells us we shouldn't engage in moral struggle to figure out the meaning of our lives. "The idea that we should learn to read nature, and when we read nature right we'll figure it all out, is problematic".

In conclusion Gould asks us to reconcile science and religion with the wisdom that science can supply factual material that will help us in our struggle to reach moral decisions, but moral truth is not what science can go after.

Question: What have humanist and theological traditions wanted evolution to tell us?

Question: Discuss the tension between science and the religious or spiritual traditions.

Question: Why does Gould argue this tension is misplaced?

Question: Comment on social and philosophical influences on scientific work with respect to Darwin and/or other examples.

From the Teaching Guide that accompanies the video:

In a scientific context, what does "theory" mean?

Explain how Darwin's theory of evolution by natural selection follows from these three facts: all species produce more offspring than can survive, there is variation within a species, and there is inheritance of that variation.

Explain the "argument from design" that William Paley puts forth in *Natural Theology*. In what way does natural selection undermine the argument from design? How does undermining the argument from design point to a philosophically discomfoting implication of natural selection?

Why did Darwin not use the word “evolution” and instead preferred the phrase “descent with modification?”

In the video *Darwin’s Revolution in Thought*, Stephen Jay Gould shows a series of slides to illustrate the popular view of evolution. How is this view incorrect?

Summarize the three radicalisms revealed by Gould’s riddles, and discuss their relationship to the continued resistance to, and misunderstanding of, Darwin’s theory of evolution by natural selection.