Magnifying evolutionary problems

A review of
Evolution under the Microscope
David W. Swift
Leighton Academic Press, Stirling, 2002

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The author of this book believes that the earth is millions of years old,[1] but his central thesis is that 'the complexity of biochemistry is the reef on which the whole theory of evolution founders' (p. 187) and that we 'cannot legitimately divorce morphological change from the underlying genetic and molecular mechanisms' (p. 314). Swift ably expounds his subject and makes readers think critically. The publishers themselves state:

> 'It successfully tackles the scientific issues at an appropriate level for consideration by professional biologists, and at the same time makes the subject accessible to the more general reader.'[2]

I concur with this but would add that any potential 'general reader' would need to have a grounding in biology equivalent to undergraduate level to really benefit from this semitechnical book, which is sadly lacking in illustrations and diagrams—only twelve figures and eleven box sections (of supplementary information) in the entire 423-page book. In places, this makes for a demanding, even dry, read. Notwithstanding, the perseverant reader will find Swift's book a veritable *tour de force* as a scientific critique of Neo-Darwinism.

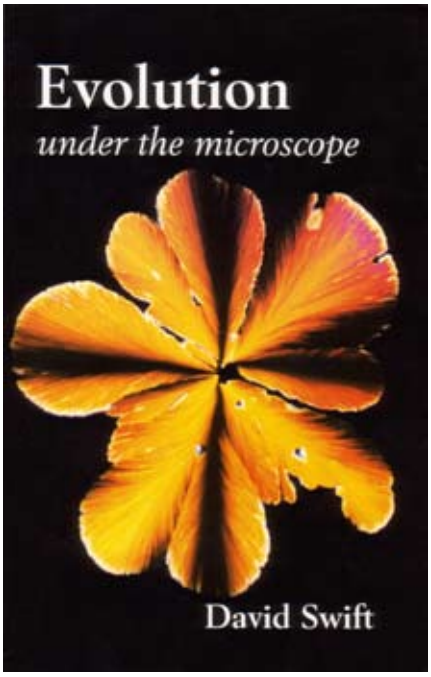
The eEarly chapters are primarily a historical overview of the rise of empirical science and the revolutionary ideas of cosmic, geologic and biologic evolution. Swift sketches the historical background to emerging ideas of natural selection, genetics, the nature of genes, mutation theory and Neo-Darwinism. This is followed by a description of the 'nuts and bolts' of the whole story, the nucleic acids and proteins.

Proteins—naturalism defied

The foregoing occupies a third of the book but is designed to prepare the reader for the meaty arguments that begin in earnest in chapter seven. Swift's declared purpose is to present the biochemical challenge to evolution, posed by the sheer improbability of obtaining a useful macromolecule. He details a probability calculation that (like those of Hoyle and Wickramasinghe and many others)

> 'demonstrates quite unequivocally … that we cannot rely on random mutations to produce specific proteins, whether directly or of the corresponding nucleic acid genes … . It is no longer tenable to hide behind millions or even billions of years—trying to argue that even the improbable becomes probable given time—nor even behind the argument that life did not have to evolve on earth but could have arisen on any one of an astronomical number of possible planets' (pp. 137–139).

Several pages are devoted to the nitty-gritty of theories of protein evolution, with great emphasis on the much-studied globin family and cytochrome c. This is a devastating critique of all such theories, showing how shamefully simplistic and unscientific they actually are in view of contemporary knowledge of the complexities of protein structure and function. For instance, many proteins have highly invariant amino



acid sequences, meaning that no other amino acid will suffice for that position in the chain. One example is the small protein ubiquitin, which variously functions in DNA repair, cell differentiation and the immune response and has been found in most eukaryotic organisms:

> 'Ubiquitin has just 76 amino acids, but 69 are totally invariant, and there are only three differences between the sequences found in yeast and humans' (p. 155).

Of course, this demonstrates that proteins like ubiquitin (Histone H4 is another) are really irreducibly complex molecular machines. Molecular phylogenetic trees are shown to be highly contrived and internally inconsistent and only survive in textbooks today because they provide superficial support for evolutionary scenarios. Molecular clocks are interpreted to tick at different rates in different higher taxa and the number of possible trees is actually so huge that, in practice, 'the accepted morphological tree becomes a guide for constructing molecular trees' (p. 159). As other writers have highlighted, where molecular phylogenies agree with the presupposed evolutionary tree (based on anatomy) they are accepted,

but otherwise are ignored. To include a mention of the many worthy points on the impossibility of random protein assembly is beyond the scope of this review, but the author really does a great demolition job on the whole idea. He argues that the typical treatment of protein evolution in the average evolutionary textbook is 'not just wishful thinking, it is misleading—a gross misrepresentation of the facts' (p. 172). Furthermore:

> 'I think that the general scientific community just has not been prepared to face up to the overwhelming odds against acquiring new useful genetic material' (p. 181).
>
> 'On the contrary, the picture emerging from protein families, the neutral theory, crystallographic data, and detailed examination of enzymes which are considered to have evolved early on, all point to proteins being essentially complete and fully functional when they first appear' (p. 182).

Swift moves on from the complexity of individual macromolecules to the ingenious associations and tightly interwoven systems that they constitute. As several detailed examples of this multiple-component complexity are exhibited, the author's ever-present challenge is:

> 'is it really realistic that these mechanisms could have arisen by chance, even in a progressive manner by fortuitous (opportunistic) trial and error? What routes might have been possible? Is any realistic?' (p. 187).

DNA replication involves a host of protein components: those that uncoil the double helix, primers, polymerase enzymes, and yet more to remove supercoils and tangles—all must be present. RNA polymerase enzymes in both prokaryotes and eukaryotes are very long proteins made of multiple subunits, which are vital to correct functioning—loss of any subunits invariably results in cell death. The famous *lac* operon (refer to figure 1) mechanism, for the transcription of genes that result in lactose metabolism, is just one of over a hundred sophisticated regulatory systems now elucidated in bacteria. In each case, substrate availability affects the switching on/off of key enzymes, and repressor proteins play a crucial role. Then there is the eukaryotic assembly of over 40 specific polypeptides termed the transcription/initiation complex—a viable complex necessitates that all these specific components be put together in the correct fashion. Many transcription factors have a dual role as steroid hormone receptors, allowing steroid hormones to function in transcription of important genes in specific target tissues in the body. These and other examples in the book pose a serious challenge to naturalism:

> 'It is not just that there are many macromolecules which have specific sequences that need to be 'found' by evolution, but most function only in collaboration with others—in isolation they have no utility whatever' (p. 197).

One supreme example of such 'irreducible complexity'[3] of biochemical and molecular biological systems is steroid biosynthesis, something that Swift skillfully expounds. Several pages detail the steps required for enzymatic synthesis of cholesterol, each involving a separate enzyme, the last twenty-two of which involve intermediates *with no known function*—other than in cholesterol production (p. 204)! Since prokaryotes cannot make steroids, they rely on eukaryotic cells as a source for these, so how would they have managed before eukaryotes evolved? Moreover, as plants and fungi use different steroids to animals (stigmasterol and ergosterol respectively), three versions of the whole improbable array of molecular machinery must have arisen independently since the origin of the first eukaryotes!

By this and many other examples, Swift makes a strong case that the

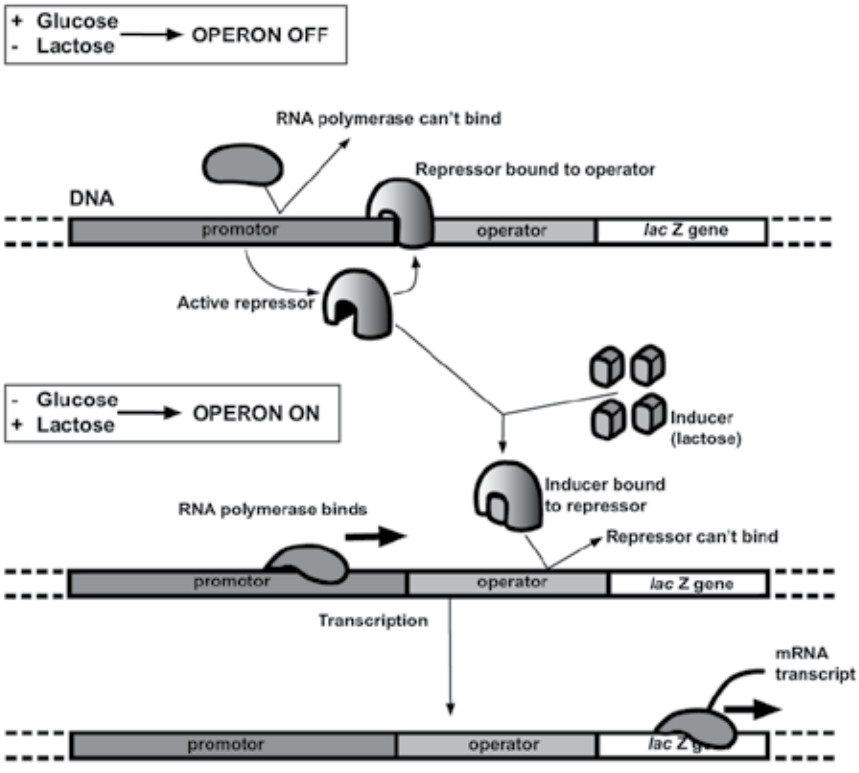


Figure 1. *Mechanism for the transcription of the* lac *operon, resulting in lactose metabolism. Over a hundred sophisticated regulatory systems have now been elucidated in bacteria (adapted from <www.accessexcellence.org/RC/VL/GG/induction.html>).*

piecemeal production of complexity at *all levels*—the proteins themselves, their cooperation in various cellular systems, and the associated control mechanisms—are inexplicable by naturalistic processes. He justifies a design explanation as follows:

> 'I am not saying "Look at the complexity of molecular biology: doesn't it look wonderful—it must have been designed." Rather, I am saying: "Look at the complexity of molecular biology, and, because we know much of the underlying chemistry, we can objectively conclude that it could not possibly have arisen by chance"' (p. 217).

In other words, the author argues for a tighter definition of design than many creationists have used in the past. However, I suspect many will feel that he overstates his case somewhat when he writes:

> 'So the argument for design, or purpose, or teleology in biology is weak at the morphological level. But at the molecular level we have an unequivocal case' (p. 218).

The 'variation is evolution' fudge critiqued

The author discusses what natural selection is and what it is not, invoking oft-cited examples in evolutionary literature. However, his arguments regarding industrial melanism in peppered moths, though basically sound, unfortunately show an ignorance of the many problems with Kettlewell's experiments—such as the fact that *Biston betularia* does not actually rest on tree trunks—now the subject of two books and many articles, by both evolutionists and creationists (pp. 221–223 and several references elsewhere in the book).[4] He clearly highlights that changes in gene frequency in the popular examples of 'evolution in action' tell us nothing about the origin of the genes themselves. However, in spite of the equivocation over 'natural selection' and 'evolution' which he criticizes, he doesn't seem to object to the use of the term 'evolution' if it is defined each time it is used—in fact he talks of 'evolution within limits' (p. 249; p. 382). In my opinion, 'evolution' carries so much baggage that to continue to use it as Swift suggests is impractical and could mislead a reader to think that one accepts evolution wholesale; an example is where Swift writes:

> 'Adaptive selection and segregation of gene combinations is an important aspect of the evolutionary process—it illustrates the adaptive role of natural selection and the potential for divergence leading to the formation of a new species' (p. 225).

Nevertheless, he rightly points out that while intraspecies divergence (e.g. with ring species) and even speciation (e.g. Galápagos finches) do occur, this requires no new genetic material. Thus, the scope for biological change by natural or artificial selection is limited—unless, that is, a source of new genetic material is available. However, the author demonstrates that mutation theory is a dead duck and spends time reflecting on why this Neo-Darwinian belief persists—chiefly because the whole idea became entrenched in evolutionary thought *before* a biochemical understanding of genetics developed. In a discussion of resistance to antibiotics and insecticides, he does concede that a few instances involve a 'new and useful' gene (though less fit outside the confines of the local toxic environment). However, he goes on to say that these do not produce a new protein from scratch—rather a pre-existing protein is *modified* to the tune of a few amino acids only (up to four in the case of ß-lactamase enzymes). So, he actually accepts that progressive evolution of macromolecules is at least possible *in principle*, but considers this to be academic, as the formation of such a molecule in the first place is impossible (p. 243).

Swift never makes mention of genetic *information*, but instead refers to the genetic *material*. In one sense, his arguments can therefore be viewed as an independent verification of those ventured by other evo-sceptic scientists, both YECs and those from 'intelligent design' quarters. However, absent from his book is an *explicit* challenge to 'big-picture evolution' based on the crucial *direction of change,*[5] although Swift does state that

> 'there is no evidence for the mutations that would be required to enable an *increase* in complexity—for higher organisms to emerge from lower forms' (emphasis added; p. 246).

Also absent is an alternative explanation for the production of the original genetic material within living organisms—how did these creatures arise and where did the designed complexity come from, if not by evolution? Swift seems to think that his arguments are wholly objective, devoid of any presuppositions:

> 'However, approaching the question from an *unprejudiced* stance—not trying to defend a traditional creationist [in the context: belief in species fixity] or traditional

Light and dark (melanic) forms of the peppered moth Biston betularia. This popular textbook example of 'evolution in action' is fraught with problems. A change in gene frequencies does not amount to an increase in complexity.

> evolutionary position … It seems to me that the evidence points to the creation of highly plastic and adaptable primordial organisms (i.e. populations of extensive genetic variability) from which present day species have evolved by gene segregation' (emphasis added; pp. 256–257).

Rather, he seems to have decided, *a priori*, to sidestep the question of the Designer (whether the God of the Bible, Gaia, aliens or whatever) for most of the book. Even though he discusses Design/Designer arguments in the last chapter, he still plays his cards close to his chest:

> 'All I am challenging is the presumption that there *must* be a natural explanation. And, if persistent searching fails to come up with a natural explanation, it is entirely reasonable—and consistent with science—to leave open the possibility of a supernatural one' (p. 408).

One might presume that—because of the sound scientific objections to evolutionary naturalism he has so ably presented—the author believes a supernatural explanation is the only viable one. Yet he states:

> 'On the other hand, I would accept that the design need not have been by direct action of a supreme being but could have been mediated: perhaps through intermediate beings [extraterrestrial assumed], as advocated by e.g. Fred Hoyle' (p. 400).

Is it enough to simply point to Design? The conviction of many Christians is that societal decline and antipathy to the gospel is inextricably related to people's acceptance of this godless evolutionary myth and their consequent rejection of scriptural authority. However, Swift is silent on these issues.

Other arguments

There is a helpful treatment of animal and plant fossils (though lacking any illustrations!) and why these offer no support for uphill evolutionary change—for instance, basic anatomical types 'appear' abruptly in the fossil record (without credible evidence of ancestors) and there are marked discontinuities between them. This is pushing an increasing number of palaeontologists towards polyphyletic explanations for many taxa; e.g. whereas the common features of the five extinct amphibian orders might suggest a common ancestral amphibian (*mono*phyletic origin)—but their distinct features strongly contradict this—the transition from a lobe-finned fish perhaps happened *several* times in a short time period. The compounded improbability of such scenarios makes these ideas controversial to say the least!

An obvious solution to the dilemma posed by these stark fossil facts is to question the assumption that the fossil layers represent long time periods, but Swift ignores this; in fact, where fossils show stasis with minor progressive morphological changes, Swift interprets this as species diversification.[6]

In view of the fine arguments put forward elsewhere, it is disappointing to see the author 'trot out' a superficial description of the horse series—even calling it 'horse evolution'. Reassuringly, later on, he examines the details and argues that this 'evolution' occurred merely via segregation of existing genes, not by the generation of new ones. Thus, he compares the Equidae (which includes all the fossil horses) to the dog family, even speculating, '… if it were not for the time barrier, could *Hyracotherium* have bred with the modern horse?' (p. 291).

Swift believes it likely that the genetic basis for features of these horse-like creatures was already present in this hyrax-like creature, sometimes dubbed the 'dawn horse' (unjustifiably in my view[7]). Furthermore, he is explicit that the specializations seen in adaptive radiations of this kind[8] are due to the loss of, not gain of, genetic material.

Swift ably demolishes the kind of evolutionary just-so stories offered for vertebrate eye development from an eye spot and for feathers from a reptilian scale. These superficial ideas ignore—as they must—the underlying biochemical and molecular biological basis of these complex tissues.

One chapter dissects the homology argument for evolution. Not only do alleged phylogenetically-related groups show significant non-homologies—many examples are given—but the underlying embryological sources of many tissues and their developmental mechanisms are totally inimical to perceived morphological homologies.

Biochemical homology is also scrutinized and found wanting. It is not merely that homology can no longer be honestly used to support evolution—the very existence of similar morphological structures which lack common embryology and biochemistry indicates, *prima facie*, that they are *not* derived from a common ancestor.

The theory of 'ontogeny recapitulates phylogeny' (including Haeckel's biogenetic law) is shown to have been thoroughly discredited. Problems with cladistics are highlighted, and while it is alleged to be an objective method that maximizes homology and minimizes homoplasy (i.e. similar characteristics that are believed to have independent origins), it actually presupposes the very phylogeny that it was designed to investigate!

In the penultimate chapter, Swift draws all the accumulated evidence together to demonstrate the substantial challenge of the molecular and biochemical evidence to the claims of evolution. He asks why the scientific community has been so reluctant to address seriously these criticisms and, as many others have done, applies Kuhn's paradigm thesis to entrenched evolutionary doctrine.

> 'Some biologists, recognizing there is evidence for some evolution [i.e. based on gene segregation

but not new genes] but also that there are substantial difficulties, adopt the stance that the puzzles relate only to mechanism. That is, there may be debate about *how* evolution has occurred, but not *that* it has occurred' (p. 379).

At the same time, he concedes:

'Of course, not for a moment do I pretend to be commenting from a completely neutral or paradigm-free stance. On the contrary, I recognize that we all have a world-view … and that some of my fundamental premises and beliefs would be unacceptable to many evolutionary biologists' (p. 381).

Since Kuhn taught that a paradigm would only be overturned by another, better one, most evolutionists are loathe to reject evolution in favour of non-naturalistic explanations; their worldview entails a belief that all supernatural explanations are a retrograde step:

'It is not that there is no conceivable alternative to evolution, but there is no viable *natural* alternative' (p. 388).

It is on this theme that Swift dwells in his concluding chapter, appropriately titled, *Pride and prejudice.* Sadly, it is here that one encounters a real 'fly in the ointment'. It is one thing to write a scientific critique of evolution that ignores biblical arguments but quite another to slate that which doesn't:

'Especially since the time of Darwin, religion has acquired a reputation for being reactionary or obscurantist if not directly opposed to science. Even in recent years we find comments such as the following from "creation scientists":

'"Creation or evolution?" Now this question is basically an issue of authority—the authority of God versus the authority of the scientists; the authority of the Word of God, the Bible, versus the authority of the words of scientists in their textbooks' [White, Preface][9] (p. 394; parentheses in original).

Swift obviously thinks that a contributory reason for the intransigence of some evolutionary scientists in the face of the amassed contradictory evidence is this stand that many creationists take on the Bible—he fails to realize that the conflict of worldviews applies here, too. It is pertinent that Swift offers no explanation for how—much less why—the biological complexity he has been discussing originated, if it wasn't by evolution—a classic case of question begging. In the last analysis, his views seem to fit squarely with those of the ID (Intelligent Design) movement:

'Biological macromolecules, in themselves, present a case for design for which we do not have a natural or scientific explanation; they point clearly to their having been a purposeful designer' (p. 399).

Conclusion

With the caveats mentioned in this review, this is a helpful, well-researched book and a welcome addition to the armoury of scientific critiques of Neo-Darwinism. The author's uncritical acceptance of the millions-of-years timescale for the fossil record (evident in several places in chapter 10) is a weakness in a book that otherwise brings the biochemical challenge to evolution into sharp focus. It appears that the author is unaware of the many other (creationist) writers who have formulated similar evolutionary objections in recent years[10]—the extensive reference list only includes two books by creationist/ID writers—but this independence of ideas could be considered helpful. There is a good index, incorporating a glossary.

References

1. See the publisher's website: <www.leightonacademic.co.uk/eutm1.htm>, 12 August 2004.
2. In an email from the publisher to book retailers, dated 14 January 2003.
3. Note that 'irreducible complexity' is not a term that the author himself uses, although he does credit Michael Behe for the concept. Behe first coined this term in: *Darwin's Black Box*, The Free Press, New York, 1996. For a review of this book, see: Mitchell, R.T., *Creation* **19**(2):29–30, 1997.
4. Wieland, C., Goodbye peppered moths, *Creation* **21**(3):56, 1999. Wieland, C., The moth files: an update on the peppered moth fiasco, *Creation* **25**(1):14–15, 2002; also at <www.answersingenesis.org/creation/v25/i1/moth.asp>.
5. Wieland, C., The evolution train's a-comin' (sorry, a-goin'—in the wrong direction), *Creation* **24**(2):16–19, 2002. Also at: <www.answersingenesis.org/creation/v24/i2/evolution_train.asp>.
6. Creationist geologists will obviously agree/disagree with the author here, depending on opinions about where the Flood/post-Flood boundary is in the Geological Column.
7. See Sarfati, J., The non-evolution of the horse: special creation or evolved rock badger? *Creation* **21**(3):28–31, 1999. Also at <www.answersingenesis.org/creation/v21/i3/horse.asp>.
8. Specifically, adaptive radiation at a low taxonomic level, as opposed to those radiations claimed for creatures that clearly traverse multiple baramins.
9. White, A.J.M. (Monty), *What about Origins,* Dunestone Printers Ltd, 1978.
10. In fact, his comments on p. 364 indicate that he is probably unaware of any other books in this vein (apart from Behe's)!