Mirroring Science:
The Visuals of Passing Intelligent Design Off as Fact

The theory of evolution by natural selection was first published and popularized by Charles Darwin in 1859. A few years later, Gregor Mendel used pea plants to demonstrate the way that traits were transferred from parent to child, which added further weight to Darwin's natural selection. The "modern synthesis" of evolutionary theory comes from the discovery and understanding of DNA, thanks to the efforts of Rosalind Franklin, James Watson, and Francis Crick in 1953. These observations were made clear and easy to understand through both physical evidence and visuals like the famous illustration of Darwin's Finches, Mendel's diagrams of pea plant genealogy, and Franklin's famous photograph that proved the double helix structure of DNA. All that to say, evolution is a theory with a capital "T" in the sense that it has been thoroughly tested and is well understood as the mechanism by which complex life changes and distinguishes itself. Yet 38% of Americans today believe in a strictly biblical creationist view that humans were created in their present form (*Gallup News*). Understanding this disconnect requires a close look into the history of creationism in the United States, and the term "intelligent design" which has become the pseudoscientific approach to passing off a religious standpoint as science. In essence, proponents of intelligent design have become skilled in the presentation and framing of real visualized scientific evidence in a way that allows them to argue for equal treatment as a theory alongside evolution. This paper will examine the history of intelligent design along with its key figures, methods and logic in order to show how scientific images can be repurposed to support an alternate perspective.

Before I continue, I want to be clear that this paper is in no way an argument against the existence of a higher power. The underlying philosophies are too complex to discuss within the

scope of this work, so for the purpose of my argument the reader must understand that I approach this subject under the assumption—which I feel is reasonable—that a "creator" or god from any religion exists in the realm of the supernatural. As science is the observation and study of the natural world, there is no way for science to prove or disprove the existence of such a being. Therefore, an individual may comfortably accept the ideas of science while believing in the existence of a god; this paper will not dispute that. The subject of this paper—intelligent design—is in fact an effort to use science to offer definitive proof of the supernatural; it is an attempt to do something that cannot be done.

Darwinian evolution has a long history of causing controversy among groups who mistakenly interpret it to mean that mankind evolved from a "lower order" of animals. To stay within the bounds of relevance, we will jump ahead and start with one particular controversy in the United States within public education. According to Edward J. Larson, this controversy begins roughly in the 1920's when teenagers began attending high school in greater numbers, and more attention was given to the theory of evolution which they encountered in their biology textbooks. Parents, taxpayers, and religious leaders objected to this theory that they felt contradicted their religious text, and the resulting fight centered around the high school biology classroom and the minds of those students that occupied it. "In most cases, the objection sprang out of religious concerns, and the reason is obvious. Religion addresses great questions in life. Why are we here? Where did we come from? Where are we going? To the extent that science addresses these questions, it is treading on holy ground" (Comfort 63-64; ch.4). In 1925, a Tennessee bill called the Butler Act prohibited the teaching of evolution and any other theory that "denies the story of the Divine creation of man as taught in the Bible." Any teachers caught violating the law would be fined between $100 and $500 dollars each time they were in violation

(*Tennessee Evolution Statutes*). Now, this is a clear violation of the First Amendment, so the ACLU wasted no time in sending out a notice that they would defend any Tennessee high school teacher who would go to court in order to challenge the new law. That offer was accepted by a group in Dayton, Tennessee around a young substitute teacher named John Scopes who had been in violation of the law while teaching the theory of evolution alongside the state-approved textbook that did not mention it. This trial became famously known as the Scopes Monkey Trial. "Scopes presented an ideal defendant for the test case. Single, easygoing without any fixed intention of staying in Dayton, he had little to lose from a summertime caper" (Larson 90; ch.4). As Larson continues, the trial suffered from multiple upsets and road blocks, but the nature of the case made the proceedings a widespread spectacle for the whole country that would have lasting implications beyond the decision in the courtroom. Though the result of the trial did not lead to the reintroduction of evolution into the biology classroom, it sparked a debate across the country that would eventually lead to the reintroduction of the theory into classrooms around the 1960s.

Enacting evolution over creationism as the standard in public education forced the religious groups opposed to reevaluate their tactics. The term "Creation Science" was born, and was used to implement the "Balanced Treatment Act" in Louisiana that allowed "Creation Science" to be taught in schools alongside evolution in order to teach an alternate perspective. Around this same time, an organization called the Foundation for Thought and Ethics was in the beginning stages of writing a book that would be sold to Louisiana schools to teach these ideas alongside Darwin's evolution. Of course, this Louisiana law was challenged on the same grounds as the Scopes Monkey Trial before it. The ruling of Edwards vs. Aguillard by the United States Supreme Court found that the law was unconstitutional under the Establishment Clause of the First Amendment, because though the law stated that the intentions were secular in nature in

order to "examine all arguments" the religious tones of this counterargument to evolution were clear (Schimmelpfennig 238). "Creation Science" was deemed too overtly religious to be taught in public schools, and so the Foundation for Thought and Ethics and the Creationists involved had to scramble once more to rebrand themselves as fair and balanced science.

"Intelligent design" was born. That manuscript that the Foundation had been drafting, now called *Of Pandas and People* quickly had to replace "Creation Science" with "intelligent design," and the resulting textbook was published in 1989 in Richardson, Texas. Since then, the book has gone through two editions. The second, published in 1993, includes the addition of major arguments and contributions by Dr. Michael Behe. This edition, along with Dr. Behe's own brand of reframing scientific visuals in order to support a creationist supposition, will be discussed later in this piece. The third edition to the book was published in 2007, and was rebranded once again to be titled *The Design of Life: Discovering Signs of Intelligence in Biological Systems*. This third edition came in response to yet another trial, Kitzmiller vs. Dover, in Dover, Pennsylvania which ruled that intelligent design is indistinguishable from creationism (*JUSTIA*). *The Design of Life* attempts to brush off this court ruling and presents an argument that "explanations that call on intelligent causes require no miracles but cannot be reduced to materialistic explanations" (*Evolution News*). It is yet another attempt to distance the material and debate away from a direct connect to a supernatural being while presenting arguments that presume the existence of one.

Though this social pushback on science between religious groups and the court system has a long history, the arguments that proponents of intelligent design have put forward over the years have changed very little. The presumption of course, is that an intelligent designer exists and that this being designed life as we see it today. The outcome of this thought process precedes

the search for evidence to prove it, and therefore can barely be acknowledged as science as it is understood in the modern world.

The faces of this evidence are figures such as Percival Davis and Dean Keyon—both authors of *Of Pandas and People*— and others holding advanced degrees in science such as Michael Behe. These people give the movement the illusion of scientific objectivity that it did not have in the days of arguing for creationism to be taught in schools. They exhibit an attempt to create scientific authority out of an unscientific position by using the fact that people with advanced degrees argue in favor of intelligent design as self-evident proof that it should be taken seriously. This strategy bears some resemblance of Robert Boyle's "social technology" of establishing a reliable witness to an experiment in order to establish it as a "matter of fact" for those who were not present to witness the event themselves, as per Steven Shapin's *Pump and Circumstance*. "Boyle insisted that witnessing was to be a collective enterprise…because it is thought reasonable to suppose, that, though each testimony single be but probable, yet a concurrence of such probabilities, (which ought in reason to be attributed to the truth of what they jointly tend to prove) may well amount to a moral certainty" (Shapin 487-488). Of course, this is that same "social technology" repurposed not to virtually witness an air-pump when the written word and diagram were all that was available, but to pass off an unscientific premise with the image of authentic scientifically rigorous research. The fact that these proponents of intelligent design still exist is the very reason that the debate over evolution is to this day seen as such a divisive issue, since without them texts like *Pandas* and *The Design of Life* would not have been published and creationism would never have been rebranded to contest a scientific theory.

Michael Behe—mentioned briefly earlier—received his PhD in Biochemistry from the University of Pennsylvania in 1978 and is a current faculty member at Lehigh University. He is well known for his book *Darwin's Black Box* and his work on the "theory of irreducible complexity." On his faculty page of the university's website, Behe writes the following disclaimer under the summary of his research: "My ideas about irreducible complexity and intelligent design are entirely my own. They certainly are not in any sense endorsed by either Lehigh University in general or the Department of Biological Sciences in particular. In fact, most of my colleagues in the Department strongly disagree with them" (*Lehigh University*). He makes it publicly clear that he does not operate within a scientific consensus, which would go against this image of scientific validity that texts such as *Pandas* rely on.

Behe's main contribution to the idea of intelligent design—and the reason he is being brought into focus here—is the idea of "irreducible complexity" which Behe believes is the nail in the coffin for Darwinian evolution. In Behe's own words: "It turns out that Darwin himself gave us a criterion by which we could judge whether something is explainable by his theory of natural selection. In *The Origin* he wrote: If it could be demonstrated that any complex organ existed which could not possibly have been by numerous, successive, slight modifications, my theory would absolutely break down" (*Irreducible Complexity* 00:12:17). Behe has dedicated his research to finding what he believes are examples of these irreducibly complex organs in biology, and uses a simple example as the basis for an organ that he might classify as something to delegitimize Darwin's theory. The example in question is a mouse trap.

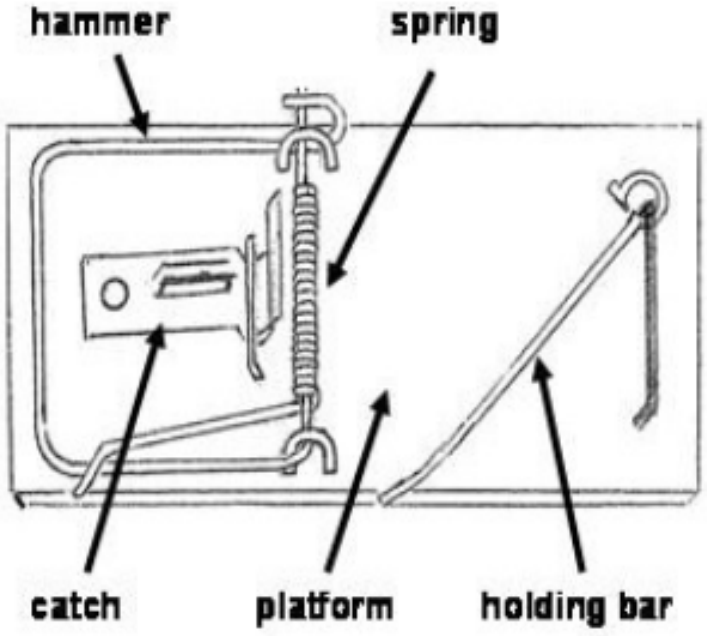


Figure 1. Michael Behe's Irreducible Complexity from Lehigh University.

In a video discussing this example, Behe walks his audience through the various components of a mouse trap. "A mouse trap consists of a number of different parts. It's got a wooden platform, which holds the other pieces. It's got a spring with extended ends that press against the platform here, and against this little bar which is called the hammer which actually does the job of squashing the mouse…Now all of these pieces are needed for the mouse trap to work, and that's what we mean by irreducible complexity. You can't have just the platform and catch a mouse, and add the spring and catch a few more mice." (*Irreducible Complexity* 00:13:30). The fundamental idea behind Behe's work is a metaphor that crumbles under scrutiny, in that it states that because humans are observably the "intelligent designers" of this mousetrap design, complex systems in nature prove the existence of an intelligent designer that has not been observed. Despite this, Behe uses an electron micrograph of lung tissue, a diagram of the human eye, and an animated bacterial flagellum to illustrate biological organisms that he believes could not have evolved on their own. "The bacterial flagellum is literally an outboard motor that bacteria use to swim through solution. It's a rotary device…If it was not for the propeller, you wouldn't get any motion when it

rotated… In the absence of any of those fifty different components, you do not get a flagellum that works half as well or a quarter as well—again—you have a broken flagellum. I like to use this illustration, which is from a popular biochemistry textbook written by Voet and Voet, because when people look at this that this is a machine. It's not like a machine, it is a machine" (*Irreducible Complexity* 00:21:10). Though this framing of a scientific diagram is clever for the purposes of supporting his argument, Behe shows his hand in claiming that the bacterial flagellum is irreducibly complex. There are examples of "precursors" or "parts working without the whole" in biochemical research today. Kenneth Miller in *The Flagellum Unspun* goes into detail on this subject, where he states that the flagellum bears a striking resemblance to a "type III secretory system, or TTSS" which allows bacteria to inject proteins directly into the membrane of a host cell. "Stated directly, the TTSS does its dirty work using a handful of proteins from the base of the flagellum. …it's to be expected that the opportunism of evolutionary processes would mix and match proteins to produce new and novel functions. According to the doctrine of irreducible complexity, however, this should not be possible. If the flagellum is indeed irreducibly complex, then removing just one part… should render what remains 'by definition nonfunctional.' Yet the TTSS is indeed fully-functional, even though it is missing most of the parts of the flagellum" (Miller 7). Though Behe uses the imagery of a flagellum as a machine from a biochemistry textbook as his smoking gun for the proof of an intelligent designer, the mechanical analogy does not hold up to scrutiny. Though the image of biology as a machine might be a useful teaching tool, it does not reflect the reality that "incomplete" flagellum do exist in nature and manage to serve a useful function rather than breaking down as Behe would assume.

Despite the paper thin nature of his argument when put up to real scrutiny, Behe demonstrates in his presentation of scientific data a remarkable aptitude for visual communication and visual literacy as defined by Peter Dallow in *The Visual Complex*. He presents in the video referenced above information through slides and images that, along with his credentials, give the illusion of a "rhetoric of objectivity." "The very idea of an image carries with it also the sense of it being a "likeness" of bearing a *resemblance* to something" (Dallow 95). Meaning that he frames the bacterial flagellum's resemblance of a machine—like a mouse trap—in the diagram that he chose to use in order to connect it with his idea of irreducible complexity, thus attempting to provide evidence in favor of intelligent design.

This reframing of scientific images is not limited to the presentation and performance of a figure like Michael Behe on a stage, it is most prevalent and clear in written work on the page, and is the basis for the presentation and argument contained within *Of Pandas and People*. The text relies on the reframing of past scientific work with "healthy scientific skepticism" in mind in order to weigh intelligent design against Darwinian evolution.

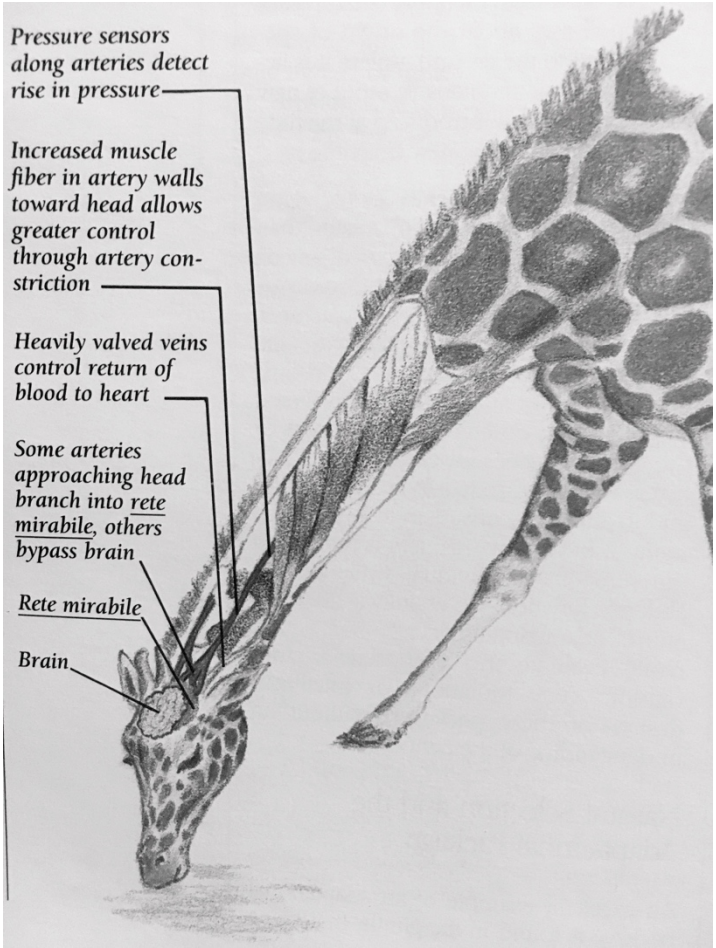
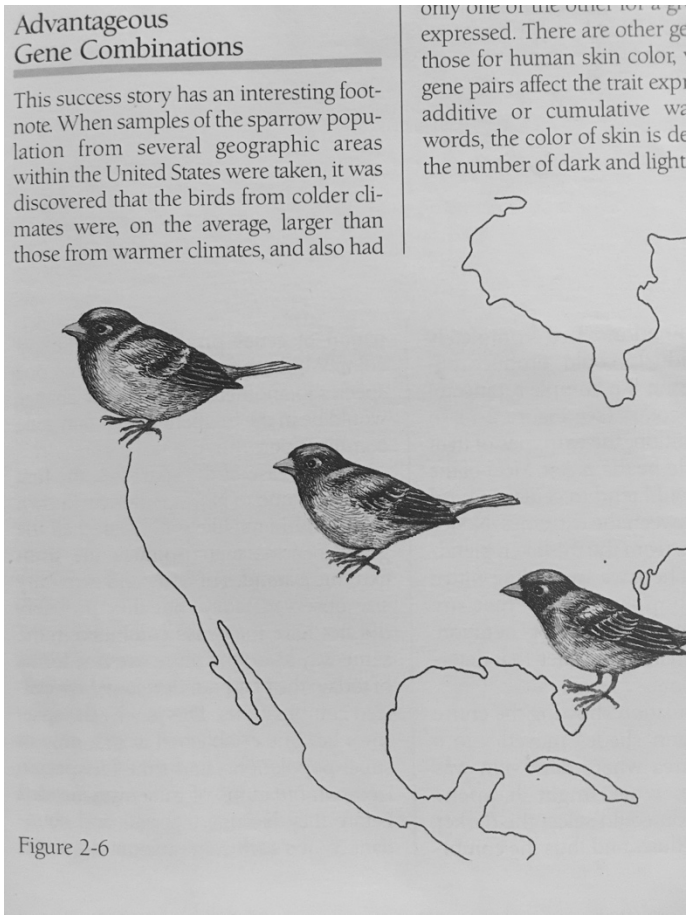


Figure 1. Of Pandas and People p.70

In one section titled “change and the origin of new structures” in the second edition of the book, *Pandas* poses the idea of a giraffe’s neck as an example of the now familiar idea of irreducible complexity. This argument uses the French biologist Jean Baptiste de Lamarck’s incorrect theory that an organism’s structure alters to accommodate its need—for which he postulated that the giraffe’s neck grew to reach the highest leaves on trees—alongside the Darwinian theory of evolution to discredit both theories in favor of intelligent design (Davis 70). Instead of stating immediately that modern science understands Lamarck’s theory to be incorrect—like the anthropology textbook *Our Origins* by Clark Spenser Larson does when it states “offspring do not inherit traits acquired from their parents”—*Pandas* first equates the idea to Darwin’s beliefs before disproving it (Larsen 34). This frames past scientific observations as flawed by association and attempts to offer intelligent design as the only alternative.


Advantageous
Gene Combinations

This success story has an interesting footnote. When samples of the sparrow population from several geographic areas within the United States were taken, it was discovered that the birds from colder climates were, on the average, larger than those from warmer climates, and also had

expressed. There are other ge
those for human skin color,
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words, the color of skin is de
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Figure 2-6

Figure 2. Of Pandas and People p.73

Another example of this reframing of science by *Pandas* occurs when it takes a stab at Darwin’s finches. Instead of offering the more prominently held scientific view that Darwin’s finches had adapted to different diets as evidenced by their beak shape and size, Davis in *Pandas* offers a different solution (Larsen 28).

In this example, the body type of different groups of English sparrows in North America is used as evidence for "gene packages" or the idea that an intelligent designer provided organisms a toolbox of genes to deploy as needed and therefore appear varied by region (Davis 73).

Michael Baxandall addresses the type of image manipulation going on in these examples in *Patterns of Intention*. He lays out the distinct "Cause words, comparison words, and effect words" that surround an image in order to frame its meaning in a given context (Baxandall 6). Though Baxandall is focused on meanings and patterns that can be derived from paintings outside of descriptive language of the work itself, the concept applies easily to argument-driven work and the examples above. Davis starts with the evidence offered by Darwinian evolution, compares it to a known incorrect idea about evolution, and then poses intelligent design as the solution—all surrounding a real illustration depicting a scientific fact—in order to frame his argument as the only feasible solution.

At its core, the argument for intelligent design centers around misinterpretations of Darwin's theory, the fear that such a theory conflicts with a presupposed view of the world, and posing gaps in the scientific understanding of human evolution as evidence of a higher power. Because these positions are clearly unscientific in nature, but secular thought is now required by law for an idea to be taught in the public school system, proponents of intelligent design attempt to replicate the image of scientific objectivity to pass off creationism as science. Through selectively reframing real data and images, presented by individuals holding symbols of scientific objectivity within their advanced degrees in science, Creationists achieve this illusion to a degree. This effort shows to an extreme how data and imagery can be used to promote falsehoods as tested scientific fact. The techniques employed here by Creationists are surely employed elsewhere, so they should be taken as a serious threat to presentable scientific fact.

Bibliography

- AccessResearch. "Irreducible Complexity." *YouTube*, YouTube, 9 Feb. 2014, www.youtube.com/watch?v=yudmK5jZy9A.
- Baxandall, Michael. *Patterns of intention: on the historical explanation of pictures*. Yale Univ. Pr., 1992.
- Dallow, Peter. "The Visual Complex: Mapping Some Interdisciplinary Dimensions of Visual Literacy." *Academia.edu*, www.academia.edu/171794/The_Visual_Complex_Mapping_Some_Interdisciplinary_Dimensions_of_Visual_Literacy.
- Davis, P. William. *Of Pandas and People - The Central Question of Biological Origins*. Vol. 2, Foundation for Thought and Ethics, 1993.
- *Department of Biological Sciences, Lehigh University*, www.lehigh.edu/~inbios/Faculty/Behe.html.
- "Kitzmiller v. Dover Area School Dist., 400 F. Supp. 2d 707 (M.D. Pa. 2005)." *Justia Law*, http://law.justia.com/cases/federal/district-courts/FSupp2/400/707/2414073/.
- Larsen, Clark Spencer. *Our origins: discovering physical anthropology*. 4th ed., W.W. Norton & Company, 2017.
- Larson, Edward J. *Summer for the Gods: The Scope's Trial and America's Continuing Debate over Science and Religion* (New York: Basic Books,1997), 87-110.
- Larson, Edward J. "The Classroom Controversy: A History of the Dispute over Teaching Evolution," in *The Panda's Black Box: Opening Up the Intelligent Design Controversy*, edited by Nathaniel C. Comfort (Baltimore: Johns Hopkins University Press, 2007), 63-82.
- Miller, Kenneth R. "The Flagellum Unspun." *Debating Design*, pp. 81–97., doi:10.1017/cbo9780511804823.006.
- Randy E. Schimmelpfennig, Louisiana's Balanced-Treatment Act and the Establishment Clause: Edwards v. Aguillard, 23 Tulsa L. J. 235 (2013).
- Shapin, Steven. "Pump and Circumstance: Robert Boyles Literary Technology." *Social Studies of Science*, vol. 14, no. 4, 1984, pp. 481–520.
- Swift, Art. "In U.S., Belief in Creationist View of Humans at New Low." *Gallup.com*, 22 May 2017, http://news.gallup.com/poll/210956/belief-creationist-view-humans-new-low.aspx
- "Tennessee Evolution Statutes." *Tennesse Anti-Evolution Statute - UMKC School of Law*, http://law2.umkc.edu/faculty/Projects/FTrials/scopes/TENNSTAT.HTM.