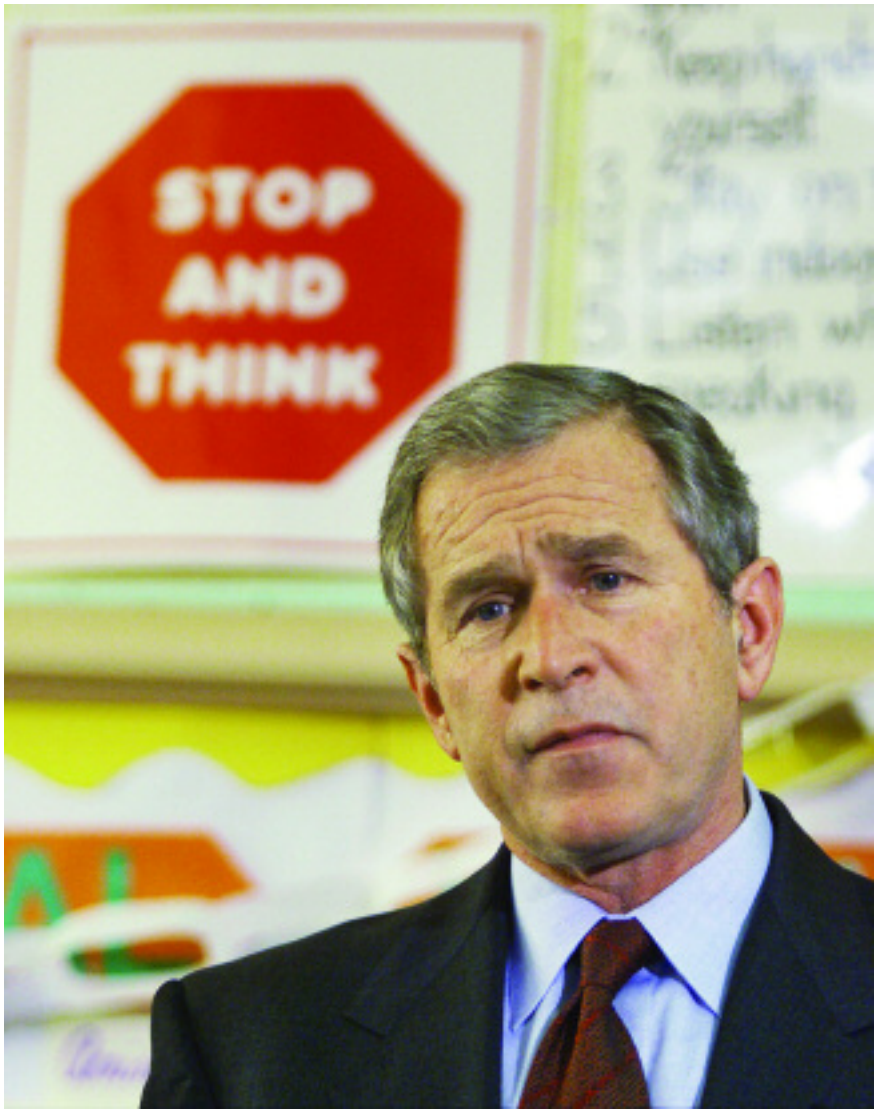

US President George W. Bush, who believes that intelligent design should be taught alongside evolution, could have learned a lesson himself at this elementary school.
Photo: Getty Images

Time for Our Leaders to STOP AND THINK about INTELLIGENT DESIGN

Alex Reisner questions why prominent politicians are unwilling to resist the push for religious fundamentalism to be taught in science classes.

William Jennings Bryan was a three-times defeated US presidential candidate. He was a fundamentalist Christian and made no bones about it. By 1925, Bryan and his followers had succeeded in getting legislation introduced in 15 of the United States to ban the teaching of evolution.

While Bryan successfully led the prosecution in the famous 1925 Scopes trial of a Tennessee high school teacher for teaching evolution, he lost the intellectual battle and the field was ceded to Darwin's theory of evolution by natural selection. Or so it was mooted.

A recent news feature in *Nature* describes the "intelligent design" movement as "a small but growing force on US university campuses. For some it bridges the gap between science and faith, for others it goes beyond the pale." It is now receiving tacit support among influential government leaders here and in the US.

On 1 August, a journalist quizzed US President George W. Bush about "the validity of intelligent design as an alternative to evolution". Bush responded: "I think that part of education is to expose people to different schools of thought… You're asking me whether or not people ought to be exposed to different ideas, and the answer is yes."

On 10 August Australia's Minister for Education, Science and Training, Dr Brendan Nelson, told the National Press Club that he would oppose replacing evolution with intelligent design in Australia's science classes but said parents should be able to choose that their children learn about it.

"Do I think it should be a replacement for teaching the origins of mankind in a scientific sense? I most certainly don't think that it should be at all. In fact, I'd be quite concerned if it were to replace it.

"Do I think that parents and schools should have the opportunity – if they wish to – for students also to be exposed to this and to be taught about it? Yes I think that's fine. As far as I'm concerned, students can be taught and should be taught the basic science in terms of the evolution of man, but if schools also want to present students

with intelligent design, I don't have any difficulty with that. It's about choice, reasonable choice.

There's nothing like having the courage of your convictions and stating them so that the great unwashed public know where you stand, but what effect might that have on one's onward and upward political movement? Mind you, Nelson was not asked whether or not intelligent design should be taught as "hard science".

The Federal Minister for Health, Tony Abbott, was equally strong-hearted when asked about his views regarding the teaching of intelligent design in schools. "This is a traditional argument which is put forward in theological classes, but I'm not a theologian," he said.

Not that the Federal Labor Party's Deputy Leader and spokeswoman for Education and Science, Jenny Macklin was less equivocal: "All young people should have an understanding of a range of religious beliefs," she said.

With supporters like these, does science need enemies? Bill Hodgson, head of Campus Crusade for Christ Australia, said that Nelson's remarks were "fantastic", adding: "I think any reasonable and balanced approach to education has to take that view. He said his group had never advocated the removal of the theory of evolution from school curricula and described intelligent design as hard science, not creationism. "There is evidence of intelligent design," he said. "All we're saying is that the cutting edge of science is adhering increasingly to intelligent design."

There is no evidence for intelligent design, full stop. Intelligent design declares that elements of life are so complex that it is inconceivable that they could come into existence through the natural selection of chance alterations. "Inconceivable" is equated to impossible. This is a declamation and there are no data to support it. By it's very nature it cannot be substantiated. Stated as an article of faith... that's a different matter.

It has been pointed out by creationists and those defending intelligent design that neo-Darwinism is merely a theory. Theory, yes. Merely, no.

Genetic mutation and environmental selection have been demonstrated in the laboratory time and time again. And it has been pointed out in a recent letter in *Science* by Laubichler, Müller, Fontana and Wagner that "the evolutionary process rests on the dynamics of molecular and developmental interactions that collectively shape the outcomes of random mutation and selection in a non-random way. This weaving together of evolution and developmental processes provides the modern experimental and theoretical framework, grounded in Darwinian thinking, for explaining the organisation of living systems."

The argument brought in defence of intelligent design is that it is all very well to demonstrate evolution for clearly identifiable stepwise changes but how can you possibly go, for example, from a light-sensitive spot in a single-celled organism to a vertebrate or cephalopod eye via undirected mutation and mere environmental selection.

Any honest evolutionist will reply: "I don't know, but I can outline various mechanisms by which it could have occurred. It's true that currently we don't have a fossil record indicating how it occurred and we're not yet knowledgeable enough to set up conditions to demonstrate it in the laboratory, but that's very different from saying it required the existence of a supreme intelligent designer."

Those who invoke intelligent design are immediately blocked from further

"... if schools also want to present students with intelligent design, I don't have any difficulty with that" – *Dr Brendan Nelson, Science Minister*

Hard Science or Religious Faith?

The Australian Academy of Science has not published an opinion on intelligent design but has issued the following statement on creationism.

- All scientific ideas are theories, imperfect and subject to test. That the theory of evolution is imperfect, and still the subject of study and modification, affirms that the theory is part of science. Many attempts to modify and expand the theory have been successful, showing (since Darwin's day) the gene basis of inheritance, the basis of gene reproduction in the double helix structure of DNA, the "genetic drift" basis of the origin of breeds, and so on. Many challenges to the fundamentals of the theory have failed empirical test. The theory has attracted enormous empirical testing and remains one of the most powerful of scientific ideas.
- The creationist account of the origin of life has been and remains an important idea in human culture. However, it is not a scientific idea. That is, it is not open to empirical test. It is an article of religious faith.
- The creationist account of the origin of life is not therefore appropriate to a course in the science of biology, and the claim that it is a viable scientific explanation of the diversity of life does not warrant support.
- The Academy sees no objection to the teaching of creationism in schools as part of a course in dogmatic or comparative religion, or in some other non-scientific context. There are no grounds, however, for requiring that creationism be taught as part of a science course.

inquiry into the mechanism of biological evolution just as much as those who state that the universe is a product of a creator or intelligent designer are precluded from cosmological research. The cosmologist currently evokes the Big Bang of a "singularity" as the beginning of our universe, not as something incontrovertible but rather as a concept that, with our current state of knowledge, is compatible with what we know. Might that change with further observation and experimentation? It might and indeed it probably will. If it does then the concept will be modified, just as Newtonian physics was refined with Einstein's discovery of relativity.

Intelligent design inherently precludes scientific research, but neither Nelson nor Macklin were prepared to say so. Neither was prepared to say that part of the science syllabus should explain just what science is in contrast to beliefs that preclude constructive scientific curiosity.

Evidence of evolution? Source: bushorchimp.com

On 31 August *ScienceNow* published a short item that demonstrated the scientific approach to the question of how might life have begun. The method described doesn't give a definitive answer but it suggests a step in the path, and it is clearly in opposition to the declamatory approach that "life was the creation of an intelligent designer".

How did life evolve from non-life? The jury's still out on that one, but scientists have now answered the equally important and related question about how early RNA molecules grow longer and more complex without succumbing to destructive mutations. RNA, it turns out, can withstand a surprising amount of mutation and keep on ticking.

Scientists' best guess as to how life got kick-started in the primordial soup is that self-replicating RNA molecules acquired the ability to act like enzymes, using their shape to catalyse the biochemical reactions essential for the growth of primitive cells.

But therein lies a paradox. Larger genomes are required for higher complexity, yet larger genomes provide a larger target for mutations that might turn it into gobbledygook.

According to mathematical models, primitive RNA genomes that lacked error-correcting enzymes would have suffered a mutation overload long before they could have pulled off any tricks fancier than self-replication, let alone cell maintenance. But these models have a weak link, according to a team led by Eörs Szathmáry, a mathematical biologist at the Institute for Advanced Study in Budapest, Hungary. The researchers focused on an assumption made by the models called the "error threshold," which predicts how large a genome can become before mutations warp its shape and render it useless.

To get a better handle on what the error threshold for early ribozymes might have been, the researchers turned to modern ribozymes. They pooled data on the effect of mutation on two simple ribozymes – one from yeast and another from viruses – that can cleave themselves in half. The team then tallied the effect of mutations on the ribozymes' shape and cleaving ability.

They found that ribozymes appear to be a whole lot tougher than was originally thought. Most single mutations did not affect the critical shape of the molecule, and multiple mutations tended to compensate for those that did.

Based on their results, the researchers calculate that early ribozymes could have had as many as 100 simple genes, which is close to the minimum number thought to be required for primitive life.

The team reported its results in *Nature Genetics* last month. This is "a landmark paper," said Günter von Kiedrowski, a biochemist at Ruhr University in Bochum, Germany. The next step, which von Kiedrowski calls "the Big Bang of biology," is to figure out how early self-replicating ribozymes came to be in the first place.

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