Was Darwin a Creationist?

Chris Cosans

ABSTRACT Throughout the *Origin of Species*, Darwin contrasts his theory of natural selection with the theory that God independently created each species. This makes it seem as though the *Origin* offers a scientific alternative to a theological worldview. A few months after the *Origin* appeared, however, the eminent anatomist Richard Owen published a review that pointed out the theological assumptions of Darwin's theory. Owen worked in the tradition of rational morphology, within which one might suggest that evolution occurs by processes that are continuous with those by which life arises from matter; in contrast, Darwin rested his account of life's origins on the notion that God created one or a few life forms upon which natural selection could act. Owen argued that Darwin's reliance on God to explain the origins of life makes his version of evolution no less supernatural than the special creationist that Darwin criticizes: although Darwin limits God to one or a few acts of creation, he still relies upon God to explain life's existence.

And the Lord God formed man of the dust of the ground,
and breathed into his nostrils the breath of life;
and man became a living soul.

—Genesis 2:3–2:7

Since its beginnings, Western thought has had creation stories at its core. Both the Bible and the extant works of the earliest pre-Socratic philosophers make an effort to explain how the universe, life, and even humans might have originally come into being. Creation stories are important because they provide us with a perspective from which we view the world. Scientific accounts of origins can be considered "empirical" to the extent that they can be constructed by

Department of Philosophy, Indiana University–Purdue University, Fort Wayne, IN 46805.
E-mail: philoanat@aol.com.

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reasoning backwards from what we observe to a theory about causes that would produce the present conditions (Cosans 1994, pp. 129–31; Hanson 1958). However, these accounts also take on a mythic dimension. Their construction requires the use of analogical language to take the imagination beyond what we see today, back to the origin of things. Such a way of speaking has usually been the province of religion.

When he published the *On the Origin of Species* in 1859, Charles Darwin (1809–1882) advanced science into that sacred realm. The *Origin* gives an account of how species arose, discusses the origins of life itself, and makes literary references to Genesis at frequent intervals. Darwin contrasts his theory with the naïve creationist view that God created each species separately. Many Christians in their turn have challenged Darwin's theory from the special creationist perspective, and in the United States opposition to "Darwinism" has become a social and political movement. Ironically, Darwin's *Origin* itself was criticized shortly after its publication for advancing a religiously naïve proposal. The objector was Richard Owen (1804–1892), an eminent anatomist and paleontologist, who at the time was in charge of the natural history department of the British Museum.

Five months after the publication of the *Origin*, Owen launched a series of objections in an anonymous essay in the *Edinburgh Review* (Owen 1860). In his review, Owen agrees that new species evolve as the result of natural laws, but he rejects Darwin's reliance on natural selection to account for this process, claiming it is just one of several speculative hypotheses that can explain the evolutionary process. He is especially critical of Darwin for framing the question of evolution in terms of whether or not the theory of natural selection is better than the creation story given in Genesis. Owen complains that Darwin criticizes those who might believe that each species was created by God, but himself claims God to have miraculously imparted life to the very first organic being from whom natural selection produced all other forms. On a philosophical level, it would seem that the Darwin of the *Origin* is a creationist. But one ought, Owen contends, to account for the origins of life by appealing to the same kind of presently operating laws that explain its transformation. If we could identify and understand the secondary laws by which living beings arise from inanimate matter, then these laws might also shed light on the process by which new life forms arise from previous ones. An analysis of this aspect of the Darwin-Owen dispute reveals much about both men's perspectives on philosophy and how religious assumptions enter into science.

DARWIN'S ADAM

Darwin's discussion of the origins of life, about which Owen is so critical, occurs in the concluding chapter of the *Origin*. There Darwin examines the extent to which the theory of natural selection can account for biological diversity. While he is confident that natural selection can explain how different varieties can arise

from a given species, he admits that the "more distinct the forms are which we may consider, by so much the arguments fall away in force" (Darwin 1859, p. 483). The fewer traits two organisms have in common, the more difficult it is to conclude that they descended from a common ancestor. At the very least, Darwin is absolutely certain that his "theory of descent with modification embraces all the members of the same class" (pp. 483–84). He supports this claim by citing the fact that members of each class share well-developed adult characters, that intermediate fossil forms exist, that rudimentary organs indicate earlier adaptations, and that embryos have common patterns. Given this, Darwin reasons that "animals have descended from at most only four of five progenitors, and plants from an equal or lesser number" (p. 484). Darwin urges further, however, that similarities between plants and animals suggest that "probably all the organic beings which have ever lived on earth have descended from some one primordial form, into which life was first breathed" (p. 484). Darwin's mention of life being "breathed" into matter is a reference to Genesis 2:7, where God breathes life into the nostrils of the first human. Like the writer of Genesis, Darwin has his Adam.

Darwin argues that the primordial organism came into being long ago. If variations were accumulated at the present rate of change, which is too slow to discern without careful considerations of such things as breeding and the fossil record, it would have taken a tremendous amount of time for a single organism to leave descendants as diverse as humans and plants. However, Darwin believes that for most of life's history the rate of accumulation has in fact been glacially slow. For the main mechanism driving the accumulation according to Darwin is natural selection, and that device requires a diversity of forms from which to select. Consequently, "during early periods of the earth's history, when the forms of life were probably fewer and simpler, the rate of change was probably slower; and at the first dawn of life, when very few forms of the simplest structure existed, the rate of change may have been slow in an extreme degree" (p. 488). It is only after enough diversity had been accumulated that the descendants of a common ancestor began to differ significantly. Although the progenitors "lived long before the first bed of the Silurian system was deposited," Darwin is "certain that the ordinary succession by generation has never once been broken" (p. 489). This implies that during this tremendous amount of time no other progenitors have come into being. For Darwin, there must have been something very special about the moment when life was breathed into nonliving matter for the first and only time.

Although usually ignored by neo-Darwinists, Darwin's hint about the supernatural origins of life is actually a critical aspect of his framework of analysis. Throughout the *Origin*, he usually contrasts his account not with that of other evolutionists such as Lamarck or Chambers, but with that of someone we would now call a "special creationist." The position of Darwin's hypothetical creationist is the dialectical opposite of that endorsed in the *Origin*. The *Origin*'s crea-

tionist would seem in fact to be a younger less sophisticated version of Darwin himself. In the introduction to the *Origin*, Darwin tells us he used to believe that "each species has been independently created" (p. 6). While the Darwin of the *Origin* believes all life is united by its common ancestor, his creationist rejects the unity of life. Darwin believes "all living and extinct forms can be grouped together in one great system" (p. 433), but his creationist believes each form is special and unique. Darwin accounts for the diversity of life as the result of natural selection acting on existing variation; his creationist accounts for it as the result of God creating the progenitors of the varieties of organisms. Whereas Darwin believes life came into being only once, his creationist believes "that at innumerable periods in the earth's history certain elemental atoms have been commanded suddenly to flash into living tissues" (p. 483).

If Darwin would have conceded the possibility that life came to be more than once, the *Origin*'s framework of analysis would have lost much of its force. For then it would not be clear to what extent diversity is due to natural selection and to what extent to multiple independent origins. Multiple origins of organisms would disrupt the grand unity of life; it would tear at the very heart of the *Origin*. Thus Darwin must extend his theory of descent so as to include both plants and animals, not so much because of their similarity, but because of his philosophical perspective.

Darwin's assertion in the *Origin* that all the living things we observe descended from one organism can be traced back to speculations he had made on theology during the 1830s. When considering the transmutation of species in his notebook from 1837 and 1838, Darwin considered the theological meaning of whether or not transmutation follows from a fixed natural law. He remarks at one point in his private notebook that:

> Astronomers might formely [*sic*] have said that God ordered each planet to move in its particular destiny.—In same manner God orders each animal created with certain form in certain country, but how much more simple, & sublime power let attraction act according to certain law such are inevitable consequences let animal be created, then by the fixed laws of generation, such will be their successors. (Darwin 1838, p. 185)

Just as Newton showed the greatness of God in his *Principia* by explaining how the one law of gravity governs the motion of all the planets, Darwin is interested in showing that God did not make each species but created one organic being from which different species could be generated by fixed laws.

Although his beliefs about God developed over the ensuing 20 years, Darwin framed his biological *Principia* in a theological context. He opens the *Origin* with two epigraphs on natural theology. The first, by Whewell, refers to the British theological reconciliation of science and religion by holding that the laws discovered by science are secondary causes, while God, as the Creator of these laws, is the primary cause: "events are brought about not by insulated interpositions of

Divine power, exerted in each particular case, but by the establishment of general laws." A second quote, from Bacon, states no man can "be too well studied in the book of God's word, or in the book of God's works," implying the need to study both scripture and science to understand the world in which we live. Almost 500 pages later, Darwin brings the *Origin* to a conclusion with a reference to Genesis that echoes his 1838 remarks about science and religion: "There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved" (Darwin 1859, p. 490). In a single sentence Darwin interweaves the metaphysical breath of Genesis with the physical gravity of Newton's *Principia*.

UNITY BY COMMON LAW

Owen's critique of the *Origin* places the theory of evolution in a much broader framework than the question of whether species are the result of natural selection or special creation. Owen worked in the research tradition of rational morphology and the 19th-century Romantic philosophy of nature. Inspired by such works as Kant's *Critique of Judgment* (1790), rational morphologists studied the variations of anatomical structure in search of natural laws of organic form. The Romantic philosophers rejected the Newtonian mechanistic theory that matter consisted of inert corpuscles in favor of theories that saw matter as something that could move from forces internal to itself (Smith 1999, p. 37). Owen believed that anatomical observations of living and fossil organisms supported the idea that new living things were constantly generated and evolving. In both 1858 and 1859, Owen gave public lectures in which he distinguished between axioms that biologists can establish from inductive research and speculative theories they might create to explain the axioms (Desmond 1982, p. 62). As a curator of the British Museum, his vocation was to empirically display the scope of anatomical forms in public exhibits. In his requests to Parliament for funding of the national museum, Owen asked for acres of space and five miles of halls for the display of the varieties of life forms (Rupke 1994, p. 38). He wanted an entire hall for displaying all the species of whales, and he also argued that every single species of large land mammal should be put on exhibit (Rupke 1994, p. 35). Owen coined the term *dinosaur* from the Greek words for "awesome" (*denios*) and "lizard" (*sauros*). His museum would have indeed awed the public. He did not think that Darwin's book did justice to the nature of living things, however. In scrutinizing the *Origin*, Owen argued that Darwin's analysis was both unsupported by inductive evidence and theologically naive.

Owen's review of the *Origin* makes constant reference to the philosophical foundations of biology and draws a contrast between literary and inductive approaches to science. Referring to Darwin's reputation for vivid and clear writ-

ing, Owen credits Darwin's fame "to the Literary World, by the charming style in which his original observations on a variety of natural phenomena are recorded" (Owen 1860, p. 175). He notes that with its "pleasing style" and "certain artistic disposition," the *Origin* had already persuaded much of the reading public to believe the theory of natural selection. Owen questions, however, whether Darwin's style had advanced the cause of truth. He insists theories must have "principles, based on rigorous and extensive observation" (p. 180), and that hypotheses must have the support of "inductive bases." He cautions that because comparative anatomy uses "analogical probability," it does not give us the kind of certainty that could easily prove the means by which evolution occurs.

From the perspective of someone considering all of the anatomical structures that five miles of museum halls could display, there is much more to the question of evolution than whether the account of Genesis is literally true. Owen neither shares Darwin's faith that all organisms descended from one primordial progenitor, nor accepts the special creationist's notion that all living things are not part of one unified system. He grants to Darwin "that species are changed" but claims that the evidence Darwin cites fails to prove "the mode of change" (p. 212). For Owen, what unites all living things is not an origin from a common ancestor, but the fact that all life originated as a result of the same natural laws. Biological phenomena that Owen cites as indicating species arise by "a constantly operating" law include the repetition and variation of form in body segments, relations of species to general archetypes, the analogies of embryonic stages in different species, the alteration of generations in some organisms where the larva and adults appear to have forms of different species, and "the succession of forms throughout time and space" (p. 181).

Owen claims that the special creationist and Darwin both ultimately rely on the action of God. Insofar as Darwin concludes the *Origin* with the Biblical phrasing, Darwin recognizes: "a direct creative act, something like that supernatural or miraculous one which, in the preceding page, he defines, as 'certain elemental atoms which have been commanded suddenly to flash into living tissues'" (Owen 1860, p. 191). Darwin is no less a creationist than his dialectical rival merely because he limits God to one intervention. Indeed, Owen argues that in Darwin's theory, God's act of creation is even more miraculous. For it requires God, at that one moment, to impart to the progenitor the capacity to vary in such a way as to eventually result in the present organisms' "infinity of complications and their morphological results, which now try to the utmost the naturalist's faculties to comprehend and classify" (Owen 1860, p. 191). Darwin's theism requires God to have an incredible amount of foresight.

With his focus on ways life might have changed in the past, Owen sees Darwin as not adequately addressing what anatomists can directly observe about the forms present today. When Owen argues that all vertebrates share a common prototype, he gives a diagram of the archetypal vertebrate and explains how the morphology of all other vertebrates can be derived from it (Owen 1849). He

holds that homologous parts shared by different species have a common underlying form because the organism follows natural laws discernible by anatomists (Cosans 1994). Darwin, however, uses a less empirically verifiable strategy. Owen notes that if Darwin has an idea of what the nature of the prototype was then "he refrains from submitting it to criticism" (Owen 1860, p. 191). The only property he seems to attribute to his progenitor is existence.

Owen reasons further that in Darwin's theory the progenitor must be "eminently plastic, is modified by the influence of external circumstances, and propagates such modification by generation" (Owen 1860, p. 192). Over an enormous period of time, natural selection acted upon the progenitor's descendants so as to produce organisms as diverse as humans and plants. Owen reasons that if its form is this plastic, it is inconceivable that any of the descendants of the progenitor would have retained the original form. If Darwin's analysis were true then "no living being, therefore, can now manifest the mysterious primeval form to which Darwin restricts the direct creative act" (p. 193). However, very simple organism do exist today.

Owen claims that an inductive comparison of the different forms of life indicates that living beings are not as plastic as Darwin's theory of natural selection requires. Owen argues that instead of an indefinite variation among organisms, we can observe four main forms of life. The most basic form, that of the nucleated cell, is possessed by all living things. Owen notes that the nucleated cell "is a grade represented and passed through by the germ of every, even the highest, class of animals, in the course of embryonic development" (pp. 193–94). The three other forms are instantiated by the groups protozoa, plants, and animals. Protozoa are mostly small and simple, while plants and animals have "distinctive superadditions." A plant "is rooted, has neither mouth nor stomach, exhales oxygen, and has tissues composed of 'cellulose' or of binary or ternary compounds." An animal, on the other hand, can move, "receives the nutritive matter by a mouth, inhales oxygen, and exhales carbonic acid, and develops tissues, the proximate principles of which are quaternary compounds of carbon, hydrogen, oxygen, and nitrogen" (p. 194).

With his focus on the forms alive today, Owen maintains that the group of protozoa, which he considers the simplest life forms, are generated from inanimate matter as the result of ever-operating natural laws. He holds that like the species, the progenitor organisms themselves "originate, and have ever originated, from the operation of secondary and continuously operating creative laws" (p. 195). This reflects the position he would take throughout the 1860s as one of the leading figures in British science to endorse the theory of spontaneous generation (Strick 2000, pp. 37–61). Owen sees in the living kingdom a progressive yet continuous hierarchy of complexity, which he attributes to the amount of time the laws governing forms of life have been operating on a given monad or lineage. The more remote the time a monad's first progenitor became a living organism, the more complex its members will be; the more recent the initial progenitor, the more simple. Thus Owen infers that the monad that

> has ultimately become man, dates from the farthest point in the remote past upon which our feigners of developmental hypotheses can draw with unlimited credit, the monad which by its superficial vibratile cilia darted across the field of the microscope we were looking through this morning, is the result of the collocation of particles which, without "sudden flash," took place under the operation of the heterogeneous organizing force of yesterday. (Owen 1860, p. 195)

While all life does not descend from one particular progenitor, it is derived from one universal form caused by the same natural laws.

Owen's skepticism about Darwin's monophyly and his belief that life has multiple origins thus follows from a deistic theology, in which God established whatever natural laws cause the generation of life forms when he first created the universe. In Owen's view God created the laws responsible for the generation of life forms at the same time as he created the laws of physics. He would not need to intervene further in the course of nature in order to create life in particular locations, because matter itself contains the forces that produce new life forms. For Darwin, matter is inert unless the breath of life is imparted to it from without. Darwinian evolution has Newtonian overtones, with new species arising from the action of natural selection upon individual organisms, just as in Newton's mechanics motion arises from forces acting upon corpuscles. For Owen, by contrast, matter constantly produces new life, both in the cases when simple forms arise from nonliving matter and when new forms arise from previously existing species.

THE NATURAL AND THE MIRACULOUS

Underlying the dispute between Owen and Darwin are two different ways of looking at nature. Both frameworks of analysis can be used to give an account of the living things. However, both are ultimately grounded on suppositions that must be accepted *before* one gets an account. What one sees depends to a great extent on the methods that follow from one's philosophical perspective. Both Owen and Darwin understand life as unified, but they understand different things by this unity. Owen postulates that all the phenomena of life from its origins to the present diversity are due to natural laws that have been present in nature from the beginning. Darwin is more modest with naturalism; he accounts for the origin of species as the result of natural laws that govern reproduction, inheritance, variability, and the struggle for life. However, he does not try to use natural laws to account for the existence of life itself. In the second edition of the *Origin*, Darwin actually added a passage in which he noted that his belief that God only made one or a few original progenitors is "just as noble a conception of the Deity" as that held by special creationists (Gillespie 1979, p. 132). Darwin's system no more explains how and why life came to be than Owen's explains how and why all life follows the laws of anatomical form. Although most biologists today would cite Darwin as a founder of their research program, a minor-

ity still might be seen as working in Owen's tradition. A school of thought known as structuralism focuses less on natural selection and more on a search for more basic laws of organic form and self-organization (Kauffman 1993; Webster and Goodwin 1982). These investigators have been especially active in current research into the possible origins of life.

Why did Darwin's account experience such success? The folk history is that Darwinism succeeded simply because it offered a scientific explanation of something that had only previously been accounted for the stories in the Bible: it is a case of the triumph of naturalistic science over supernatural religion. However, if one defines a miracle as an extraordinary event, one that occurs contrary to the normal patterns of nature, then it is *Darwin's* system that is the more supernatural. It sees matter as inert and holds that life normally does not come to be from nonliving things, but it holds that once long ago one or a few organisms had precisely this kind of genesis. The *Origin* thus does not provide an account of life that is free of supernaturalistic presuppositions. It does, however, provide its believers with a comprehensive account of life. All life is unified because it descended from a common ancestor with the differences arising from natural selection. Darwin tells us a simple story that lets our imagination see where all the species came from.

Popular culture views Darwin's theory as providing scientific evidence against religion. However, this is not supported by a close analysis of the text of the *Origin* and its implications. A simple way of reading the *Origin* as supporting theistic thinking is to see the first progenitors and the laws of reproduction, variation, and selection as the results of God's action. In his autobiography, Darwin confesses that this indeed was his conviction when writing the *Origin*. Many historians of science have discussed the ways Darwin's analysis drew upon the Christian theology of his time (Brown 1986; Gillespie 1979, p. 124; Richards 1999, pp. 130–35). Although later in life Darwin began to entertain an agnostic perspective, this was after he had conceived of his theory.

There is, however, a deeper way in which Darwin's theory conforms not just to natural theology, but to Christianity. Although he later consciously rejected revealed religion (Darwin 1892, p. 86), Darwin's account in the *Origin* is one of someone who, as a child, was raised in the literary tradition of the Bible. In the Bible, all life has its roots in an initial period in which God creates the ancestors of all living things. It is most detailed about the case of our ancestors. When God created the first human, he "formed man of the dust of ground and breathed into his nostrils the breath of life" (Genesis 2:7). From the rib of Adam, God created Eve and from these two all of humankind descend. Consequently, all humans are members of one great family. After they eat from the Tree of Knowledge, God drives Adam and Eve out of Eden lest they eat the fruit of the Tree of Life (Genesis 3:22–3:24). Eons later, Darwin tells us a story about another "Tree of Life" (1859, p. 130). In the *Origin* all living things have descended from one form into which life was "originally breathed" (p. 490). By telling his story with Biblical

wording and thought patterns, Darwin juxtaposes the narrative of the *Origin* with the myth of Genesis. In the *Origin*, Darwin tells civilized humans that they are but a twig in one great Tree of Life. All organisms, humans as well as plants, descended from common ancestors and are members of this great Tree. This is, perhaps, the most penetrating claim of Darwin's creation story.

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