
Evolution of a school teacher's consciousness

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Teaching, for all its challenges, offers up some beautiful moments. The other week I was walking through the school grounds and a thirteen-year-old student called out to me, 'Hey, Mister – today's was just the best class ever.' Now there is a type of eager-to-please little snot from whom such words would mean very little, but this particular kid isn't like that. Indeed she's one of those students you worry about. A Māori kid in danger of ticking all the clichéd boxes, falling in with the wrong crowd, sucked away from her path of learning by the inexorable gravitational pull of an alternative lifestyle that feels so much more urgent, compelling and indeed real than the abstractions we offer in the classroom. For now, she's hanging in there, a small success of the type we must notch up one by one if our country is to have any sort of a future. So her praise of the lesson was most heartening and I'd like to tell you about that lesson now, and use it as a way of examining the place of evolution in modern education.

I'm an English teacher and I was introducing a unit we do called Myths and Legends. The concept is that we survey various foundation tales from around the world, partly as a way of seeking to understand the role story plays in shaping the beliefs and culture of a group, partly as a way of opening the students' eyes to the rather startling thought that the stories they have been brought up with are not the only ones on offer, and partly of course because it's just sort of cool to read about devious, venal, petty gods beating the living bejesus out of one another. The lesson started in a fairly dull and uninspiring way, with the students asked to list as many different creation myths as they could think of, any stories or scraps of stories they could remember about how we got to be here, sucked tightly to the edge of this spinning, tugging little mass of glorious creation.

The kids duly came up with all the usual suspects, the seven day creation, the prising apart of Rangi and Papa, and some vague recollection about a giant turtle. From there comes the

obvious question, why do diverse cultures all seem to have the same need for creation stories? One possibility raised was that we are by our nature curious creatures. Not knowing just bugs us. From there it's only a small step to the question the modern teacher is, I believe, obliged to ask. How did we get here then? What does humanity now know about philosophy's three great questions: Why is there something and not nothing? (The creation question) How did life get here? (The evolution question) and What is thinking? (The question question).

I duly informed the class that modern science has an excellent answer to one of these questions, some pretty weird suggestions on how we might go about exploring another of them, and no real idea what the question even means in the third instance.

It was at exactly this point that the class shifted gear, from a state of semi-engaged compliance to one of genuine interest. Here's the heartening thing about the young, they're curious little beggars. Beneath the thin veneer of downloaded, logo-burdened, globalised disinterest there beats the same burning desire to know about the world they live in that got Archimedes out of his bath, Eratosthenes staring down his well, and Galileo contemplating the gently swinging chandelier. They did nothing to hide their delight as surprising answers and urgent questions wrapped themselves about one another in the ancient rhythm of the dance of knowledge.

Were we really once apes? So how did our brains get so big? What does a brain look like? Is it true you can scoop out a brain with a blunt spoon? Did they know patients are often kept conscious during brain surgery? Did they realise big brains are massively wasteful of resources, make us ridiculously vulnerable to brain injury and compromise greatly the opportunity for ante-natal development? Yes, come to think of it, baby humans are a bit useless, so how on earth did big brains evolve if they're such a hindrance?

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In 2005 Bernard was awarded a New Zealand Science, Mathematics and Technology Teacher Fellowship where he worked on a project examining DNA and human settlement in the South Pacific. This experience led to the publication of *Genesis* in 2006, which won the Young Adult Category in the 2007 New Zealand Post Book Awards. In 2008 the book made publishing history when UK publisher Quercus Books offered the largest advance ever put forward for a young adult novel in New Zealand. The novel, also published in Australia, is to be released in the UK as two separate editions: adult and young adult, and is to be published – at this date – in over 20 countries

Bernard's fascination for science also led to *Falling for Science: Asking the Big Questions* (2007), his non-fiction exploration of the relationship between story-telling and science. He may be contacted at bbeckett@xtra.co.nz



Once the basics of natural selection were explained, the students were hooked on the mystery of being us. Our new big brains must have offered some stunning survival and reproductive advantages to make it through the brutal sieve of selection. But what? We careered from there down a path of sexual selection, and to the mindblowing (and for a thirteen-year-old deeply disturbing) conclusion that each and every one of their forebears had a common quality, that they had exhibited the ability to survive, find a mate and successfully reproduce, producing offspring with these abilities.

Next thing we were discussing the fact that the human machine, no matter what else it is designed to do, is almost certainly going to be devoting a good deal of its time and energy to thinking about, plotting over, and practising for sexual conquests, a point no early adolescent has difficulty grasping. We were steaming straight ahead to an anthropological consideration of the modern adolescent's mating strategies when the bell took us rudely from our task. Such are the constraints of education on the cheap.

Learning doesn't happen often in a classroom. Learning requires a rare mix of curiosity, engagement and vitality and it doesn't visit often. And as the students bustled out, still talking about this weird and wonderful world they had just been exposed to, I realised two important things.

First, no myths or legends I could present to them in the following unit would come close to matching the story of evolution. No hoary old story about gods fashioning creatures out of clay would be able to produce the breadth, the surprise, the detail, the exuberance and most vitally the relevance of the evolutionary story. Because, the kids instinctively understand, it isn't just a story. It's us. It represents the very best understanding we currently have and it's changing day by day. And that immediacy is rocket fuel for the emerging imagination.

Second, depressingly, it is only through accidental collisions like this that most of our students will be exposed to the ideas of evolution, and even then only in a brief and superficial manner. The school where I work is comparatively large. There are approximately 350 students in Year 9. I had 27 of them in my class, and evolution, thanks in no small part to the influence of the Allan Wilson Centre, is something of an obsession of mine. The other 323 students won't get a scrap of it. Not in English when they study creation myths, not in social studies when they learn of the history of human thought and not, criminally, in their science lessons, where their introduction to biology is still most likely to come via carefully copied diagrams of flowers and experiments with oxygen weed.

Indeed, the average New Zealand student is still likely to complete twelve years of state-funded education in New Zealand without touching upon the mechanism of natural selection, despite it standing as prime candidate for the title of humanity's most important big idea. Under the new school curriculum, the big story of evolutionary processes, and the placing of humans as a result of these processes, in short the modern story of creation, does not appear until level eight, which equates to the old 7th form. That is to say, big picture evolution, the context for all our thinking about biological processes, is available only to those students who choose to take biology right up until their last year at college. That represents, I would contend, nothing less than gross negligence on the part of the education community.

Negligence born partly of sheer ignorance. For I would claim, and will attempt to substantiate this, that we as educators haven't yet grasped the full implications of what the philosopher Daniel Dennett refers to as Darwin's Dangerous Idea.

Let me then offer you three reasons why it is irresponsible to deny our students access to big-picture Darwinism. First, isn't there just something bloody-minded about the fact that for generation after generation we have subjected our offspring to the careful catechism of ideas that are simply wrong. Even now, we treat their continued transmission with a kind of patronising cultural tolerance, whereas, having finally come upon a creation story that actually matches the available data, sits within a coherent and consistent intellectual framework and most dramatically, points the way forward to new thoughts and discoveries, we drop the ball and lose our enthusiasm for passing it on? What is it about our evolutionary past that favoured such a contrary nature?

The second reason is pragmatic. All of our citizens are going to be asked, over the coming decades, to engage sensibly with the potential of new technologies that only make sense within an evolutionary framework. We have to come to grips with the potential and responsibilities of new reproductive technologies, and in the absence of an informed populace we will cede power to fundamentalists of all stripes. And of course an informed populace is a more likely source of the next generation of theorists. If ever there was a time to invest a little more in scientists and a little less in financial speculators, this is surely it. But that won't happen if we are not piquing the interest of the generation of youngsters choosing their future paths.

The third reason, and the one dearest to my heart, concerns philosophy. David Penny said in a recent radio interview that, 'Beliefs are the enemy of the thinking class.' I would like to modify it slightly to, 'Unexamined beliefs are the enemy of the thinking class,' for beliefs themselves cannot be the enemies of thinking, as they are necessary components of the thinking process. Scientific thinking after all requires a belief in inductive reasoning, leans heavily on a discomfort with contradictions and rejects, as an article of faith, the tenets of idealism. Legal thinking requires a belief in the existence of effective free will, and all of social thinking stems ultimately from a deep faith in the conscious experience of others. There is, however, an important distinction to be made between this type of belief, embraced for pragmatic reasons by those who understand full well the utility and limitations of the belief, and the slavish, often fearful devotion to the bedrock beliefs of our inherited culture.

We need to be aware, and make our students aware, that an acceptance of evolutionary principles runs smack bang into some of the most sacred stories of the Western Philosophical tradition. Why? Because knowledge is tremendously hard to uninvent, and an insistence upon stories that work against knowledge is a recipe for instability and conflict. What are these stories I speak of?

Well a good place to start would be Plato's notion of the soul which later became firmly entrenched in the Christian tradition and as such underpins so much of our mythology. In a world where so little was understood about this mysterious thing called life, and even less of the brain and the magical biological process we call thinking, the idea of knowledge and consciousness floating free of the physical substrate was quite tenable.

The evolutionary perspective, however, which has the human design as the current state of an ongoing, stepwise process of accumulating errors, makes it far harder to believe that Uncle Jasper's ghost is still banging about in the cellar. I think we need to discuss this far more openly. I think we need to front up to it, and in doing so start on the path to developing a new set of sacred stories that accommodate our best current understanding of the physical world. This is the role of education.

Aristotle gave a formal sort of credibility to a teleological understanding of the world, to the habit of thinking about things in terms of the purpose for which they were created. And so our Western thinking is highly biased towards talk of prime movers and purposeful creation. Evolution of course asks us to turn such reasoning on its head, seeing the natural design process as reactive rather than anticipatory. That represents a huge and difficult shift in our thinking. To even contemplate that non-teleological selection could produce a world of such intricacy, variety and invention requires an intellectual bravery that is still beyond many. And to return to the philosophy, take out the purpose of the creator, and from whence will our own sense of purpose derive? That's tricky. Purpose must be seen as an invention not of nature, but of the individual, and working out how to form a coherent and peaceful social contract about that understanding is a great challenge for the next generation, one they will not be able to meet if they are allowed to cling, unchallenged, to Aristotle.

As a third example in an almost unlimited series, Descartes, who did so much to lay the groundwork for taking the mystery out of biological processes, nevertheless ring-fenced the human mind, proposing that thought itself deserves a special ontologi-

cal status. He argued that human thought is the only thing the human mind is incapable of doubting, that thought is therefore the primary reality. In doing so he cut the scientific world a certain slack, allowing scientists to examine the physical whilst leaving some sacred turf for those who derived their power from alternative means of enlightenment. But again, evolution is an impolite dinner guest that insists upon starting the awkward conversations. While the question, 'What is thought?' remains on many levels unanswered, evolution does at the very least point towards new ways of framing it – by asking first, how thought might have evolved, and then, by implication, insisting that the thing (or rather things) we call consciousness must somehow emerge from the physical world. And so we study the links between the human genome and the human brain. So we examine the genome of our closest relative, the chimp, so we pay special interest to the development of language and the way it shapes our thinking, and so we even begin to consider the way culture itself may evolve, and be considered perhaps part of the extended human phenotype.

We are nowhere near understanding thought, and much modern research will surely lead us down blind alleys, but once again, courtesy of evolution's impressive reach, the ground has shifted. And once again our most sacred stories are being ripped asunder by the seismic activity. We need to be discussing this. The responsibility of processing and synthesising the new knowledge that evolution has foisted on us lies with the next generation. Our responsibility then lies in ensuring they are properly equipped for the task.

