

Darwin's theory of evolution has always provoked much controversy and opposition. Non-acceptance of evolution still has a considerable number of supporters in the US (47% in a 1991 Gallup poll). This rejection of evolution in favour of a recent creation of man indicates a low level of scientific literacy where evolution is concerned.

Active opposition to evolution comes from various fundamentalist religious groups who see it as a threat to long-held beliefs concerning ultimate origins and our place in the universe. There should be no objection to people clinging to cherished beliefs, but when they unjustifiably claim scientific credence for them, and also insist that they be taught in the science classroom, then there is just cause for concern by skeptics and others.

Possibly the most militant of the anti-evolutionists are the "creation scientists", a group of "young-earth" Christians based in the United States. They wish to see their literal interpretation of the Bible taught in schools as a viable alternative to evolution. Of the strategies devised to achieve this, the one which has found most success is where the religious nature of their belief system is down-played and the language of science used to give an impression of scientific credibility.

The religious nature of "creation science" is especially exemplified in the statements of faith required for membership to the various organisations established in its name - statements, for example, relating to a creator, a universal flood, minimal changes to created "kinds", and a young earth. By creation is meant the bringing into

being of the basic "kinds" of organisms as described in *Genesis*, a process which creationists themselves acknowledge is beyond the scope of scientific inquiry.

If we are to believe the anti-evolutionists, evolution is "a theory in crisis", teetering on the brink of oblivion. In reality, evolution in scientific circles has attained the status of fact. This declaration invariably elicits cries of "foul" and "dogmatism" from evolution's opponents. They ask, how can theory be fact? The answer, in the same way we distinguish between the fact of continental drift and its proposed mechanism, the theory of plate tectonics.

Darwin's theory comprises two major propositions:

(1) evolution (or descent with modification) has occurred

(2) the key mechanism of evolution, the "how" of the process, is natural selection

Proposition (1) is a fact, supported by overwhelming evidence from many research fields; proposition (2) is theory.

These two aspects of evolution are often conflated by anti-evolutionists.

They cannot resist highlighting conflicting views concerning the mechanism of the process so as to make it appear that evolutionists are questioning the validity of evolution itself.

One common argument against evolution is that it is "only a theory", implying that creationism has equal validity as a different theory. This is a

misleading use of the word as, in science, it means much more than conjecture or even hypothesis.

Theory is used by scientists as a shorthand term for describing an explanatory structure which is broadly based across a range of specialist areas, reasonably secure, and supported by consistent observations and experimentation. The knowledge held within this theory can be organised in a highly formal system using basic underlying principles as an explanatory tool from which to explore further.

In declaring evolution a fact, the accusation of dogmatism is unjustified since scientists make no claim to absolute truth (unlike the anti-evolutionists). A fact in science means, as Stephen J. Gould notes, is something "confirmed to such a degree that it would be perverse to withhold provisional assent". It is against this bastion of scientific certitude that the anti-evolutionists have mounted their Quixotic attacks, employing invalid arguments and questionable tactics.

The "strawman technique" involves setting up evolution in such a way that the caricature erected is easily demolished. Evolution is portrayed as a process of pure chance or accident. Therefore, any possibility of producing complexity is nil. But evolutionists do not conceive the process in just this way. Chance factors are involved (such as mutation and recombination), but natural selection, itself, working on new gene combinations helps in explaining not only speciation but also the evolution of complexity.

The most insidious of creationist tactics is the selective quotation. The creationist literature abounds with extracts lifted from the

evolutionary literature in such a way that they then convey meanings never intended by their authors.

Occasionally, creationists will admit that creation "science" depends on faith. But evolution, too, is a religion, they argue. This is nonsense. Prominent skeptic, Michael Shermer, defines science as "a set of methods designed to describe and interpret observed or inferred phenomena, past and present, and aimed at building a testable body of knowledge open to rejection or confirmation".

On the other hand, creationists start with a set of absolute beliefs, and facts or concepts which contradict these must either be declared false, or made to fit a preconceived mould. This is the antithesis of scientific inquiry. Acceptance in science is not a matter of faith or belief, it is a matter of evidence. Evolutionary science meets this criterion.

One of the problems in debating with creationists is in the broad range of arguments that they often employ. Thus in arguing with a geologist, they will concentrate on biological factors, and vice versa.

Does creation "science" deserve a place in the school science classroom? The answer to this question, given its nature and the tactics employed by its proponents, has to be a resounding no!

Understandably, creation "science" poses a much greater threat to the integrity of science education in the US than it does in New Zealand. But recent reports indicate that creationism has already become established in a number of our

schools, so that principals, teachers and boards of trustees cannot afford to be complacent over this issue. In an educational climate in which the distinction between science and non-science is becoming more and more blurred, constant vigilance is essential.

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Noah's Flood would have required 5 billion cubic kilometres of water, and a rainfall totalling 99.9% of the atmosphere producing a condensation temperature of 3,500°C.



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Creation "science"

Scientific creationism is a grotesque parody of human thought and a downright misuse of human intelligence. In short, to the believer, it is an insult to God.

Michael Ruse

Many "creation scientists" clearly hold their view for religious, not scientific reasons. They have every right to hold the religious views of their choice, but to pretend that these are scientific is a misrepresentation.

Martin Bridgstock

Creation Science if followed to its conclusions, is anti-knowledge, anti-religions and anti-science.

Peter Hollingworth
Anglican Archbishop of Brisbane