

## LITERATURE REVIEWS

*Readers are invited to submit reviews of current literature relating to origins. Mailing address: ORIGINS, Geoscience Research Institute, 11060 Campus St., Loma Linda, California 92350 USA. The Institute does not distribute the publications reviewed; please contact the publisher directly.*

## BLACK BOXES AND DESIGNERS

*David Ekkens*

*Southern Adventist University, Collegedale, Tennessee*

DARWIN'S BLACK BOX: THE BIOCHEMICAL CHALLENGE TO EVOLUTION. Michael J. Behe. 1996. NY: The Free Press. 307 p. Cloth, \$25.50.

Of all the books that have been written recently dealing with the creation/evolution debate, this book surely ranks at or near the top. As one college teacher put it, "*Darwin's Black Box* really strengthened my faith."

Even though the author, Michael J. Behe, is Associate Professor of Biochemistry at Lehigh University (Pennsylvania), he has a style of writing that makes interesting reading for anyone, chemist or non-chemist. His illustrations range from baking a cake, to a swim in the pool, to woodchucks crossing a thousand-lane freeway at rush hour. He does include short sections of technical biochemistry in nearly every chapter, but a non-chemist can skip those sections and still get the major message of the book.

The book's main theme is an examination of problems associated with applying Charles Darwin's theory of natural selection to cell evolution. Behe wants to know if several small changes in a cell's chemicals could produce the chemical machines that cells use to live.

### **Part I: The Box is Opened**

In this first section, Behe describes why molecular details are important. How life works at the molecular level was never explained by Darwin because the science of biochemistry was nonexistent in Darwin's day. Therefore the cell was a black box for Darwin — he

really couldn't look into it to see how it worked or how it could have evolved. Now, says Behe, our knowledge of biochemistry is advanced to the extent that we can look into the black box and see if Darwinian theory can explain the evolution of cell components.

As Behe states:

*Anatomy is, quite simply, irrelevant to the question of whether evolution could take place on the molecular level. So is the fossil record. It no longer matters whether there are huge gaps in the fossil record.... The fossil record has nothing to tell us about whether the interactions of [several chemicals involved in vision] could have developed step-by-step.... Until recently ... evolutionary biologists could be unconcerned with the molecular details of life because so little was known about them. Now the black box of the cell has been opened, and the infinitesimal world that stands revealed must be explained* (p 22).

To demonstrate how upset some people are with neo-Darwinism, Behe quotes from several scientists. He quotes a scientist named Lynn Margulis: “Neo-Darwinism, which insists on (the slow accrual of mutations), is in a complete funk” (p 26). Behe quotes two other scientists (Orr and Coyne) as saying: “We conclude — unexpectedly — that there is little evidence for the neo-Darwinian view: its theoretical foundations and the experimental evidence supporting it are weak” (p 29).

But how can we test Darwinian theory and be able to accept or reject it? Behe quotes the so-called “criterion of failure” from Charles Darwin’s book *The Origin of Species*, published in 1872:

*‘If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down’* (p 39).

Behe then asks what kind of system could there be that “could not possibly have been formed by ‘numerous, successive, slight modifications.’” The answer he gives is an irreducibly complex system:

*... 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 to effectively cease functioning* (p 39).

When we look at a large system (an eye, for example), its complexity makes it practically impossible to think about all the molecules at the same time and to guess how complicated structure could have evolved from a simpler structure. But if we look at smaller structures, all necessary chemicals (and each of their functions) are known. Therefore we should be able to see if the irreducibly complex system could have evolved from some other functioning system. (Remember, natural selection only works on functioning systems. The precursor to the system must function and each intermediate stage must function — otherwise it will be eliminated. The other side of the coin labeled “survival of the fittest” is labeled “death of the unfit.”)

## **Part II: Examining the Contents of the Box**

This is the “meat and potatoes” section of the book. Behe examines several irreducibly complex systems: the cilium, the blood-clotting system, protein production and transport in a cell, cellular defense mechanisms (immunity), and production by a cell of AMP. Each of these systems consists of several interacting chemicals.

Behe’s conclusion from studying each of these is that the probability of any of them evolving by Darwinian successive changes is infinitesimally small:

*In summary, as biochemists have begun to examine apparently simple structures like cilia and flagella, they have discovered staggering complexity, with dozens or even hundreds of precisely tailored parts.... As the number of required parts increases, the difficulty of gradually putting the system together skyrockets, and the likelihood of indirect scenarios plummets (p 73).*

At the end of each of the chapters in Part II, Behe describes how he searched the professional literature to see if any good explanations have been published of how molecular evolution occurred. Each of these searches ended in failure: the conclusion is that no one knows. And yet, we are told that nothing makes sense in biology except in the light of evolution.

## **Part III: What Does the Box Tell Us?**

In this concluding section, Behe examines in more detail what has been published in the professional literature concerning molecular evo-

lution. The *Journal of Molecular Evolution*, established in 1971, is devoted exclusively to answering how life at the molecular level came to be. Approximately 1000 papers have been published in JME over the last decade. Each of these papers falls into one of three classes. About 10% of them deal with origin-of-life research. Classical evolutionists believe that life originated by spontaneous generation. The first research of this type (done by Stanley Miller in 1954) electrified the world when amino acids were produced. People assumed that life would soon be made in the test tube. But listen to the conclusions quoted by Behe from Klaus Dose, one of the researchers in the field:

*'More than 30 years of experimentation on the origin of life in the fields of chemical and molecular evolution have led to a better perception of the immensity of the problem of the origin of life on Earth rather than to its solution. At present all discussions on principal theories and experiments in the field either end in stalemate or in a confession of ignorance'*  
(p 168).

The second type of papers in JME (5%) deals with mathematical methods for comparing and interpreting sequence data. Although interesting, these papers assume that evolution is a gradual process; they do nothing to demonstrate it.

The third type of papers (about 80%) were sequence comparisons of nucleic acids or proteins from different organisms. "Although useful for determining possible lines of descent, ... comparing sequences cannot show how a complex biochemical system achieved its function" (p 175). The conclusion Behe reaches is that "none of the papers published in *JME* over the entire course of its life as a journal has ever proposed a detailed model by which a complex biochemical system might have been produced in a gradual, step-by-step Darwinian fashion" (p 176). (Behe has been criticized for not mentioning a book by Cairns-Smith, *Seven Clues to the Origin of Life*, which supposedly deals with some of the issues Behe raises.)

Behe's final chapters describe his overall conclusion: life was designed by an intelligent being. Behe discusses design and goes into a long discussion of early ideas of design. He asks why most scientists reject design and concludes that it has to do with the implications of the design idea: if one side of the elephant is labeled "intelligent design," the other side might be labeled "God." But why do scientists not want

to entertain ideas about God? Behe discusses several reasons in his final chapter.

You owe it to yourself to read this book. One word of caution: don't read this book hoping to disprove evolution, and please don't tell people that evolution has now been proven false. *Darwin's Black Box* does not prove that evolution did not or could not happen. Behe makes it clear that he is not saying anything about evolution at higher levels or about how long ago life originated. In his introductory chapter he states:

*For the record, I have no reason to doubt that the universe is the billions of years old that physicists say it is. Further, I find the idea of common descent ... fairly convincing.... I think that evolutionary biologists have contributed enormously to our understanding of the world.... however, I do not believe [natural selection] explains molecular life (p 5).*