

## MARXISM AND PUNCTUATED EVOLUTION

Richard J. Meyer, *Biology*

*A fact is a fact whether discovered by a communist or a fascist, in the U.S.A. or in the U.S.S.R.*

Julian Huxley

There is an alleged controversy these days in the field of biology about whether evolution occurs gradually or in occasional spurts. "Gradualism" is the conventional wisdom and is a point of view traceable directly to Charles Darwin (1859). Although G.G. Simpson (1944) elaborated Darwin's theory to say that gradual change is observed to occur at highly variable rates, the mechanisms of evolution were agreed to be the same in spite of different rates. "Fast" evolution might produce a new species in 5000 years, "slow" evolution might produce the same change in 50 million years. Some things, like horseshoe crabs, have not changed outwardly in 200 million years. But presumably, both horseshoe crabs and the rapidly evolving horse evolve the same way—by the gradual accumulation of so-called "microevolutionary" changes i.e., small changes each generation, which, with the passage of time (even 5000 years is a lot of generations for change to accumulate), result in a new species.

A contrasting view has been suggested by Niles Eldredge and Stephen Jay Gould (1972; see also Gould and Eldredge, 1977; and Gould, 1980), named by its authors the "punctuated equilibrium model." They say that organisms tend to stay the same for the most part, and then change abruptly. They say that evolution is characterized by stasis and leaps, that is, no change, then sudden change. The basis for this view was their reading of the fossil record (both are paleo-biologists), although the idea of "saltational evolution" has a long

history, dating to pre-Darwinian times.

This academic argument includes an interesting sidelight not normally encountered in biology. Perhaps predictably, the theory of punctuated equilibrium has not been rapidly assimilated into the main body of evolutionary theory, mainly because most biologists think of punctuated evolution as nothing new. Gould and Eldredge (1977) have charged that the gradualist stance and the resistance of current authorities to notions contrary to gradualism are the result of the *political* viewpoint of the scientific establishment. They claim that Darwin's view of evolutionary change was colored by his Victorian politics. Gradualism is the pattern of change perceived by an apologist for the monarchy, where overall stability is the rule and whatever change that does occur, occurs gradually and non-disruptively. Citing Lovejoy (1936), they state, "The general preference that so many of us hold for gradualism is a metaphysical stance embedded in the modern history of western Cultures . . . the translation into biology of the order, harmony and continuity that European rulers hoped to maintain in a society already assaulted by calls for a fundamental social change."

Gould and Eldredge go on to consider alternate conceptions of change, specifically dialectical materialism, the line of Hegel-Engels-Marx-Lenin. In this view a stable system gradually accumulates quantitative changes until it is suddenly transformed from one state to another, a qualitative

change, a leap. Oppress the people long enough and a revolution will occur. Species remain static for long periods, then suddenly become a new species. The Marxist view is punctuational, saltational. They are saying that the resistance of academic biology to their theory is due more to the capitalistic (i.e. non-Marxist) leanings of biologists than it is due to a valid consideration of the evidence.

This is a definite curve ball. To cry politics is not one of your more common scientific arguments. My reaction (and probably that of many biologists) is one of insecurity about the whole matter because it puts me out of my normal element.

Nonetheless, it is my impression that science is pretty much independent of politics or the kind of government under which one works. I see no scientific consequence of being a Marxist or a capitalist. I know of many excellent scientists of both persuasions, although labelling scientists by their politics would seem very questionable. Is a citizen of a Marxist state to be considered a Marxist philosophically? Is a scientist who lives in the U.S. and generally accedes to the two party system and "American democracy" to be considered a non-Marxist philosophically? Actually, there are only a few cases where I am aware of the political leanings of a prominent scientist. That is presumably because politics has nothing to do with science. One does not list one's political affiliation after one's name when authoring a scientific paper. It does not matter. Or it should not.

The junior author of the original statement of the theory of punctuated equilibrium, Stephen Jay Gould of Harvard, is a brilliant and prolific essayist. Niles Eldredge (of the American Museum of Natural History) actually came up with both the idea and name of the theory, but Gould is more widely recognized as the primary advocate of punctuated evolution. It may not be correct to say that Gould is a Marxist, but he admits that he "learned his Marxism, literally at his daddy's knee."

The quotation opening this paper comes from an interesting book published in 1948 entitled *Heredity East and West* in which Huxley reviews genetics in Russia during the Stalin years. Most people are familiar with, or even remember how the charlatan Lysenko was given suzerainty over Soviet agricultural science. Through some sort of twisted thinking, Lysenko's incorrect view (actually the idea came from an earlier Soviet scientist named Michurin) that environmental effects could become part of heredity was seen as compatible with the

dialectical materialism of the Soviet state philosophy. The result was a disaster for Soviet agriculture, academic biology in Russia, and Russia's overall relations with the West.

In saying "A fact is a fact . . ." Huxley is saying that science operates outside the political realm. The tragedy of Lysenko was not that he was wrong, but that whatever his scientific view, it was endowed with extra weight because it was interpreted to be in conformance with the handbook of Marxism-Leninism. Huxley is saying this is wrong because it is bad science. It also would seem to be pretty silly politics. But the point worth underlining here is that politics is inappropriate in science. To infuse theories and hypotheses with political value contaminates the objectivity.

I am not saying that Eldredge and Gould are like Lysenko. (In fact, Gould has written an essay condemning Lysenko and that period of Soviet science.) But a fact is a fact regardless of politics and a bad theory is a bad theory regardless of politics.

Having overstated my case slightly, let me retreat a bit and interject a few caveats. Naturally, some interface between science and politics must be admitted. Science of various sorts is either supported or not by political agencies, people, decisions and trends. What is considered "worthwhile" science is very much a political process. But I do not feel that the metaphysics of science is significantly alterable by the body politic.

I admit that society at large and the particular moment we occupy in history go a long way in determining our world view, and hence the metaphysical stance of scientists as well as merchants, soldiers and rulers. Thomas Kuhn (1962) I think has effectively pointed out the role of cultural relativism in the progress of science. He says that the accumulation of specific scientific knowledge is meaningful only within a given paradigm which serves to lend structure to the observed world. Scientific revolutions occur by paradigm shifts, such as physics changing from a Newtonian to an Einsteinian universe, or biology shifting from a Platonistic to a Darwinian world. So the point is, yes, we are to some degree prisoners of our culture, including the political superstructure, when we pursue empirical science. But punctuated evolution does not constitute a paradigm shift. Nor in my opinion, does our current objective paradigm bias our view on the debate over gradualism vs. punctuated evolution.

Punctuated evolution is an interesting theory and may indeed represent a valid contribution to the study of evolution. I mentioned before that most biologist are gradualists. Gradualism has come to be associated with the "Modern Synthesis," an emergent dogma first discussed circa 1940, also called neo-Darwinism, which was a marriage of Darwin's selectionism with the more recent theories of genetic variation. The Modern Synthesis is an ideological cornerstone of some magnitude. Eldredge and Gould are blunt in pointing out that to falsify gradualism is to cast significant shadows on the whole Modern Synthesis.

Some say this is a semantic argument only. What is the difference between gradual change at variable rates, and punctuated equilibrium? Some would say nothing. Perhaps those are just two ways to say the same thing. But Eldredge and Gould maintain that the punctuated theory carries with it different mechanisms of species formation that are not now part of the Modern Synthesis.

Eldredge and Gould seem to be overplaying their sparring with the Modern Synthesis. G. Ledyard Stebbins, one of the major architects of the Modern Synthesis, has pointed out that all of the arguments used to support punctuationism are already part of the Modern Synthesis (Stebbins and Ayala, 1981). If this is accurate, the theory would constitute not so much a revolution, as merely a refinement of the Modern Synthesis.

At any rate, punctuationism leads to certain predictions about biological change over time, and as observations of nature accumulate in the future it should be possible to assess the validity of the theory. But these matters are beyond my concern in this paper.

My thesis is that Eldredge and Gould's claim of political bias on the part of opponents of punctuated equilibrium is a red herring. To have to deal with politics in a scientific paper is not only unexpected, it is disarming. Perhaps that is why the authors resorted to it. My scientific tool kit has no politics in it. I think that means that politics is not science rather than that my tool kit is incomplete.

A related point comes to mind. Is the science of Eldredge and Gould suspect because of their politics? Are they using science as a forum for their politics? Such suggestions may be unfair, but by dragging politics into the argument one does wonder, one's suspicions do become aroused. I am particularly sensitive to these points in the case of Gould because of an essay of his published a few years ago (Gould, 1976) in which he objected to

sociobiology being applied to the human species because sociobiology is very genetical. His point was that even if genes are important in human behavior we should not study it, we should not discuss it because society is better off if human potential is emphasized. To him, genetics implies limitations and to view the human organism as genetically constrained is socially wrong. I happen to disagree with that and feel he is uncomfortably close to advocating a kind of political censorship of science. With that background, when Gould claims that the Marxist metaphysic more accurately portrays biological evolution, I say something smells.

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