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Nine Evolutionary Myths: The Closing of the Darwinian Mind
(conference presentation)

The reality of evolution, self-evident since the time of *The Origin* where Darwin masterfully gathered the evidence, has paradoxically led to a closure of further investigations. In a field now dominated by ultra-Darwinists the rhetoric has become circular and as more than one investigator has pointed out so mutable are its premises that it is not clear whether anything is really testable. My intention is certainly not to contest the fact of evolution, nor the primacy of the Darwinian formulation, but to suggest politely that we still face unfinished business – just like any other science.

Here I will outline nine evolutionary myths: not, of course, in the sense of fairy tales but on the deep and pervasive un-examined assumptions that underpin the current dogma. And here they are

- The myth of the “twig”, the notion that because the tree of life necessarily ends in almost innumerable twigs this somehow reduces each and every product to complete insignificance. That would only be true if the tree is an undisciplined arborescent sprawl, but it isn’t.
- The myth of randomness, the sense that with mutation and big rocks falling out of the sky the whole evolutionary process is a decidedly chancy business. It isn’t, as evolutionary convergence demonstrates.
- The myth of simplicity, the pervasive idea that primitive things are stupidly simple: they are not.
- The myth of “well, it will do”, the belief that just because evolution is constrained with what it can employ the end-products are near-disasters of engineering. The reverse is the case: things don’t work fairly well, they work superbly well.
- The myth of one molecule, one function. Well perhaps nobody is silly enough to believe this, but largely unremarked is the “Swiss Army Knife Syndrome” of molecules, and their remarkable versatility.
- The myth of cladistics, the notion that phylogenetic relationships can only be understood by the atomistic reductionism of the cladistic methodology. It is a powerful method, but haunted with problems.
- The myth of missing links. What! Denying “missing links”? Not at all, just pointing out that their real importance lies in quite another area.
- The myth of mass extinctions. Not again, surely this clown is not denying their existence? Of course not! All I question is how important they are in re-directing evolution, and rather suggest their role is very different.
- The myth of mentality, to use Raymond Tallis’ useful word “neuromythologists”, the quaint notion that mind and brain are the same. One might as well believe in phlogiston.

Darwin’s Compass: Why the Evolution of Humans is Inevitable
(public address)

Amongst the unshakeable orthodoxies of neo-Darwinism is the notion that the evolutionary process is for all intents and purposes open-ended and indeterminate. In this view of life everything is an evolutionary fluke, a point perhaps most clearly articulated by Steven Jay Gould and his famous metaphor of re-running the tape of life. Go back to the time of the Cambrian “explosion” and see the process unwind for a second time: plenty of animals but no humans; they are just another evolutionary accident.

I argue the exact reverse: evolution is highly predictable and the evolution of humans is an inevitability. The basis for this deeply unfashionable claim revolves around three observations. First, the great deal of what is required for the evolution of complex systems, say a nervous system or an eye, have from a molecular perspective evolved far in advance of the structure. Combine this with the remarkable versatility of various proteins, then a great deal of the template for the emergence of complexity is pre-ordained. Second, emerging evidence suggests that the process of evolutionary bifurcations are far more organized than is popularly supposed. This can certainly be demonstrated at a relatively low taxonomic level, and given it is the same evolutionary processes that operate at any level it seems difficult to avoid a regress of argument that will encompass the entire Tree of Life. Third, and perhaps most importantly, is the ubiquity of evolutionary convergence, that is the fact that from decidedly different starting positions in the Tree of Life phylogenetic trajectories navigate to very much the same functional solution. All quite consistent with the Darwinian formulation, but less appreciated is that the examples range from molecular to behavioural. Evolutionary convergence invites us to think in terms of biological properties, and also emphasizes the risks of looking at differences that turn out to be skin deep. And most significantly it allows us to open new doors of enquiry, not least the rampant convergence in the evolution of sensory systems and what implications this might have for our understanding of that grave-yard of scientific endeavour, the evolution of consciousness.