

Preface

This book is about the evolution of evolutionary theory against the background of Creationism and Intelligent Design. It looks at evolutionary theory from a historical perspective in an attempt to clarify some very basic issues surrounding evolutionary theory, yet issues that are rooted in the metatheoretical background of this theory. What is the metatheoretical background of a scientific theory?

Evolutionary theory has become a highly complex, multifaceted body of thought. Subdisciplines may sometimes appear partially contradictory to the layperson; some require special training for a proper understanding. And yet, evolutionary theory has become a predominant worldview in modern times. Evolutionary theory primarily addresses the problem of the origin of the diversity of plant and animal species that we observe today. In more recent times, however, evolutionary theory has gained currency far beyond its original confines. Attempts to understand the origin of the earth, indeed of the solar system, are now cast in an evolutionary context. And so are attempts to understand the origin and historical development of human culture, civilization, and language; the origin of the powers of human cognition; and even the origin of moral and ethical values guiding and constraining everyday life in human society. Engineering uses computer software to simulate evolutionary processes such as (natural) selection in the attempt to optimize the design of complex mechanical systems such as aircraft. Natural selection theory is put to use in the development of vaccines.

Charles Darwin explained the origin of new species through a process of random variation and natural selection. Those variations would be favored and hence propagated, which would provide for a slightly better adaptation to the environment, i.e., those that would have a selective advantage in terms of relative reproductive success. As the eminent evolutionary biologist Ernst Mayr never tired to emphasize, this is a statistical issue, an issue of relative numbers of offspring, not an issue of good versus bad, and nothing in between. Stripped to its essentials, the theory of natural selection explains the adaptation of organisms to their particular environment, but it does not necessarily imply progressive evolution to higher levels of complexity or optimization of biomechanical design. The notion of progressive evolution, of perfection of design – notions that Darwin himself

entertained at least during the early stages of the development of his theory – is not inherent in the Darwinian theory of natural selection. It is added to that theory as a belief rather than as a theoretical component supported by the study of nature. Progressionism is one metatheoretical burden imposed on evolutionary theory, but it is only one among many. Others are Social Darwinism, the slogan of the “survival of the fittest,” and Lord Alfred Tennyson’s metaphor of “nature red in tooth and claw,” the idea that historical or sociological changes proceed gradually and in small steps for the benefit of society or the belief that human powers of cognition have been shaped by natural selection and hence are adapted to cognize the world as it really is, at least to a degree assuring the survival of the human race. Moral as well as ethical standards guiding and constraining human social behavior are claimed to have an evolutionary basis – but how could a morally indifferent natural process such as biological evolution give rise to the intellectual insight that the way things “are” may not always be the way things “ought to be,” if judged from an ethical point of view?

Small wonder that many were left dissatisfied with evolutionary theory, when in fact they were opposing the metatheoretical baggage imposed on that theory. Opponents of evolutionary theory may have read this metaphysical baggage into evolutionary theory the way they understood it and hence may simply have set up a straw man in order to knock it down. In many cases, however, popular accounts of evolutionary theory are loaded with the same metatheoretical baggage and are justly criticized on that account. Most importantly, however, contemporary evolutionary theory has become so intricate and complex that it is often hard to distinguish between scientific theory and metatheoretical beliefs, even for the informed critic.

This is why I propose to look back on two books published during the middle of the nineteenth century, published a few years before Darwin’s *Origin of Species*. The two books deal with an evolutionary theory and its criticism yet in a context that was much easier to understand than it is today. Both books, pro and contra evolution, were written by educated laymen, who presented their arguments in a manner highly transparent to a general readership. However, the same metatheoretical baggage is still with us today: is evolution subject to any lawfulness, is evolution progressive, is adaptation perfect? But the context is much easier: no theory of inheritance had yet been developed, the meaning of fossils was only beginning to become clear, and the mechanisms of embryonic development still remained a black box. Black boxes are suitable containers for projections of the mind, and this is why we find these black boxes filled with beliefs and projections that still concern us today.

The two books I want to discuss are Robert Chambers’ “*Vestiges of the Natural History of Creation*” (1844), an early, perhaps even “naïve” (if viewed from a modern perspective), enactment of evolutionary theory, yet a book that provoked stern criticism, as voiced by Hugh Miller in his “*Foot-prints of the Creator*” (1849). I propose to look at these two publications not as mirrors of Victorian culture in nineteenth Century Great Britain, nor as the state of the art of professional science in pre-Darwinian nineteenth century biology and geology, nor do I plan to place

their authors into their proper social and political contemporary settings to elucidate their broader motives and concerns as they published these books. Readers interested in these aspects of science and its history should consult treatises such as James A. Secord's "*Victorian Sensation*,"¹ or Martin J.S. Rudwick's two companion volumes "*Bursting the Limits of Time*"² and "*Worlds before Adam*."³ Instead, I propose to screen these two books for conflicts of interest or intellect that are still with us and yet use the less complex context of the nineteenth century debate to bring out the essentials of these conflicts in better contrast than would be possible in the context of modern "population biology" or "phylogenetic analysis." At the same time, this approach will allow us to investigate how Darwin dealt with the issues raised by these two authors in an attempt to preempt criticism of his own theory that might be voiced by the informed public. Note that Chambers' "*Vestiges*" was published in the same year (1844) in which Darwin completed a lengthy essay on his theory of evolution, instructing his wife to have it published in case of his premature death.⁴ Naturally, the clash between Chambers and Miller in the mid-nineteenth century played out in the context of a conflict between creationist ideas opposing materialist theories of species transformation – a conflict that has become prominent again in modern times.

In the nineteenth century, as well as before and after, there were two views of God's involvement with the works of nature. The doctrine known as Theism invokes a God who is personally and actively involved in the natural processes. The problem here is that an eternal Entity is supposed to enter time in space, when from a logical point of view, "you cannot make temporal 'events' out of 'eternal objects' without impairment of the eternality of those objects."⁵ Deism is the doctrine that God directs the natural course of events through the enactment of natural laws, the so-called secondary causes. There is no conflict studying the natural course of events, while believing that what we discover to be natural laws do in fact lead back to a First Cause. It must be recognized however, that moving the discussion from secondary causes to the First Cause means to "*go meta*," as philosophers say. It means to move up one level: we move from science to a metascientific level of discourse, i.e., a discourse that extends beyond the reach of the arm of science. The discourse within science is about which natural laws range over which natural processes. At the metascientific level, the discourse is no longer about the relation of natural laws to natural processes. Natural processes do

¹Secord, J.A., 2000. *Victorian Sensation. The Extraordinary Publication, Reception, and Secret of Vestiges of the Natural History of Creation*. The University of Chicago Press, Chicago.

²Rudwick, M.J.S. 2005. *Bursting the Limits of Time. The Reconstruction of Geohistory in the Age of Revolution*. The University of Chicago Press, Chicago.

³Rudwick, M.J.S. 2008. *Worlds Before Adam. The Reconstruction of Geohistory in the Age of Reform*. The University of Chicago Press, Chicago.

⁴Egerton, F.N. 1970. *Refutation and Conjecture: Darwin's Response to Sedwick's Attack on Chambers*. *Studies in History and Philosophy of Science*, 1: 176–183.

⁵Lovejoy, A.O. 1930 (1977). *The Revolt Against Dualism*. Open Court, Chicago, p. 137.

not figure any more in this upper level discourse. Instead, the discourse is about the natural laws themselves and about how they relate to a First Cause.

Thomas Aquinas (also known as Thomas) famously elaborated on the fact that the human foot and the horse's foot are perfectly adapted – each in its own way – for the purpose that they had been designed for by the Creator. The idea that organisms are built according to a blueprint is Creationist in nature. The organism is compared to a complex yet perfect machine (“clockwork”), built to obey laws of nature or secondary causes, and one cannot tinker with only one or the other part of the machine without interfering with its proper function. Either the machine remains the way it is, or an entirely new clockwork has to be designed (“created”).

Intelligent Design is a sophisticated version of Creationism that does not tie God to particular space–time regions. The argument is more of a “First Cause→secondary causes” type. The idea is that natural selection does or can work, but this theory takes us only so far. It is said that there are structures in nature that are simply too complex to be the result of chance variation and contingent natural selection. Therefore, some other forces must be at work in nature that lead back to the First Cause. The issue centrally at stake here is the notion of the “explanatory power” of scientific theories. It is often said that proponents of “Intelligent Design” redefine science. What proponents of “Intelligent Design” in fact do is to gloss over the step where they “*go meta*”; they blur the proper distinction between different levels of discourse.

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