

Evolutionary camp divided

A review of
*Reinventing Darwin—The
 Great Debate at the High
 Table of Evolutionary Theory*
 by Niles J. Eldredge
 John Wiley and Sons Inc.,
 New York, 1995

A.W. Mehlert

The battle-lines between the gradualists and the punctuationalists have never been drawn more clearly than in this book by Niles Eldredge. It is also his most controversial, as he tackles the gradualists head-on, neither giving nor asking quarter. This is a battle within the transformist camp over the mechanics of the evolutionary process. Many evolutionists have tried to play down this persistent conflict saying that it is only a minor brawl over the 'how' of evolution, and not about the 'fact' of evolution. However, as we will see, this battle is much more than a minor disagreement—the implications are of fundamental importance in the real battle between Creation and evolution. Creationism is seen, even by Eldredge, as the common enemy:

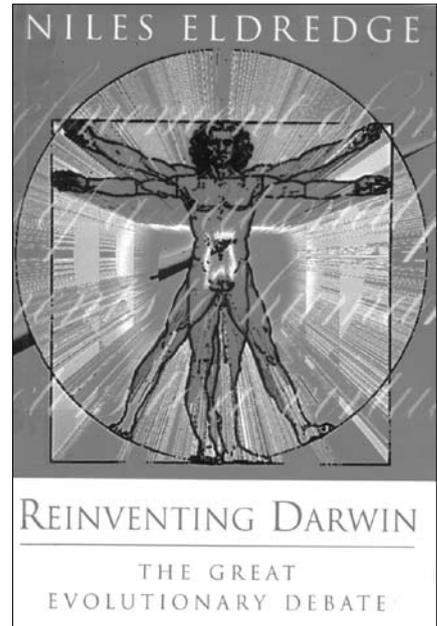
'Just as neo-Darwinians united against the (rather slender) forces of saltationism, so we disputants around the High Table in the 1980s have been united in common opposition to a movement outside the confines of biology: creationism. Indeed, the canniest creationists (and others of unmistakable creationist bent who profess simple disagreement with evolution, such as lawyer Philip Johnson) have long accused evolutionary biologists of hiding our very real disagreements under a cloak of unanimity—so united are we against the pseudo-science of creationism' (page 103).

Co-founder (with S.J. Gould) of the well-known theory of *Punctuated Equilibrium*, Eldredge makes a spirited, and at times, hostile attack on the geneticists led by Richard Dawkins, George Williams, Phil Gingerich, and John Maynard Smith, who contend that evolution always proceeds in a gradual manner, with the driving force being competition between genes perpetuating their own DNA. Readers will recall Dawkins' book *The Selfish Gene*, which pushed the view that the genes, not the organism, are in direct competition for future survival.¹

The fossil record, itself used as evidence for evolution, is simultaneously the cause of the 'Great Debate' between the two camps (a polite term for what is really a fight to the finish). Eldredge, Steven Stanley, S.J. Gould, and Elisabeth Vrba, lead the camp of the paleontologists who take the fossil record at face value: that evolution proceeds in a sporadic manner—long periods of stasis punctuated by episodes of rapid evolutionary activity. They reject the Dawkins' notion of the 'selfish gene', and insist that evolution is driven by environmental and other forces, including speciation events, a taboo subject for Dawkins and his supporters.

In 1859, Darwin himself lamented the fact that he could find no evidence for gradual evolution because of the universal lack of fossil transitional forms. He could only claim that the fossil record was imperfect, and that further exploration would eventually yield the required evidence. A century and a half later, that evidence has still not been found. Eldredge and his fellow punctuationalists acknowledge this, and insist that the rock record shows not innumerable insensibly-graded forms, but stratigraphically speaking, long stretches of no change punctuated by the sudden appearance of new species, and of course new higher taxa, families, orders, classes etc.

In the Prologue the author makes it



quite clear that he resents the 'haughty' attitude of the gradualists who insist they alone are qualified to pass judgement on the subject. On page 3, Eldredge accuses them of having an adherence to classical Darwinian thinking:

'I see slavish adherence to a tradition that dates back to Darwin, serving as the pivotal article of faith in a geneticist's approach to understanding evolution. The credo goes like this: we have a fundamental understanding of what causes genetic information to change within a population from one generation to the next. Factoring out random factors for a moment, that understanding is embodied in the principle of natural selection. Grasping that central truth, we then assert that evolutionary history is the outcome of natural selection working on available genetic information. Period. End of story. We have an elegantly simple theory of evolutionary change and, if we are to heed geneticists (and Darwin), we simply take the natural selection model of generation-by-generation change and extrapolate it through geological time. And that, to my paleontological eyes, is not good enough.'

He says that in his work in the

field, he found only stasis and sudden bursts of macro change.

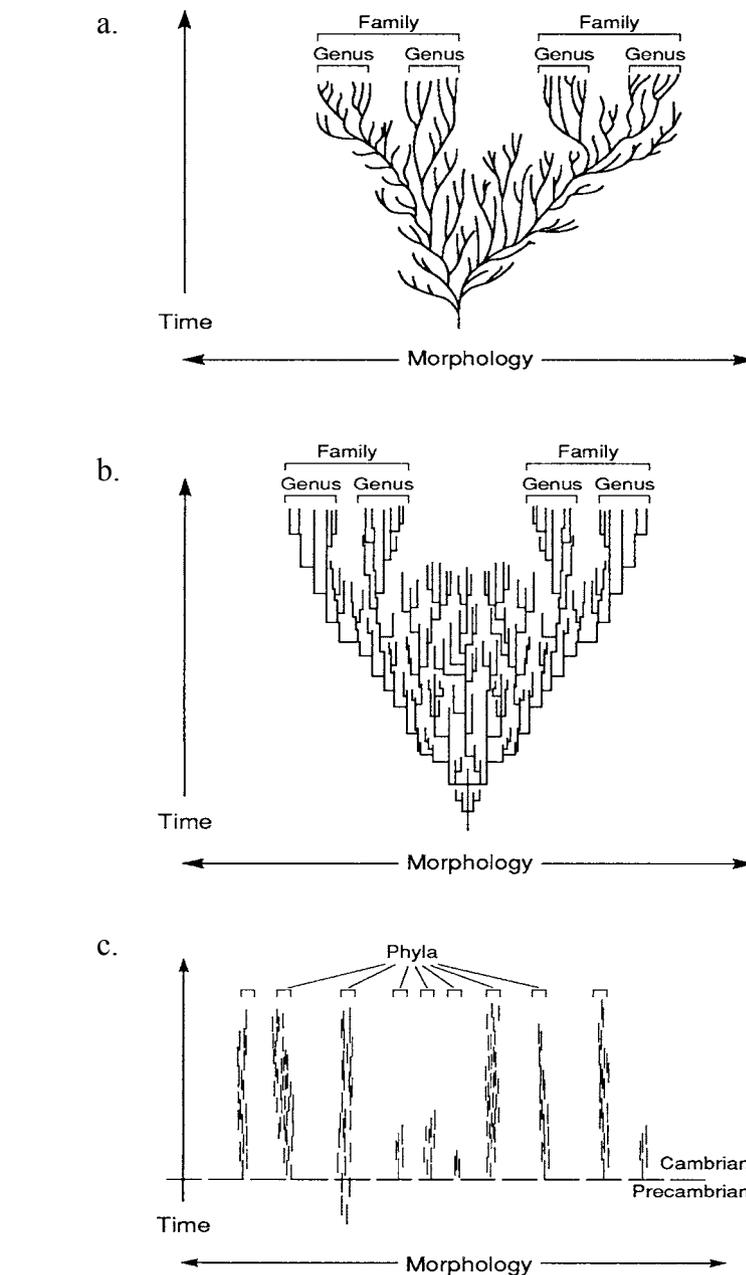
‘Simple extrapolation does not work. I found that out back in the 1960s as I tried in vain to document examples of the kind of slow, steady directional change we all thought *ought* to be there, ever since Darwin told us that natural selection should leave precisely a telltale signal as we collect fossils up cliff faces. I found instead, that once species appear in the fossil record, they tend not to change very much at all. Species remain imper- turbably, implacably resistant to change as a matter of course—often for millions of years.’

This he says, is anathema to what he describes as the ‘ultra-Darwinian’, and he brands Richard Dawkins as the ‘ultimate ultra-Darwinian’.

The ultra-Darwinists, Eldredge complains, have dominated evolutionary theory since the 1950s, pointing out that paleontologists have a better understanding of how evolution progresses, through their ‘hands on’ experience in the field, rather than ‘watching fruit flies in laboratory jars’, or drawing graphs. On page 169 he says the Dawkins view is that genes are more important than the organism itself:

‘Dawkins’s “selfish genes” gambit posits, in effect, that genetic information, viewed as the instructions for constructing an organism is more important than the system it builds—the organism itself. Evolution is strictly competition among genes for representation in the next generation. This is the ultimate reductionist scenario yet concocted in evolutionary biology.’

Some examples of, Eldredge’s thinking appear on pages 21, and 74–75, where he emphasizes the lack of fossil evidence for major change in whales and bats over 55 million years from the Eocene to the present. He says that the earliest bats and whales are ‘primitive’ *vis-a-vis* modern species, but they are recognizably bats and whales, and true members of their groups. (The first bats already had an



Evolutionary predictions about patterns of diversity and disparity through time do not match the fossil records. The above are the patterns a) suggested by Darwinian Gradualism, b) suggested by punctuated equilibrium theory, and c) suggested by the fossil record (from Austin 1994).⁵

By extrapolating this rate of non-change, these creatures would have had to diverge from primitive terrestrial mammalian ancestors, long before any placental mammals had themselves evolved! This, Eldredge says, is absurd. He therefore claims that evolution must sometimes proceed very fast, which again is anathema to the gradualist camp. He rejects the incompleteness of the geological record as being a valid explanation for the

rapidity by which so many of the major taxa appear without apparent precursors, claiming that speciation events are sufficient to explain this common phenomenon. (While this may have some value for new species, the stasis/speciation model cannot be stretched to encompass large-scale, higher taxa, or mega-change.) The harsh fact is that the fossils, showing long periods of no change, and sudden appearances of new higher taxa, contradict *both* evolutionary models.

A fundamental problem is here exposed—either the gene substitution (mutation) rate is constant over time, in which case there is no explanation for the sudden appearance of so many new higher taxa, or the rate is highly variable, which cannot be demonstrated, but is simply assumed. Whatever the theorizing, stasis and non-change is what the fossil record shows, and this supports Creation, not evolution. Among his solutions Eldredge lists speciation and migration as substantial factors in the abrupt emergence of new species. He argues that species tend to migrate as the ecology in their given areas undergoes change—this is also known as habitat tracking. He says that species have only two ‘choices’ when their habitat changes drastically—either go extinct, or move to another region of similar ecology. He argues that stasis exists because species tend to resist major change. Creationists would certainly agree with this statement.

On pages 78–80 Eldredge emphasizes the point—over long (evolutionary) time spans, species tend to ‘zig and zag’ around a medium without any major change being observed.

‘As he [George Williams²] puts it, though lay people have often wondered if there has been enough geological time for evolution to produce the great diversity of living form we see around us, the real question is why have organisms “not done nearly so much as we should reasonably expect”?’ (p. 86)

On page 88 he says that natural selection acts to stabilize organisms; again creationists would generally approve of this statement. On page 96 he says there is not much evidence of anatomical change even in good rock/fossil sequences over millions of years.

‘But we saw—as did several paleontological contemporaries of Darwin—that if you do collect a series of fossils up through a sequence of sedimentary rock, and if you don’t see much evidence of anatomical change through that series, that is

indeed evidence that substantial gradual evolutionary change has not occurred within the species lineage, no matter how gappy the record may be.

I simply thought that the time had come to take the fossil record—the patterns of stability and change—a bit more literally than had traditionally been the case. George Simpson³ had begun the process when he insisted that gaps do not explain away the abrupt appearance of large-scale taxa—meaning, large-scale events of evolutionary change. Simpson was perfectly content to blame the absence of examples of gradual change within and between species on gaps in the record, but found (to his everlasting credit) that the argument could not be stretched to encompass large-scale evolutionary change, such as the derivation of whales or bats from terrestrial mammalian precursors.’

On page 147 an example is given—the Hamilton sediments in North America took six million years (supposedly) to accumulate, but he found only minor amounts of change. In fact the central species lasted the whole six million years, and the same went for the vast majority of the other 300-odd species of Hamilton invertebrate. ‘The *entire fauna* appears rather abruptly, persists with great monotony (and much habitat tracking), and eventually disappears with the same abruptness with which it first appeared [emphasis added].’

Although in a previous work,⁴ Eldredge acknowledged the ‘virtual total lack’ of transitional forms at the level of family, order and class, he makes no attempt to address this key problem in this book. On page 158 he simply asks the rhetorical question, ‘What can we say about the rise of truly new adaptations?’

I have studied most of Eldredge’s publications over the past two decades, but I have never before seen him employ such strong and hostile language about fellow evolutionists as in this work. This book is valuable and wor-

thy of creationist study mainly because once again it shows up the continuing confusion and disarray in evolutionary circles. The fossil record is hostile to *both* evolutionary perspectives, gradual or punctuational.

I commend this book to creationists. Eldredge has had the courage to go out on a limb and defy the ‘knights of the High Table’ who, as he declares, represent the ‘supercilious essence, the hubris’, of the inner group of geneticists dominating evolutionary biology. It highlights the basic problems of a so-called theory whose adherents cannot agree on a credible mechanism.

References

1. Dawkins, R. *The Selfish Gene*, Oxford University Press, Oxford, 1976.
2. Williams, G.C., Professor Emeritus, Department of Ecology and Evolution, State University of New York, is author of: *Adaptation and Natural Selection*, Princeton University Press, Princeton, 1966; *Sex and Evolution*, Princeton University Press, Princeton, 1975; *Natural Selection: Domains, Levels, and Challenges*, Oxford University Press, New York/Oxford, 1992.
3. George Gaylord Simpson was the most influential paleontologist of the 20th century. He was a leading expert on Mesozoic, Paleocene, and South American mammals, plus penguins. Arguably the first paleontologist to make consistent use of statistics, not just in alpha taxonomy, but in paleoecology and macroevolution. Author of: *Tempo and Mode of Evolution*, Columbia University Press, New York, 1944; *The Major Features of Evolution*, Columbia University Press, New York, 1953; *Principles of Animal Taxonomy*, Columbia University Press, New York, 1961.
4. Eldredge, N., *Fossils: The Evolution and Extinction of Species*, Aurum Press, London, p. 171, 1991.
5. Austin, S.A., *Grand Canyon: Monument to Catastrophe*, ICR, p. 148, 1994.