An Appreciation of Stephen Jay Gould

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STEPHEN JAY GOULD died on May 20, 2002 of cancer at the age of 60. He leaves behind a vast scientific and literary legacy imbued indelibly with his unique humanist and socialist commitments.

For the last thirty-five years Gould was a faculty member at Harvard where he taught geology and the history of science. He was an immensely popular lecturer and writer.

His essays, collected in numerous volumes from his regular column in the *Natural History* magazine, were in a tradition of popular science writing dating back to at least the 1930s, when socialist scientists such as J.B.S. Haldane and Lancelot Hogben attempted to make science accessible to ordinary people in the essay and book form.

Gould, however, excelled well beyond his predecessors in explaining science to the lay reader without sacrificing any of its complexity. His essays were suffused with the vagaries and ironies of history, a topic of endless fascination for him.

It was in his historicism that science came alive. He militated against the celebration of icons and their eccentric ways, and celebrated science instead as a supremely human experience of understanding grounded in and circumscribed by real historical circumstances.

It was perhaps Gould's historicism that inspired the ire of many of his fellow scientists who saw in his historical grounding of science an attempt at undermining the a-historical, timeless and objective qualities of science that they so firmly believed in.

Beyond Orthodox Darwinism

As an evolutionary biologist Gould is best known for his joint work with Niles Eldredge on the theory of "punctuated equilibrium."

Gould and Eldredge made a radical break with standard Darwinian lore, according to which evolution is a continuous process in which gradual changes over long periods of time account entirely for the immense biological diversity that we see all around us.

Instead they posited that the "missing links" in the fossil record connecting different species are not empty slots waiting only to be filled by diligent paleontologists, but evidence that there are no "missing links"—that far from being a continuous incremental process, evolution proceeds in fits and

starts, where long periods of relative stability are disrupted by bursts of (relatively) rapid cataclysmic change.

This hypothesis at once addressed a major puzzle in evolutionary biology while challenging one of its key unquestioned assumptions.

In another important contribution to evolutionary biology, Gould along with his Harvard colleague, the Marxist biologist Richard Lewontin, questioned the orthodoxy of selection as the sole mechanism of evolutionary change.

Gould and Lewontin provocatively titled their paper "The Spandrels of San Marco." They argued that organisms may have features which cannot be explained in terms of adaptation. The metaphor they employed to illustrate their point was that of the spandrels in the arches of San Marco.

These spandrels, they argued, seem so intricate and beautiful that one is tempted to explain their existence in terms of design. Yet given the existence of the arches the spandrels are a structural necessity that no architect could have done away with. Thus there is no independent explanation for the existence of the spandrels except as an inevitable consequence of the existence of the arches themselves.

Gould and Lewontin concluded that many features of organisms might similarly be structurally necessary due to the existence of other features, which may or may not have been subject to selection.

Reconsidering Fitness

In fact, the "spandrels argument" was part of a much larger project. Gould insisted that selection is only a part of the evolutionary story. He openly rejected the teleological claims of many of his contemporaries, who insisted that evolution was essentially selection leading to fitter organisms, a process whose culmination is the human species.

Fitness to Gould could not be defined outside of the actual environment and circumstances in which the evolving species existed. Thus fitness as an a-historical concept made no sense.

Secondly, Gould emphasized, particularly in his majestic *Wonderful Life*, that most evolution was "horizontal:" Instead of the vertical ascendancy model of many evolutionists in which species evolve into steadily more complex organisms, most evolution entailed the diversification of species at the same level of complexity.

As Gould was fond of pointing out, selection alone is incapable of explaining the immense number of species of beetles. In place of the hierarchical model of evolution in which the dominant metaphor is that of climbing a ladder, Gould presented the metaphor of a tree-like structure in which the branches grow out horizontally as much as they do vertically.

Gould's understanding of evolution also emphasized the contingent in history. The grand plan of "climbing mount improbable" (to quote Richard Dawkins) was for Gould a pipe dream of the simple-minded, which replaced God with a new god of an illusory a-historical evolutionary perfection towards which everything strove.

To Gould the contingency of history was not an attempt to obfuscate the real mechanisms of evolutionary change but to recognize with honesty what drove evolutionary change. [1] He saw in

the “imperfections” of species the proof of evolution, while his adversaries, in their teleological fervor, saw it only in those features for which they could invent the selectionist “Just So” stories Gould derided.

A Humanist and Socialist

Gould’s thinking about science was deeply infused with his humanist and socialist commitments. His commitments were particularly in evidence in his staunch opposition to sociobiology [a theory popularized by Edward O. Wilson] in the seventies and eighties, and his rejection of sociobiology’s latter day embodiment “evolutionary psychology” in the nineties.

Both sociobiology and evolutionary psychology attempted to explain disparate forms of human behavior as determined by the genetic make-up of the organism. This genetic makeup, according to the sociobiologists, was a direct consequence of selection in the evolutionary process.

Gould along with other Marxist and socialist critics of sociobiology understood it for what it was: an attempt to justify the stratification of capitalist society along class, gender and racial lines as an inescapable consequence of biology.

He explained the motivation for his own stance very clearly: “The protracted and intense debate surrounding biological determinism has arisen as a function of its social and political message . . . . [B]iological determinism has always been used to defend existing social arrangements as biologically inevitable—from `ye have the poor always with you’ to nineteenth century imperialism to modern sexism. Why else would a set of ideas so devoid of factual support gain such a consistently good press from established media throughout the centuries.” [2]

In his important book-length study *The Mismeasure of Man* [3] Gould took on the pseudo-scientific apologists of capitalist stratification. It is interesting to recapitulate some aspects of his argument since they show his political commitments not only in the side he took in the debate, but also in the method he employed which is very clearly compatible with, if not derived from, Marxist methodology.

What is most surprising about the book, considering that the author is a scientist, is its insistence on putting science in a historical context. Gould laid out a history of “scientific” attempts at characterizing deviant or undesirable behavior as stemming from biological features as a project of justifying the status quo.

In this he parted company with defenders of the dominant paradigm of science as an a-historical cumulative process of steadily approaching the “truth.” Gould understood that the problems addressed by science and the solutions posed by it are very much part and parcel of the times.

Recovering Dialectics

In this Gould made a distinction between science as methodology and the ideology with which it is inescapably infused by its historical specificity. Thus while Gould saw science as a historically grounded effort, he did not reject its ability to arrive at certain truths about the world.

Gould understood that science contained in it many potentialities of which only some are realized at a particular point in time. He remained a defender of rationalism and enlightenment ideals. In fact, his main tool in refuting the claims of biological determinists was scientific methodology itself.

He summarizes his vision of science as follows:

"The idea of unilinear progress not only lies behind the racial rankings that I have criticized as social prejudice throughout this book; it also suggests a false concept of how science develops. In this view, any science begins in the nothingness of ignorance and moves toward truth by gathering more and more information, constructing theories as facts accumulate. In such a world, debunking would be primarily negative, for it would only shuck some rotten apples from the barrel of accumulating knowledge. But the barrel of theory is always full; sciences work with elaborated contexts for explaining facts from the very outset." (*The Mismeasure of Man*, Norton, 1981,)

In *The Mismeasure of Man*, Gould identified the main philosophical error in biological determinist theories of human behavior as that of reification. Reification is an attempt at treating the abstract or qualitative as something physical. This error, according to Gould, is in evidence in the attempts at extracting a single number (IQ) to characterize a person's intelligence, as it is in theories of genetic determinism where complex human behavior is argued to be a direct consequence of specific genes.

While reification is not an exclusively Marxist concept, it has played a distinguished role in Marxist critiques of capitalism. Marx himself identified reification as an element of capitalist commodity production where social relations among humans are seemingly crystallized in objective relationships between commodities.

Lukacs elaborated on this theme in his important study of alienation "Reification and the consciousness of the proletariat." It would be disingenuous to suggest that the employment of reification as a concept is explicitly Marxist, yet it would be equally disingenuous to not recognize this element in it. In any case, the concept of reification was a powerful critical tool that Gould employed in his battle against biological determinism.

One should recognize the peculiar circumstances in which Gould and his fellow radical scientists operated. In the 1930s the idea of "dialectical materialism" became part of the Stalinist orthodoxy. Its arcane and formalized rules were regularly used to denounce the thinking of those who deviated from the straight and narrow of Comintern dictates as being "un-dialectical."

It is not surprising, therefore, to find in later generations a conscious eschewing of the label of dialectical materialism for their way of thinking. Although many radical scientists of the younger generation, in particular Levins, Lewontin and the Roses, openly claimed to work in the dialectical mode, they had to re-establish its legitimacy.

Gould did not openly identify himself as a Marxist nor did he claim to use dialectical reasoning. Nevertheless many features of Gould's thought are marked by an influence of Marxism and its dialectical approach.

In relation to his theory of punctuated equilibria he wrote:

"If gradualism is more a product of Western thought than a fact of nature, then we should consider alternate philosophies of change to enlarge our realm of constraining prejudices. In the Soviet Union, for example, scientists are trained with a very different philosophy of change—the so-called dialectical laws, reformulated by Engels from Hegel's philosophy. The dialectical laws are explicitly punctuational. They speak, for example, of the"transformation of quantity into quality.

This may sound like mumbo jumbo, but it suggests that change occurs in large leaps following a slow accumulation of stresses that a system resists until it reaches the breaking point. Heat water and it eventually boils. Oppress the workers more and more and bring on the revolution. Eldredge and I were fascinated to learn that many Russian paleontologists support a model similar to our

punctuated equilibria.“ (”Episodic Evolutionary Change," in The Panda’s Thumb, Norton, 1980).

Scientists for the People

Gould’s thought shares many elements with Marxism. These elements include an egalitarian vision of the future, grounding theory in history, and an emphasis on complex matrices of relations as opposed to linear deterministic ones.

Let me emphasize that while Gould’s was a lonely voice, his was not the only one. Gould was on the fringes of a movement of leftwing scientists which in the 1970s called itself “Science for Vietnam,” later becoming “Science for the People.” He was also part of the “Sociobiology Study Group.”

Like the earlier movement of radical British scientists in the 1930s, Gould was associated with a movement which included many eminent scientists including such figures as Richard Levins, Richard Lewontin, Ruth Hubbard, Steven and Hilary Rose, and Jonathan Beckwith among others.

Gould’s thought owed much to the fortuitous coming together of these socialist thinkers and scientists. Throughout his life Gould continued to participate in socialist forums, such as the annual Socialist Scholars Conference and events at the Brecht Forum (on whose board he served) including the meeting on the 150th anniversary of the Communist Manifesto.

Gould’s was a dulcet and urgent voice on our side. He will be missed by all of us who strive for a world free of oppression and exploitation.

Ansar Fayyazuddin

P.S.

* Against the Current (ATC) 99, July-August 2002. Original title: “Militant Islam in Central Asia”.

* Ansar Fayyazuddin is a member of Solidarity. He is an Assistant Professor of Physics at Stockholm University and Visiting Scientist at the Center for Theoretical Physics, MIT. He would like to thank Richard Levins, Abha Sur, and Dessima Williams for useful discussions and comments.

Footnotes

[1] Gould’s insistence on contingency, to my mind at least, has a certain affinity with Robert Brenner and Ellen Meiksins Wood’s emphasis on the importance of a singular historical break in English peasant economy in bringing about the global capitalist system. In explaining the rise of capitalism there is a dominant teleological model of capitalist inevitability. Brenner and Wood’s model in contrast emphasizes the accidental and contingent in history, which led to the dominance of the market. See Ellen Meiksins Wood’s clear presentation of both the dominant model and Brenner’s model in her masterful The Origins of Capitalism (Monthly Review Press 1999).

[2] Stephen Jay Gould, “Potentiality vs. Darwinism” in Ever Since Darwin (Norton, 1977), p. 258.

[3] This book along with in Not in Our Genes by Richard Lewontin, Leon Kamin, and Steven Rose remain the two clearest refutations of attempts at explaining social behavior in terms of biology.