

Feynman's Unanswered Question

Herman E. Daly

Introduction

In a series of lectures given in 1963, and only recently published, physicist Richard P. Feynman raised what he called a central question to which he said he did not have the answer. Thirty years later that same question arose in a conference on science and religion, and once again remained unanswered. Probably the question has been raised by others on other occasions as well, and perhaps even answered. If so the answer has not yet reached me, and so I raise the question again.

In beginning his discussion of science and religion Feynman noted that:

...even the greatest forces and abilities don't seem to carry with them any clear instructions on how to use them. As an example, the great accumulation of understanding as to how the physical world behaves only convinces one that this behavior has a kind of meaninglessness about it. The sciences do not directly teach good and bad.

Most people seek enlightenment on good and bad from religion in the broad sense. Feynman distinguishes three aspects of religion—the metaphysical, the ethical, and the inspirational. By the last he means a ground for conviction that one's actions are not meaningless—"if you are working for God and obeying God's will, you are in some way connected to the universe, your actions have meaning in the greater world, and that is an inspiring aspect."

However, Feynman continues a few pages later:

That brings me to a central question that I would like to ask you all, because I have no idea of the answer. The source of inspiration today, the source of strength and comfort in any religion, is closely knit with the metaphysical aspects. That is, the inspiration comes from working for God, from obeying His will, and so on. Now an emotional tie expressed in this manner, the strong feeling that you are doing right, is weakened when the slightest amount of doubt is expressed as to the existence of God. So when a belief in God is uncertain, this particular method of obtaining inspiration fails. I don't know the answer to the problem, the problem of maintaining the real value of religion as a source of strength and courage to most men while at the same time not requiring an absolute faith in the metaphysical system.

Feynman said this in 1963. Today the question is sharper and more obvious—how to maintain inspira-

tion to provide the strength to do good in the face, not of a slight doubt as to the existence of God, but in the face of aggressive assertions by the high intelligentsia that the very idea of God is an infantile superstition.

Of course many today claim that ethics does not require a theistic or even a religious basis—it can, they say, be explained scientifically. But Feynman rejected this, noting that scientific understanding of nature's behavior simply increases one's sense of meaninglessness. Furthermore, he argues that ethics by itself, merely knowing good and bad, from wherever this knowledge is derived, is powerless to produce action without inspiration, the third element of religion. We are then back to the dilemma that the more we understand the behavior of nature, the more meaningless it seems, and consequently the harder it is to find inspiration to serve any goal at all.

A Moral Compass in an Inert World?

The logic of Feynman's question was played out in a meeting on science and religion some thirty years later. Some prominent scientists, turned part-time prophets calling for environmental repentance, asked themselves this same question. They noted that science has the techniques, but is unable to ignite sufficient inspiration or moral fervor to induce the public to accept and finance policies that apply these techniques to even so basic a goal as conserving the capacity of the

Today the question is . . . how to maintain inspiration to provide the strength to do good in the face . . . of aggressive assertions . . . that the very idea of God is an infantile superstition.

earth to support life. They thought that it would be worth a try to appeal to religion to supply the missing inspiration as a basis for policy. This resulted, in May of 1992, in the "Joint Appeal by Science and Religion on the Environment," led by the eminent scientists Edward O. Wilson, the late Stephen Jay Gould, and the

late Carl Sagan, along with a few religious leaders, and hosted by then Senator Al Gore. The three scientists are quite well known for their affirmations of scientific materialism and consequent renunciations of any religious interpretation of the cosmos, as well as for their highly-informed and genuine concern about the environment. Their rationale for courting the religious community was that while science had the understanding on which to act, it lacked the moral fire to inspire action by others (and perhaps itself). In a frequently-used metaphor, religion was asked to supply the moral compass, to show the direction, and science would supply the vehicle to get there.

I was a participant in the conference, and was vaguely troubled at the time by what seemed to me a somewhat less than honest appeal by the scientists to a somewhat puzzled group of religious leaders. A year or so later I read a book by theologian John F. Haught, who had also been present, and discovered that he had precisely articulated my uneasiness.

Haught wondered aloud:

... whether it is completely honest for them [the scientists] to drink in this case so lustily from the stream of moral fervor that flows from what they have consistently taken to be the inappropriate and even false consciousness of religious believers ... the well-intended effort by the skeptics to co-opt the moral enthusiasm of the religious for the sake of ecology is especially puzzling, in view of the fact that it is only because believers take their religious symbols and ideas to be disclosive of the truth of reality that they are aroused to moral passion in the first place. If devotees thought that their religions were not representative of the way things really are, then the religions would be ethically impotent.

He further wondered:

It is hard to imagine how any thorough transformation of the habits of humans will occur without a corporate human confidence in the ultimate worthwhileness of our moral endeavors. And without a deep trust in reality itself, ecological morality will, I am afraid, ultimately languish and die. Such trust ... must be grounded in a conviction that the universe carries a meaning, or that it is the unfolding of a "promise." A commonly held sense that the cosmos is a significant process, that it unfolds something analogous to what we humans call "purpose," is, I think, an essential prerequisite of sustained global and intergenerational commitment to the earth's well-being.

Haught's point, of course, is that Sagan, Wilson, and Gould proclaim the cosmology of scientific materialism, which considers the cosmos an absurd accident, and life within it to be no more than another accident ultimately reducible to matter in motion. In their view there is no such thing as value in any objective sense, or purpose, beyond short-term survival and reproduction which are purely instinctual, and thus ultimately mechanical. Calling for a moral compass in such a world is as absurd as calling for a magnetic compass in a world in which you proclaim that there is no such thing as magnetic north. A sensitive compass needle is worthless if there is no external lure toward which it is

pulled. A morally sensitive person in a world in which there is no lure of objective value to pull and persuade this sensitized person toward itself, is equally worthless.

In Feynman's earlier formulation religion loses its power to inspire when the truth of its metaphysics is denied, or even doubted. If science tells us nothing about good and evil, and if it pictures the universe as

*Calling for a moral compass in ... a world
[existing via random, unintentional causes] is
as absurd as calling for a magnetic compass in
a world in which you proclaim that there is no
such thing as magnetic north.*

basically meaningless, and denies the existence of God, then what is the ground for inspiration to do anything, to serve any purpose (which could only be an illusion anyway)? In the conference this void of purpose was papered over by sentimental references to "our children," and to "other species." But if we are purposeless accidents then so are they, and the dilemma is not solved by pushing it one generation forward, or one species to the side. The meaninglessness refers to all of Creation, a term which, from these scientists' perspective, should be replaced by "Accidentdom" or "Randomdom."

Feynman's question, sharpened by Haught, is still awaiting an answer. At least it deserves to be taken seriously, even if we can't answer it—especially if we can't answer it!

Metaphysical Impatience

It is worth considering Feynman's question anew because it underlies the culture war over the issue of intelligent design versus neodarwinism. Much of this debate is simply noise and knee-jerk reaction from both sides. Let us try to cut away some irrelevancies. First, there are the biblical literalists who do a disservice to both science and the bible. Let's forget them. Beyond that we must ask just what is meant by "evolution" in each case. Some deny the considerable evidence for microevolution (natural selection for differing characteristics within a species, including such things as development of resistance to antibiotics in bacterial populations). This has been confirmed by repeated observation, and those who deny microevolution can also be ignored. Macroevolution is an extrapolation of the same mechanism observed in microevolution (random mutation and natural selection) to explain the development of all species from a presumed single ancestor over a very long period of time. This cannot be directly observed nor repeated in a laboratory and is an

extrapolation, a conjecture. Is it a reasonable conjecture? Certainly. Is there evidence for it? Yes. Are there gaps in the evidence and logical glitches in the theory? Yes. Scientists themselves debate these when they think creationists are not listening.

The intelligent design folks, however, have been listening attentively, and while they may not have understood everything they heard, they have understood enough to raise some questions within the framework of science. The main question, at the level of macroevolution, is the one that Darwin himself proposed as the key to refuting his theory, namely: "If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down." The critics claim that this is indeed the case not only for much-discussed complex organs such as the eye—they consider existing Darwinian explanations unconvincing—but also for many molecular machines at the sub-cellular level. These recently-discovered micro machines at the most basic level of life exhibit, they say, "irreducible complexity," i.e., every part must be present before the machine can perform its function. Within microbiology, they claim, even attempts to explain the origin of such irreducible complexity by Darwinian "numerous, successive, and slight" modifications are largely absent from the literature. The logical glitch is that natural selection selects by how well a system functions (to perform a task that increases reproductive success). If the system cannot function at all until it has been completed by the numerous, successive, slight modifications, then how could natural selection preserve successive random modifications that by themselves confer no advantage, until the system is completed? The modifications would have to be more simultaneous than successive, large rather than slight, or few rather than numerous. The gap in the evidence that critics point to is mainly the relative absence in the fossil record of gradual change, and the presence of the Cambrian explosion in number of species. These are questions that, except for the microbiology dimension, have been around for a long time. All the more reason to expect that by now, say the critics, we would have better answers to them.

Instead of forthrightly answering such questions of micro- and macroevolution, as best they can, many neodarwinists have reacted defensively and insecurely by attacking the motives of their critics, and even claiming that consideration of their questions in the curriculum would undermine science itself, and even weaken US scientific preeminence and competitive advantage in the global economy! It is probably true that the motivation of many in the intelligent design camp is ultimately to reopen a metaphysical space for God in modern intellectual discourse. But it is an ele-

mentary rule of logic that the correctness of an argument, or relevance of a question, does not depend on the motivations of the persons raising it. Science generally abhors *ad hominem* refutations, and should not make an exception in this case. Both sides seem to suffer from a certain metaphysical impatience in the face of uncertainty and mystery.

Sometimes "evolution" is stretched beyond the descent of all species from a common ancestor to the origin of that first living ancestor from what is invariably called the "primal soup." Many scientists, including Sir Francis Crick, think that there simply has not been enough time since the earth's beginning for any random physical process to create life from inanimate matter, let alone differentiate it into so many forms. Crick prefers the hypothesis of "panspermia"—that the primordial ancestor arrived on earth from space in some unexplained cosmic ejaculation. Some scientists dislike this apparent retreat from randomness and postulate that although the random origin of life in our single world is infinitely improbable, it so happens that our world is just one of infinitely many other (unobservable) worlds, and is obviously the one in which the improbable event actually happened. Surely the people who want evolution to be referred to as a "fact, not a theory" in the textbooks should at least exclude this whimsy from their meaning of "evolution."

The "infinitely many worlds" hypothesis shows the extreme *a priori* devotion of some scientists and philosophers to randomness as universal cause. It is also employed against the "anthropic principle," which holds that the extremely balanced fine-tuning of many physical constants necessary for life to exist is infinitely improbable in an accidental universe. Some conclude that our single universe is therefore not accidental; others that there "must" be infinitely many accidental universes! Interestingly, physicists seem willing to discuss and debate the anthropic principle in a relatively civil manner, in spite of its creationist implications.

Survival Value?

In addition to the distinctions between micro- and macroevolution, and the cosmic evolution of the living from the nonliving, there is another set of ambiguities inherent in the way we use the word "evolution." Specifically, what range of human experience is thought to be explained by random mutation and natural selection? The stories of the giraffe's long neck, and of our opposable thumb, etc., are generalized by some to an explanation of everything, including morality, religion, reason, and self-awareness. If reason itself is merely the product of randomness (no matter over how long a time period), then why should we trust it? Remember, mutations are considered random, as are changes in the environment to which natural selection

adapts. If morality is likewise reducible to the random, then why obey it? Good and evil are reduced to survival value, and even survival is just something that happens or doesn't, not a purpose or a good thing.

To reply that we trust reason and obey morality because evolution has programmed us that way as evidenced by our survival so far, fails in several respects. First, it is inherently circular or tautological—if irrationality had resulted in survival then presumably we would follow it, and logic and mathematics would be incoherent if they existed at all. If mathematics has survival value, it is probably because it is independently true. Its truth is not likely a function of its presumed survival value. Further, once we understand evolution we are in a position to control it, to decide at least to some extent what genetic combinations henceforth will be eligible to play in the (rigged) survival lottery. In order to decide the direction in which to influence evolution, we need an external criterion for goodness (one other than survival). Otherwise evolution is still controlling us through a happy illusion. Finally, in a world that is the product only of random events, survival (or extinction) of our species is just another random event. Is it not self-contradictory to have policies in favor of one "random" event (survival) over another (extinction)?

It has been said before that a theory that explains everything ends up explaining nothing. Pushed to its logical limit randomness explains away explanation itself. Scientists have shown a remarkable incapacity for recognizing the nihilistic implications of their materialism when it is extrapolated from a working hypothesis to a metaphysical world view. Feynman, and no

It may seem contradictory to complain of science's excessive reliance on randomness and at the same time of its determinism. The point is that in neither case is there room for purpose as an independent cause in the real world.

doubt many others, are exceptions. But the public mainly hears the evangelical atheism of Sagan, Gould, and Wilson, aided by Richard Dawkins, Daniel Dennett, and others. The public, whether vaguely or clearly, senses the nihilistic consequences of these ideas and sensibly reacts against them. Unfortunately, the public often shoots at the wrong target, denying that microevolution is a fact, or that macroevolution is a fruitful working hypothesis. Feynman's question helps us to identify the right target—namely the apotheosis of a good working hypothesis about the origin of species from a presumed common ancestor, to a complete materialist world view having no room for the most important parts of human experience, namely

freedom, purpose, good and evil. Unfortunately, the more successful the working hypothesis in its limited domain, the greater its imperialist ambitions.

American writer, philosopher, and farmer Wendell Berry clarifies this overreach in the following comment on biologist Edward O. Wilson's book, *Consilience*:

A theoretical materialism as strictly principled as Mr. Wilson's is inescapably deterministic. We and our works and acts, he holds, are determined by our genes, which are determined by the laws of biology, which are determined ultimately by the laws of physics. He sees that this directly contradicts the idea of free will, which even as a scientist he seems unwilling to give up, and which as a conservationist he cannot afford to give up. He deals with this dilemma oddly and inconsistently.

First, he says that we have, and need, "the illusion of free will," which, he says further, is "biologically adaptive." I have read his sentences several times, hoping to find that I have misunderstood them, but I am afraid that I understand them. He is saying that there is an evolutionary advantage in illusion. The proposition that our ancestors survived because they were foolish enough to believe an illusion is certainly optimistic, but it does not seem very probable. And what are we to think of a materialism that can be used to validate an illusion? Mr. Wilson nevertheless insists upon his point; in another place he speaks of "self-deception" as granting to our species the "adaptive edge."

Later, in discussing the need for conservation, Mr. Wilson affirms the Enlightenment belief that we can "choose wisely." How a wise choice can be made on the basis of an illusory freedom of the will is impossible to conceive, and Mr. Wilson wisely chooses not to try to conceive it.

Also, if a particular illusion has survival value, then would not recognizing and seeing through the illusion diminish our odds of surviving? Can an illusion be effective once exposed? Contrary to Wilson, might it turn out that the survival value of the neodarwinist world view is negative for the species that really believes it?

It may seem contradictory to complain of science's excessive reliance on randomness, and at the same time of its determinism. The point is that in neither case is there room for purpose as an independent cause in the real world. Neither deterministic nor stochastic models of the world allow purpose to exert any independent influence on events—in that sense it is all determinism, whether law-like or random.

Misplaced Concreteness

The British logician and philosopher Alfred North Whitehead identified an error characteristic of modern thought that he called the "fallacy of misplaced concreteness." This fallacy consists in taking our abstractions as more real than the concrete experiences that our abstractions seek to explain. We all have the experience of purpose and freedom. This experience is well known and direct, unmediated by the sometimes deceptive senses, and apparently uni-

versal. Whitehead's radical empiricism says we should take that experience itself as the more well-known thing in terms of which we try to explain less well-known things. If I, the part of the universe I know best, experience freedom and purpose, then freedom and purpose are at least not absent from the part of the universe consisting of me. Instead we seem to start with less well known things—abstractions like random mutation and natural selection—and use them to explain away our direct experience of freedom, purpose, good and evil, as illusory. This is anti-empirical. Abstraction is powerful, and we cannot think without it. All the more reason, says Whitehead, to be conscious of its limits. And the more reason yet to be conscious of the danger of moral and intellectual decay inherent in preaching a misplaced metaphysic of purposelessness that aborts the very possibility of policy.

We cannot all be as brilliant as Richard Feynman or as clear-headed as Wendell Berry, but if both sides in the evolution culture war would reflect deeply on the questions these thinkers have raised, maybe a bit of their honesty, humility, and metaphysical patience will rub off on us, opening the way to both reconciliation and coherent policy. And if it turns out that the conflict is too deep to be reconciled, then at least we will have a better understanding of what we are fighting about.

Herman E. Daly
Professor
School of Public Policy
University of Maryland
hdaly@umd.edu

Sources: Richard P. Feynman, *The Meaning of It All: Thoughts of a Citizen-Scientist* (Helix Books, 2005); Feynman's question was also implicit in the famous closing statement of Stephen Weinberg's 1977 book, *The First Three Minutes*: "The more the universe seems comprehensible, the more it also seems pointless." (New York: Basic Books, 1977); John F. Haught, *The Promise*

of Nature: Ecology and Cosmic Purpose, (Mahwah, NJ: Paulist Press, 1993); Charles Darwin, *Origin of Species by Means of Natural Selection*, (NY: NY Univ. Press, 1988) 6th edition. Charles Darwin expresses his own "horrid doubt" at the recognition of the circularity of the argument that we trust reason and obey morality because evolution programmed us that way. To a correspondent he writes: "Nevertheless you have expressed my inward conviction, though far more vividly and clearly than I could have done, that the Universe is not the result of chance. But then with me the horrid doubt always arises whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any one trust in the convictions of a monkey's mind, if there are any convictions in such a mind?" (*Life and Letters of Charles Darwin*, vol. 1, ch. VIII, Religion, pp. 274-286 (NY: D. Appleton & Co., 1896, edited by Francis Darwin). This is a curious statement. Darwin asserts an inward conviction that the Universe is not the result of chance. But he then disparages his own troublesome conviction as untrustworthy, having developed from a "monkey's mind." Yet he seems not to discount his own theory for that reason, although it must have the same mental ancestry as his other convictions. Wendell Berry, *Life is a Miracle: An Essay Against Modern Superstition* (Washington, DC: Counterpoint, 2000); Alfred North Whitehead, *Science and the Modern World* (NY: The Free Press, 1967; first publication 1925).

