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A Black Box or a Black Hole?

A Response to Michael J. Behe

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It is indeed a pleasure to review Dr. Michael J. Behe's paper "Design vs. Randomness in Evolution: Where Do the Data Point?" He is a personal friend whose strong Christian faith has encouraged me, and whose scholarship in the origins debate has sharpened my understanding of these complex issues.

We both agree that the complexity in nature, as seen through the science of biology, points to an intelligent designer. Different versions of this "argument from design" are seen throughout Church history, and these provide some of the strongest rational arguments for the existence of God (1). We also agree that the complexity in

biology is not, as Cardinal Joseph Ratzinger states in 1986, "the products of chance and error." Finally, we both recognize that biological evolution or common descent is not necessarily inimical to the Christian faith, and we resonate fully with Pope John Paul II's 1996 statement that evolution is "more than a hypothesis."

It must be pointed out to Roman Catholic readers that Behe has become internationally known for his book *Darwin's Black Box: The Biochemical Challenge to Evolution* (1996), and in particular in Protestant fundamentalist and evangelical circles. During this century, these Christian traditions in North America have been characterized by their firm anti-evolutionary stance, which is by and large due to their very literal reading of the opening chapters of the Bible. Behe's book has become central to fundamentalist and evangelical critiques against biological evolution, and he has emerged as the leading scientific figure in the so-called "Intelligent Design" movement. It is interesting to note that Intelligent Design theorists are mostly evangelicals and fundamentalists, and they typically do not accept biological evolution. Why, then, is a Roman Catholic like Behe, who accepts the recent papal affirmation of evolution, so popular in these circles?

First, Behe openly criticizes Charles Darwin's views on the origin of life. In the fundamentalist and evangelical world, Darwin has been demonized because his theory of evolution threatens their literal interpretation of the early chapters of the Book of Genesis. Moreover, these Christians have misrepresented Darwin's views as being entirely dysteleological. That is, Darwinian evolution is interpreted as being an entirely chance or random process, a view of origins that no Christian can accept. Behe supports this interpretation in his paper by claiming that "random variation" is the mechanism that drives Darwinian evolution. Behe and these Protestants, however, are simply not familiar with the historical record. This atheistic view of evolution was never Darwin's position. No fewer than seven times in his famed *On the Origin of Species* (1859) does he refer to a Creator in a positive and supportive context (2). For example, Darwin asserts, "To my mind, it accords better with what we know of the laws impressed on matter by the Creator that the production and extinction of the past and present inhabitants of the world should have been due to secondary causes like those determining the birth and death of an individual" (3). Only a few years before his death, Darwin admitted that he "had never been an atheist in the sense of denying the existence of God" (4). More anon regarding Darwin's actual views.

More importantly, Behe's popularity in Christian fundamentalism and evangelicalism is due to the anti-evolutionism expressed in his book *Darwin's Black Box*. This is also seen in his paper when he states that so-called "irreducibly complex" structures like cilia "cannot be put together in the gradual fashion that Darwin anticipated because they only function when the system is essentially complete." In his book, Behe defines this concept of irreducible complexity which he has coined:

By irreducibly complex I mean a single system composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system effectively to cease functioning. An irreducibly complex system cannot be produced directly (that is, by continuously improving the initial function, which continues to work by the same mechanism) by slight, successive modifications of a precursor system, because any precursor to an irreducibly complex system that is missing a part is by definition non-functional. An irreducibly complex biological system, if there is such a thing, would be a powerful challenge to Darwinian evolution. Since natural selection can only choose systems that are already working, then, if a biological system cannot be produced gradually, it would have to arise as an integrated unit, in one fell swoop, for natural selection to have anything to act on. (5)

As a result, if certain biological structures can only be brought into existence in "one fell swoop," then there must be someone who is accountable for this act.

Behe has been cautious in not committing himself to the view that God intervenes directly into nature to create these purportedly irreducibly complex structures. In *Darwin's Black Box*, however, he speculates in one brief passage if divine intervention might have resulted in the direct creation of a cell from which all of life has evolved:

The irreducibly complex biochemical systems that I have discussed in this book did not have to be produced recently. It is entirely possible, based simply on an examination of the systems themselves, that they were designed billions of years ago and that they have been passed down to the present by the normal processes of cellular reproduction. Perhaps a speculative scenario will illustrate the point. Suppose that nearly four billion years ago the designer made the first cell, already containing all of the irreducibly complex biochemical systems discussed here and many others. (One can postulate that the designs for systems that were to be used later, such as blood clotting, were present but not "turned on." In present-day organisms, plenty of genes are turned off for a while, sometimes for generations, to be turned on at a later time.) Additionally, suppose the designer placed enough evidence to conclude some design. The cell containing the designed systems then was left on autopilot to reproduce, mutate, eat and be eaten, bump against rocks, and suffer all the vagaries of life on earth. (6)

Understandably, fundamentalists and evangelicals have quickly grabbed hold of Behe's notion of irreducible complexity and the necessity for direct divine intervention to affirm their interventionistic view of God's creative method. That is, these Christians only understand the creation of life through dramatic miraculous acts. Of course, for those who are familiar with Darwin's actual views, the irony of Behe's first-cell thesis is that a similar view of life's origin is found in *On the Origin of Species*. In the famed last sentence of the 1859 book, Darwin writes, "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 on cycling 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" (7).

But what are we to make of Behe's assessment of the scientific data and of his theory about how irreducibly complex structures were created? To be sure, in contrast to most of the Intelligent Design theorists, he is a well-trained scientist specializing in biochemistry. His book accurately reports the amazing and God-glorifying complexity of the cell. In addition, Behe is correct to point out that modern science has yet to reveal how the biomolecules and the cell have evolved. Early attempts to explain this part of evolution have been dismissed by the scientific community. But the vital question that must be asked is, Does the inability to explain how these complex structures arose reflect a black box in which God intervenes or a black hole in our knowledge? Stated another way, is the creation of an original first cell a true and real "gap" within the usually continuous economy of the laws of nature, that is, a "gap" needing the intervening hand of God? Or, is Behe's position just another example of the problematic "God-of-the-gaps" position, in which the "gaps" are only gaps in our knowledge that will be filled by the advancing light of science?

I have two concerns with regard to Behe's thesis for the creation of irreducible structures in "one fell swoop." First, before Christians come to claim publicly the existence of any miraculous intervention during the course of geological time, it behooves them to be certain lest they embarrass the Church with rash and intellectually (in this case, scientifically) unsubstantiated claims. I am more than uncomfortable with the assertions of a single man, the biochemist Behe. Such claims should, at the very least, be made within a community of biochemists. I know a number of professional biochemists, including many devout Christians, and their assessment of Behe's "one fell swoop" thesis is quite negative.

Second, it must be emphasized that the theory of evolution was built on the fossil record of tissues and not biomolecular structures. The reason for this is that biomolecular structures, like Behe's oft-used example of cilia, are too small to be fossilized. As a result, Behe and biochemists like him are at a disadvantage in attempting to reconstruct evolutionary precursors, in that they simply do not have a biomolecular fossil record from which to work. By contrast, large and hard tissues, like bones and teeth, can easily be fossilized and preserved, as the geological record reveals. Let me offer an example from my biological specialty (the development and evolution of teeth and jaws) to help explain the problem that biochemists like Behe have in understanding biochemical evolution. If I were given only a modern human dentition, and if I were not aware of the fossil record for the evolution of teeth and jaws, then I cannot imagine how I could ever come up with the series of dental precursors which is known today from the fossils. This is the very problem that Behe

and the biochemists face in determining biochemical precursors. They only have the modern form of cilia before them, and no fossil cilia to aid in determining the series of stages that this biomolecular structure passed through in its evolution.

Undoubtedly, the utter complexity of biomolecules and the limits of human imagination may prove to be factors that will leave this aspect of evolutionary theory open-ended and unknown. On the other hand, and I suspect that this will probably be the case as history reveals, the gap in the knowledge of biomolecular evolution will be closed. To be sure, this will be quite a complex story, and will undoubtedly be a new chapter in the design argument. However, if Behe is right, and there was indeed in the distant past a divine "one fell swoop" intervention for the creation of the first cell, then he will go down in history to take his place alongside scientific stalwarts like Galileo, Newton, and Einstein, and I will burn this paper and then boast to my grandchildren that he was a good friend. If such a gap truly exists, then further research will only widen the gap, thus supporting the necessity for intervention from outside the natural causal nexus of the universe. To repeat, however, history does not offer one example of such a gap. Rather, the historical record reveals that the many gaps which have been proposed have all been closed by the advance of science and a fuller understanding of nature.

I have followed with interest the development of the Intelligent Design movement over the last five years. They claim to be in the process of creating and ushering in what they term as "theistic science." Behe's work is the scientific centrepiece in their programme. The greatest problem with this movement, however, is that it never clearly defines "theistic science," nor does it offer a model of origins. For that matter, Intelligent Design theorists hold a variety of differing and contradictory views, and there is even evidence of significant shifts in their positions during the short period of the movement's existence (8). Behe's views are an example. As noted in his paper in this journal and in his book *Darwin on Trial*, he accepts so-called "irreducible complexity," a feature that seems to appear in the world through some extraordinary event other than a slow and gradual process like evolution. It is because of this interventionism and anti-evolutionism that his work has gained acclaim in evangelical and fundamentalist circles. But in following Behe's writings and after a number of personal conversations with him, I began to wonder what he really believes.

In preparation for this review of Behe's paper, I asked him to elaborate on his notion of the first cell created in "one fell swoop," or the "super cell," as some of his colleagues have referred to it. Dr. Behe answered me directly, and he has even graciously permitted me to quote his personal response in my paper. He writes:

I do not think there had to be a "super cell." Intelligent Design is compatible with a lot of different scenarios for how the information was placed into the system. It could have been present in the initial conditions of the Big Bang, or

added over time somehow. I mentioned the “super cell” in my book not to endorse it, but simply to show that the issue of the age of biochemical systems is different from the issue of how they got here. My official position is agnostic: I think we don’t have enough information yet to decide how the design was implemented. We do, however, have enough evidence in the Intelligent Design view to decide that explicit design occurred, and that the random processes envisioned by Darwinism can’t cut it. (9)

Now, a number of significant points are made in this remarkable passage.

First, Behe continues to maintain that a dysteleological (or random) view of evolution cannot account for the origin of life. I agree with him. He again suggests that this view of life’s origin was Darwin’s position. As noted previously, however, this is not the historical record because Charles Darwin openly admitted that he never held such a position.

Second, note that Behe strays from his notion of irreducible complexity. Recall that irreducibly complex biomolecular structures “cannot be put together in the gradual fashion that Darwin anticipated because they only function when the system is essentially complete;” as a result, since “a biological system cannot be produced gradually, it would have to arise as an integrated unit, in one fell swoop.” However, Behe’s “official position is agnostic” on how this Intelligent Design or irreducible complexity arises in living systems. In other words, Behe’s position is not that of the interventionism expressed in *Darwin’s Black Box*. Proof that Behe’s book is interventionistic and anti-evolutionary is the fact that it is today the most important book on the topic of origins in the fundamentalist and evangelical world, a religious tradition characterized by interventionistic creationism and anti-evolutionism.

Third, note that Behe even speculates that Intelligent Design could have been implemented in the Big Bang. If this is indeed the case, then he truly betrays the concept of irreducible complexity. By definition, irreducibly complex biomolecular structures cannot be put together one piece at a time through a gradual process. Irreducible complexity can only come about through “one fell swoop” acts during the course of time, and not at the very beginning of time. Behe’s shift in the direction of a full evolutionary theory, not requiring interventions during the history of life, is characteristic of many who have gone before him, in that the gaps that they once believed existed in nature are only gaps in their knowledge. Suggesting that Intelligent Design could have been loaded in the initial conditions of the Big Bang is evidence that the gaps are closing in Behe’s view of origins, and that he is coming to terms with biological evolution.

To close, it is always a pleasure to interact with my good friend Dr. Behe. I have always enjoyed our exchanges and have viewed them in the proverbial context of iron sharpening iron (Proverbs 27: 17), even with the occasional spark! I believe that his black box thesis is, in reality, a black hole or gap in our knowledge which, as

history reveals, will be filled in by the findings of modern science. My respectful suggestion to Dr. Behe is to return to the Mother Church's view of biological origins and to leave behind the interventionism and anti-evolutionism of Protestant evangelicalism and fundamentalism.

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Notes

1. For example, even Charles Darwin acknowledged "the extreme difficulty or rather impossibility of conceiving this immense and wondrous universe, including man with his capacity of looking backwards and far into futurity, as the result of blind chance or necessity." Charles Robert Darwin, *The Autobiography of Charles Darwin, 1809-1882*, ed. Nora Barlow (London: Collins, 1958) 92.
2. Charles Robert Darwin, *On the Origin of Species*, a facsimile edition of the first edition, ed. Ernst Mayr (Cambridge: Harvard UP) 186, 188, 189, 413 (twice), 435, 488.
3. *Ibid.* 488.
4. Francis Darwin, *The Life and Letters of Charles Darwin* (London: John Murray, 1888) 1: 304.
5. Michael J. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (New York: Free, 1996) 39.
6. *Ibid.* 227-28.
7. *On the Origin of Species* 490.
8. For an example of this intellectual shifting, see my response to the Intelligent Design movement's leader Phillip E. Johnson, entitled "The Gaps Are Closing: The Intellectual Evolution of Phillip E. Johnson," in Phillip E. Johnson and Denis O. Lamoureux, *Darwinism Defeated?: The Johnson-Lamoureux Debate on Biological Origins* (Vancouver: Regent College, 1999).
9. Michael J. Behe to Denis O. Lamoureux, e-mail correspondence 23 April 1999. Reproduced with the permission of Michael J. Behe 24 April 1999.