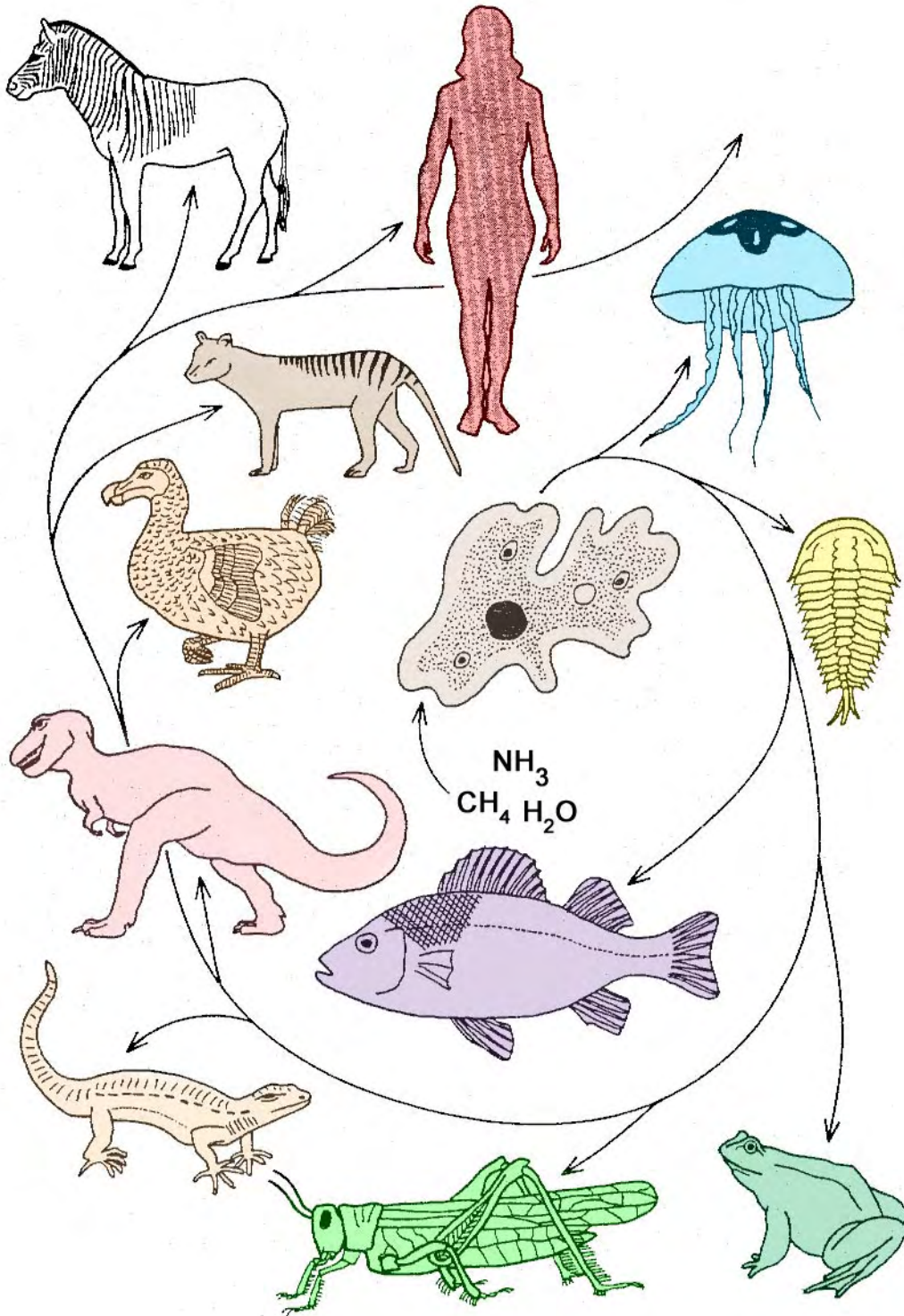


THE OTHER QUOTE BOOK

in support of evolution

234 quotations demonstrating the widespread and confident acceptance of evolution as the best explanation for the origin of the species, and the unscientific, disreputable nature of creation science.



Isaac Asimov
Ken Ham
John Mackay
Pope John Paul II
Stephen Jay Gould
Michael Archer

Written, compiled and
designed by

A.G. Wheeler

Creation science requires the belief that the universe, the world, and all life upon it were created by God as described in their own literal interpretation of the “King James” Bible. This belief is propagated strongly in the U.S.A. The Creation Science Foundation Ltd. is the main overseas organization, and is a non-profit company headquartered in Sunnybank in Brisbane, Queensland.

The Quote Book was published as a supplement to the October, 1984, (volume 7 number 2) issue of Ex Nihilo by the Creation-Science Foundation Ltd in an effort to promote the idea that creation science has a widespread following amongst academics, scientists and other authorities. This proved to be a very effective part of this company’s campaign to have creation science more widely accepted as a legitimate philosophy.

Close examinations of the quotes presented to their readers revealed that there were many major faults; particularly the taking of isolated phrases out of context and the omission of other clarifying intermediate phrases. The result of these errors was generally, to present a false impression of the convictions of those people quoted, often the opposite to that which these authors originally intended. Also there were many minor errors, such as referring to the wrong year, journal volume, number or pages, with the result that if the reader did not have access to the entire run of a journal or the alternative editions of a book as in a major university library it would be very difficult to find the quotations and realise the deception. (In this context these “minor” faults are, in fact, very important.) The net effect is the strong suggestion that creation science is a reasonable, scientific and reputable alternative to the scientific theory of evolution; however, this suggestion is just not true.

In an effort to restore the balance, this book of quotations has been compiled to present a more accurate impression of the widespread and popular support that evolution has amongst academics, scientists and others as-the most effective explanation that we presently have for the origin of the vast number of species of plants and animals that we can see today. Further, this book contains quotations describing the widespread disreputability of creation science amongst those scientists best qualified to judge its value, and even the concern felt that this abomination should be not included in school science curricula.

Every effort has been made to quote the various authors fairly and accurately; any errors are purely mine and are not intentional. Because these quotations have been extracted from longer texts, clarification, of pronouns in particular, has been required and the insertions made are in brackets []. References to sources within parentheses have been omitted. Of course, please feel free to check these quotations for accuracy. If you find any errors please do not hesitate to inform me.

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Scientists argue that despite its name creation science isn't "science" at all, but religion masquerading as science.

'A scientist is someone who plays the game of science. He or she must, of course, play by the rules or it is some other game. There's nothing wrong with playing other games, since many are equally worthwhile or perhaps even more so, but if some other game is being played, it shouldn't be called "science".'

'The pseudoscientists are not really interested in possums, dinosaurs, lightning bugs, or fossil sponges. They are interested only in proving something. They generally don't get out there and get their hands dirty studying actual wild animals, plants, and fossils ... so they usually get their information from the writings of real scientists. This lack of first-hand experience with the creatures of phenomena they copy statements about is painfully obvious to any real naturalist.'

'It might seem curious that Jews, believing as they do in exactly the same Genesis as Christians, are excluded from membership in what is ostensibly a society of scholars [the Creation Research Society] dedicated to "proving" that Genesis is "True."

Ronald H. Pine (zoologist; research associate, Chicago Field Museum of Natural History; professor of Ecology and Environmental Studies, George Williams College), "But some of - them are scientists, aren't they?", Creation/Evolution, 1:984, no 14, pp 6-18.

'However, creation is a religious belief, while evolution is a scientific theory.'

John Knight (lecturer, Department of Education, University of Queensland), "Creation distinct from evolution", Courier-Mail, 4 April 1984, p 4.

'It is, therefore, our unequivocal conclusion that creationism, with its accounts of the origin of life by supernatural means, is not science.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984, National Academy Press (Washington, D.C.), p 26.

Creation science has erected a revised history of the world and all the life therein based on the Bible (divine creation, Noah's flood, etc.); this account is held inviolate and is supported by whatever science they can muster for the purpose. While their "scientific evidence" may be criticised, abandoned, revised, readopted, etc., the central ideology is retained absolutely unchanged.

'... special creation is neither a successful theory nor a testable hypothesis for the origin of the universe, the earth, or of life thereon. Creationism reverses the scientific process. It accepts as authoritative a conclusion seen as unalterable and then seeks to support that conclusion by whatever means possible.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984, National Academy Press (Washington, D.C.), p11.

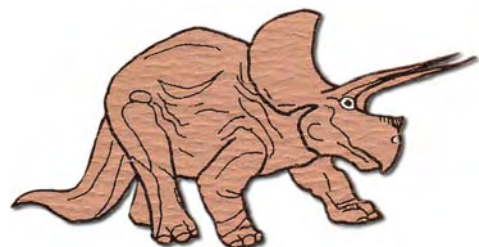
'Revelationists can consider the question [of the origin of the species] but can only accept those answers which fit the revelation.'

John MacKay (Chief Editor of Ex Nihilo, periodical published by Creation Science Foundation; member of the advisory board of that company) "Creation as science", Ex Nihilo, 1979, vol 2, no 3, p 10.

'The Creation Science Ministry is totally convinced God's word (the Bible) is Truth and therefore must provide the framework into which all scientific research about origins must fit

'... the most important part of this [Creation Science] ministry is to preach the Gospel. The scientific aspects of creation are of secondary importance...'

Ken Ham (Ministry Director, Creation Science Foundation, editorial advisor of Ex Nihilo), "Creation science methodology", Ex Nihilo, 1980, vol 3, no 2, pp 21-24.



Creation science is generally recognized to be not science at all.

‘Moreover, when the evidence for creationism has been subjected to the tests of the scientific method, it has been found invalid.’

“Science and creationism” by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 26.

‘...for the Genesis record is quite without scientific basis. The scientific community is virtually unanimous in its rejection of the claim that the Genesis stories are scientific.’

‘Many Christians deny that the Genesis stories are science, for them the conflict is a mirage which disappears on close examination. They see Genesis as an inspired account conveying great insights about the nature of creation.’

Rod Rodgers (head, Department of Botany, University of Queensland; member of Indooroopilly Uniting Church Parish), “The limits of science”. Life and Times, 22 Aug 1984, p 9.

Further, many of the leading creation scientists are considered not even appropriately qualified scientists.

‘Twelve of the 19 members of the Creation Science Foundation advisory board are or were teachers, most of them in science. Of the other seven, three are medical doctors. These facts give a clue to the real orientation of the organization. Only one member is an academic from Queensland tertiary institutions in the fields of science and education, persons whom one might expect to find in strength on the advisory board of an organization claiming to be so rigorously scientific.’

John Harrison (editor of the Uniting Church newspaper Life and Times), “Creation Scientists... origins of THAT species”, Life and Times, 13 June 1984, pp 8-9.

In the U.S.A. it has been important for the creation scientists to emphasize the claimed scientific basis of creation science and hide its religious basis (because of their constitution requiring that religion not be taught in schools).

‘One strategy not employed by creationists is reference to Scripture (at least in debates). The debater wishes to seem as “scientific” as possible, and to use Biblical quotes would tend to weaken this image.’

David H. Milne (teacher of biology and ecology, Evergreen State College), “How to debate with creationists - and ‘win’” American Biology Teacher, May 1981, vol 43, no 5, p 237.

‘Without mentioning God, the Bible, or Divine Creation, they are prepared to introduce in schools “scientific” evidence of the “sudden” and “relatively recent” creation of the universe, solar system, and life on earth.’

Arthur N. Strahler (author; past professor of geomorphology, Department of Geology, Columbia University), “Creationists change their strategy”, Journal of Geological Education, 1982, vol 30. p 24.

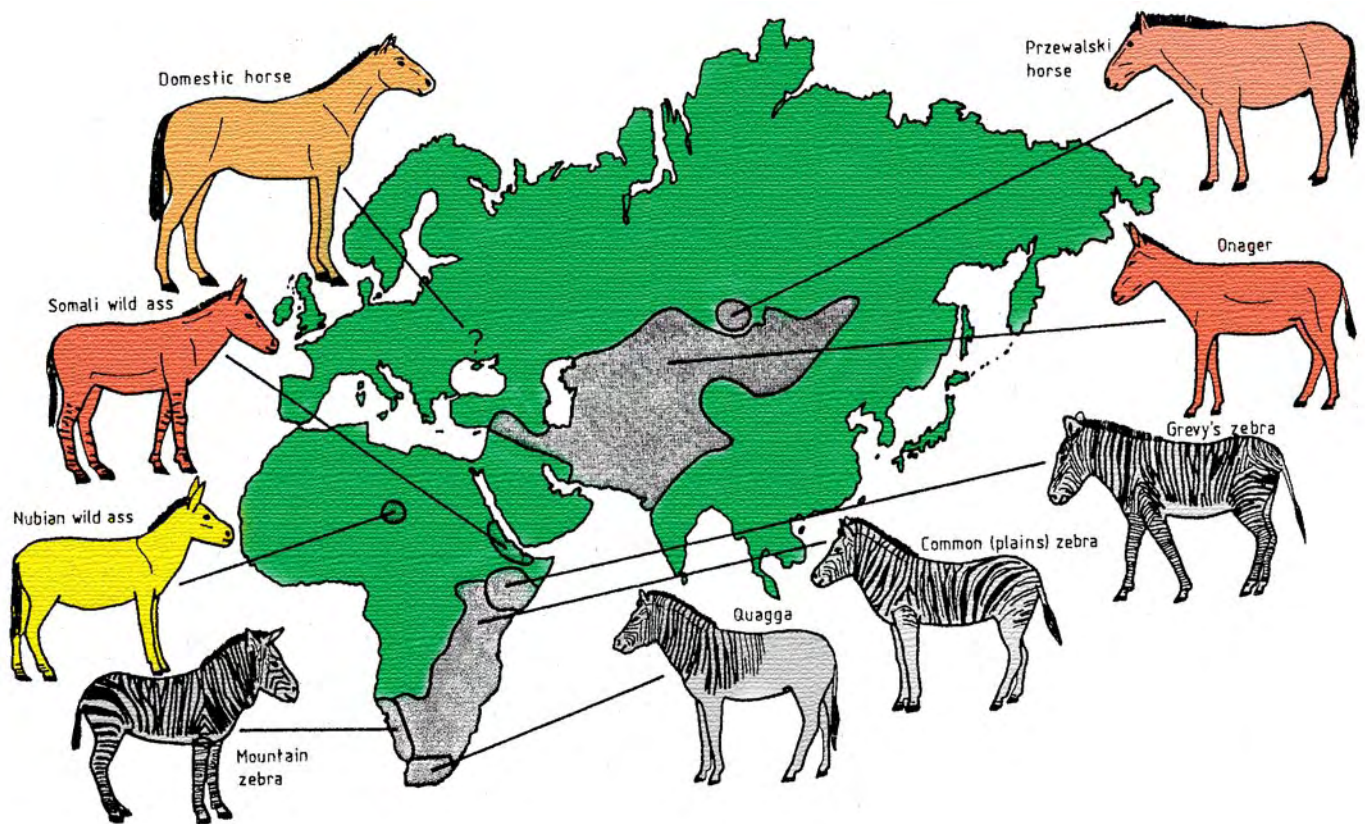
‘Indeed, even “scientific” creationists, when they abandon their pretence of being legitimate scientists and engage in their more customary activity of finding biblical support for their various fundamentalist theological stances, are fond of contending that it is unacceptable to cite biblical passages out of context (a rule more often broken than observed).’

Leon H. Albert (anthropology teacher, East Los Angeles College), “‘Lucy’ out of context”, Skeptical Inquirer, summer 1985, vol 9, p 364.

‘Especially is it pleasing to find the books in the right sections of the libraries, under Science and History, instead of Religion as the atheistic Dewey system would require.’

Ken Ham, “Creation science methodology”, Ex Nihilo, 1980, vol 3, no 2, p 23.

Translocations: The origin of the numerous species of horses can be explained by the spontaneous re-distribution of the genetic material in the chromosomes. (Short, 1976)



In Australia there are no constitutional restrictions, and creation scientists exploit their religious basis to their advantage and lean heavily on a very literal interpretation of the Bible (King James' translation) as God's inspired word and their ultimate authority on all things scientific and historical.

'For the past century or so it has been generally recognised that, whatever their authority in matters spiritual and ethical, the authors of the Bible were fallible in their interpretations of physical and biological phenomena. Absolute belief in the literal truth of the book has been largely restricted to members of enthusiastic puritanical sects that combine primitive Christianity with certain exclusive observances or prohibitions.'

Ronald Strahan (Chairman of the editorial board and Honorary Editor of Search, journal of the Australian and New Zealand Association for the Advancement of Science), "Ex Nihilo ad absurdum", Search, July 1981, vol 12, no 7, p 169.

'A creationist can deny the body of science by the simple affirmation that he or she accepts the literal truth of a particular version of the Bible. A scientist who regards organic evolution as proven, and the neo-Darwinian theory as a convincing explanation of the underlying processes, bases this opinion on a vast volume of interlocking evidence.'

Ronald Strahan, "Creation anti-science", Search, Nov 1981, vol 12, no 11, p 373.

'As late as the 17th century the Biblical account was taken to be literally true by the great scientific thinkers. In this, as in other instances (e.g. the Creation), discrepancies between the Bible's version and the results of scientific research were generally thought to stem from Man's imperfect interpretation of Nature, or of the Bible, or of both. While alien to our way of thinking, this betrays a humility apparently unknown to modern Biblical fundamentalists, who base their theories against, e.g. evolution, cosmology, on the word-for-word literal truth of what is anyway a translation.'

John Grant, "A directory of discarded ideas", 1981 Ashgrove Press (U.K.), 1983 Corgi (London), pp 19-20.

'When it comes to the Bible, therefore, it is not enough to assert, "the Bible says..." If I say, "I saw a marvellous sunset last night" this does not mean that this is scientifically speaking what happens. My statement must be interpreted as an accepted figure of speech. A popular description - not a scientific observation. So, too, as well as knowing what the Bible states, we need to know what the Bible means.'

'There are no eye witness accounts of Creation. There could not be since nobody but God was present at the beginnings of the universe and of man. The inspired authors knew no more than we do the exact way in which God made the world. Nor were they particularly interested in the question.'

Fr Brian Gleeson, CP (theologian), "Religion, science - partners", The Leader, 27 May 1984, p 9.

'The mind-set of the "creationists" is not one of confident faith, but of anxiety for mathematical-type certainty. If one "jot or tittle" is found to be unacceptable, their whole belief structure is likely to crumble, as clearly Calvin's was not. The approach of the "creationists" is not only misled and contrary to faith, but it also is theologically damaging.'

Ian Gillman (head of Department of Studies in Religion, University of Queensland; associate minister in Corinda Uniting Church parish), "Calvin sheds light on creationism", Life and Times, 13 June 1984, p 9.

'We no longer think the earth is flat, as the biblical writers did. We no longer think that the earth stands on huge pillars (Job 9:6) in a sea of water (Genesis 7:11). We do not believe that the earth is at the centre of the galaxy, or that the sun and moon rise and fall over a stationary earth (Joshua 10:13).'

'The human race begins with one man, with the first woman being created from his rib. The plays on words (explained in footnotes of the T.E.V. Bible) suggest the story was not necessarily taken literally by those hearing it.'

Peter Horsfield (Minister of The Gap Uniting Church), "What is the Bible?", Life and Times 22 Aug 1984, p 8.

'By the investigations of George Smith among the Assyrian tablets of the British Museum, in 1872, and by his discoveries just afterward in Assyria it was put beyond a reasonable doubt that a great mass of accounts in Genesis are simply adaptations of earlier and especially of Chaldean myths and legends.'

Andrew D. White, "A history of the warfare of science with theology in Christendom", 1895, 1955 Arco Publishers (London), p 237.

[Question by unidentified telephone caller :] 'Do you have a Hebrew dictionary that was published at the same time as Genesis was written?'

[Ken Ham:] 'No, I'm afraid not.'

Ken Ham, Lesley Daniel's City Extra, ABC Radio 4QR, 0900-1000, 9 May 1985.

'Theologians regard the Book of Genesis as the story of a religious happening, rather than as scientific fact.'

Fr Ron McKiernan (chairman of the Queensland Catholic Education Commission Religious Education Committee), "No creationism in our science classes", The Leader (Catholic Church newspaper), 27 May 1984, p 9.



To confuse matters creation scientists counter with the claim that science itself isn't "science" either, and that it too is a religious belief.

'Their most recent gambit is a suggestion that the theory of organic evolution is, in fact, a religious concept and, as such, should be banned from presentation in government-supported educational institutions.'

Arthur N. Strahler, "Creationists change their strategy" Journal of Geological Education, 1982, vol 30, p 24.

'Elmendorf [a Creation Scientist speaker] wants to have evolution banned from the schools on the grounds that it is also religion.'

Robert S. Schadewald, "Bible-Science conference: emphasis on geocentricity" The Skeptical Inquirer, winter 1984-85, vol 9, p 113.

'The scientific creationist has already made up his mind about the broad outlines of reality and by a process of deduction concludes how everything must be and then says that's the way it is. Since another way of operating is inconceivable to him, he imputes nothing more than the same deductive processes to evolutionary theorists. These creationists are convinced that all "evolutionists" had an a priori acceptance of an old universe and of evolution and that they have merely deductively extrapolated from that to specific cases.'

Ronald H. Pine, "But some of them are scientists, aren't they?", Creation/Evolution, 1984, no 14, p 12.

'Creationists confuse science with religion, and they will continue to promote a false debate over evolution as long as they confuse material and spiritual realms of being.'

Philip D. Gingerich (associate professor, University of Michigan; Director of Museum of Palaeontology), "Evidence for evolution from the vertebrate fossil record", Journal of Geological Education, 1983, vol 31, p 140

Another of the creation scientists' tactics is to misquote by distortion, taking statements out of context, and even by making judicious changes, the statements of famous scientists and authorities.

'I should say I object to their [creation scientists] method of presenting quotations from evolutionary scientists out of context, in such a way as to make them appear antievolutionary statements.'

Piero P. Giorgi (senior lecturer, Department of Anatomy, University of Queensland), "DID it all begin with Adam and Eve?", Courier Mail (Brisbane), 21 March 1985, p 5.

'I am angry that so many good Christian people are led astray by those who write "Creation Science" books. I am horrified that writers who blaze their scientific expertise all over the covers of their books could be so monolithically incompetent or so fanatical in their opinions that they distort and misinform to make their point.'

Rod Rodgers, "No faith in creationism", Life and Times, 13 June 1984, p 8.

'He [Duane Gish] began ... by saying he didn't want to be accused of quoting anyone out of context or misrepresenting anyone, and then spent half an hour quoting evolutionists out of context (rarely more than one or two sentences) and misrepresenting their views.'

Robert J. Schadewald, "Creationist conference recasts physics, cosmology, and geology", The Skeptical Inquirer, winter 1983-84, vol 8, pp 98-101.

'The ten references were found to have twelve minor errors, nine major distortions and one gross misquotation.'

Martin Bridgstock (School of Science, Griffith University), "Ten checks upon creation science", Australian Science Teachers' Journal, March 1985, vol 30, no 4, p 26.

'Creationists use very specific rhetorical methods to either intensify or downplay certain aspects of messages to achieve their goals. In some instances, they use both techniques like a magician who draws attention away from something to pull off an illusion.'

Thomas R. Koballa (assistant professor) and Earl J. Montague (professor, Science Education Center, University of Texas), "Creationism and doublespeak", The Science Teacher, Jan 1985, p 28.

'In its magazines and publications the foundation frequently quotes scientific authorities in such a way that the quotes are carefully edited, rearranged and taken out of context ... The end result is a quotation that bears little or no relation to the author's intent.'

Alex Ritchie (director of earth sciences, Australian Museum), quoted by Bob Beale, "Build on rock, scientist tells creationists", Sydney Morning Herald, 10 Aug 1985.

'Morris and Parker's book is proclaimed on the cover to be "suitable for public schools". It's shoddy, dishonest, and deceptive scholarship ... proclaims the inevitable results of adopting a zealous belief system that claims a monopoly on the truth.'

Leon H. Albert, "'Lucy' out of context", The Skeptical Inquirer, summer 1985, vol 9, p 371

'Creationists have developed a skill unique to their trade: that of misquotation and quotation out of context from the works of leading evolutionists.'

John R. Cole (assistant professor of anthropology, University of Northern Iowa), "Misquoted scientists respond", Creation/Evolution, no 6, p 34.



Creation scientists counter with examples of errors and fraud by scientists.

'In fact, in every case that creationists have pointed out that scientists made errors, the errors were originally discovered by scientists themselves - not by creationists who have made no significant contribution to the literature of evolution.'

Kenneth Miller (professor of biology, Brown University), "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 10.



Much is made by creation scientists of the debates within science between scientists concerning the detailed mechanisms of evolution, the taxonomic classification of species and fossil remains, etc.

'The lack of agreement and the changing hypotheses and theories in actual science are often treated by pseudoscientists as if they constituted a weakness. They are its strength.'

Ronald H. Pine, "But some of them are scientists, aren't they?", Creation/Evolution, 1984, no 14, p 14.

'Since we proposed punctuated equilibria to explain trends, it is infuriating to be quoted again and again by creationists - whether through design or stupidity I do not know - as admitting that the fossil record includes no transitional forms.'

Stephen J. Gould (Museum of Comparative Zoology, Harvard University), quoted by John Stackhouse, "Evolution a hypothesis that works", The Bulletin, 11 August 1981, p 60.

A major argument propounded by creation scientists is that evolution is "only a theory". This strategy is very effective since most people don't appreciate that a "theory" is a very important high-level construct in scientific parlance, and indeed in some respects there are no "facts" at all in science.

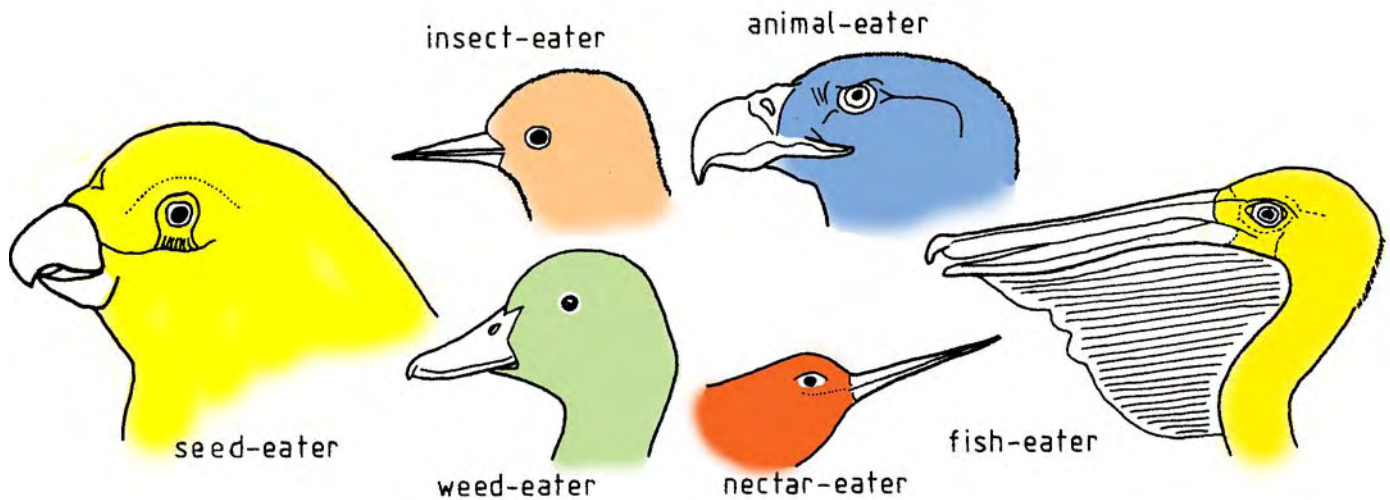
'An idea that has not yet been sufficiently tested is called a hypothesis. Different hypotheses are sometimes advanced to explain the same factual evidence. Rigor in the testing of hypotheses is the heart of science ... A fruitful hypothesis may develop into a theory after substantial observational or experimental support has accumulated. When a hypothesis has survived repeated opportunities for disproof and when competing hypotheses have been eliminated as a result of failure to produce the predicted consequences, that hypothesis may become the accepted theory explaining the original facts ... It is always possible that a theory that has withstood previous testing may eventually be disproved. But as theories survive more tests, they are regarded with higher levels of confidence. A theory that has withstood as many severe tests as, for example, that of biological evolution by means of natural selection is held with a very high degree of confidence.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 9-10.

'To concede that evolutionary biology is a theory is not to suppose that there are alternatives to it that are equally worthy of a place in our curriculum. All theories are revisable, but not all theories are equal. Even though our present evidence does not prove that evolutionary biology or quantum physics, or plate tectonics, or any other theory - is true, evolutionary biologists will maintain that the present evidence is overwhelmingly in favour of their theory and overwhelmingly against its supposed rivals.'

Philip Kitcher, "Abusing science (the case against creationism)", 1982 MIT Press (Cambridge, Ma.), p 34.

Homology: natural selection has resulted in the structural adaption of the avian beak for a diversity of functions. (Hanauer, 1967)



'The theory of evolution has successfully withstood the tests of science many, many times. Thousands of geologists, paleontologists, biologists, chemists, and physicists have gathered evidence in support of evolution as a fundamental process of nature.'

'Theories that are supported by evidence, and which survive the rigorous testing of the scientific method, are passed on to future generations. Examples are the germ theory of disease; the theory of gravity, which controls the movements of planets; and the theory of evolution. Those that are discounted by the evidence, and which fail by the scientific method, are of interest only to the historians of science.'

Frank Press (President of the National Academy of Sciences), "Preface" to "Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 6.

'Theories are subject to revision, observations are open to a variety of interpretations and scientists quarrel among themselves.'

Isaac Asimov (writer), "Adam and Eve fight back against Darwin", The Bulletin, 11 Aug 1981, p 62.

'Evolution is taught for the same reason that the cell theory and germ theory of disease is taught: each theory successfully fought it out in the scientific arena and convinced the scientific community (including the teachers of science in public schools).'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 12.

'A theory (as the word is used by scientists) is a detailed description of some facet of the universe's workings that is based on long observation and, where possible, experiment. It is the result of careful reasoning from those observations and experiments and has survived the critical study of scientists. Creationism, on the other hand, is not a theory. There is no evidence in the scientific sense, that supports it.'

Isaac Asimov, "Adam and Eve fight back against Darwin", The Bulletin, 11 Aug 1981, p 59.

'Evolution is more than "just a theory". It is a hypothesis that works. In this sense it can be said to have been "proved".'

John Stackhouse, "Evolution a hypothesis that works", The Bulletin, 11 Aug 1981, p 60

Despite being “only a theory” (in the words of the creation scientists), evolution is very widely accepted as by far the best, if not the only, explanation of the origin of the species.

‘Rightly or wrongly, then, the overwhelming majority of scientists have concluded that of the possible explanations which have the potential of becoming accepted scientific ones, the evolutionary one seems best.’

‘Without exception, every single paleontologist, taxonomist, ecologist, biogeographer, comparative anatomist, botanist, mammalogist, ornithologist, herpetologist, ichthyologist, entomologist, and other invertebrate zoologist that I have ever met (and I have met and talked to hundreds, if not thousands) has been utterly convinced that the scientific evidence supports unequivocally and overwhelmingly, an old earth, an old universe, and evolution.’

Ronald H. Pine, “But some of them are scientists, aren’t they?”, Creation/Evolution, 1984, no 14, pp 6-18.

‘The theory of evolution has been the backbone of scientific teaching in the Western world for a century.’

Greg Roberts (journalist), “Some Qld schools teach Genesis as fact”, Sydney Morning Herald, 12 May 1984.

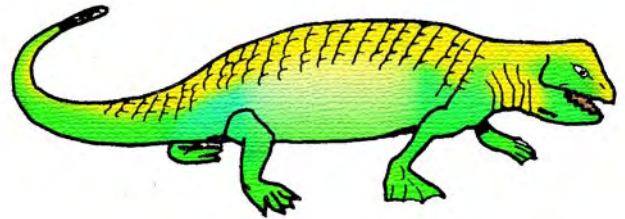
‘Darwin’s arguments and his methods have been tested, retested, examined, discussed, and refined by perhaps the greatest army of diligent and skeptical investigators ever to examine any testable hypothesis in the history of man. No evidence is available to deny the evolutionary process that is accepted as the working hypothesis of probably more than 99% of the active investigators in biology today.’

Richard D. Alexander (professor of zoology and curator of insects, Museum of Zoology, University of Michigan), “Evolution, creation, and biology teaching”, The American Biology Teacher, Feb 1978, vol 40, p 93.



‘Darwinian evolution may itself evolve into a form its author would scarcely recognize, but if that happens it will be because his is the standard against which all the rival theories are being measured for their resemblance to that elusive truth.’

Sharon Begley (science journalist), “Science contra Darwin”, The Bulletin (Newsweek), 9 April 1985, p 132.



Further, evolution is seen as one of the great unifying theories of science transcending many disciplines in its relevance.

‘The critics [creation scientists] have taken on a formidable target, for Darwin changed the face of science forever. Without his theory, very little in biology makes sense.’

Sharon Begley, “Science contra Darwin”, The Bulletin (Newsweek), 9 April 1985, p 131.

‘Theodosius Dobzhansky, the great geneticist, said: “Without evolution nothing would make sense in biology”. This also holds true for geology, astronomy and the other branches of science.’

Norman D. Newell (American Museum of Natural History, New York), “Why scientists believe in evolution”, May 1984 American Geological Institute.

‘Evolution pervades all biological phenomena. To ignore that it occurred or to classify it as a form of dogma is to deprive the student of the most fundamental organizational concept in the biological sciences. No other biological concept has been more extensively tested and more thoroughly corroborated than the evolutionary history of organisms.’

“Science and creationism” by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 22.

Although creation scientists speak and write prolifically, their actual contribution to science has been minimal.

'What little "research" is done is manifestly non-objective and superficial, and results in little, if any, new data that is useful in arriving at conclusive judgments. The "field work" is frequently designed to merely provide material for popular books and movies.'

Ronald H. Pine, "But some of them are scientists, aren't they?" Creation/Evolution, 1984, no 14, p 13.

'Creationists do not bother to scientifically prove their allegations. Indeed, the most striking aspect of the creationist literature is the lack of experimental or historical investigation.'

Thomas R. Koballa and Earl J. Montague, "Creationism and doublespeak", The Science Teacher, January 1985, p 29.

'The pap provided by creationists is soft and (given the enzyme of blind faith) easily digested. The slow growing fruits of scientific enquiry are tough and often unpalatable. Creationism - like Tarot, astrology, iridology and similar nostrums offered to an apprehensive world - is a cop out.'

Ronald Strahan, "Creation anti-science" Search, Nov 1981, vol 12, no 11, p 373.

'To be published, one must first submit, and scientific creationists are apparently not submitting manuscripts.'

Eugenie C. Scott (Program in Medical Anthropology, University of California) and Henry P. Cole (Department of Educational and Counselling Psychology, University of Kentucky), "The elusive scientific basis of creation 'science'", Quarterly Review of Biology, March 1985, vol 60, no 1, p 28.



The creation scientists argue persistently over the scientific basis of evolution, exploiting the technical nature of science, making scientifically naive statements that appear superficially valid and persuasive. Their case is fundamentally always negative in that they criticize evolution, and then (wrongly) offer creation science as the only alternative.

'The creationist strategy in debate is to attempt to find discrepancies in the evidence and logic supporting the evolutionary theory, and to show that such problems are avoided if one accepts the Genesis explanation.'

'Their intent is to make evolutionary authors look foolish and to create confusion in the minds of the audience as to what the evolutionary theory really says.'

David H. Milne, "How to debate with creationists - and 'win'". American Biology Teacher, May 1981, vol 43, no 5, pp 235-266.

'The [creationist] textbooks are written by people who have not made any mark as scientists, and, while they discuss geology, paleontology and biology with correct scientific terminology, they are devoted almost entirely to raising doubts over the legitimacy of the evidence and reasoning underlying evolutionary thinking on the assumption that this leaves creationism as the only possible alternative.'

Isaac Asimov, "Adam and Eve fight back against Darwin", The Bulletin, 11 August 1981, p 60.

'Creationist arguments are few, and they are repeated almost without change or development throughout the creationist literature of this and other decades. Their applicability to biological questions depends wholly upon a number of highly questionable or demonstrably false dichotomies. Creationist arguments can also be shown to involve significant retreats, indicative of untenable hypotheses.'

Richard D. Alexander, "Evolution, creation and biology teaching", The American Biology Teacher, February 1978, vol 40, p 92.

'... creationists employ a destructive, shotgun approach. They present no testable alternative but fire a volley of rhetorical criticism in the form of unconnected, shaky factual claims - a potpourri (literally, a rotten pot, in this case) of nonsense that beguiles many people because it masquerades in the guise of fact and trades upon the false prestige of supposedly pure observation.'

Stephen Jay Gould, "Hen's teeth and horse's toes", 1983 W.W. Norton (U.S.A.), 1984 Pelican Books (U.K.), pp 384-385.

'Current theory does work well, despite the assertions of "Creation Scientists". "Creation Science" is, however, a vexing problem, for it is unnecessary, un-Christian, and anti-scientific. It is a hotch-potch of double standards, of faulty logic and misinformation.'

Rod Rodgers, "No faith in creationism", Life and Times, 13 June 1984, p 8.

'The zoologist [talking for evolution] led off calmly and the schoolteacher [talking for creation science] followed with rhetoric, personal disparagement of the previous speaker, and strange generalisations illustrated by obscure graphs: he was a very effective performer.'

Ronald Strahan, "Creation anti-science" Search, Nov 1981, vol 12, no 11, p 373.

'...his only real argument [Michael Pitman putting the case for creationism] is that anything that has not yet been adequately explained by science counts as evidence for creationism.'

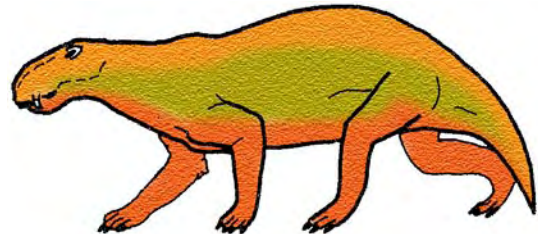
P.T. Saunders (head, Department of Mathematics, Queen Elizabeth College, University of London), "Another case for creationism", New Scientist, 21 Feb 1985, no 1444, p 44.

'Unfortunately, when hydrogen peroxide is poured onto hydroquinone, the mixture slowly and quietly turns brown. Although he knows this, Gish continues to recite before audiences the fable of the chemicals that go "BOOM! Sale of his book, uncorrected, continues.'

Thomas H. Jukes (Department of Biophysics and Medical Physics, University of California), "The creationist challenge to science", Nature, 29 March 1984, vol 308, p 398.

'As usual there was little serious effort to offer evidence for creation.'

Robert S. Schadewald, "Bible-science conference: emphasis on geocentricity", Skeptical Inquirer, winter 1984-85, vol 9, pp 111-113.



A repeated plea by creation scientists is that no scientist was there at the beginning to observe the origins of the universe, the earth, and life; so how could they know? On the other hand God was there, and they (the creation scientists) have his literal scientifically and historically accurate account of what happened in the Bible.

'Slow changes now taking place are extrapolated back in time, passing from the known present into the unknown - but knowable - past. Scientific knowledge about present-day organisms, rivers, wind, ice, and earthquakes provides a "key to the past".'

Norman D. Newell, "Why scientists believe in evolution", May 1984, American Geological Institute.

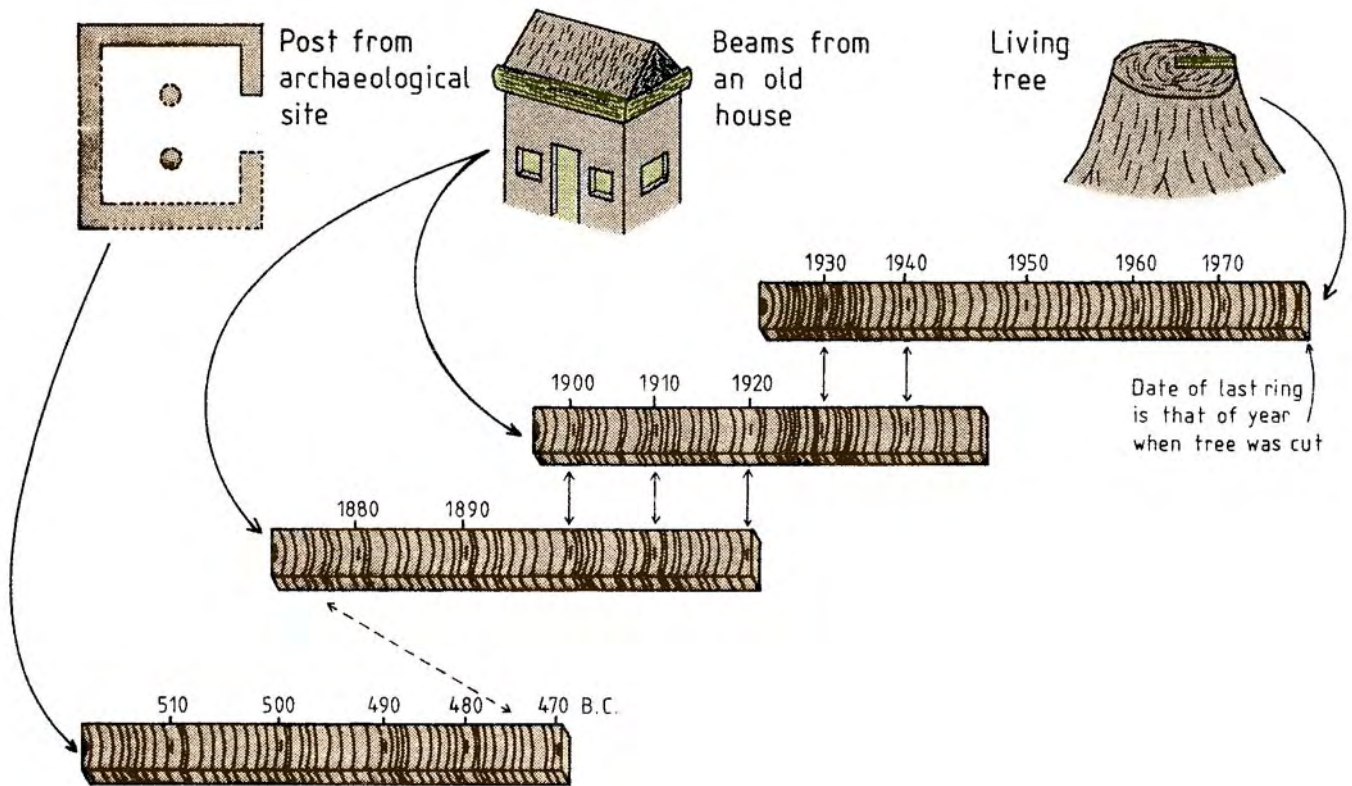
'The creationist assertion that earth history is fundamentally "unknowable" by scientific methods because no one was there to observe the events is false and completely misrepresents the nature of science.'

James H. Shea (professor of geology, University of Wisconsin), "Creationism, uniformitarianism, geology and science". Journal of Geological Education, 1983, vol 31, p 105.

'With bacteria as subjects we have actually been able to observe evolution in progress.'

Francis J. Ryan, "Evolution observed", Scientific American, Oct 1953, vol 189, no 4, p 78.

Dendochronology: Annual tree rings have been counted back in unbroken sequences for more than seven thousand years. (Stallings, 1949)



Based on detailed studies of the genealogies described in the Bible, and assuming that all the generations since Adam and Eve are included, the creation scientists claim that the earth is less than 10,000 years old, even only about 6,000 years old. This claim is important since if true there would be far too little time for evolution to have occurred.

'Some of these [creationist] arguments [that the universe is young] are clearly fallacious and, in some cases, mutually contradictory. Most are oversimplified and neglect other factors that vitiate the creationist age arguments. In no case does a creationist argument stand up to even the most cursory scrutiny in light of the astronomical literature.'

Steven I. Dutch (amateur astronomer; assistant professor, College of Environmental Sciences, University of Wisconsin). "A critique of creationist cosmology", Journal of Geological Education, 1982, vol 30, p 27.

'... in 1654, James Ussher, Archbishop of Armagh, Ireland, ... worked out that earth was created at 9 am on October 26, 4004 BC - a benchmark figure which, for those of a fundamentalist Christian persuasion, including the creation science movement, has stood the test of time.'

Michael Daley (executive producer, science, ABC-T.V.), "The war of words against reason", The Bulletin, 11 August 1981, p 62.

'In 1701, the 4004 BC date of Bishop Ussher was added as a marginal note to the Oxford Press reprint of the English Bible and there it remained in the King James version up to the mid-twentieth century, without any explanation as to its derivation or origin. In recent times this date has once again become a focal point for those who prefer to adhere to a Creationist explanation for the origin of the world.'

William R. Brice (Geology & Planetary Science Department, University of Pittsburgh), "Bishop Ussher, John Lightfoot and the age of creation", Journal of Geological Education, 1982, vol 30, p 23.

'In rejecting evidence for the great age of the universe, creationists are in conflict with data from astronomy, astrophysics, nuclear physics, geology, geochemistry, and geophysics.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington D.C.), p 13.

Much scientific data substantiates the widely accepted conclusion that the universe is some 20 billion years old, the earth is some 4.6 billion years old, and that life has been present on the earth for a considerable proportion of this time.

'In short, we now have direct evidence of life in the oldest rocks [3.4 billion years] that could contain it ... Life probably arose about as soon as the earth became cool enough to support it.'

Stephen Jay Gould, "The Panda's thumb: more reflections in natural history", 1980 W.W. Norton (U.S.A.) & George McLeod (Canada), 1983 Pelican (U.K.), p 187.

' ... every single rock from the moon for which rubidium-strontium isochrons could be determined (the most sensitive and reliable way of radiometric dating) showed an age of formation of billions of years.'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 11.

'Evidence that the evolution of the universe has taken place over at least several billion years is overwhelming. Among the most striking indications of this process are the receding velocities of distant galaxies ... Extrapolating backwards, astronomers today estimate that the expansion probably began some 10 to 20 billion years ago. This concept of expansion from a more dense early state was dramatically confirmed in 1965, when faint radio static left over from the early universe was discovered by radio astronomers at the Bell laboratories.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 12.

'The oldest rocks so far discovered are found in Greenland, and are approximately 3.8 billion years old. Lunar rocks date back 4.1 billion years, and the oldest meteorites have been dated at 4.6 billion years. All these factors indicate that the earth and moon probably formed about 4.6 billion years ago.'

Catherine A. Callaghan (associate professor of linguistics, Ohio State University), "Evolution and creationist arguments", American Biology Teacher, Oct 1980, vol 42, no 7, p 422.

In an effort to re-interpret this data the creation scientists suggest that this should be done on the basis of the speed of light having decreased drastically since creation, with the result that a much younger earth and universe may be concluded. The main exponent is the Australian Barry Setterfield.

'First, none of the data listed by Setterfield, purporting to support his theory actually does.'

'If Setterfield is correct, there should not be any uranium 235 left. The fact that it still exists argues strongly that he is wrong.'

Glenn R. Morton, "It's no light criticism", Ex Nihilo, 1982, vol 4, no 4, p 77.

'The arbitrary cut-off at 1960 renders the authors claims untestable in the strict sense, and this can only be viewed with some suspicion.'

'The reported values of c [the speed of light] do decrease in time, but the data do not support the hypothesis of a regular decline to any convincing degree. An explanation based on "Intellectual phase locking" appears to be at least as good. The curve fitted is contrived and by no means unique. The author's contention that the change in c ceased in 1960 is trivial and suspicious. The extrapolation is unjustified by almost any reasonable standard. The author's case appears to me at least decidedly "not proven".'

Peter Cadusch (Applied Physics Department, Swinburne Institute of Technology, Victoria), "Comments", Ex Nihilo, 1982, vol 4, no 4, p 82.

'A little later in the last paragraph of their paper Goldstein, Trasco and Ogburn state 'We conclude that the velocity of light did not differ by 0.5% in 1668 to 1678 from the current value". Unfortunately Setterfield, entirely without any justification, has changed these two statements into a claim that the speed of light in 1675 was 0.5% higher than the present value.'

'...Setterfield's hypothesis that the speed of light was five hundred thousand million times its present value six thousand years ago is entirely without foundation.'

'It appears to me that there is no adequate evidence to support the idea that the speed of light was thousands of millions of times faster in the past than it is now. Consequently the great distances of the furthest galaxies from our galaxy is strong evidence that the universe is of the order of ten billion years old. Furthermore, the rubidium-strontium radioactive decay method of measuring the ages of meteorites and lunar rocks gives consistent results of the order of 4.6 billion years for the ages of these objects, and the internal check of the model used gives a clear indication of the validity of the method.'

Edward D. Fackerell (associate professor in applied mathematics, University of Sydney), "The age of the astronomical universe", Interchange, 1983, no 33, pp 56-65.



The observation of light from stars so distant that it must have taken millions of years to reach us contradicts the suggestion of a universe only a few thousand years old. One explanation is that the light was created by God en route from the distant stars to the earth so that we don't actually see the stars as they were millions of years ago, but the created light representing what they might have looked like now if the universe were really many billions of years old.

'The idea of light being created with the appearance of coming from the distant galaxies is in fact another way of saying that this light did not originate from the apparent sources. Such a view of necessity involves God as presenting us with data that are deceptive and as such is in direct conflict with the biblical data that emphasizes the faithfulness and reliability of God.'

Edward D. Fackerell, "The age of the astronomical universe", Interchange, 1983, no 33, pp 57-58.

Another "red herring" is that unallowed-for variation in the strength of the earth's magnetic field has given the earth a falsely great age.

'There are no properties of the magnetid [magnetic] field that can be used to place an upper limit on the earth's age.'

G. Brent Dalrymple (assistant chief geologist for western region, U.S. Geological Survey), "Can the earth be dated from decay of its magnetic field?", Journal of Geological Education, 1983, vol 31, p 124.

'Recent attempts to support this conclusion [that the earth is only a few thousand years old] include arguments that the present magnetic field of the earth is the decaying remnant of a magnetic field that was created with it and that if the earth were more than 10,000 years old the initial strength of the field would have been impossibly large. This is one creationist tenet that can be, and has been, scientifically tested but that has not withstood scrutiny. Current scientific data support the theory that the earth's magnetic field is a product of the motions of its fluid core. The field varies and shifts, but between shifts it is maintained and is constantly renewed by dynamo effects within the core.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 14.

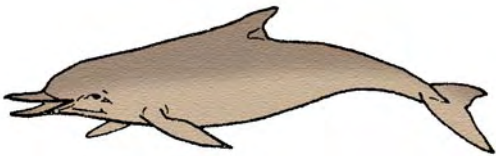
A favourite with creation scientists is to claim that evolution transgresses the second law of thermodynamics.

'The ICR [Institute of Creation Research] argument contains many other flaws. For example, the second law [of thermodynamics] is held to preclude absolutely the formation of stars - an interpretation that is flatly contradicted by the appearance of the new star Fu Orionis in 1932.'

David H. Milne, "How to debate with creationists - and 'win'", American Biology Teacher, May 1981, vol 43, no 5, p 236.

'Evolution can proceed and build up the complex from the simple, thus moving uphill, without violating the Second Law, as long as another interlocking part of the system - the sun, which delivers energy to the Earth continually - moves downhill (as it does) at a much faster rate than evolution moves uphill.'

Isaac Asimov, "Adam and Eve fight back against Darwin", Bulletin, 11 Aug 1981, p 60



Radioactive dating methods are used to determine the ages of rocks. Creation scientists refute the conclusions so derived by naive and deceptive pseud-criticism that will impress anyone unfamiliar with the detail of the techniques and theory.

'The invariant spontaneous decay of the radioactive isotopes of some elements, resulting in the formation of inert daughter isotopes of other elements, provides further evidence that the universe is billions of years old. Analyses of the relative abundances of radioactive isotopes and their inert decay products in the earth, meteorites, and moon rocks all lead to the conclusion that these bodies are about 4.5 billion years old.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 12.

'However, it appears to me that Slusher's criticisms [of the rubidium strontium method of determining ages] are not valid either in the case of meteoritic samples or in the case of moon rock samples ... '

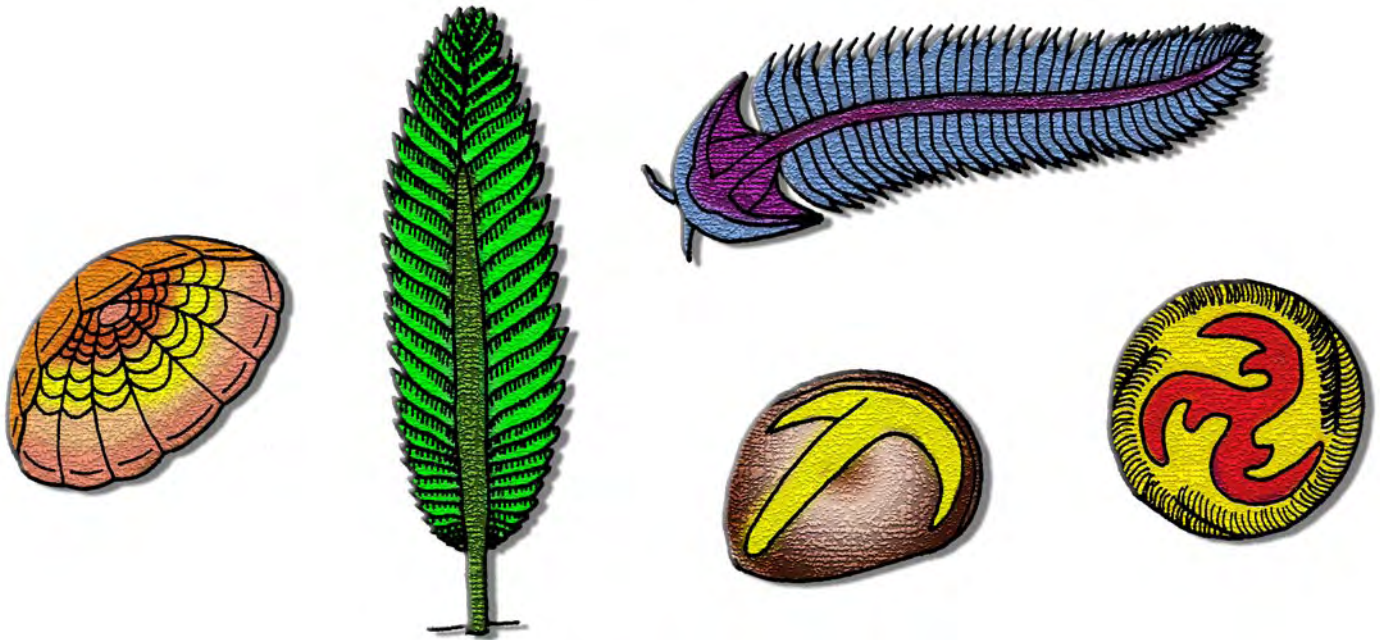
Edward D. Fackerell, "The age of the astronomical universe", Interchange, 1983, no 33, p 64.

Geological strata, visible to anyone in the right place, are explained as being formed from sediments produced during Noah's flood.

'For just at this time the traditional view of the [Noachian] Deluge received its death-blow, and in a manner entirely unexpected. By the investigations of George Smith among the Assyrian tablets of the British Museum, in 1872, and by his discoveries just afterward in Assyria, it was put beyond a reasonable doubt that a great mass of accounts in Genesis are simply adaptations of earlier and especially of Chaldean myths and legends. While this proved to be the fact as regards the accounts of Creation and the fall of man, it was seen to be most strikingly so as regards the Deluge. The eleventh of the twelve tablets, on which the most important of these inscriptions was found, was almost wholly preserved, and it revealed in this legend, dating from a time far earlier than that of Moses, such features peculiar to the childhood of the world as the building of the great ship or ark to escape the flood, the careful caulking of its seams, the saving of a man beloved of Heaven, his selecting and taking with him into the vessel animals of all sorts in couples, the impressive final closing of the door, the sending forth different birds as the flood abated, the offering of sacrifices when the flood had subsided, the joy of the Divine Being who had caused the flood as the odour of the sacrifice reached his nostrils; while throughout all was shown that partiality for the Chaldean sacred number seven which appears so constantly in the Genesis legends and throughout the Hebrew sacred books.'

Andrew D. White, "A history of the warfare of science with theology in Christendom", 1895, 1955 Arco Publishers (London), pp 237238.

Fossils: The progressive appearance of later species in later geological strata is the fossil record. These fossils are among the earliest found and are from pre-Cambrian (pre-creation?) strata. (Cloud, 1983)



'The creationist's assertion that the entire complex [of rock layers] was formed in Noah's universal ocean is simply not supported by geologic evidence.'

Norman D. Newell, "Why scientists believe in evolution", May 1984 American Geological Institute.

'... there is clear evidence in the form of intertidal and terrestrial deposits that at no recorded time in the past has the entire planet been under water.'

'The belief that all this sediment with its fossils was deposited in an orderly sequence in a year's time defies all geological observations and physical principles concerning sedimentation rates and possible quantities of suspended solid matter.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 18.

The chemical origin of life as has been reconstructed has been particularly ridiculed by creation scientists using simplistic, but highly deceitful, analogies and mathematics.

'... the sequences [of protein or DNA] that Dr. Gish says could never form would in fact self-assemble in a few months or years...'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 7.

The fossil evidence strongly supports the theory of evolution;

'The fossil record not only documents evolution but the very existence of the fossil record was the force that drove unwilling scientists to admit nearly two centuries ago that living forms had changed (evolved).'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 8.

'Hundreds of thousands of fossil organisms found in well-dated rock sequences represent a succession of forms through time and manifest many evolutionary transitions.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 16.

'Hopefully, we are not returning to the time when some regarded fossils as works of Satan placed in the ground to tempt men.'

A.J. Boucot (professor of geology and zoology, Oregon State University), "How good is the fossil record?", Journal of Geological Education, 1983, vol 31, p 73.

the absence of fossils of "advanced" species in strata; early (pre-Cambrian) strata;

'This argument [that the pre-Cambrian fossil record is virtually blank] is so long out of date that it is a wonder it is still repeated in any form at all.'

Catherine A. Callaghan, "Evolution and creationist arguments". American Biology Teacher, October 1980, vol 42, no 7, p 423.

'Despite creationist claims, the entire biological world does not suddenly appear, complete, at the bottom of the fossil record.'

Norman D. Newell, "Why scientists believe in evolution", May 1984 American Geological Institute.

the progressive first occurrence of these "advancing" fossils in later strata;

'The fact that various life forms appear in various places along the geologic column is actually deadly evidence against Gish's notion of a single creation event.'

Kenneth Miller, "Answers to the standard creationist arguments" Creation/Evolution, winter 1982, no 7, p 9.

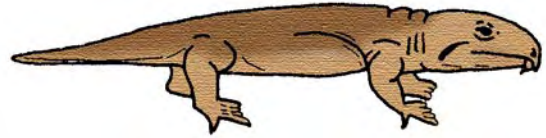
'Paleontologists the world over read the fossil sequence from top to bottom much as musicians read a musical score. Whenever an oil well is drilled, the international sequence of fossils is tested and is generally found to be highly predictable.'

'Fossils show that the organisms living today, including man, originated during very recent time from ancestors now extinct.'

Norman D. Newell, "Why scientists believe in evolution", May 1984 American Geological Institute.

'This argument [that several families of complex organisms appeared suddenly during the early Cambrian Period] is also out of date.'

Catherine A. Callaghan, "Evolution and creationist arguments", The American Biology Teacher, October 1980, vol 42, no 7, p 424.



and the finding of fossils of species transitional (intermediate) between those of known species and groups.

'This [fossil] record shows intermediate form after intermediate form. There is a long series of intermediates linking reptiles with mammals. There are evolutionary sequences showing the evolution of the horse, the elephant, sea urchins, snails, major groups of plants, and many other animals now extinct. Furthermore, these fossils show an orderly succession which fully documents the evolutionary tree of life.'

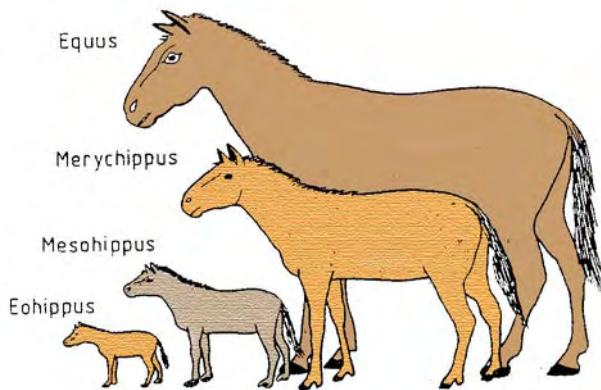
'Yet if one really wanted to discuss the Archaeopteryx fossils in detail, one should be aware that several fossilized Archaeopteryx skeletons were discovered before one was found with feathers preserved. How were these specimens first classified? They were thought to be reptiles and were placed in museums alongside other small dinosaurs. In short, Archaeopteryx was an animal whose skeletal structure was reptilian but upon whose skin the first feathers had appeared. Just how much more intermediate does something have to be?'

Kenneth Miller, "Answers to the standard creationist arguments" Creation/Evolution, winter 1982, no 7, pp 8-9.

'Paleontologists have now discovered two intermediate forms of mammal-like reptiles (Therapsida) with a double jaw joint - one composed of the bones that persist in mammalian jaws, the other consisting of bones that eventually became the hammer and anvil of the mammalian ear.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 19.

Transitional forms: The intermediate species in the evolution of the modern horse have been particularly well established. (Burnett, Fisher & Zimm, 1958)



'As creationist authors admit, the existence of even a few truly transitional fossils would make a very strong case for evolution. They are bound, therefore, to deny that any such fossils exist, and do so by demanding to be shown fossils that are transitional between the transitional forms.'

'A major taxonomic gap between the fishes and the later amphibians is bridged by Ichthyostega, and it is as perfect a transitional fossil as we are ever likely to see.'

David H. Milne, "How to debate with creationists - and 'win'", American Biology Teacher, May 1981, vol 43, no 5, pp 236 & 237.

Of all the fossils the creation scientists' favourite must be the dinosaur tracks in the Paluxy River bed at Glen Rose, Texas, with the accompanying claimed human footprints. Of course, if men and dinosaurs walked together (i.e. at the same time) then evolution as a theory would be in big trouble.

'On the surface of each was splayed the near-likeness of a human foot, perfect in every detail. But each imprint was 15 inches long! ... It was ridiculous to think they were human footprints. They were too large and bear-like ... I felt a keen sense of regret when I told the clerk: "I'm afraid your Jack Hill has found himself a pair of fake footprints."'

Roland T. Bird (Department of Vertebrate Paleontology, American Museum of Natural History), "Thunder in his footsteps", Natural History, May 1939, vol 43, p 255.

'The author [John Morris] speaks with confidence and an apparent knowledge of track-forming processes that seems respectable, but his argument evaporates when closely scrutinized. The photographs in his paper are of poor quality and do not permit close inspection, the "footprints" often exhibit a seven-foot stride, and some are twenty-one inches long. The author explains this by reference to Genesis - "and there were giants in the Earth, in those days."'

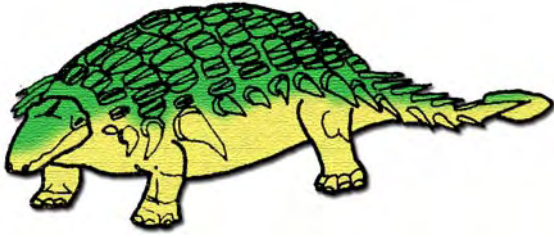
'In another of his illustrations showing human footprints "in obvious stride," patches of sand, visible in the photograph, cover those places where the rest of a dinosaur's foot might be expected to show had the tracks of such a beast been obscured to highlight selected toe marks.'

'Langston mentions that the "human" footprints of this formation often have the "instep" along the outside edge of the foot, mentions a means by which a large clawed foot, withdrawn from mud, can leave a human-like track, mentions that some of the "human" footprints show a large rear claw, and also notes that a local prankster delights in carving human tracks in the rock for the express purpose of misleading creationists.'

David H. Milne, "How to debate with creationists, and 'win'", American Biology Teacher, May 1981, vol 43, no 5, p 241.

'The inescapable conclusion is that there is no footprint evidence in Texas supporting the notion of human and dinosaur contemporaneity.'

Laurie R. Godfrey (associate professor of anthropology, University of Massachusetts; M.I. Bunting Science Fellow, Radcliffe-Harvard), "Foot notes of an anatomist" Creation/Evolution, 1985, issue 15, p 36.



'All Paluxy "human" prints are vague (in contrast with many clear dinosaur prints). Most are 15 inches long or longer. Many are so poorly defined that non-creationists overlook them and creationists disagree on their lengths and whether they are left or right prints. Several have been altered by carving. Creationist documentation and analysis of the prints is riddled with omissions, misrepresentations, contradictions and errors. No qualified scientist would advocate that the Paluxy riverbed features are human footprints on the basis of the evidence presented by the creationists.'

David H. Milne and Steven D. Schaferman (Department of Geology, Rice University; President of Texas Council for Science Education), "Dinosaur tracks, erosion marks and midnight chisel work (but no human footprints) in the cretaceous limestone of the Paluxy river bed, Texas", Journal of Geological Education, 1983, vol 31, p 111.

'Parker emphasizes simultaneous life of human beings and dinosaurs as evidenced by fossilized human footprints superimposed on dinosaur tracks. He has synthesized a fake exhibit to substantiate this falsehood...'

Thomas H. Jukes, "The creationist challenge to science", Nature, 29 March 1984, vol 308, p 399.

'It was subsequently discovered by a young creationist himself that some of the human-looking footprints had been carved by pranksters and that the reportedly convincing ones were no longer present. There is no evidence that humans lived at the time of the dinosaurs.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 17.

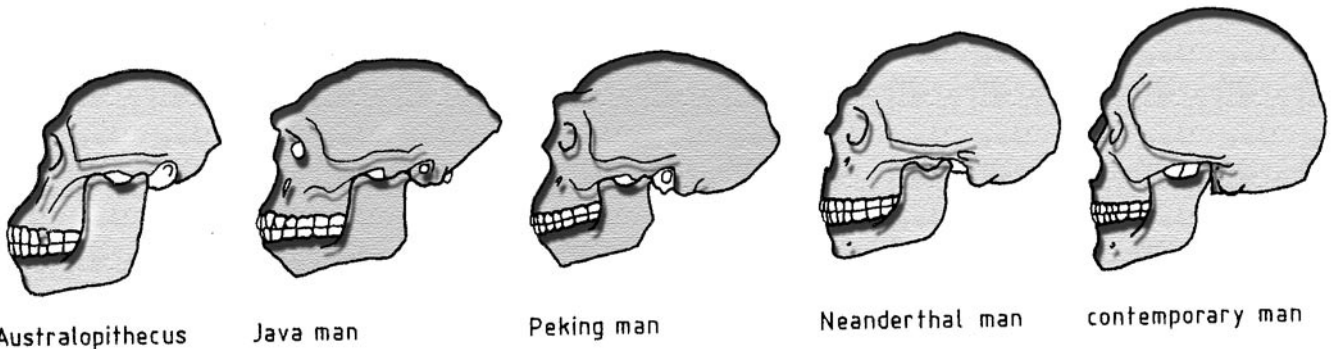
Of course human evolution is denied with particular vehemence.

'Studies in evolutionary biology have led to the conclusion that mankind arose from ancestral primates.'

'These changes occurred through a succession of well-documented intermediate forms or species. Finally, approximately 50,000 years ago, Homo sapiens sapiens - the oldest human being of morphologically modern character - appeared.'

'Today, however, there is no significant scientific doubt about the close evolutionary relationships among all primates or between apes and humans. The "missing links" that troubled Darwin and his followers are no longer missing. Today, not one but many such connecting links, intermediate between various branches of the primate family tree, have been found as fossils.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 23-24.



Missing links: The evolutionary changes in man's descent from apes (e.g. the increase in cranial capacity and decrease in the protrusion of the jaws) have been particularly thoroughly documented. (Rukang & Shenglong, 1983)

'Creationists dismiss all fossil evidence of human evolution as fakes or misinterpretation. At the moment this amounts to thousands of distinct fossil finds from hundreds of different sites in Europe, Africa and Asia. According to creationists, scientists are apparently amazingly gullible, or dishonest, or both.'

Stewart Nicol (senior lecturer in physiology, University of Tasmania), The Mercury (Hobart), 5 June 1984.

'The fossil record is not really necessary to defend an evolutionary explanation of life. Nevertheless, it is extraordinarily supportive of evolution. In terms of whether or not long-term evolution by natural selection has occurred, there simply are no significant problems, just as there are no real missing links between man and proto-man.'

Richard D. Alexander, "Evolution, creation and biology teaching", American Biology Teacher, February 1978, vol 40, p 101.

'The genetic distance between humans and chimpanzees is so small, in fact, that it corresponds to that between sibling (closely allied) species and is less than between two nonsibling species of the same genus.'

'It is also apparent that the malarial parasites of man and those of every one of the apes evolved from a common ancestor. This is an important point, as it indicates that their hosts, man and apes, did likewise.'

'The great apes undoubtedly exhibit the most advanced intelligence known to man, except for man himself. This can only be a further confirmation of the evolutionary linkages between the two.'

J.Richard Greenwell (secretary to the Arid Lands Natural Resources Committee, University of Arizona), "Tiptoeing beyond Darwin", Skeptical Inquirer, Spring 1980, pp 42-54.

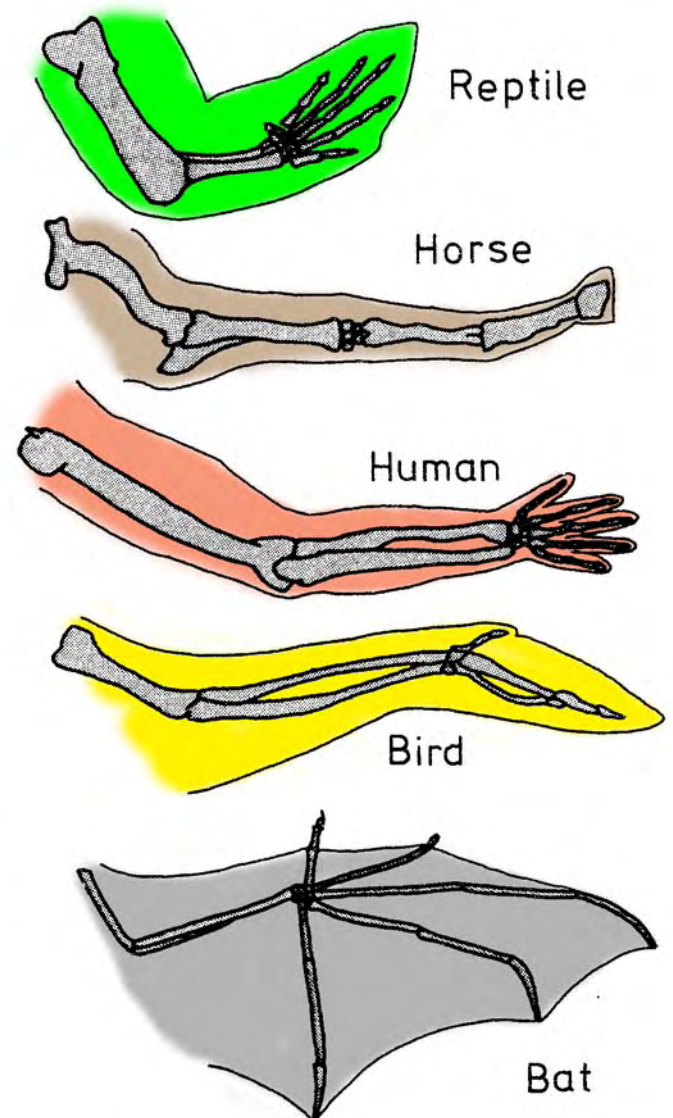
'... we have obtained estimates of genetic differentiation between humans and the great apes no greater than, say, those observed between morphologically indistinguishable (sibling) species of *Drosophila* flies.'

Elizabeth J. Bruce & Francisco J. Ayala (Department of Genetics, University of California), "Humans and apes are genetically very similar", Nature, 16 Nov 1978, vol 276, p 265.

Comparing the anatomy and embryology of animals with reference to the closeness of their relationships also strongly supports evolution.

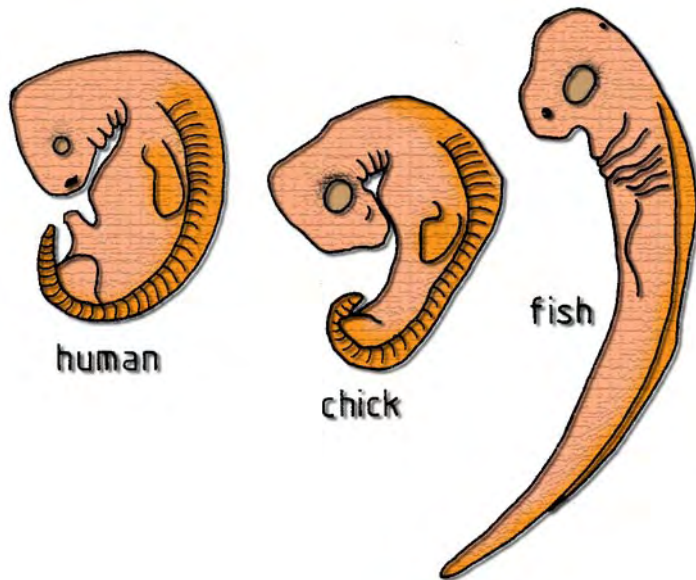
'Inferences about common descent derived from paleontology have been reinforced by comparative anatomy. The skeletons of humans, dogs, whales, and bats are strikingly similar, despite the different ways of life led by these animals and the diversity of environments in which they have flourished.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 16-20.



Homology: The adaptation of the same structure in different species to different functions suggests evolution from common ancestors. (Hemingway, 1977)

Embryology: The anatomical comparison of embryos can elucidate evolutionary histories and relationships. (Hanauer, 1967)



'Modern horses, for example, are sometimes born with extra toes, either because some of them still retain and express genes for such features, inherited from their remote ancestors, or because God created them with a genetic resemblance to certain other of His creatures that perished in the Flood. The bones of the forelimbs of vertebrates are homologous, whether the limbs are used for manipulation, flight, swimming, or running. If they evolved, they simply retain the pattern of their remote ancestor. If they were created, this suggests either the unlikely possibility that this particular design is the best one conceivable for all these diverse functions, or that the Creator was somehow constrained to use the same design over and over as He invented wings, flippers, hands, legs, and the like.'

David H. Milne, "How to debate with creationists - and 'win'". American Biology Teacher, May 1981, vol 43, no 5, pp 239-240.



'The similarity of larval stages supports the conclusion that all crustaceans have homologous parts and a common ancestry.'

'The sequence of observed forms and the fact that all except the first [microbial cells] are constructed from the same basic cellular type strongly imply that all these major categories of life (including plants, true algae, and fungi) have a common ancestry in the first eucaryotic cell.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 16-20.

Molecular biology has recently allowed the closeness of the relationships between species and groups to be assessed, providing unexpected, convincing and very consistent support for evolution.

'Very recent studies in molecular biology have independently confirmed the judgments of paleontologists and classical biologists about relationships among lineages and the order in which species appeared within lineages.'

'The precision whereby evolutionary events can be thus reconstructed is one reason why the evidence from molecular biology is so compelling. In unveiling the universality of the chemical basis of heredity, molecular biology has profoundly affirmed common ancestry.'

'The genetic code by which the information contained in the nuclear DNA is used to form proteins is essentially the same in all organisms.'

'This unity reveals the genetic continuity of living organisms, thereby giving independent confirmation of descent from a common ancestry.'

'Thus molecular biology validates the already impressive evidence that all living organisms, from bacteria to humans, are ultimately descended from common ancestors.'

'But the evidence for evolution from molecular biology goes further. The degree of similarity in the sequence of nucleotides in DNA (or of amino acids

in proteins) can now be precisely quantified. For example, the protein cytochrome-c in humans and chimpanzees consists of the same 104 amino acids in exactly the same order, whereas that of rhesus monkeys differs from them by one amino acid, that of horses by 11 amino acids, and that of the tuna by 21 amino acids. Only a few of the countless possible tests have been performed, of course. But of the many hundred that have been conducted, none has provided evidence contrary to the concept of evolution. Instead, molecular biology confirms the idea of common descent in every aspect.'

'These conclusions from comparative anatomy, stratigraphy, dating techniques, and paleoanthropology are backed up by findings from studies in molecular biology. A 99 percent similarity is found between the DNA of human beings and the DNA of chimpanzees. Such studies link humans, the chimpanzee, and the gorilla together in the same biological family.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 20-25.

'If we take pairs of species with securely dated times of divergence from a common ancestor in the fossil record, we find that the number of amino acid differences correlates remarkably well with the time since the split - the longer the two lineages have been separate, the more the molecular difference. This regularity has led to the establishment of a molecular clock to predict times of divergence for pairs of species without good fossil evidence of ancestry.'

Stephen Jay Gould, "The Panda's thumb: more reflections in natural history", 1980 W.W. Norton (U.S.A.) & George McLeod (Canada), 1983 Pelican (U.K.), p 108.

'Comparisons of polypeptides, chromosomes, and blood proteins demonstrate a definite evolutionary linkage between man and all the primates, particularly the apes.'

J. Richard Greenwell, "Tiptoeing beyond Darwin", The Skeptical Inquirer, spring 1980, p 47.

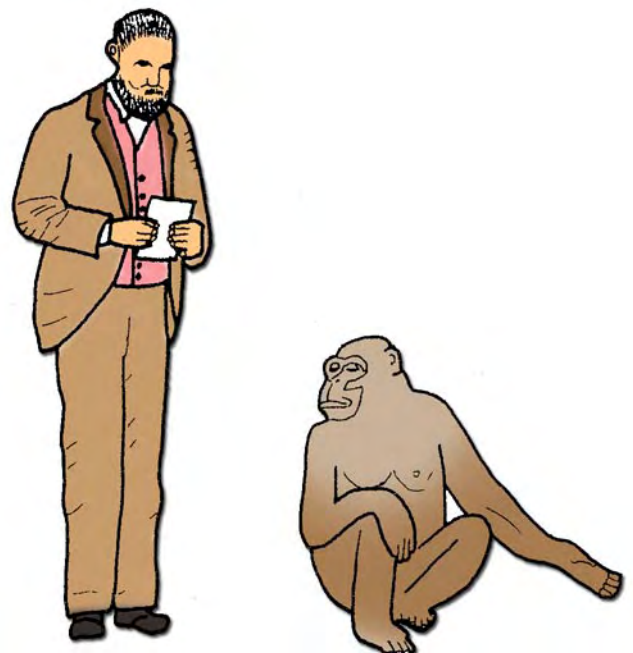
If each and every kind had been individually created by God, as the creation scientists claim, surely he would have done a better job of it?

'The message is paradoxical but profound. Orchids manufacture their intricate devices from the common components of ordinary flowers, parts usually fitted for very different functions. If God had designed a beautiful machine to reflect his wisdom and power, surely he would not have used a collection of parts generally fashioned for other purposes. Orchids were not made by an ideal engineer; they are jury-rigged from a limited set of available components. Thus, they must have evolved from ordinary flowers.'

Stephen Jay Gould, "The Panda's thumb: more reflections on natural history", 1980 W.W. Norton (U.S.A.) & George J. McLeod (Canada), 1983 Pelican Books (U.K.), p 20.

'The fact that there are creationists - people who say we are the centre of the universe - reminds me that, in many ways, we are just animals. The fact that man cannot perceive that there are any other creatures more important than himself strikes me as being supremely arrogant.'

Michael Archer (palaeontologist; University of New South Wales), quoted by Bruce Stannard (journalist), "Australia's fantastic time tunnel where the great mammals grazed", Bulletin, 28 May 1985, p 79.



To conclude this part, the scientific evidence for the theory of evolution is overwhelming, while that for creation science is just not there.

‘Evidence for relation by common descent has been provided by paleontology, comparative anatomy, biogeography, embryology, biochemistry, molecular genetics, and other biological disciplines.’

‘...special creation is neither a successful theory nor a testable hypothesis for the origin of the universe, the earth, or of life thereon. Creationism reverses the scientific process. It accepts as authoritative a conclusion seen as unalterable and then seeks to support that conclusion by whatever means possible.’

“Science and creationism” by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 11 & 15.

‘I also think creation scientists still have a lot of homework to do before claiming they have one single piece of scientific evidence supporting Genesis’ literal version of the origin of life forms.’

Piero P. Giorgi, “DID it all begin with Adam and Eve?”, Courier-Mail (Brisbane), 21 March 1985, P 5.

‘But all techniques for determining relationships [between species] have consistently given results that fit with the evolutionary prediction. Creationists have recently tried to claim that some data go against the prediction (which shows that creationists also see this prediction as significant), but their arguments are all based on incorrect data.’

‘After a century and a quarter of strenuous questioning and testing in many fields, the theory of evolution stands stronger than ever. ... Evolution unites genetics, physiology, paleontology, embryology, biogeography, systematics, and geology into a coherent whole. And this is another reason why evolution is a good scientific theory.’

Kenneth Miller, “Answers to the standard creationist arguments”, Creation/Evolution, winter 1982, no 7, p 5.

‘...no scientist or thinking person doubts the basic fact that life evolves.’

Stephen Jay Gould, “Hen’s teeth and Horse toes”, 1983 W.W. Norton (U.S.A.), 1984 Pelican Books (U.K.), p 14.

Creation scientists claim persecution by the scientific establishment.

‘Creationists are not being persecuted by scientists; they have deliberately avoided the scientific community.’

Kenneth Miller, “Answers to the standard creationist arguments”, Creation/Evolution, winter 1982, no 7, p 12.

While some church leaders originally opposed evolution (as some had opposed so many other scientific and medical advances at the time) they soon accepted the scientific validity of evolution, and that the theory was not the focus of a serious challenge to religion.

‘Many devout Christians (including many scientists) see no difficulties for their faith in accepting the current scientific view of the universe.’

Ronald H. Pine, “But some of them are scientists, aren’t they?”, Creation/Evolution, 1984, no 14, p 16.

‘Collaboration between religion and modern science is to the advantage of both, without at all violating their respective autonomy. Just as religion requires religious freedom, so science legitimately claims freedom of research.’

Pope John Paul II, “Faith, science and the search for truth”, Origins, 1979-80, Vol 9, pp 389-392.

‘I pointed out that the language of Genesis contains approximately as many phrases that can be taken to support evolution as it does those which speak of direct creation (for example, Genesis 1:12) and that the language of the Biblical verses seems to contain an explanation of life appropriate both for pre-technological societies and for ours.’

David H. Milne, “How to debate with creationists – and ‘win’”. American Biology Teacher, May 1981, vol 43, no 5, p 242.

Creation scientists scare up supporters by suggesting that scientists and evolutionists are essentially anti-religion and immoral, and that all “good” Christians will support them. The creation scientists claim theirs is the only true understanding. This picture of essential conflict disturbs many Christians who do not fully appreciate how eccentric creation science is, and that none of the major religions endorse it.

‘There is no conflict between the idea of the Creation and the theory of evolution by natural selection.’

‘Attempting to answer such questions comes dangerously close to trying to read God’s, mind! - but that is exactly what the devout Creationists were doing; and, in some parts of the world, still are.’

‘Thus the fundamentalist objection to the theory of evolution, that it is in direct conflict with the words of the Bible, must rank as a discarded idea. It seems almost cruel to add that the Hebrew for “day” is the same word as for “period”.’

John Grant, “A directory of discarded ideas”, 1981 Ashgrove Press (U.K.), 1983 Corgi (London), p 46.

‘The creation-evolution controversy should, therefore, be a stimulus for science and religion to find harmony by removing prejudices and dogmatisms. Theistic evolution (God created the universe with a built-in power to evolve as part of the divine design) is already accepted by spiritually minded scientists and by most religions.’

Piero P. Giorgi, “DID it all begin with Adam and Eve?”, Courier-Mail (Brisbane), 21 March 1985, p 5.

‘Although the overwhelming majority of Christians now accept evolution as being consistent with their religion, one group, the Institute for Creation Research, based in California and now with an outpost in Queensland, is maintaining a running war of disinformation and confusion against the theory.’

Stewart Nicol, The Mercury, 5 June 1984.

‘...and there are also Catholic, Protestant, Jewish, Buddhist, and many other evolutionists who see no contradiction between evolution and their particular belief system.’

‘Creationists insist that one must accept either creation or evolution, that these two beliefs are mutually exclusive. This is unfortunate because those young people who perceive the errors in the model the Creationists propose are likely to reject everything they say - and lose interest in religion altogether.’

Catherine A. Callaghan, “Evolution and creationist arguments”, American ‘Biology Teacher, Oct 1980, vol 42, no 7, p 425.

‘I would like to add that Dr Gish’s suggestion that evolution and creation are mutually exclusive ideas is insulting to me personally (I am a Roman Catholic) as well as to the great majority of scientists of Christian, Jewish, Moslem, Hindu, Buddhist and other faiths who understand quite well that biological evolution is a scientifically supported fact. The theory of evolution is not inconsistent with the belief in a created universe per se.’

Kenneth Miller, “Answers to the standard creationist arguments”, Creation/Evolution, winter 1982, no 7, p 3.

‘Why not think of a supreme deity who devised the scheme of evolution?’

Thomas Eisner (biologist; Cornell University), quoted by Natalie Angier (journalist), “Drafting the Bombardier Beetle”, Time, 25 February 1985.

‘Specifically, there need be no conflict or contradiction between what is put forward in the theory of evolution and what responsible contemporary biblical scholars, using scientific methods, are saying about the meaning of the Genesis stories.’

‘It must be acknowledged then that the claim “either Creationism or evolution” is a false division of the matter. The Bible and science approach man and the universe from different angles. Religion and science, far from contradicting one another, must be seen as partners, the one complementing the other, to give us a fuller picture of our world and of ourselves.’

Fr Brian Gleeson CP, “Religion, science - partners”, The Leader, 27 May 1984, p 9.

'The theory of evolution seems to be the best scientific theory of Creation, based on available data ... but allowing that God's creative act was the origin and the beginning of all.'

Fr Ron McKiernan, "No creationism in our science class", The Leader, 27 May 1984, p 9

'The dismissive attitude towards biblical scholarship pinpoints the creation science movement as being really interested in the propagation of only one point of view - their own. They refuse to acknowledge that for many Christians there is no conflict between the theory of evolution and the scriptures.'

John Harrison, "Creation Scientists... origins of THAT species", Life and Times, 13 June 1984, p 9.

'A belief in God as creator, and an acceptance of evolution are in no way alternatives. I do not believe in evolution, nor in gravity. They are facts of life. I believe in God the Father Almighty, maker of heaven and earth. That is worth believing!'

Rod Rodgers, "No faith in creationism", Life and Times, 13 June 1984, p 8.

'First: the opposite of creation is not evolution. The opposite of creation is accident ...

Second: The major disagreement between Christians is not over whether we believe in creation or evolution. All Christians (that I have met, anyway) believe in creation, i.e. that God created the world. What we disagree on is how it happened, i.e. whether God created the world by a process of sudden events that took 144 hours (6 days, as Genesis 1 seems to suggest) or by a long slow process taking millions of years (as evolution seems to suggest).

Third: Creation is not something that can be proved - it is an affirmation of faith.'

'So today, there are both scientists who look at findings about the world and its origins and see nothing more than mechanical accident, and other scientists who look at those same findings and in faith see in them the hand of a Creator. The difference for faith is not in the findings - the difference is in the attitude of the one who is doing the looking.'

Peter Horsfield, "What is the Bible?", Life and Times, 22 August 1984, p 8.

'Clearly, Calvin is not entering the science versus religion controversy on the side of literalism. He is ready to accept the findings of science in their proper context, and at the same time to defend the authority of the insights of Scripture about the relationship of humanity to its Creator and His universe. No one was more committed to the authority of Scripture in its own proper sphere.'

Ian Gillman, "Calvin sheds light of creationism", Life and Times, 13 June 1984, p 9.

'What creationists and other sensationalists have in common is the division of the world into true believers heading for salvation and all others heading for damnation. The "saved" group may exclude members of certain racial minorities, social classes, or political factions (socialists or communists), or homosexuals, or evolutionists.'

Laurie R. Godfrey (assistant professor of anthropology, University of Massachusetts), "Science and evolution in the public eye", Skeptical Inquirer, vol 4, no 1, p 23.

'To declare that any point of view about the work of God in creation is based on scientific evidence is to wrongly invoke a non-faith argument for a faith statement.'

Rod Rodgers, "The limits of science", Life and Times, 22 August 1984, p 9.

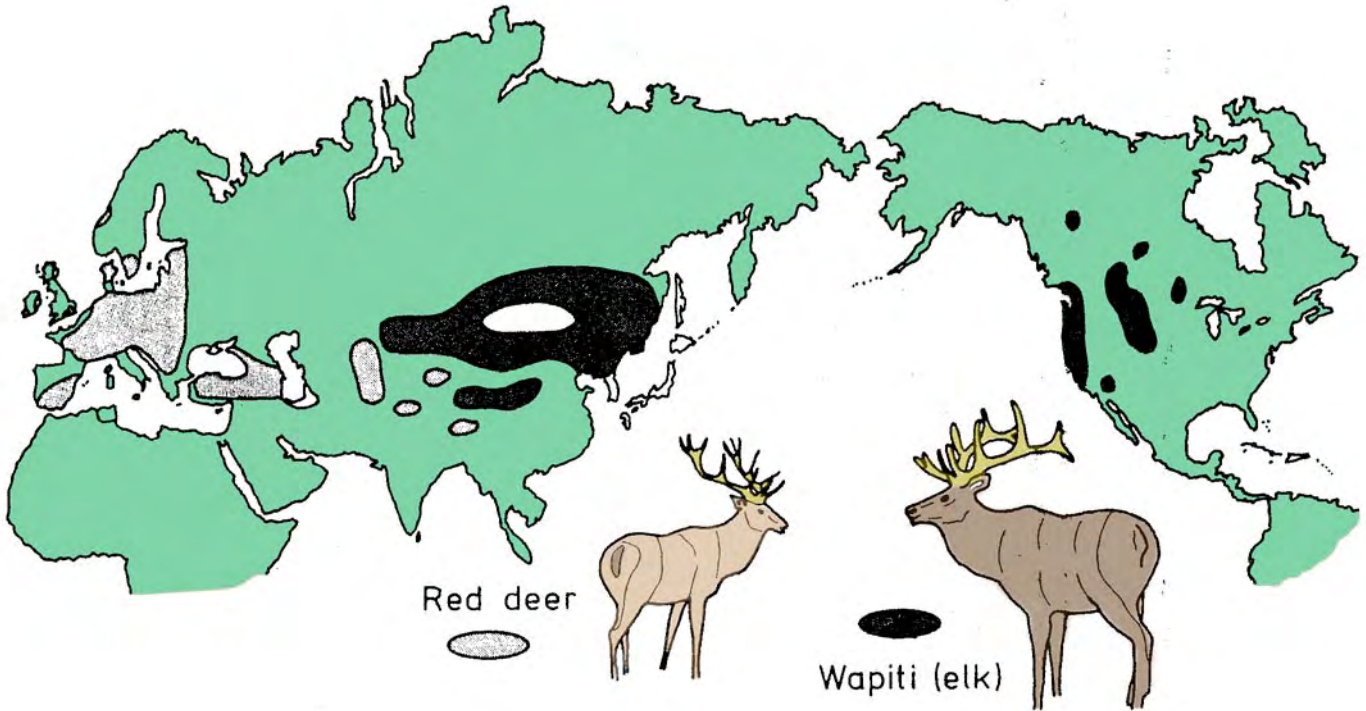
'I say it [creation science] is bad philosophy, bad science, bad theology, and bad hermeneutics (textual interpretation), and no good thing at all.'

Charles Hartshorne (philosopher, retired educator), "Omnipotence and other theological mistakes", 1984 State University of New York (Albany), p 67.

'The Bible itself speaks to us of the origin of the universe and its makeup, not in order to provide us with a scientific treatise, but in order to state the correct relationships of man with God and with the universe ... Any other teaching about the origin and makeup of the universe is alien to the intentions of the Bible, which does not wish to teach how heaven was made, but how one goes to heaven'

Pope John Paul II, "Science and scripture: the path of scientific discovery", Origins, 1981, vol 11, p 279.

Biogeography: A species that is divided into geographically separate populations which are subjected to different environmental stresses may produce new species. Red deer and Wapiti are intermediate in this process in that while differing they will still interbreed if re-united. (Short, 1976)



‘Now that scientists have tested and disagreed with Genesis’ sequences of creation, the “creationists” fear that the same demonstration has disproved the existence of God. It has not done so, and cannot do any such thing!’

Ian Gillman, “The faith IS at stake here”, Life and Times, 22 August 1984, pp 8-9.

‘The hostility of creationists toward the sciences that deal with human and cosmic origins stems from fundamentalist conviction that evolution threatens religion. This is not true.’

‘To attack science in the name of religious orthodoxy is detrimental to both science and religion.’

Norman D. Newell, “Why scientists believe in evolution” May 1984, American Geological Institute.

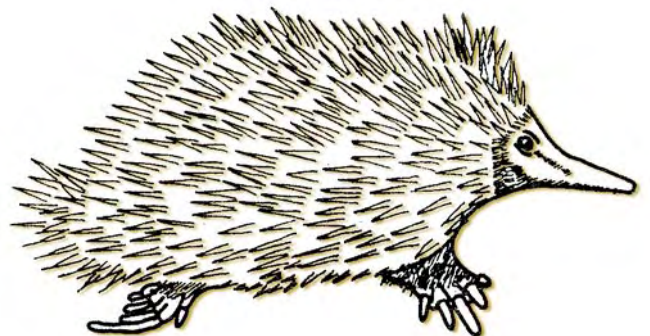
‘A study of the process of creation (i.e. evolution) is as little affected by Christian or atheistic beliefs as a study of combustion would be affected by who lit the fire.’

R.W. Berry (geologist), quoted by Ian Gillman, “The faith IS at stake here”, Life and Times, 22 August 1984, pp 8-9.

Indeed, some of the opponents of creation science and proponents of independent education have been religious groups.

‘Most religious leaders disapprove of creation-science primarily because of what they perceive to be, at best, its religious inadequacies and oversimplifications. Judged by the standards of accepted Jewish and Christian understandings of the Bible and of belief, the creationist conception seems to be warped in various degrees...’

Roland Mushat Frye, “Is God a creationist?”, 1983 Charles Scribner’s Sons (N.Y.), p 141.



'Science education has many friends, ranging from Sigma Xi, the fraternity of science researchers, to professional associations such as the American Association of University Women, to religious organizations such as the American Jewish Congress. There are more clergy listed among the co plaintiffs in both Arkansas and Louisiana than any other group, and clergy are among the strongest supporters of unfettered science education.'

Wayne A. Moyer (past executive director of the National Association of Biology Teachers, science director for People for the American Way), "How Texas rewrote your textbooks", Science Teacher, Jan 1985, p 27.



Nevertheless, evolutionary theory is one of the greatest triumphs of science ever; it is widely accepted by scientists and others, including the major churches, as the best biological explanation of the origin of the species.

'In fact, so clear was the victory of the Darwinian viewpoint that, when Darwin died in 1882, he was buried, with widespread veneration, in Westminster Abbey, where lie England's greats. In addition, the town of Darwin in northern Australia was named in his honour.'

Isaac Asimov, "Asimov's Guide to Science, vol 2, The Biological Sciences", 1972 Basic Books (U.S.A.), 1975 Pelican Books (U.K.), p 325.

'The most puzzling aspect of the creation-evolution debate is, in my opinion, its futility. In fact most modern evangelical theologians agree that a strict reading of Genesis does not rule out an evolutionary interpretation of the origin of life on earth.'

Piero P. Giogi, "DID it all begin with Adam and Eve?", Courier-Mail (Brisbane), 21 March 1985, p 5.

Creation scientists have been, and still are, fighting hard for credibility in science and education, and have traditionally concentrated their efforts on the secondary school system.

'A contest is in progress between creationists and supporters of science. It involves the teaching of biology, the funding of education, and the content of school science textbooks. It is not a polite discussion of differences in philosophy, and creationists are not merely desirous of "equal time" for their ideas in the classroom. They regard evolution as being inimical to their concepts of public education, and they perceive evolution as being diabolical.'

Thomas H. Jukes, "The creationist challenge to science", Nature, 29 March 1984, vol 308, p 398.

'Creationists have concentrated their efforts on secondary and primary school biology courses where they can involve those parents for whom this may become an emotional issue, both because of apparent conflict with religious beliefs and because parents may feel some responsibility to guard their younger children against exposure to certain issues or attitudes.'

Richard D. Alexander, "Evolution, creation, and biology teaching", American Biology Teacher, February 1978, vol 40, p 91.

'We have beaten them [creationists] in all public and legal forums, but they haven't gone away and they will never go away. They've got millions of dollars and they will forever be working through school boards for evolution to be deleted from text books.'

Stephen Jay Gould, quoted by Andrew McKenzie (journalist) in "He doesn't believe in the missing link", Courier-Mail (Brisbane), 14 March 1985.

'Censorship of school science textbooks has been successfully practiced by creationists for more than 50 years.'

Thomas H. Jukes, "The creationist challenge to science", Nature, 29 March 1984, vol 308, p 400.

'Regardless of how one views the creation-evolution debate of the past 120 years, a persistent impression is one of endless repetition. Much the same arguments pass tirelessly from one generation to the next, the quality of many of the arguments bearing little relation to the dedication and enthusiasm of the adversaries.'

D. Gareth Jones (professor of anatomy, University of Otago), "The creation-evolution debate: some general scientific and biological issues", Interchange, 1983, no 33, p 37.

'Legal arguments advocating laws, court orders, and school policies requiring the teaching of creationism as coequal with evolutionism are blatant attempts to define "proper science" according to political guidelines and without reference to either predictive advantage or rational explanation. Unfortunately, while scientific creationism is very poor science, most people are ill equipped to evaluate it as such.'

Laurie R. Godfrey, "Science and evolution in the public eye", Skeptical Inquirer, fall 1979, vol 4, no 1, p 24.

Creation scientists plead for "equal time" with evolution in school science curricula on the basis that pupils should be free to review the evidence and decide which is the better theory for themselves.

'They claim that creationism is a science and as such deserves a place in the school science curriculum, and that creationism should get at least equal time to evolution in biology courses. This is generally worded as an appeal to our sense of justice. "Shouldn't children be presented with both sides of the issue?" We should remember that not all theories are equal. Ideas have to earn the right to our respect. Not every theory that might be thought up merits a place in the school curriculum. We should be open minded, but not simple minded. Open mindedness does not require that we abandon our intellectual standards, but that we use them to examine our own and others' ideas.'

Stewart Nicol, The Mercury, 5 June 1984.

'The claim that equity demands balanced treatment of the two [evolution and creationism] in the same classroom reflects misunderstanding of what science is and how it is conducted.'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 8.

'Such debates [for and against the inclusion of creationism in school science classes], of course, are neither part of the scientific process nor a contribution of anything to scientific understanding. Their purpose is political; so scientists participate only in the hopes of making them educational.'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 1.

'In Australia the creation scientists are working determinedly but not, so far, with a great deal of success, to persuade educational authorities to give "equal time" for the teaching of the creation view.'

Michael Daley, "The war of words against reason", The Bulletin, 11 August 1981, p 62.

'The demand for equal time is asymmetrical, for it is not accompanied by the offer to share pulpits with scientists. Moreover, and as is admitted by creationists when off guard, opposition to evolution is not a grand strategy but merely a tactical thrust at what is perceived as the soft underbelly of humanistic civilization. Geology, astronomy, physics, medicine, anthropology, history and democracy itself are imperilled by the ayatollahs of the, Christian right. They should be opposed by liberal Christian but little is heard from their embattled ranks.'

Ronald Strahan, "Creation anti-science" Search, Nov 1981, vol 12, no 11, p 373.

'Educators have a responsibility to resist political pressures urging them to bastardize the educational process by pretending that "all ideas are equal".'

Laurie R. Godfrey, "Science and evolution in the public eye", The Skeptical Inquirer, fall 1979, Vol 4, no 1, p 31.

'However, equal time policies are not necessarily fair or educationally sound. Equal time policies could result in a biology curriculum that included the view, held by Nazis and members of the Ku Klux Klan, that different ethnic groups had separate creations. Such ideas of fairness might also dictate teaching the satanic view of origins or the belief that humans resulted from crossbreeding of extraterrestrials and apes.'

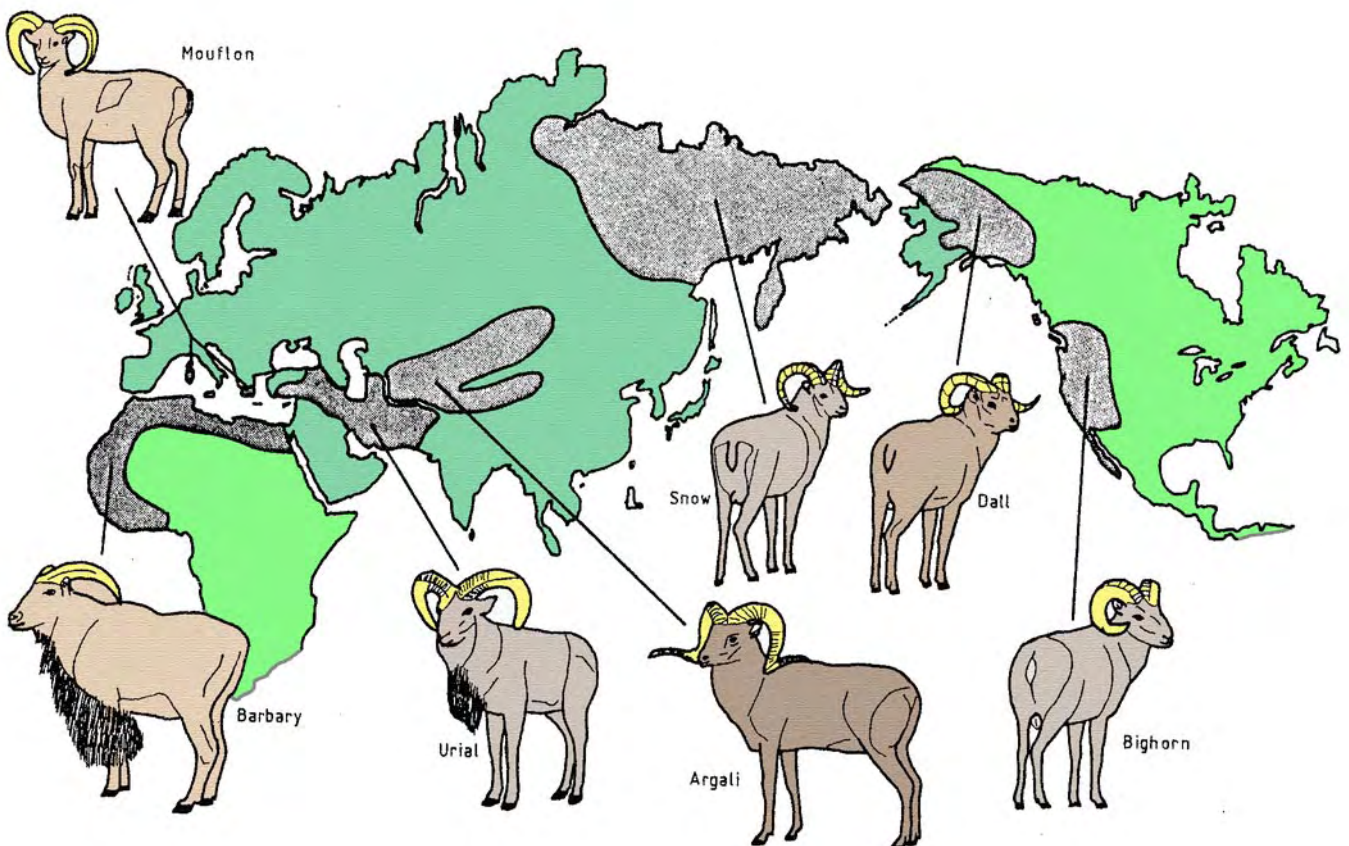
'Science teachers cannot treat all knowledge equally. We must select content based on its power to explain the natural world scientifically and its ability to unify, illuminate, and integrate other facts. We should not include ideas that cannot serve these functions.'

Gerald Skoog (president-elect of National Science Teachers' Association; professor of secondary education, Texas Technical University), editorial, The Science Teacher, January 1985, p 8.

Scientists have generally been reluctant to oppose creation scientists (for various reasons), and this fault has allowed them to make legal headway and deceitfully gain public support. Those concerned at the threat posed to scientific and educational freedom (as well as civil liberties) exhort their colleagues to correct mis-statements, challenge misquotations and oppose restrictions.

'Despite the recent court decisions that have gone against the creationists, it seems highly unlikely that the issue will disappear, and it behoves geologists to stay informed on the matter and involved in its solution.'

James H. Shea, "A list of selected references on creationism" Journal of Geological Education, January 1984, vol 32, p 43.



Translocations: The spontaneous and random re-arrangement of the genetic material of the chromosomes led to the evolution of the various species of sheep from the goats. (Short, 1976)

Creation science is not accepted by scientists or teachers as science, and is therefore not voluntarily included in science textbooks or curricula. Consequently creation scientists resort to legal challenges to have creation science included and/or evolution diminished.

'This is an attack on knowledge throughout Australia, and it is dangerous to think it is confined to the "deep north".'

Alex Ritchie quoted by Greg Roberts, "Some Qld schools teach Genesis as fact", Sydney Morning Herald, 12 May 1984.

'No attempt at repression has ever backfired so impressively. Where one person had been interested in evolution before the trial, scores were reading and inquiring at its close. Within a year the prohibitive bills which had been pending in other states were dropped or killed. Tennessee had been made to appear so ridiculous in the eyes of the nation that other states did not care to follow its lead.'

Prof Fay-Cooper Cole (expert witness on human evolution at the 1925 trial of Thomas Scopes in Dayton, Tennessee, U.S.A., for teaching evolution; past chairman of the anthropology department, University of Chicago), "A witness at the Scopes trial", Scientific American, Jan 1959, vol 200, no 1, p 130.

When a creationist, Darwinist, Marxist or supporter of any other theory defends his or her views publicly, he or she does everyone a service. But when anyone attempts to establish laws or rules requiring that certain theories be taught or not be taught, he or she invites us to take a step towards totalitarianism.'

'No laws were ever passed saying that evolution had to be taught in biology courses. The prestige of evolutionary theory has been built by its impact on the thousands of biologists who have learned its power and usefulness in the study of living things. No laws need to be passed for creationists to do the same thing.'

Richard D. Alexander, "Evolution, creation and biology teaching", American Biology Teacher, Feb 1978, vol 40, pp 91 & 103-104.

'But the Fundamentalist position (and the state of Tennessee) had stood [in 1925] in so ridiculous a light in the eyes of the educated world that the anti-evolutionists have not made any serious stand since then - at least not in broad daylight.'

Isaac Asimov, "Asimovs guide to science, vol 2, the biological sciences", 1972 Basic Books (U.S.A.), 1975 Pelican Books (U.K.), p 326.

'... creationists must be fearful that creationism cannot survive a careful scientific scrutiny in the free marketplace of ideas. This must be why creationism is the only hypothesis in need of special legislative protection.'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, p 12.

'Teaching creationism is like asking our children to believe on faith, without recourse to time-tested evidence, that the dimensions of the world are the same as those depicted in maps drawn in the days before Columbus set sail with his three small ships, when we know from factual observations that they are really quite different. It is false, however, to think that the theory of evolution represents an irreconcilable conflict between religion and science. A great many religious leaders and scientists accept evolution on scientific grounds without relinquishing their belief in religious principles.'

Frank Press, "Preface" to "Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), pp 5-6.

'In 1974 the Texas State Board of Education adopted its antievolution rule and coverage of evolution began to drop.'

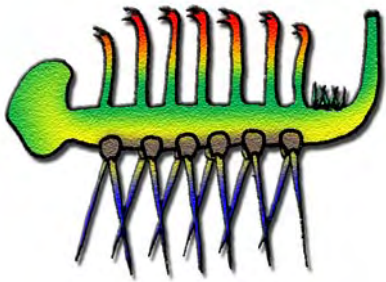
'In March 1984 the Texas attorney general announced that the Texas code violated the First Amendment by favouring a particular religious view - biblical creationism.'

Wayne A. Moyer, "How Texas rewrote your textbooks", Science Teacher, January 1985, pp 23 & 26.

'The hypothesis of special creation has, over nearly two centuries, been repeatedly and sympathetically considered and rejected on evidential grounds by qualified observers and experimentalists. In the forms given in the first two chapters of Genesis, it is now an invalidated hypothesis. To reintroduce it into the public schools at this time as an element of science teaching would be akin to requiring the teaching of Ptolemaic astronomy or pre-Columbian geography.'

'As a historic representative of the scientific profession and designated advisor to the [U.S.A.] Federal Government in matters of science, the Academy states unequivocally that the tenets of "creation science" are not supported by scientific evidence, that creationism has no place in a science curriculum at any level ...'

"Science and creationism" by the Committee on Science and Creationism of the National Academy of Sciences, 1984 National Academy Press (Washington, D.C.), p 7.



In Queensland State School science teachers have been instructed by the Minister for Education to include creationism, catastrophism and spontaneous generation alongside evolution as possible explanations for the origin of the species.

'It is improper and inappropriate in this day and age for a Minister for Education for all children in the State [Queensland] to be interfering in curriculum areas.'

'There is an increasing tendency for politicians to interfere in the setting of school curriculums and this is [a] matter more appropriate for members of the Education Department with experience and expertise in curriculum development, who would then be accountable to the Minister.'

Fr Ron McKiernan, "No creationism in our science classes", Leader, 27 May 1984, p 9.

One result of this controversy is that many publishers avoid any possible future trouble by omitting any statements likely to be challenged.

'Any responsible citizen concerned with these matters will be appalled, after even casually inspecting the great bulk of the public school textbooks in life and earth science, to realize that they have been almost totally stripped of any serious consideration of these "forbidden" topics.'

A. J. Boucot, "How good is the fossil record?", Journal of Geological Education, 1983, vol 31, p 73.

'The economic self-interests of publishers and the desire of policymakers to avoid controversy also will persist. Thus, it seems plausible that both imposed censorship and self-censorship could continue, weakening the vitality and integrity of the science curriculum.'

Gerald Skoog, Science Teacher, Jan 1985, p 8

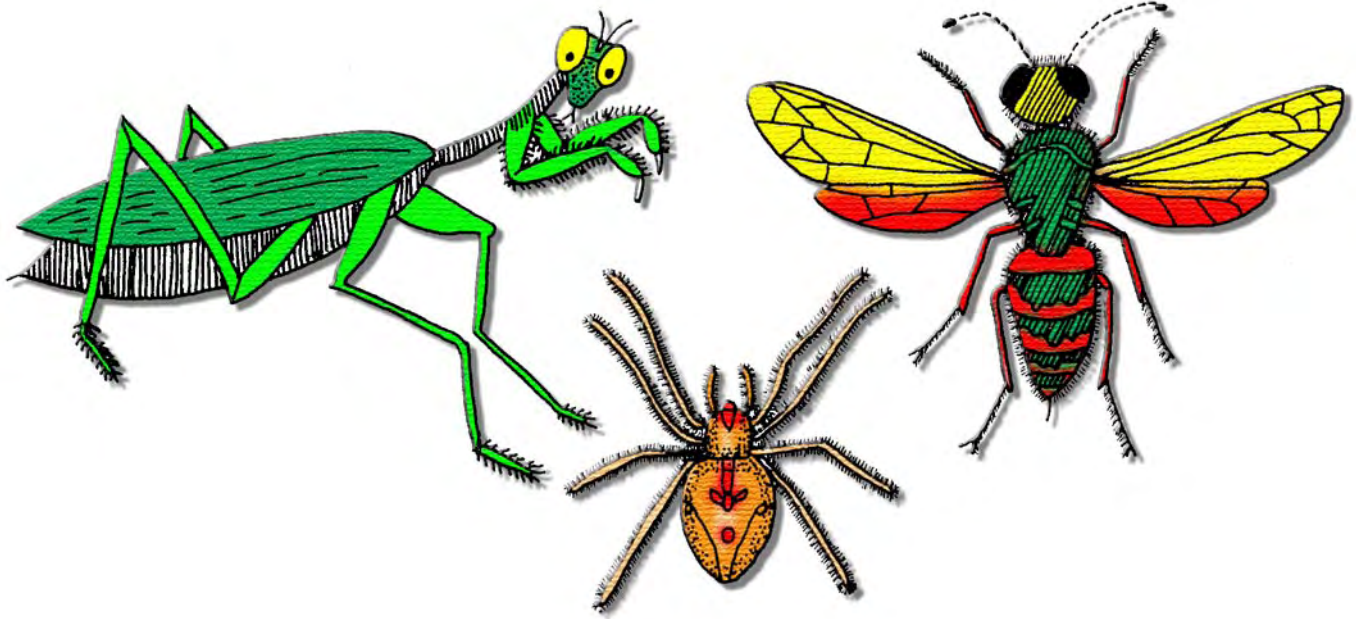
Many see such legal intervention in the content of science textbooks and curricula as the first step in a possibly major and permanent bias in education, science and social attitudes by a minority eccentric political/religious group.

'Although the creationist campaign appears to be simply an attack on evolutionary theory, in reality it constitutes an attack on the whole of science. Evolutionary biology is entwined with other sciences. If evolutionary theory is dismissed then the fundamental principles of other sciences would also have to be cut out.'

Stewart Nicol, The Mercury, 5 June 1984.

'The evidence for evolution is overwhelming. Creationism is not a scientific theory, and to suggest otherwise is treading on dangerous ground. if you accept it as true, you are assuming every other science is wrong.'

Barry Williams (assistant director of the United States Marketing Centre; chairman of the N.S.W. branch of the Australian Skeptics), quoted by Greg Roberts, "Some Qld schools teach Genesis as fact", Sydney Morning Herald, 12 May 1984.



'This is the hidden creation model. So now we see why Dr Gish didn't wish to mention it in debate. It would have revealed the real purpose behind the creation movement: to bring biblical fundamentalism into the science classroom.'

'Dr. Gish's audience was made up of sincere and well-meaning Christians, who desired to defend God and promote fairness. They were not aware of how his appeals would effectively misdirect their energies in ways harmful both to science and religious freedom. Yet, this is how far creationists must go in order to buoy up a discarded and disproved theory of science and a minority position in religion. Citizens should not be misled into subsidizing sectarian religious pseudoscience in the public school classroom.'

Kenneth Miller, "Answers to the standard creationist arguments", Creation/Evolution, winter 1982, no 7, pp 12-13.

'...it is now urgent for educators and scientists to publicize the nature of creationism ...'

Norman D. Newell, "Creation and science education", Journal of Geological Education, 1983, vol 31, p 74.

'This fight is not about to go away. It is easy to laugh at the notion that the fossil record is responsible for alcoholism, prostitution, drug use, adultery, child abuse, robbery, and just about every other sort of abuse known to man. But to these dedicated religionists this is the correct view.'

A. J. Boucot, "How good is the fossil record?", Journal of Geological Education, 1983, vol 31, p 73.

'The experience led me to read some of the literature of "creation scientists" and thence to the exposure of a sample of their fatuities. I found then and since that concern about their insidious doctrines is more widespread than I had realized. The American Association for the Advancement of Science and its journal Science have expressed strong opposition to legislative moves in several American states to provide equal time in schools and universities for teaching the theory of evolution and the doctrine of creation...'

'The Sydney Bulletin, not noted for its concern with matters of scientific theory, recently devoted six pages to an article by Isaac Asimov and supplementary comments by Australian authorities on the dangers posed by creeping creationism.'

Ronald Strahan, "Creation anti-science" Search, Nov 1981, vol 12, no 11, p 373.

While evolution is the focal point, the creation scientists are really challenging the whole fabric of modern science.

'And it's not just biology that's in danger, it's all of science: geology, physics, astronomy. The creationists are attempting to mandate what is appropriate for study and what is not.'

William Mayer (director, Biological Sciences Curriculum Study, Colorado) quoted by Roger Lewin (deputy editor, American Association for the Advancement of Science), "A response to creationism evolves", Science, 6 Nov 1981, vol 214, p 635.

'Creationism, therefore, is not simply an attack on the theory of evolution. It attacks virtually the whole range of science. If creationism is right, then geological findings about the formation of rocks must be wrong. So must the astrophysics of stars, the physics of radioactive dating and chemical experiments which indicate how life began in the primeval ocean. Further, creationists make clear that their beliefs are unalterable: science must fit into their particular set of ideas.'

Martin Bridnstock (lecturer, School of Science, Griffith University), "Creation science; you've got to believe it to see it!", Ideas in Education, July 1985, p 12.



Nevertheless, where pro-creation science and anti-evolution laws have been challenged in the courts the creation scientists have invariably lost.

'The New Right lost heavily in Arkansas, where their attempt to legislate "balanced treatment of creation science" was declared unconstitutional. They are losing control in Texas, and it is very likely they will lose the Louisiana case challenging that state's balanced treatment law.'

Wayne A. Moyer, "How Texas rewrote your textbooks", Science Teacher, Jan 1985, p 27.

'Knowledge of evolutionary theory is essential for understanding the natural world and the processes that shape it.'

Gerald Skoog, Science Teacher, Jan 1985, p 8

'On January 5, 1982, Federal District Judge William R. Overton declared the Arkansas act unconstitutional because it forces biology teachers to purvey religion in science classrooms.'

Stephen Jay Gould, "Hen's teeth and horse's toes", 1983 W.W. Norton (U.S.A.), 1984 Pelican Books (U.K.), p 290.

'The board of the largest American state voted unanimously to reject the purchase of any more books for 12 and 13-year-old students until certain chapters were rewritten to give fuller treatment to evolution.'

Reuter's, "Hot talk on evolution" Sunday Mail, 15 September 1985, p 8.



In conclusion, creation science is a powerful force threatening in the first instance the teaching of science with fundamental censorship; it is a force to be resisted.

'It is religion that recruits their squadrons. Tens of millions of Americans, who neither know nor understand the actual arguments for - or even against - evolution, march in the army of the night with their Bibles held high. And they are a strong and frightening force, impervious to, and immunised against, the feeble lance of mere reason which their opponents raise.'

'I don't suppose that the creationists really plan the decline of the United States, but their loudly expressed patriotism is as simpleminded as their "science". If they succeed, they will, in their folly, achieve the opposite of what they say they wish.'

Isaac Asimov, "Adam and Eve fight back against Darwin", The Bulletin, 11 August 1981, pp 60 & 53.