

Nick Strobel's "cliff notes" of Jerry Coyne's article in *New Republic*. See Coyne's article for the full details with examples. Strobel bears all responsibility for errors in these notes.

Jerry Coyne "The Faith That Dare Not Speak Its Name: The Case Against Intelligent Design"

in *The New Republic*, Aug 22 & 29, 2005 issue, p. 21-33. Available at <http://www.tnr.com/doc.mhtml?i=20050822&s=coyne082205>

Reason why the Dover School Board presented Intelligent Design as a requirement was explicitly for religious, particularly Christian, reasons. The chair of the school board said at the school board meeting open to the public that the textbooks should include Biblical theories of creation: "This country wasn't found on Muslim beliefs or evolution. This country was founded on Christianity and our students should be taught as such." One week later, he said "Two thousand years ago, someone died on a cross. Can't someone take a stand for him? Nowhere in the Constitution does it call for a separation of church and state." The school board explicitly endorsed the use "Of Pandas and People" as an alternative to the biology textbooks and required biology classes to be made aware of the book.

Intelligent Design is merely the latest incarnation of the biblical creationism of the young-earth, literalist, creationists.

Amendment 1 of the Constitution: Amendment I - Freedom of Religion, Press, Expression. Ratified 12/15/1791.

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

1968, Supreme Court upholds teacher's, Susan Epperson of Arkansas, right to teach evolution. Anti-evolutionists recast themselves as "scientific creationists" to be more respectable. Henry Morris devises this strategy (Institution for Creation Research in San Diego). Interprets Bible literally. Scientific Creationists say that the Earth can be only 6000 to 10,000 years old while ample scientific evidence says 4.6 billion year age to Earth and ample evidence for species changing over time, as well as for fossils that illustrate large morphological transformations. Scientific Creationism says that geological record result of great flood and more advanced organisms are found higher up in the fossil layers because they climbed hills and mountains to escape the flood—can't explain why dolphins and whales are in just the upper strata.

1981, Federal Court in *William McLean (United Methodist minister) vs. Arkansas Board of Education* rules that requiring teaching of creationism violates 1st Amendment Establishment Clause: 1) lacks a secular legislative purpose; 2) primary effect is to advance religion; 3) fosters excessive government entanglement with religion.

1986, Supreme Court in *Edwards v Aguillard* requiring equal-time teaching creationism was unconstitutional. In 2005 federal court says that warning stickers on biology

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textbooks singling out evolution as uniquely controversial, cater to religious biases. Why no warnings on physics textbooks regarding gravity and electrons that nobody has seen?

II. Intelligent Design

ID is latest pseudoscientific incarnation of religious creationism. Two parts: (a) evolutionary theory is fatally flawed when it tries to explain the origin and development and diversity of life; (b) major features of life are best understood as the result of creation by supernatural intelligent designer.

OED defines scientific theory as "a scheme or system of ideas or statements held as a n explanation or account of a group of facts or phenomena; a hypothesis that has been confirmed or established by observation or experiment, and is propounded or accepted as accounting for the known facts." In science, a theory is a convincing explanation for a diversity of data from nature.

Neo-Darwinism theory has several propositions:

- Populations of organisms have evolved. "Descent with modification"—species on Earth today are the descendents of other species that lived earlier, and the change in these lineages has been gradual, taking thousands to millions of years.
- New forms of life are continually generated by the splitting of a single lineage into two or more lineages. "Speciation". A species of primate split into a lineage leading to the modern chimpanzee and the other to modern humans about 5 mill yrs ago. That primate ancestor shared common ancestor with earlier primates, they shared common ancestor with other mammals, etc. Trace twigs of "tree of life" back to node of common ancestor. We evolved from apelike species that no longer exist. I am related to my cousin, but the ancestors we share are two extinct grandparents.
- Most (though not all) evolutionary change is probably driven by natural selection: individuals carrying genes that better suit them to the current environment leave more offspring than individuals carrying genes that make them less adapted. *[Ed: the Earth, environment, has changed over time, so life must have changed over time to survive.]*

Darwin provided voluminous and convincing evidence for these propositions.

Fossil Record: geologic record clearly displays changes in the forms of life existing over large spans of time, with deepest/oldest sediments showing marine invertebrates, fishes appearing later, amphibians, reptiles, and mammals still later. Creationist geologists established this---they interpreted it to be hundreds of acts of divine creation.

Evolution predicts succession of forms PLUS genetic lineages. Transitional series of genetic lineages have turned up. Transitional forms connect fish with tetrapods, dinosaurs with birds, reptiles with mammals, land mammals with whales. Predicted by Darwin, now verified. **Species were not created in their present form and thereafter remained unchanged.**

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Developmental and Structural Remnants of Past Ancestry that We Find in Living Species: birds + toothless anteaters have tooth buds as embryos => remnant of teeth of reptilian ancestor of birds and toothless anteater. Flightless kiwi bird has vestigial wings under its feathers => flightless birds all evolved from flying ancestors. Cave animals have rudimentary eyes that cannot see => degenerated from sighted ancestor. Why would Intelligent Designer bestow these on present species? In humans: appendix is vestigial remnant of intestinal pouch used to ferment the hard-to-digest plant diets of our ancestors (Orangutans + grazing animals have large hollow appendix). Five-month old human embryo grow thin coat of hair all over body: evolutionary remnant of our primate ancestry. Human genome has a huge amount of non-functional DNA. Humans, like primates and unlike most mammals, require vitamin C in diet because we can't synthesize it from simpler chemicals. Yet, we still carry all of the genes for synthesizing vitamin C. Gene inactivated by mutations 40 mill yrs ago, probably because it was unnecessary in fruit-eating primates.

Biogeography, the study of the geographic distribution of plants and animals.

Bizarre nature of flora and fauna on oceanic islands such as Hawaii and Galapagos that were never connected to continents. Oceanic islands are missing or impoverished in many types of animals. Hawaii has no native mammals, reptiles, or amphibians. St Helena in middle of S Atlantic Oceans is missing these too and has no freshwater fish. Those animals introduced by humans have done spectacularly well on Hawaii. Natives: clusters of numerous similar species ("radiations") over-represented compared to continents. Native species bear greatest similarity to species found on nearest mainland despite the great difference in habitat—argues against creationism. The native species are those that can easily get there. Insects & birds can fly or be borne by winds. Seeds of plants transported by wind or ocean current or bird stomachs. Other oceanic islands have aerial mammals (bats) but no terrestrial (land) mammals. Only evolution explains the lack of native animal types on oceanic islands (they cannot get there), the radiation of some groups into many species (the few ancestor species found empty niches and speciated profusely), and resemblance of island species to nearest mainland (island colonist most likely to come from closest source).

Natural Selection. Darwin had no evidence but now we do. Bacterial resistance to antibiotics, insect resistance to DDT, HIV resistance to antiviral drugs, resistance of fish & mice to predators via camouflage, and plants adapting to toxic minerals in the soil (see John Endler's *Natural Selection in the Wild* for a long list of examples. Extrapolating over long periods explains the diversification of life on Earth.

Natural selection is not the only agent of evolutionary change (e.g., random, non-adaptive changes in the frequencies of different genetic variants) but it is the only known evolutionary force that can produce the fit between organism and environment. Such an abundance of evidence across a huge diversity of lifeforms and environments that we now say that evolution is a fact as much as gravity is a fact. Provisional truth: we could find human fossils co-existing with dinosaur fossils, or bird fossils alongside those of earliest invertebrates 600 mill yrs ago. These would prove neo-Darwinism false.

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III. Intelligent Design's Cleverer Tactics

No evidence or insufficiency of neo-Darwinism that warrants overturning evolution. ID is scientific creationism with a few adjustments designed to get past courts. ID has further removed God from the picture, hid God better than earlier scientific creationism. Neutral-sounding "intelligent designer". If you listen to all of what ID'ers say, the designer is clearly the biblical God. Use of impressive-sounding terms such as "irreducible complexity". ID'ers have more impressive academic credentials and majority work at secular institutions. The Center for Science and Culture (division of Discovery Institute in Seattle) was designed explicitly "to defeat scientific materialism and its destructive moral, cultural, and political legacies" and "to replace materialistic explanations with the theistic understanding that nature and human beings are created by God."

Pedigree and affiliations of authors and publishers of the book *Of Pandas and People* is clearly a scientific creationism viewpoint. [Ed: Evidence at the Dover trial clearly showed the substitution of "intelligent design" for "creation" and "creationism" in early versions of the book. The court found that intelligent design equals creationism. See <http://www2.ncseweb.org/wp/?p=80> for how creationism (creation science) evolved to intelligent design. The arguments of Pandas ID version are the same as the Pandas creation science version.]

Pandas' equivocation over the age of the earth is an attempt to paper over the strong disagreement between young-earth creationists and old-earth creationists, both of whom have marched under the banner of ID. Creationists exploit disagreements between evolutionists as proof that neo-Darwinism is dead while at the same time hiding their own disagreement from the public.

Pandas says that the fossil records shows "fully formed organisms appear all at once, separated by distinct gaps." Not exactly true. Different species appear in a distinct sequence supporting evolution. Creationists and ID'ers make much of "Cambrian explosion" (543 mya).

- Even the "Cambrian explosion" of burst in biological innovation took place over 10-30 million years.
- Cambrian species are no longer with us, though their descendants are. More than 99% of the species that have ever lived have gone extinct without leaving descendants.
- Many plants and animals do not show up as fossils until well after the Cambrian explosion. Bony fish+land plants: ~440 mya, reptiles ~350 mya, mammals ~250 mya, flowering plants ~210 mya, human ancestors ~5 mya.

Pandas like Phillip Johnson's *Darwin on Trial* emphasizes gaps in the fossil record—supposed absence of transitional forms: the "missing" links between major forms of life that, according to evolution, must have existed as common ancestor. Despite the fact that fossilization requires hard, sturdy bones being buried in aquatic sediments, we *do* have many transitional forms. *Pandas'* three cited supposedly "missing" transitions (small early horse to big modern horse, fishes to amphibians, reptiles to mammals) are well-documented to be present and at exactly the right time in the fossil record: after the ancestral forms already existed, but before the "linked" later group had evolved. Gives detailed example of reptiles transition to mammals with special attention to the trait of the

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"chewing" hinge where the jaw meets the skull. 1958 Alfred Compton described the critical transition fossil mammal-like reptile *Diarthrognathus broomi* which had a double jaw joint with two hinges. Other gaps cited by *Pandas*, *Darwin on Trial*, etc. as evidence for supernatural intervention have been filled in. Typical strategy of creationists that when skeletons of missing links turn up, creationists ignore them and insist that evidence of intermediacy be sought instead in the soft parts that rarely fossilize.

Pandas barely deals with evidence for evolution from development and vestigial traits. The best it can do is note that vestigial features can have a function, and therefore are not really vestigial. But no evolutionist denies that the remnants of ancestral traits can retain some functionality or be co-opted for other uses.

Pandas like all creationist books says nothing about biogeography.

IV. Microevolution vs. Macroevolution + Image of God

Pandas echoes the ID assertion that natural selection cannot do more than create microevolutionary changes (antibiotic resistant bacteria are still bacteria, different colored moths are still moths, wolves bred to make Chihuahuas are still all dogs, etc.). Fossils already show that "macro change" as defined by *Pandas* has occurred. Dog breeding has been going on for only a few thousand years, while the differences between dogs and cats have evolved over more than 10 mill yrs.

Pandas admits that the fruit flies of Hawaii (>300 species) all evolved from a common ancestor. We now know the common ancestor lived about 20 mill yrs ago. Some of the fly species are more different from each other than humans differ from chimps. However, humans must at all costs not be lumped in with other species, so as to protect the biblical status of humans as uniquely created in God's image.

ID suggests that "there are limits to the amount of variation that natural selection and random change mechanisms can produce." (*Pandas*) But there is nothing in ID that tells how far evolution can go. ID's view of humans as uniquely separate from other animals and not the result of natural selection but, rather, a special creation comes from ID's ancestor, scientific creationism. Scientific creationism says that a "kind" is the basic created unit (e.g., "mankind" or "catkind") but no creationist has ever defined what a "kind" is, though they are sure that humans and apes are different "kinds". [*Ed: Wilcox also talks about the "kind" issue.*] The use of the word "kind" comes from Genesis 1.

Darwin noted in *On the Origin of Species* that those who admit to natural selection producing some variation in some species but arbitrarily refuse it in other species were suffering from "blindness of preconceived opinion". He said "Although naturalists [*the term for those believing in a biblical form of creation for humans in his day*] very properly demand a full explanation of every difficulty from those who believe in the mutability of species, on their own side they ignore the whole subject of the first appearance of species in what they consider reverent silence." Until ID'ers tell us what the limits of evolution are, how they can be ascertained, and what evidence supports these limits, this notion cannot be regarded as a genuinely scientific claim.

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V. Irreducible Complexity

The idea is that organisms show some adaptations that could not be built by natural selection, thus implying the need for a supernatural creative force such as an intelligent designer. In *Darwin's Black Box: The Biochemical Challenge to Evolution*, Behe states the IC is "a single system composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning." Like a mousetrap, or a car engine, the "camera" eye of humans & other vertebrates has many parts whose individual removal would render the organ useless, including lens, retina, and optic nerve. Behe says "Since natural selection can only choose systems that are already working, then if a biological system cannot be produced gradually, it would have to arise as an integrated unit, in one fell swoop, for natural selection to have anything to act on." Fatal flaw to Behe's argument: for decades we have known that natural selection can produce systems that, over time, become integrated to the point where they *appear* to be IC. They do NOT evolve by sequential addition of parts to a feature that becomes functional only at the end. They evolve by adding, via natural selection, more and more parts into an originally rudimentary but functional system, with these parts sometimes co-opted from other structures.

Our eyes did not suddenly appear as full-fledged camera eyes, but evolved from simpler eyes, having fewer components, in ancestral species. Darwin surveyed existing species to see if one could find functional but less complex eyes that not only were useful, but also could be strung together into a hypothetical sequence showing how a camera eye might evolve. If a hypothetical sequence can be constructed, and it CAN, then the argument for IC vanishes—no need to invoke IC. Coyne gives a possible sequence, showing that the complexity of the eye is reducible to a series of small, adaptive steps. Behe's IC descends with modification from British theologian William Paley's "argument from design" idea in his 1802 book *Natural Theology*.

Our eye's imperfection arises precisely because it evolved using whatever components were at hand, or produced by mutation. Not one an engineer would design from scratch. Evolution differs from *a priori* design because it is constrained to operate by modifying whatever features have evolved previously. Thus evolution yields fitter types that often have flaws. These flaws violate reasonable principles of intelligent design.

ID'ers focus on biochemistry rather than organs, citing IC molecular systems such as the mechanism for blood-clotting and the immune system (*Darwin Black Box* and *Pandas*) that "can only work after they have been assembled by someone who knows what the final result will be" (*Pandas*) This is nonsense. Biological systems are not useful only at the end of a long evolutionary process, but during every step of that process. And biochemical systems are not assembled with foresight. Whatever useful mutations happen to arise get folded into the system. Biologists are beginning to provide plausible steps for how IC biochemical pathways might have evolved [*Ed: using standard technique of constructing darwinian histories*]. In view of our progress in understanding biochemical evolution, it is simply irrational to say that because we do not completely understand how biochemical pathways evolved, we should give up trying and invoke the intelligent designer. We get nowhere by labeling our ignorance "God".

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VI. Is Intelligent Design Good Science?

Insofar as ID theory can be tested scientifically, it has been falsified. Organisms simply do not look as if they had been intelligently designed. [*Ed: Human engineers would have done a better job.*] Either life resulted not from intelligent design, but from evolution; or the intelligent designer is a cosmic prankster who designed everything to make it look as though it had evolved (old argument of God putting fossils in the rocks to test our faith).

ID'ers admission that we cannot understand the designer's goals or methods shows that ID is not scientific. Behe in *Black Box*: "Features that strike us as odd in a design might have been placed there by the designer for a reason—for artistic reasons, to show off, for some as-yet-undetectable practical purpose, or for some unguessable reason—or they might not." *Pandas*: "An intelligent designer might reasonably be expected to use a variety (if a limited variety) of design approaches to produce a single engineering solution, also. Even if it is assumed that an intelligent designer did indeed have a good reason for every decision that was made, and for including every trait in each organism, it does not follow that such reasons will be obvious to us." Well, if we admit that the designer had a number of means and motives, which can be self-contradictory, arbitrary, improvisatory, and "unguessable," then we are left with a theory that cannot be rejected. Every conceivable observation of nature becomes compatible with ID, for the ways of the designer are unfathomable. And a theory that cannot be rejected is not a scientific theory. ID'ers need to propose a model that can be rigorously tested.

ID does not inspire much scientific research. No new results in a peer-reviewed scientific journal [*Ed: and it's not because of being locked out of journals because of anti-religious bias*]. ID'ers desperately crave scientific respectability. ID'ers demand that evolutionists produce thousands of transitional fossils and hundreds of detailed scenarios about the evolution of biochemical pathways, they put forth no observations supporting the plausibility of a supernatural designer, nor do they show how appeal to such a designer could explain the fossils record, embryology, and biogeography better than neo-Darwinism. Herbert Spencer (long time ago): "Like the majority of men who are born to a given belief, they demand the most rigorous proof of any adverse belief, but assume that their own needs none."

In *McLean v. Arkansas* Judge Overton noted that good science: 1) It is guided by natural law; 2) It has to be explanatory by reference to natural law; 3) It is testable against the empirical world; 4) Its conclusions are tentative, i.e., are not necessarily the final word; and 5) It is falsifiable. Supernatural intervention violates criteria 1 and 2; and ultimate reliance on Christian dogma and God, ID violates criteria 3, 4, and 5.

ID'ers are very clear on their religious motivations, particularly a particular form of Christianity. ID did not arise because of some long-standing problems with evolutionary theory, or because new facts have called neo-Darwinism into question. ID is a Trojan horse poised before the public schools: a seemingly secular vessel ready to inject its religious message into the science curriculum, using a cunning pedagogical ploy to circumvent legal restrictions against religious creationism.

ID is part of what Johnson calls the "wedge strategy", a carefully crafted scheme that begins with the adoption of ID as an alternative theory to evolution, after which ID will edge out evolution until it is the only view left, after which it will become full-blown

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biblical creationism. Johnson says to "get the Bible and the Book of Genesis out of the debate because you do not want to raise the so-called Bible-science dichotomy." At a conference on "Reclaiming America for Christ" in 1999, Johnson said that the objective is to convince people that Darwinism is inherently atheistic, thus shifting the debate from creationism v. evolution to the existence of God v the non-existence of God. From there people are introduced to "the truth" of the Bible and then "the question of sin" and finally "introduced to Jesus." Dembski said that "what drives me in this is that I think God's glory is being robbed by these naturalistic approaches to biological evolution, creation, the origin of the world, the origin of biological complexity and diversity. When you are attributing the wonders of nature to these mindless material mechanisms, God's glory is getting robbed." Jonathan Wells said that Reverend Moon's (Unification Church) "words, my studies, and my prayers convinced me that I should devote my life to destroying Darwinism, just as many of my fellow Unificationists had already devoted their lives to destroying Marxism."

If you accept that evolution can explain the development of the huge diversity of life throughout time, are you putting down God? No. Many theologians and religious people accept evolution. The real issue is purpose and morality: specifically, the fear that if evolution is true, then we are no different from other animals, not the special objects of God's creation but a contingent product of natural selection, and so we lack real purpose, and our morality is just the law of the jungle. This fear is pervasive in the writings of ID'ers. But the acceptance of evolution need not efface morality or purpose. Evolution is simply a theory about the process and patterns of life's diversification, not a grand philosophical scheme about the meaning of life.

Should ethics have a basis in nature? There is no logical connection between evolution and immorality, nor is there a causal connection. Civilized, unreligious Europe. Most religious scientists, laymen, and theologians have not found the acceptance of evolution to impede living an upright, meaningful life. And the idea that religion provides the sole foundation for meaning and morality also cannot be right: the world is full of skeptics, agnostics, and atheists who live good and meaningful lives.

In the end, many Americans may still reject evolution, finding the creationist alternative psychologically more comfortable. But emotion should be distinguished from thought, and a "comfort level" should not affect what is taught in the science classroom. Judge Overton:

"The application and content of First Amendment principles are not determined by public opinion polls or by a majority vote. Whether the proponents of Act 590 constitute the majority or the minority is quite irrelevant under a constitutional system of government. No group, no matter how large or small, may use the organs of government, of which the public schools are the most conspicuous and influential, to foist its religious beliefs on others."