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Chapter Two

Necessary Metaphysics for an Evolutionary Worldview

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How Metaphysics Is Used in the Science of Evolution

The theory of evolution in all its forms has always been a combination of science and metaphysics. However, this is not a criticism of evolutionary theory, because it really couldn't have been otherwise. In fact, the enterprise of science as a whole depends on an orientation to truth and a commitment to make things better that are grounded in metaphysical premises. For example, all science is founded on faith in reason, logic, and the conviction that the universe is intelligible. Scientists necessarily proceed on the premise that the truth about nature can be discovered and reliably known, and that what is true in our part of the universe is true throughout the universe. Scientists also presume that their minds can be dependably used to investigate the reality of the world, and that their sense perceptions provide accurate descriptions of the subjects of their inquiries. Science also rests on the *a priori* principle that mathematics is real and can be used to model and describe physical reality. Indeed, the presumption that matter itself is real is ultimately metaphysical.

We can also detect the use of metaphysics in the way scientists rely on the premise that scientific knowledge is a good in itself. This faith in the value of scientific truth is connected to the conviction that humanity will be benefited by science's free inquiry and progressive discovery of the truth about the universe. Similarly, the longing for greater perfection in knowledge and the hunger for discovery that motivates most scientists are also grounded in a metaphysical premise regarding the very possibility of increasing perfection. All of these foundational value assumptions thus generally presuppose a transcendent ground of ultimate value or goodness.

Beyond these specific uses of metaphysics, we can also see how the vast enterprise of science itself is supported and sustained by the metaphysics of the

modernist worldview, which originally gave rise to the notion of an objective reality that could be progressively discovered using scientific methods. Prior to the advent of modernism, it did not generally occur to people that carefully controlled experiments or empirical investigations might yield greater understanding of the natural world. For example, the basic act of cutting open a cadaver to learn about the human body for the advancement of medicine was abhorrent to premodern sensibilities. Thus, the very activity of scientific investigation is a product of the modernist reality frame, which firmly rests on the metaphysical foundations of the Enlightenment.⁶ Without these forms of foundational metaphysics, science would be impossible. And it is worth saying here that I am in firm agreement with all of the general metaphysical principles stated above.

However, when we examine the metaphysics that is bound up with the theory of evolution, we find assumptions about reality that are far less inspiring. Today, the "experts" on evolution generally recognized by mainstream academia and the corporate media are a closely-knit group of scientists known as "neo-Darwinists." Neo-Darwinists are firmly committed to the metaphysical principle that, like physics, biological evolution is essentially a mechanistic process that can be completely explained using reductionistic methods. For example, neo-Darwinists hold that macroevolution (major transitions in species or taxa) is to be understood entirely by the processes involved in microevolution (accumulation of variations in populations). Douglas Futuyama, for instance, declares that "the known mechanisms of evolution [provide] both a sufficient and necessary explanation for the diversity of life."⁷ Although it has never been proven as a matter of scientific fact, contemporary neo-Darwinists insist that the mechanisms of random genetic variation and the genetic drift of allele frequency, coupled with environmental filtering, can account for practically all forms of biological evolution. Moreover, neo-Darwinists maintain that genetic variations must always be completely random and can never be directed toward an advantageous mutation. Process philosopher David Griffin writes:

This doctrine that mutations are random [in the non-advantageous sense] is important to Darwinists for several reasons: The idea that the organism's purposes could influence evolution would contradict the ideal of making biology a purely mechanistic, deterministic science. Also, the idea that purposes could give a bias to genetic mechanisms seems impossible to most Darwinists. (Richard Dawkins, for example, says that "nobody has ever come close to suggesting any means by which this bias could come about.") And, perhaps most important, the idea that variation is somehow directed toward adaptation would reduce the importance of the central Darwinian conception, natural selection. ... We do know that some mutations are caused by cosmic rays; but we

do not know that *all* mutations are due to these or analogous causes. Many neo-Darwinists, nevertheless, express great confidence in the truth of this speculation—a confidence that, in light of the number of confidently held ideas that have in the past turned out to be false, is somewhat awe-inspiring. For example, Jacques Monod, argues that random mutations "constitute the *only* possible source of modifications in the genetic text," so that "chance *alone* is at the source of every innovation, of all creation in the biosphere."⁸

This insistence on the "scientific reality" of something that has not been proven is a clear example of how metaphysics and science are frequently mixed together. Similar examples of reality-framing metaphysical assumptions can be found in evolutionary science's commitment to the philosophical doctrine of *nominalism*, which insists that there can be no forms, archetypes, or preexisting information involved in the process of development. Despite the facts of *convergent evolution*, wherein evolutionary solutions are repeated almost exactly in different evolutionary categories or phyla, the experts are adamant that the mysterious process of organismal development (morphogenesis) cannot involve any kind of "morphic fields" or nonphysical inputs or influences.

Related to this metaphysical commitment to the exclusivity of physical causation is the premise that evolution must always proceed gradually through a step-by-step accumulation of minute changes. This gradualism is essential for neo-Darwinist accounts of evolution. Darwin himself wrote: "If it could be shown that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down."⁹ The fossil record in Darwin's time contained few transitional types, but in the last 150 years abundant transitional species have been discovered. Yet even as the fossil record has been filled in, enough gaps remain that theories such as "punctuated equilibrium" are still needed to explain transitions at the species level. Moreover, paleontologists have found that "once a species appears in the fossil record, it tends to persist with little appreciable change throughout the remainder of its existence."¹⁰ This finding underscores that at some point in the appearance of every major new form or evolutionary innovation, significant novelty enters the universe. In other words, evolutionary scientists now agree that *emergence* is a ubiquitous characteristic of biological evolution, and emergence by definition signifies that there has been a jump or a surge—that something more has come from something less.

Thus, when we face the facts of evolutionary emergence, we can begin to see that the underlying assumption that evolution must *always* occur randomly through tiny steps and without the influence of any "outside information" is not a scientific fact, but

rather a commitment of faith held for the sake of the consistency of the theory. Unproven theoretical conclusions in science do not necessarily amount to metaphysical premises, but when these theoretical conclusions contradict the weight of evidence and are held primarily because they preserve *a priori* metaphysical commitments to materialism, they are more metaphysical than scientific.

Among the many philosophical principles used in the evolutionary sciences, perhaps the most radically metaphysical of all is the assertion that evolution is not progressive and indeed pointless. Today, it appears that the majority of biologists think that evolution does not progress, and that the development of species over time is merely a "random walk." Stephen Jay Gould went so far as to call the idea of progress in evolution "noxious," maintaining that there are no criteria by which improvement could be measured. Gould wrote: "If an amoeba is as well adapted to its environment as we are to ours, who is to say that we are higher creatures?"¹¹ And despite the basic moral intuition shared by most people that a dolphin or an elephant is "higher" (and thus worthy of greater moral consideration) than an ant or a bacterium, Gould's repudiation of the notion of evolutionary progress is accepted by many biologists without question. This "scientific proposition" can be found not only within the field of biological evolution, it is also echoed by cosmologists. In an oft-quoted passage, Nobel Laureate in physics, Steven Weinberg, writes: "The more the universe seems comprehensible, the more it also seems pointless." But by this stage of our discussion, I hope it is obvious that science has not "proven" that evolution is unprogressive, let alone pointless. These pessimistic assertions are based on the philosophy of *scientism*—the materialistic belief system that has become an embedded feature of the institutional culture of science.

We will return to the discussion of evolutionary progress in chapters 5 and 6. The point to be emphasized here is that within the academic study of evolution, including cosmological, biological, and cultural evolution, the metaphysics of the scientific worldview plays a major role in determining the boundary conditions under which evolution can be studied or even understood. These metaphysical commitments are for the most part unconscious, and thus they are usually held uncritically. And because the metaphysics of the modernist, scientific worldview is generally *received* by scientists in the course of their training and held unconsciously, this metaphysics is passed on to others far more readily by insinuation rather than by direct argument. Despite the fact that the metaphysics of the modernist worldview has been severely questioned by professional philosophers, professional scientists continue to use this reality frame as a definitional container for the institutional study of evolution.

However, from an integral perspective, modernist metaphysics is not "all wrong," as some postmodern philosophers contend. The naturalistic spirit of the scientific enterprise has been responsible for many of science's greatest achievements. Integral philosophy thus seeks to include the advantages of methodological naturalism within its purview, even as it transcends the limitations of scientific materialism. As we look at the history of science we can see how the various philosophies of materialism and positivism have served the important function of cleansing our thinking about nature by ridding it of superstition and all kinds of fallacious assumptions. In a world that was once dominated by traditional consciousness and state-sponsored religious political authority, mechanistic materialism served as the protective shell out of which the "chick" of science could be born. But now the chick is hatched and science has become the new politically empowered authority on the truth. And this has resulted in the accompanying metaphysics of scientism becoming a new kind of state-sponsored belief system, used by materialists as a quasi-religious power base in academia and the mainstream media.

As we have seen, there is no getting around metaphysics—if we want to investigate reality we must have a categorical framework with which to organize both our investigations and our findings. Historically, the metaphysics of materialism served science well because it was the most minimal form of metaphysics available. Scientists wanted to get at the bare facts, and it was presumed that a philosophy of materialism would interfere the least in their apprehension of these facts. However, scientists adopted materialist metaphysics not only because it seemed to interfere least with the process of getting at the facts. In practice, the primary use of materialistic accounts of evolution was found in their symbolic role of overcoming the cultural power of traditional religious worldviews. Throughout the nineteenth and twentieth centuries the theory of evolution was used as an effective tool for recruiting people into the modernist worldview because it provided a creation story that was more rational and more satisfying than Biblical, or other scriptural accounts. Thus, despite its abundant utility for science, the theory's greatest power was found in its ability to produce *cultural evolution*. As Stanford scholar Robert Wesson observes: "Darwinism became the banner of those who would overthrow what they saw as an irrational, superstitious view of human origins. ... The theory of evolution became the focus of the confrontation of science and religion."¹²

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This discussion of the metaphysics that is closely, sometimes imperceptibly, associated with the evolutionary sciences is not an attempt to refute the sturdy basics of descent with modification. As explained in the introduction, I am not trying to smuggle in a specific spiritual belief system or otherwise advocate unscientific theories such as intelligent design. Rather, my intent is to affirm as much evolutionary science as possible. Yet at the same time, I want to show how the abundant metaphysical assumptions that frame so many features of the evolutionary sciences have become theoretical handcuffs that prevent us from moving to the next phase in our understanding of evolution. For most fields of scientific investigation, metaphysical materialism continues to provide an adequate reality frame for doing science. But in the field of evolution, which has such profound explanatory relevance for human affairs, the metaphysics of strict materialism is now worn out.

Contrary to the assertions of scientific materialists, explanations of evolution that rely exclusively on the mechanisms of chance mutation and environmental selection cannot explain the appearance of self-consciousness and the transcendent powers of human awareness. Moreover, as we discussed in chapter 1, materialism's need to assert physical causation as the only possible explanation of the origins of natural phenomena breaks down when confronted with the radical novelty of emergence. As we will explore further below, the ubiquity of emergent novelty and creativity that can be found throughout the evolutionary process, together with the evident affects of the downward causation produced by emergent systems, points to the influence of both the *formal causation* of information and the *final causation* of an underlying purpose. Yet if we are to come to grips with these evolutionary causes, we need a new kind of categorical framework. This new framework will not be found through a return to the supernatural metaphysics of premodern reality frames, it must retain the spirit of naturalism and be as "minimally metaphysical" as possible. However, while our new framework must keep its metaphysics both transparent and sparingly lean, it must also be willing to recognize the authentic reality of a variety of causal factors that are presently ruled out by materialism.

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