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# Book Reviews

*Up a River Without a Paddle*

## River Out of Eden: A Darwinian View of Life

by *Richard Dawkins*  
Basic Books, New York

Reviewed by Raymond G. Bohlin

Dawkins' book is the fourth in a series being published by Basic Books entitled **The Science Masters Series**. This series is said to be

*'a global publishing venture consisting of original science books written by leading scientists'*.

Purposing to

*'present cutting-edge ideas in a format that will enable a broad audience to attain scientific literacy'*,

this series is aimed at the non-specialist. The first three releases were **The Last Three Minutes: Conjectures About the Ultimate End of the Universe** by Paul Davies, **The Origin of Humankind** by Richard Leakey, and **The Origin of the Universe** by John D. Barrow. These were followed by Dawkins' contribution. A look at these books and future contributors like Daniel Dennett, Jared Diamond, Stephen Jay Gould, Murray Gell-Mann, Lynn Margulis, and George C. Williams, makes it look less like a scientific literacy series and more like an indoctrination in philosophical naturalism.

Having scanned the first three books and closely read Dawkins' work, I think that is precisely what this series is. All the books so far deal with fundamental questions that are answered with scientific data in a truly engaging, enlightening, and enter-

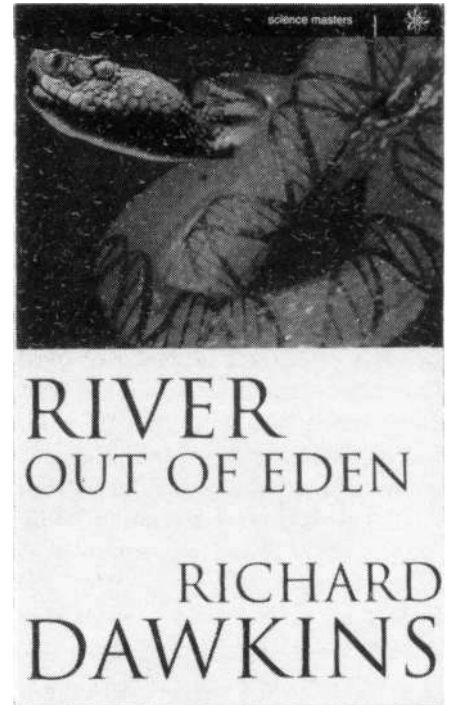
taining fashion with just the right mix of clear science and stealth philosophy. While this series can be educational, the reader needs to use discernment on every page. Each book strenuously seeks to convince the reader that the physical universe is all there is, and science is the only trustworthy vehicle to arrive at any meaningful answers in a sometimes subtle, and sometimes overt, manner.

### THE DNA 'RIVER'

Richard Dawkins' exposition of a Darwinian view of life in **River Out of Eden** certainly fits into the overt anti-theism category. His **River Out of Eden** is a river of DNA that is the true source of life and the one molecule that must be understood if life is to be understood.

This river of DNA originally flowed as one river (one species) which eventually branched into two, three, four, and eventually millions of rivers. Each river is distinct from the others and no longer exchanges water with the others, just as species are isolated reproductively from other species. This metaphor allows Dawkins to explain both the common ancestry of all life, along with the necessity of gradualism in the evolutionary process.

The commitment to gradual evolution is no surprise coming from Dawkins, but he forces himself to do



some rather grotesque hand-waving when he chooses to discuss the Cambrian explosion. He notes that some in the past have suggested that the Cambrian creatures may have evolved by some unknown mechanism, since gradual Darwinism simply can't achieve the level of diversity in the Cambrian in only 5-10 million years. Dawkins exclaims:

*'The fallacy is glaring! Even creatures as radically different from one another as mollusks and crustaceans were originally just geographically separated populations of the same species. For a while, they could have interbred if they had met, but they did not. After millions of years of separate evolution, they acquired the characteristics which we, with the hindsight of modern zoologists, now recognize as those of mollusks and crustaceans respectively.'*

This simply glosses over the evidence of sudden appearance of radically

different body plans that give no hint of having recently been geographically isolated forms of the same species. Simply saying with gusto that the 'fallacy is glaring' does not make it so.

Dawkins also refers to this river of DNA as a digital river. That is, the information contained in the DNA river is completely analogous to the digital information of languages and computers. Chapter 1 contains an excellent discussion of the differences between analogue codes and digital codes, and why DNA fits the digital model.

Surprisingly, Dawkins gives away the store in this first chapter. In pressing home the digital analogy, Dawkins first uses probability to indicate that the code arose only once and that we are all, therefore, descended from a common ancestor.

*The odds of arriving at the same 64:21 (64 codons:21 amino acids) mapping twice by chance are less than one in a million million million million million. Yet the genetic code is in fact identical in all animals, plants and bacteria that have ever been looked at. All earthly living things are certainly descended from a single ancestor*

So it is reasonable to use probability to indicate that the code could not have arisen twice, but there is no discussion of the probability of the code arising by chance even once. A curious omission! If one tried to counter with such a question, Dawkins would predictably fall back on the assumption of naturalism, that since we know only natural processes are available for the origin of anything, the genetic code must have somehow beaten the odds.

Even more glaring is Dawkins' attempt to awe the reader with the precision of the DNA code by using the illustration of an imprisoned molecular biologist. After being forced to work in a biological-warfare lab by an evil power, the biologist engineers a virus that contains a coded message in the DNA, utilising the 64 codons for the 52 upper and lower case

letters of the alphabet plus punctuation marks, explaining his predicament. The coded message is flagged by the use of an easily recognisable sequence, the first 10 prime numbers. The scientist infects himself with the virus, sneezes on others in the lab and the virus is eventually spread around the world. In attempting to halt the spread of the epidemic, scientists sequence the entire genome of the virus and are alerted to the presence of the coded message by an odd repeated pattern.

*'Alerted by the prime numbers — which cannot have arisen spontaneously — somebody tumbles to the idea of deploying code-breaking techniques. From there it would be short work to read the full English text of Professor Crickson's Message, sneezed around the world.'* (Emphasis mine.)

Amazing how the simple series of the first 10 prime numbers cannot have arisen in the genetic code by chance, but the very code itself can. I believe the emperor has no clothes!

### COMMON DNA ANCESTOR?

Chapter 2 attempts to tell the story of the now famous 'African Eve', the idea that we are all descended from a single female, probably from Africa, about 100,000 years ago. This conclusion originates from sequence data of the DNA contained in mitochondria. Mitochondria, hence mitochondrial DNA, are inherited maternally. The sperm injects only nuclear DNA into the egg cell; therefore all our mitochondria are inherited from our mother. Therefore, an analysis of mitochondrial DNA reveals maternal history only, uncluttered by the mixture of paternal DNA. Dawkins thus takes us on a rather tortuous route to prove that we are all (maternally) descended from one individual regardless of whether we know who that is.

Finally, Dawkins makes his case for the reliability of molecular phylogenies. Here he glosses over

weaknesses in the theory and actually misrepresents the data. On page 43 he says,

*'On the whole, the number of cytochrome c letter changes separating pairs of creatures is pretty much what we'd expect from previous ideas of the branching pattern of the evolutionary tree.'*

Later on page 44 when speaking of all molecular phylogenies performed on various sequences,

*'They all yield pretty much the same family tree — which by the way, is rather good evidence, if evidence were needed, that the theory of evolution is true.'*

Besides implying that evidence is not really needed to prove evolution, Dawkins stumbles in trying to display confidence in the molecular data. What exactly does 'pretty much' mean anyway?

He makes the errant claim that the differences in speed of evolution exhibited by different proteins and genes reflect the degree that a protein can tolerate amino acid substitutions. The less a protein can tolerate changes in its amino acid sequence and still perform its function, the fewer the number of substitutions over millions of years. In other words, the greater the functional constraints on a protein the less variation over the years; the fewer the constraints, the greater the variation. But the idea of functional constraints has not been verified by the data, which of course Dawkins does not bother to mention. Michael Behe reported in 1990 that the histones, thought to be the most functionally constrained proteins known, tolerate deletions and substitutions quite well.<sup>1</sup>

While this chapter contained the usual degree of arrogance from Dawkins, particularly in his disdain for the original account of Adam and Eve, it was somewhat less compelling or persuasive than is his usual style. He hedged his bet frequently and simply waived his hand at controversy. Unfortunately, this may not be picked up by the unwary reader.

## THE 'PROBLEM' OF DESIGN

In Chapter 3, 'Do Good by Stealth', Dawkins launches a full-scale assault on the argument from design. After presumably debunking arguments from the apparent design of mimicry (not perfect design, you know, just good enough) Dawkins states,

*'Never say, and never take seriously anybody who says, "I cannot believe so-and-so could have evolved by gradual selection." I have dubbed this fallacy "the Argument from Personal Incredulity."*

To some degree I'm afraid that many creationists have given Dawkins and others an easy target. Such a statement, *I cannot believe . . .*, has been used many times by well-meaning creationists but is really not very defensible. It is not helpful to simply state that you can't believe something; you must elaborate the reasons why.

First, Dawkins levels the charge that much of what exists in nature is far from perfectly designed and is only good enough. This he claims is to be expected of natural selection rather than a designer. His examples include the mimicry of orchids to appear and smell like a female wasp to elicit copulating behaviour by the male wasp and thereby pollination of the orchid, the red belly of male sticklebacks to attract a female, gull parenting and feeding behaviour, and other lesser examples. Dawkins painstakingly assembles plausible sequences to indicate that it is not all that difficult to envision a process of natural selection and mutation to account for these wonders of the natural world.

To begin with, the lack of perfection in no way argues for or against a designer or natural selection. I have always marvelled at some evolutionists who imply that if it isn't perfect, then Nature did it. Just what is perfection? And how are we to be sure that our idea of a perfect design wasn't rejected by the Creator because of some flaw we cannot perceive? It

is a classic case of creating God in our own image. The evolutionists are the ones guilty of erecting the straw man argument in this instance. In addition, Dawkins fully admits that these features work perfectly well for the task at hand. The Creator only commanded His creatures to be fruitful and multiply, not necessarily to be perfectly designed (humanly speaking) wonders. Romans 1:18-20 indicates that the evidence is sufficient if you investigate thoroughly.

Dawkins oversimplifies the complexities in each case history. For example, in the wasp/orchid mimicry, he claims that maybe the wasp doesn't need a perfect mimic of a female to get the process started. He illustrates how easy it is to sexually arouse human males and concludes on page 62,

*'Perhaps a fleeting view of a female is all a fast-flying wasp can expect to get before attempting to copulate with her. Perhaps male wasps notice only a few key stimuli anyway.'*

But if it doesn't need to be perfect, why does it appear to be so? Why has the orchid wasted so much energy approaching perfection when it is not needed? And where did the genetic capacity for genetic variation in orchids that allow for such diversity come from? Other flowers show variety in colour, but no variety at all in shape. Orchids show amazing diversity in both colour and shape. This indicates a tremendously complex genetic system to allow for such diversity. There is more to consider than just the wasp. One must also calculate the difficulties for the orchid as well. Dawkins ignores the complexities of this part of the equation. And finally, just what does human sexual response have to do with wasps anyway?

Later on page 67, after explaining the limits of wasp eyesight, Dawkins reasons that

*'At least in some respects, then, wasps are easy to fool. It is a very different kind of fooling from that engineered by the orchid. . . . If*

*insect eyesight is so poor, and if wasps are so easy to fool, why does the orchid bother to make its flower as wasp-like as it is? Well, wasp eyesight is not always so poor'*

Well there you have it, wasp eyesight is poor enough to get mimicry started, but not so poor as to be always fooled and, therefore, needs further perfection by the orchid to keep the process going. Someone is having their cake and eating it too!

Another aspect of Dawkins' argument that struck me concerned his contention that wasps and other insects see the world very differently than we do, and we shouldn't presume that our view of perfection will be the same as theirs. This exemplifies an evolutionary philosophical conundrum that is rarely addressed. Our eyesight, and concomitantly our brain, has presumably been shaped by evolution to interpret the world in such a way as to aid in survival and reproduction, not necessarily as it really is. Perhaps the insects perceive reality better than we do. How can we know? C. S. Lewis quotes from J. B. S. Haldane's **Possible Worlds**:

*'If my mental processes are determined wholly by the motions of atoms in my brain, I have no reason to suppose that my beliefs are true ... and hence I have no reason for supposing my brain to be composed of atoms.'*<sup>1</sup>

Ultimately, within philosophical naturalism, there is no truth. So why try to persuade anyone of anything?

In pages 78-82 Dawkins then moves to the eye and utilises a computer simulation experiment performed by Dan Nilsson and Susanne Pelger to demonstrate how easy it would be to evolve vertebrate (camera) eyes. They claimed that it would take less than 0.5 Ma to evolve such an eye, if it evolved in animals with one generation per year. Again, Dawkins' explanation can be very convincing until you begin asking some questions. For instance, Dawkins begins with three layers of specialised tissues. Where did these

come from? Dawkins waves his hand and says you have to start somewhere. But these are already completely ignored. The programme is set to run by accumulating changes in the structure of these tissues, with the only criterion being that the changes must be small and an improvement on what went before. 'Improvement' was defined as the visual acuity or spatial resolution of the image, which can be calculated as a single real number. However, as Dr George Marshall, Jules Thorn Lecturer in Ophthalmic Science at the University of Glasgow, Scotland, points out:

*'... even if there is an eye, it will be useless unless the organism has the neural and/or mental processes to utilize information perceived by the eye. How can a chance mutation provide this complexity in several different structures'*<sup>3</sup>

However, just because something is an 'improvement' is no guarantee that the change is significant enough to be selected for in a population.<sup>4</sup>

Dawkins then makes a pitch for the necessity of gradualism in evolution. On page 83 he states,

*'A key feature of evolution is its gradualness. This is a matter of principle rather than fact. . . . Evolution is very possibly not, in actual fact, always gradual. But it must be gradual when it is being used to explain the coming into existence of complicated, apparently designed objects, like eyes. For if it is not gradual in these cases, it ceases to have any explanatory power at all. Without gradualness in these cases, we are back to miracle, which is simply a synonym for the total absence of explanation.'*

Dawkins proclaims that his explanation is the only game in town, by definition. And he is doing the defining. Intelligent design does have explanatory power, as was dramatically demonstrated by the contributors to **The Creation Hypothesis**.<sup>5</sup>

Dawkins further closes off

criticism by declaring that

*'There will be times when it is hard to think of what the gradual intermediates may have been. These will be challenges to our ingenuity, but if our ingenuity fails, so much the worse for our ingenuity.'*

So if explanations fail us, the fault is not with the evolutionary process, just our limited thinking. How convenient that the evolutionary process is so unfalsifiable in this crucial area. But this is science and intelligent design is not!

Dawkins concludes the chapter with a discussion on the evolution of the honeybee waggle dance. It is filled with probabilistic statements like

*'The suggestion is that. . . Perhaps the dance is a kind of. . . It is not difficult to imagine . . . Nobody knows why this happens, but it does . . . It probably provided the necessary . . . !'*

Yet at the end, Dawkins proclaims,

*'we have found a plausible series of graded intermediates by which the modern bee dance could have been evolved from simpler beginnings. The story as I have told it. . . may not be the right one. But something a bit like it surely did happen.'*

Again, 'it happened' only because any other explanation has been disallowed by definition and not by the evidence.

## WHY PURPOSE?

Dawkins concludes his attack on design with a more philosophical discussion in Chapter 4, 'God's Utility Function'. He begins with a discussion of the ubiquitous presence of 'cruelty' in nature, even mentioning Darwin's loss of faith in the face of this reality. Of course his answer is that nature is neither cruel nor kind, but indifferent. That's just the way nature is.

But a curious admission ensues from his discussion. And that is, 'We humans have purpose on the brain.' Dawkins just drops that in to help him put down his fellow man in his usual

arrogant style. But I immediately asked myself, Where does this 'purpose on the brain' stuff come from? The rest of nature certainly seems indifferent: why is it that man, within an evolutionary world view, has 'purpose on the brain?' In his attempt to be cute, Dawkins has asked an important question: why is man unique in this respect? As Christians, we recognise God as a purposeful being; therefore if we are made in His image, we will also be purposeful beings. It is natural for us to ask *Why?* questions. But Dawkins just rides past the implication. No doubt if pressed, someone will dream up some selective or adaptive advantage for this trait. But this, as usual, would only be hindsight, based on the assumption of an evolutionary world view. There would be no data to back it up.

The point does lead him, however, to an interesting conclusion about *Why?* questions. He says some of them are simply inappropriate and not worth asking, much less answering. But in discussing our temptation to always ask these why questions, Dawkins states on page 96,

*'And the same temptation is often positively relished when the topic is the origin of all things or the fundamental laws of physics, culminating in the vacuous existential question "Why is there something rather than nothing?"'*

This fundamental philosophical question is vacuous to someone like Dawkins simply because he has no answer for it within his world view. He knows this will be very unsatisfying for most people, so he simply seeks to evade the question by declaring it out of bounds. He completes his condescension on page 98 when he says,

*'Before Darwin, even educated people who had abandoned "why" questions for rocks, streams and eclipses still implicitly accepted the "why" question where living creatures were concerned. [Presumably because Dawkins admits on the previous page that living things "seem to have*

*purpose written all over them."]*  
*Now only the scientifically illiterate do!*

Arrogance and condescension is the only answer that Dawkins can offer.

In the next paragraph, however, Dawkins admits that evolutionary biologists do ask 'Why' questions, like 'Why do birds sing?', but only in a special metaphorical sense. The assumption of design is only used as a working tool. Organisms expend so much energy on complex structures that selection must have crafted them for some 'purpose'. It would be too big of a waste of energy otherwise.

Dawkins then introduces the concepts of reverse engineering and utility function. Reverse engineering means deducing the purpose of some unknown object that at least appears to be designed. In living things this means complex structures. Utility function refers to the thing which the engineering is attempting to preserve or enhance. According to Dawkins the universal utility function is the maximising of DNA into the next generation. 'Why are forest trees so tall? Simply to overtop rival trees.' Those that succeed maximise their DNA replication. A mad race ensues for the tallest trees that may seem rather wasteful.

*It is ludicrous and wasteful only from the point of view of a rational economic planner thinking in terms of maximizing efficiency. But it all makes sense once you understand the true utility function — genes are maximizing their own survival'*

Dawkins' point can only be made by anthropomorphising DNA as if it is intentionally maximising its survival. Of course such is not the case; it only looks that way. There is only an 'illusion' of intentionality. With all these illusions one cannot help but at least expect that, at the very least, there is an illusionist behind it all.

At the chapter's end Dawkins returns to his initial topic.

*'So long as DNA is passed on, it does not matter who or what gets hurt in the process. . . .But Nature*

*is neither kind nor unkind . . . . Nature is not interested one way or another in suffering, unless it affects the survival of DNA.'*

He even admits that this is not a recipe for happiness. The problem of evil returns. Dawkins' simple answer is that there is no problem of evil. Nature just is. He recounts a story from the British papers of a school bus crash with numerous fatalities and reports a Catholic priest's inadequate response to the inevitable 'Why' question. The priest indicates that we really don't know why God would allow such things, but that these events at least confirm that we live in a world of real values: real positive and negative. 'If the universe were just electrons, there would be no problem of evil or suffering.' Dawkins retorts that meaningless tragedies like this are just what we expect from a universe of just electrons and selfish genes along with equally meaningless **good** fortune.

However, it is also what we expect in a fallen world. Evolutionary writers never recognise this clear biblical theme. This is not the way God intended His world to be. What is unexpected in an evolutionary world are people shaped by uncaring natural selection who care about evil and suffering at all. Why are we not as indifferent as natural selection? In making his point, Dawkins says that the amount of suffering in the natural world is beyond all 'decent' contemplation. Where does decency come from? He calls the bus crash a 'terrible' story. Why is this so terrible if it is truly meaningless? How can we be such a 'purpose-ridden species'? Clearly, Dawkins cannot live within the boundaries of his own world view. We see purpose and fret over suffering and evil, because we are created in the image of a God who has the same characteristics. There are aspects of our humanity that are not explainable by mutation and natural selection. Dawkins must try to explain it, however, because his naturalistic world view leaves him no choice.

## UNEXPLAINED THRESHOLDS

Dawkins closes his book with a final chapter on the origin of life and discussion on the possibilities of life elsewhere in the universe. This chapter is a bit of a disappointment because there is really very little to say. To be sure, it is filled with the usual Dawkins arrogance and leaps of naturalistic logic, but there is no real conclusion—just the possibility of contacting whatever other life may be out there.

Dawkins begins with a definition of life as a replication bomb. Just as some stars eventually explode in supernovas, so some planets explode with information in the form of life — life that may eventually send radio messages or actual life forms out into space. Dawkins admits that ours is the only example of a replication bomb we know, so it is difficult to generalise as to the overall sequence of events that must follow from when life first appears to the sending of information out into space, but he does it anyway.

While we can clearly distinguish between random and intelligent radio messages, Dawkins is unable to even ask the question about the origin of the information-rich DNA code. I suppose his answer is contained on page 138 when he says,

*'We do not know exactly what the original critical event, the initiation of self-replication, looked like, but we can infer what kind of an event it must have been. It began as a chemical event.'*

This inference is drawn not from chemical, geological, or biological data. Dawkins takes a few pages to evoke wonder from the reader by documenting the difficult barriers that had to be crossed. It is rather an implication that is derived from his naturalistic world view. It is a chemical event because that is all that is allowed. While it may be difficult, we are assured that it happened!

The book closes with a discussion of the Ten Thresholds that must be crossed for a civilisation of our type to exist. Along the way, Dawkins

continues to over-reach the evidence and make assumptions based on naturalism without the slightest thought that his scenario may be false or at least very wide of the mark.

The first threshold is the origin of life, some kind of self-replicating system. Threshold 2 is the Phenotype Threshold. Beyond replication, there must be some system for the 'genotype' to express a 'phenotype' or protein. Clam shells do not give rise to other shells. Shells are made by DNA, and DNA makes DNA. This is a crucial and difficult step for chemical evolution. But Dawkins gives no clues, because there are no clues as to how proteins came to be made from RNA, and RNA from DNA.

Threshold 3 is the Phenotype Team Threshold. Genes do not work in isolation. They work together. Everything affects everything else. Again, there are no real clues as to how this important jump in complexity was to be achieved. Threshold 4 is The Many-Cells Threshold. To continue to build complexity, not only must genes work together, but ultimately, cells must learn to work together. This achievement must be followed by a distribution of the tasks of living among different specialised cells or tissues. But how this occurs is not addressed.

Threshold 5 is the High-Speed Information-Processing Threshold or the Nervous System Threshold. There must be communication between the

different cells and tissues. Threshold 6 is the Consciousness Threshold. The Language Threshold is step number 7 and is probably linked to Threshold 6. Threshold 8 is crossed with an explosion of culture and technology, the Co-operative Technology Threshold. From this erupts the Radio Threshold, Threshold 9. The culmination is the Space Travel Threshold, Threshold 10. All along the way Dawkins tries to amaze us with both the necessity and complexity of each threshold but fails miserably to explain how each jump is to be accomplished. He depends totally on the explanatory power of natural selection to accomplish whatever transition is needed. It is just a matter of time.

### CONCLUSION

But of course, this begs the question. Dawkins perfects this art for 161 pages. Despite the smoke and mirrors, Richard Dawkins is still trying to sail upstream without a paddle. It just won't work. While many of his explanations and ruminations should make careful reading for creationists (he is not stupid and writes well), I have tried to point out a few of his inconsistencies, assumptions, and poor logic. What bothers me most is that this is meant to be a popular book. His wit and dogmatism will convince and influence many. For these reasons I found it a frustrating and sometimes

maddening book to read. Unfortunately, few will think their way through these pages and will be asking few if any questions of the author along the way. This is where the real danger lies. We must not only show others where he is wrong, but help them how to discover these errors on their own. We must help people to think, not just react.

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4. ReMine, W. J., 1993. **The Biotic Message: Evolution Versus Message Theory**, Saint Paul Science, Saint Paul, Minnesota. Chapter 8 shows in mathematical detail that natural selection could result in only 1667 gene substitutions in 500,000 generations given the most optimistic assumptions.
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### QUOTABLE QUOTE: Evolution

*'I confess that there seems to me to be a repulsive poverty in this material explanation, that is contradicted by the intellectual grandeur of the universe; the resources of the Deity cannot be so meagre, that, in order to create a human being endowed with reason, he must change a monkey into a man . . .'*

Agassiz, Louis, 1863. **Methods of Study in Natural History**, Ticknor and Fields, Boston, Preface, p. iv.