Evolutionary speculations, yet no 'badly designed' vertebrate eye

Life Ascending: The Ten Great Inventions of Evolution

Nick Lane

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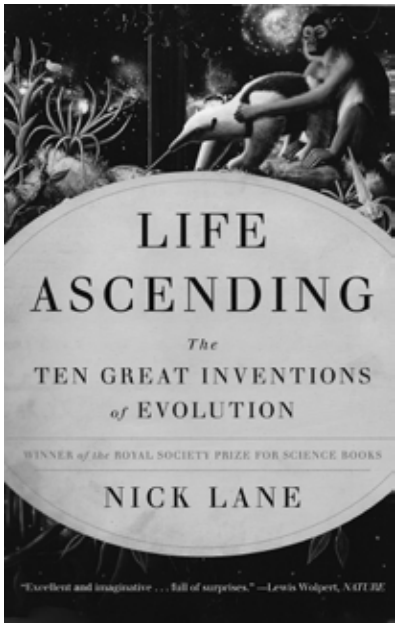

Author Nick Lane is a biochemist. He is identified as the first Provost's Venture Research Fellow at University College London.

The author comes across as a run-of-the-mill neo-Darwinian evolutionist. He generally thinks that evolution occurs step-by-step and endorses the selfish gene concept of Richard Dawkins (p. 295).

This book is primarily a biology book. Most of the time, it simply assumes evolution as an outcome of all living objects and biological processes, and does not attempt to demonstrate evolution itself. This book raises topics as diverse as abiogenesis, the DNA molecule, unicellular to multicellular life, the comparative biology of vision in animals, ectothermy and endothermy, human consciousness, the biology of ageing, and more.

Rejection of God in practice

Unlike many evolutionists who are openly atheistic, Lane leaves it an open matter whether or not belief in God, and acceptance of organic evolution, are compatible (p. 287). He also professes a desire to avoid offending the sincerely held religious beliefs of people (p. 232).

What about God 'using' evolution for His creative purposes? Upon hearing the word inventions, as in the title, one intuitively thinks of an inventor. Author Nick Lane quickly disabuses the reader of this. In fact, he rejects all teleological notions in favour of old-fashioned selectionism. Thus, he falls back on Dawkins' 'blind watchmaker' notion, in that unintelligent naturalistic processes are imagined to have virtually unlimited potential for creating exquisite designs of living things. He comments:

> "I must clarify what I mean by invention, for I don't want to imply a deliberate inventor … . Evolution has no foresight, and does not plan for the future. There is no inventor, no intelligent design. Nonetheless, natural selection subjects all traits to the most exacting tests, and the best design wins out … . Design is all

around us, the product of blind but ingenious processes" (p. 2).

Clearly, the author has no use for so-called theistic evolution. Furthermore, he rejects what he calls "adding a little God" as a solution to difficulties in evolutionary theory (p. 89).

What about God and evolution as 'separate magisteria'? Pope John Paul II had freely accepted evolution but also had asserted that the human mind is beyond science. Lane rejects this dualistic thinking and supports the understanding of the human mind in terms of science (pp. 232 ff.). He also thinks that humans have a hard time thinking of their cognitive and emotional experiences as neuronal ones for the simple reason that the brain has no pain receptors and so is not aware of its own activities.

A survey of origin-of-life hypotheses

The author begins with the classic Urey–Miller experiment of 1953. He stresses the difficulty of obtaining sufficient concentrations of reagents in the prebiotic atmosphere, as well as the fact that it is no longer believed that the earth ever had a Jupiter-like 'reducing' atmosphere (rich in hydrogen compounds).

Lane then discusses deep-ocean vents. They produce a variety of compounds, and heat. This has led to a number of scenarios on the origin of life, which the author discusses. He is, however, candid about the almost-insurmountable problems that the vent hypotheses immediately encounter. One of these is the obtaining of sufficient concentrations of organic molecules, notwithstanding the template effects of iron pyrites (p. 18). In addition:

> "Other problems include the temperature (some say too hot for organic molecules to survive), the acidity (most black smokers are too acid to support the chemistry that Wächtershäuser proposes, and his own lab synthesis only worked in alkaline conditions), and sulphur (too much, relative to modern biochemistry)" (p. 288).

Lane then 'pulls a fast one' on the reader. He credits the Krebs cycle (see figure 1) as one of the first major features of ancient life, based on its ubiquity among living things, the fact that it can work in reverse, and the fact that the cycle will 'spin' on its own if the concentrations of its chemical constituents are sufficient (p. 26). Owing to the latter, Lane suggests that genes were a later evolutionary add-on, in that they started to modulate the Krebs cycle, but not run it, just like the conductor of an orchestra modulates the music but does not make the music itself. However, in saying all this, Lane glosses over how this already-complex cycle is supposed to have spontaneously developed—or somehow been able to reproduce itself without genes! In addition, there is admittedly no clear-cut boundary between 'primordial' and 'add-on' biochemical processes: "How much of the core mechanism of life on earth arises spontaneously, and how much is a later product of genes and proteins is an interesting question, and one that is beyond the scope of a book like this" (p. 26).

Baselessness of all evolutionistic origin-of-life hypotheses

The author finds the age-old "given enough time and enough attempts, anything can happen" thinking, in his own words, unsatisfying (p. 9). However, he does not tell the reader why he finds it unsatisfying. The problem, of course, is that it is an all-purpose explanation that is really a non-explanation. For example, an astronaut could find a 500-word English-language glyphic on the moon (with fully sensible letters, syntax, grammar, and paragraphs), and someone could say that an unusual but natural chemical-etching process made that. After all, given a virtually unlimited number of planetary bodies in the universe and billions of years of chemical-etching events on these innumerable planetary

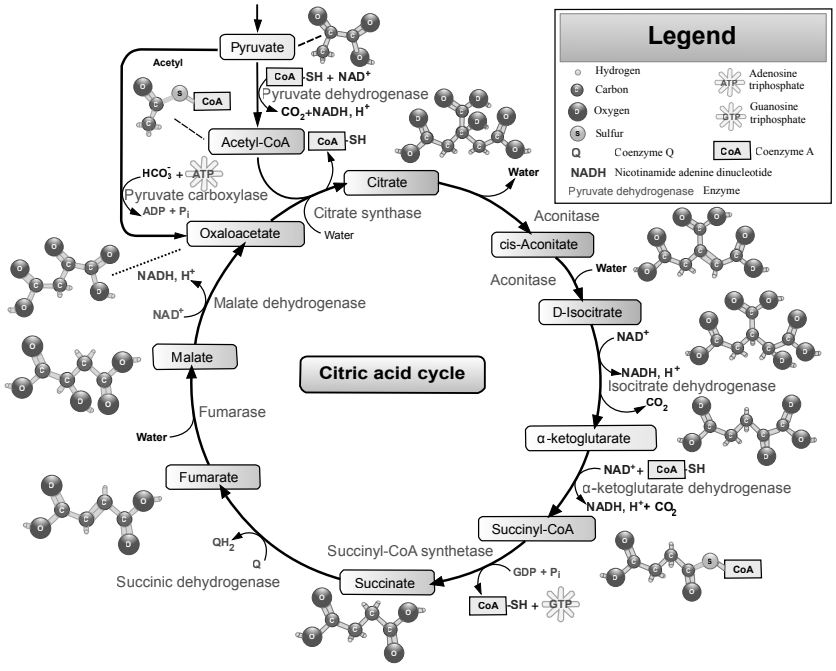

Figure 1. The Krebs, or citric-acid cycle. Though allegedly a stand-alone biochemical process in the early evolution of life, it is already quite complex.

bodies, anything could have happened. *Somewhere* it happened, so why not on our moon? Had it not happened on the moon, no one would be asking anything about it.

The author then brings up Fred Hoyle and Francis Crick and their directed panspermia hypothesis. Lane rejects this, because it assumes that science cannot explain the origin of life. However, the issue is more fundamental. Directed panspermia does not solve the problem: It merely relocates the problem. If life arose on another planet, then how did it originate on *that* planet?

Although Lane finds promise in the deep-ocean vents in the origin of life, he finally admits that the production of various molecules, which is observed there, does not account for the presumed abiotic origin of life. Instead, all he can do is engage in wishful thinking and the *assumption* that evolution took place, as he writes:

> "That is all very well, but a single reactor, however valuable, scarcely constitutes life. How did life progress from such natural reactors to the complex, marvelous tapestry of invention and ingenuity that we see around us? The answer, of course, is unknown, but there are clues that derive from life itself, and in particular from an inner core of deeply conserved reactions common to almost all life on earth today" (p. 23).

He is referring to the Krebs cycle which, as noted earlier, itself raises the question about the *origin* of the Krebs cycle.

In the end, Lane tacitly admits the inadequacy of all abiotic origin-of-life scenarios as he resorts to an *ad hoc* postulated long history of abiotic evolution. In doing so, he falls back on the 'natural selection acting on mutations can do anything and everything' magical thinking. These rationalizations encompass the newer theories that focus on the deep-sea vents. He comments:

> "Of course, a natural proton gradient is only of use if life is able to harness the gradient, and later on generate its own gradient. While it's certainly easier to harness a pre-existing gradient than it is to generate something from scratch, neither is straightforward. These mechanisms evolved by natural selection, there is no doubt … . Life could not leave the vents until it had learnt how to harness its own chemiosmotic gradient, but it could only harness its own gradient using genes and DNA. It seems inescapable: Life must have evolved a surprising degree of sophistication in its rocky hatchery" (p. 33).

And it lived happily ever after. However, natural selection requires self-reproducing life to pass on any benefits selected, so can't explain self-reproducing life in the first place.

Further proof of a giant chasm between prebiotic molecules, and the simplest forms of life, comes from Lane's discussion of the amoeba and related 'simple' animals. The author admits that, while simpler than 'higher' forms of life, they are much more complex than the postulated earlier forms of life that had supposedly descended from the common ancestor of all living things (p. 90).

Implicit evidence against serial endosymbiosis

According to serial endosymbiosis, certain organelles, notably the mitochondria and the chloroplasts, were once small, stand-alone cells. These once stand-alone cells entered into a symbiotic relationship with larger cells and then became engulfed by these larger cells. The symbiotic relationship continued, but now as organelles that dwell within the larger cells.

The author is rather dogmatic about serial endosymbiosis, even stating: "There's no dispute now that mitochrondria were once free-living bacteria" (p. 140). However, he admits that how this supposedly happened is little more than *ad hoc* speculation: "It's possible that the eukaryotic line evolved into a primitive phagocyte before engulfing the mitochondria, but there's not a shred of genetic evidence to support this conjecture" (p. 107).

But it must have happened—or did it? One of the chief lines of evidence in favour of endosymbiosis is the existence of DNA within the mitochondrion. To begin with, mitochondrial DNA is not even vestigial. Nor, as we shall soon see, is mitochondrial DNA redundant with that DNA that is located in its 'proper' place—the nucleus.

Serial endosymbiosis assumes that extra-nuclear DNA necessarily implies the 'government' of a once free-living cell. Ironically, Nick Lane admits that counter-intuitively this is not so, at least not necessarily:

> "Mitochondria are a silly place to store genes … . [However] Even when functioning normally, respiration has to be continuously fine-tuned by 'fiddling with the knobs', adjusting power to demand … . Just as an army's tactical disposition on the ground shouldn't be controlled by a remote central government, so the nucleus is not well placed to tune up or down the many hundreds of individual mitochrondia in a cell. Mitochondria, then, retain a small genome to tune respiration, matching power to demand" (p. 110).

Obviously, genes within the mitochondria are not so silly after all. The DNA within the mitochondrion serves a function that is essential to proper mitochondrial function in its existing state. There is no warrant for thinking of it as some kind of evolutionary

leftover from when the mitochondrion had supposedly been a stand-alone cell.

Prokaryotes and eukaryotes—the evolutionary tree collapses

Lane points out another chasm—that between bacteria and other forms of life. He comments:

> "Today the gap between plants and animals is perceived as quite narrow, while a dreadful gulf has opened up between bacteria and all the rest of complex life. It is the crossing of this gulf that causes so much disagreement among scientists: How exactly did life go from the primitive simplicity of bacteria to the complexity of plants and animals? Was it always likely to happen, or shatteringly improbable? Would it happen elsewhere in the universe, or are we more or less alone?" (p. 89).

The author attempts to resolve questions about the timing of the evolution of unicellular life-forms through the use of 'molecular clocks'. However, he admits that this leads to impossible results, which can only be resolved by including *ad hoc* beliefs in either the immutability or mutability of various 'molecular clocks' (p. 99).

Lane supports the division of all life into three great domains: bacteria, archaea, and eukaryota. However, any 'evolutionary tree' of these domains is completely confounded by alleged ancient gene-transfer and gene-fusion events. The author describes this unhappy situation in evolutionary thinking—one which furthermore only intensifies with additional research—as follows:

> "If we choose only genes shared by all three domains of life (those found in bacteria, archaea and eukaryotes), we can recommend robust trees for bacteria and archaea, but not eukaryotes. The eukaryotes are a confusing mix. Some of our genes apparently derive from archaea, others from bacteria. The more genes we study—the one recent analysis combined 5,700 genes, drawn from 165 species into a 'supertree'—the more plain it becomes that the eukaryotic cell did not evolve in a standard 'Darwinian' way, but rather by some sort of mammoth gene fusion. From a genetic point of view, the first eukaryote was a chimera—half archaea, half bacteria" (p. 102).

Perhaps it did not evolve at all.

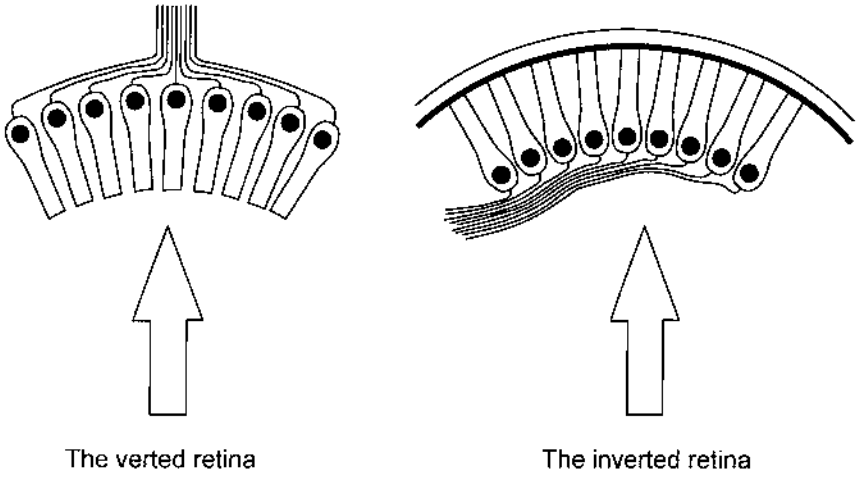

Figure 2. The 'backwards' human retina. The author is one of the few evolutionists who rejects the notion that this is 'bad design'.

Dysteleology of the 'backward-layered' human retina debunked

The author recounts the apparent inferiority of the human eye relative to the octopus eye:

> "A common argument has it that the design flaws run very deep and are in fact good evidence of the way in which evolution has cobbled together inept unplanned structures, crippled by its own lack of foresight…our own retina is often said to be plugged in backwards, an apparently idiotic arrangement. Rather than jutting out, the light-sensitive cells sit at the very back, covered by neuronal wires that pass forwards on a roundabout route to the brain. Light must pass through this forest of wires before it can reach the light-sensitive cells; and worse still, the wires form a bundle that plunges back through the retina as the optic nerve, leaving a blind spot at that point" (p. 174). (See figure 2.)

Lane then parts ways with most evolutionists, who insist that the 'backward retina' is 'bad design'. He elaborates on the non-liability, and then the advantages, of the 'backwards' human retina:

> "The wires are colourless, and so don't hinder the passage of light much; and insofar as they do, they may even act as a 'waveguide', directing light vertically on to the light-sensitive cells, making the best use of available photons. And probably more importantly, we have the advantage that our own light-sensitive cells are embedded directly in their support cells (the retinal pigment epithelium) with an excellent blood supply immediately underneath. Such an arrangement supports the continuous turnover of photosensitive pigments. The human retina consumes even more oxygen than the brain, per gram, making it the most energetic organ in the body, so this arrangement is extremely valuable. In all probabthe

> octopus eye could not sustain such a high metabolic rate. But perhaps it does not need to. Living underwater, with lower light intensity, the octopus may not need to re-cycle its pigments so quickly" (p. 175).

The foregoing chain of reasoning can be generalized. In fact, Lane exposes the flawed reasoning of *all* dysteleological arguments. This is so even within the non-theistic constraints of evolutionary reasoning. The author quips:

> "This glib assertion overlooks the mischievous rule known as the second law of Leslie Orgel: Evolution is cleverer than you are. … My point is that there are advantages and disadvantages to every arrangement in biology, and the outcome is a balance of selective forces that we don't always appreciate. This is the trouble with 'just-so' stories: all too often we see only half the picture. Arguments too conceptual in nature are always vulnerable to counterblasts" (pp. 174–175).

Of course, it is not evolution that is clever. Rather, it is God who is infinitely cleverer than all His critics.

Endothermy and ectothermy

The author discusses the comparative biology of 'cold-bloodedness' and 'warm-bloodedness' and elaborates on the decades-long debate on the thermal physiology of the dinosaurs. Ectotherms have the advantage of requiring a low food supply and of being better adapted for life in the hot desert. On the other hand, the endotherms have the advantage of being able to perform sustained actions.

The reader can think of the battle between the mongoose (an endotherm) and the snake (an ectotherm). The snake can deliver rapid bites but cannot keep repeating this action in succession. The mongoose can sustain action, repeatedly provoking the snake to strike, and then jumping out of the way. The snake becomes fatigued much sooner than the mongoose and the mongoose then turns on and kills the exhausted snake.

The limited ability of lizards to engage in sustained action is discussed by Lane (p. 210). However, this has been known since biblical times. The lizard can be caught with the hands (Proverbs 30:28) because it can readily be chased to exhaustion.

Against neurobiological reductionism of the human 'self'

The author appears to advocate, but soft-pedal, the notion that the human 'self', and human consciousness, are nothing more than the products of neurobiological processes. According to conventional evolutionary thinking, human consciousness is supposed to be a recent development in evolution and one that is a product of the 'higher' centres of the human brain.

However, the author presents intriguing evidence that this is not so. He discusses children with hydranencephaly, where most of the cranium is filled with cerebrospinal fluid and virtually all the cerebral cortices are missing (p. 257). He comments:

> "One remarkable suggestion that consciousness is more widespread than we like to credit is the survival and apparent consciousness of those few exceptional children who are born without cerebral cortices … but according to the Swedish neuroscientist Björn Merker, despite the absence of nearly all the brain regions that we normally associate with consciousness, some of these children are capable of emotional behavior, laughing and crying appropriately, and showing signs of genuinely human expression" (p. 258).

There is, of course, an unmentioned alternative to the notion that consciousness is widespread in the animal kingdom and located in the "lower" rather than the "higher" brain centres. Perhaps the human "self" is not solely reducible to neurobiological processes in the first place!

Conclusions

Despite much recent publicity about deep-ocean vents as the source of the origin of life, the evolutionistic origin-of-life hypotheses remain entirely conjectural.

The evolutionary 'tree' is an abject failure when it comes to resolving the relationships between the three main 'branches' of life: the bacteria, archaea, and eukaryotes.

The DNA found in the mitochrondrion appears to be functional, playing a role in the fine-tuning of mitochrondrial energy production. No evolutionary endosymbiosis is necessary to account for this mitochondrial DNA.

The author of this book is one of the few evolutionists who repudiates the 'bad design' argument for the 'backwards' human retina. The deployment of blood vessels in front of the photoreceptor cells does not hinder vision and turns out to be essential for the delivery of an adequate blood supply to the high-performing human retina.