



# Creationism

## MISINFORMATION/DISINFORMATION AND THE DANGER OF SEVERING REASON AND FAITH

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*This story highlights six tactics of science misinformation and disinformation efforts: lack of necessary science expertise, fabrication of wide support in science, neglect of refuting information, promoting conspiracy explanations, inability to publish in peer-reviewed outlets, and perceived threats to worldview. See our website article [Characteristics of Science Misinformation/ Disinformation Efforts](#) for more information regarding these tactics.*

### A False Dichotomy

People have always struggled with the tension between reason and faith. Some maintain that reason and faith are incompatible. This was the view held by St. Augustine early in his life during the mid-4<sup>th</sup>-century. He rejected Christianity, because its teachings appeared uncertain and frequently illogical, and the Bible too often contradictory. But his life-long passion for truth along with his life experiences drew him back to his Christian roots that he had earlier rejected. Strongly maintaining that truth did exist, he did not avoid the issue of reason and faith, nor would he accept different truths regarding theology and nature. St. Augustine argued for the unity of truth and that because God is the author of both scripture and nature, they cannot be contradictory. But he was well-aware that the books of scripture and nature are both difficult to interpret. Regarding religious text, he maintained that the literal meaning is the most difficult to comprehend. For St. Augustine, literal did not mean naïve literalism (i.e., adherence to the strict meaning of the words). Rather, it meant interpreting religious text in the context of the theological issue being addressed in the passages along with other sources of knowledge to retain the unity of truth. St. Augustine asserted that the interpretation of religious text is more difficult because it must be informed by both faith and demonstrable knowledge. St. Augustine explicitly warned about the danger of being ignorant or dismissive of demonstrable knowledge about nature. He wrote, "It is a disgraceful and dangerous thing for an unbeliever to hear a Christian, presumably giving the meaning of scripture, and talking nonsense on these topics". The failure to conform interpretation to demonstrated knowledge opens the interpreter, and

by extension Christianity, to ridicule for being unlearned.

While religion and science are often errantly portrayed as necessarily being in conflict with one another, many people are in fact deeply committed to both. Rather than forcing science and religion to provide potentially competing explanations of the world, some scholars have argued that they should be inherently free of conflict. The evolutionary biologist Stephen Jay Gould took such a position in arguing that science and religion have different aims: science being focused on why and how the world is the way that it is, while religion attempts to provide moral and spiritual guidance. Gould dubbed his idea of religion and science avoiding conflict due to their different goals nonoverlapping magisteria (NOMA) (Gould, 1997). Ecklund et al. (2016) in a study of scientists in France, Hong Kong, India, Italy, Taiwan, Turkey, the United Kingdom, and the United States report that the perception of intrinsic conflict between science and religion minimally reflects the perceptions of scientists. More than half of scientists in four of those countries identify as at least "slightly religious." In all the countries but France, scientists (ranging from a significant minority to the majority) claim belief in God without doubts. Rather than warfare or NOMA, historical and contemporary analysis more accurately illustrates the complex interaction between science and religion.

### Understanding the Diversity of Life on Earth

How the diversity of living things on Earth came to be is a question that has for most of human history been answered primarily through a religious lens. For example, the Judeo-Christian worldview maintains

that human beings have purpose ordained by an omniscient creator, and that they are conspicuously different from other life, made wholly in the image of God (Bautista et al., 2017). Followers of Islam similarly sought purpose and origin through the divine, viewing man as created intermediary of the earthly and spiritual worlds “neither angel nor animal in the absolute sense” (Nyang, 2005). For Buddhists, creation did not rely upon a creator nor occur as a singular creation event. Rather, the universe and mankind's existence were a cyclical creation and reincarnation (Allendorf, 2018). These and other religious stories were largely the only accounts available until the 19<sup>th</sup> century.

Even within these worldviews, human curiosity sought more detailed understanding. For instance, Earth's age does not appear in Judeo-Christian scripture. James Ussher, in his “Annals of the Old Testament, deduced from the first origins of the world” published in 1650, calculated the Earth to be approximately 5,650 years old. At the time of his work this placed the Earth's creation and the arrival of man in 4004 BC. Where the bible lacked clarity, Ussher employed historical data found in other sources. For example, to address the timeline between the death of Solomon and the destruction of the Temple, he examined other known dates, such as the death of King Nebuchadnezzar, recorded by the Greek astronomer Ptolemy (Linder, 2004; Moore, 2008). To derive an exact date for creation, Ussher presumed that God had a particular interest in mathematical artistry, and speculated that the world was likely created at a time when the Sun was in one of the four cardinal directions (either during a solstice or equinox).

Next, as Genesis reports a harvest of ripened fruits in the garden of Eden, Ussher surmised that creation must have occurred on the autumnal equinox, the closest Sunday, in 4004 BC, the 22<sup>nd</sup> of October (Linder, 2004). Ussher's approach was in line with other efforts (secular and religious) to use the records of people to establish a chronology for all human history, and his conclusion fit within the range determined by those other efforts. Moreover, like other theologians who refuse to sever faith and reason, Ussher stated that we can know about creation “Not only by the plain and manifold testimonies of Holy Scripture, but also by light of reason well directed” (p. 93). Evolutionary biologist

Stephen Jay Gould (1993) wrote that “Ussher could hardly have been more wrong about 4004 B.C., but his work was both honorable and interesting” (p. 187).

The Age of Enlightenment during the 18<sup>th</sup> century created a cultural environment that led to a dramatic shift in thinking about many aspects of life, including the origin of species diversity. This time period was marked by industrialization, urbanization, religious tolerance, and significant growth of science and philosophy (Ruse, 2005). Furthermore, people began to focus on how their lives could be improved via efforts related to social reform and education. These significant changes ushered in significant growth in scientific understanding, including Earth's geology and diversity of life. Table 1 provides a broad summary of this changing understanding during the late-18<sup>th</sup> and early-19<sup>th</sup> centuries.

## Backlash

Many people accept biological evolution as a valid scientific explanation for the diversity of life on Earth, while simultaneously having faith in God. This has often included scientists, including a founder of evolutionary biology, Theodosius Dobzhansky, who famously wrote:

I am a creationist, *and* an evolutionist ... Does the evolutionary doctrine clash with religious faith? It does not. ((Dobzhansky, 1973pp. 127, 129)

However, some people and religious organizations choose to see biological evolution as an existential threat to their worldview. This was particularly the case in the United States during the 20<sup>th</sup> century. In one such famous example, Tennessee passed the Butler Act of 1925 that prohibited teaching about the evolution of humans or any ideas that denied biblical accounts of creation (Webb, 2011). The law, sponsored by a Christian Fundamentalist named John Washington Butler, was aimed at combatting scientific naturalism, which Darwinian evolution was seen as promoting (de Pomerai & Harris, 2017). The Butler Act withstood a highly publicized legal challenge during the Scopes Monkey Trial, allowing the ban on teaching evolution in Tennessee to continue. The Scopes trial was a *legal* case based on ideology, not a scientific challenge.

Over the ensuing decades, the evolutionary

<b>Late 1700s</b>	Figures such as Jean-Baptiste Lamarck and Erasmus Darwin began to question the fixity of species.
<b>Early 1800s</b>	Georges Cuvier, seeking to make sense of the growing array of fossilized organisms being unearthed, asserted that the organisms were distinct, unchanging species that had gone extinct via catastrophic events and then had been replaced by entirely new species—a view that fittingly became known as catastrophism.
<b>1830</b>	Charles Lyell published <i>Principles of Geology</i> that countered catastrophism by arguing that gradual observable processes (e.g., erosion) had always been acting upon the earth—a view known as uniformitarianism. Lyell also put forth evidence that the earth was far older than previously thought.
<b>1831</b>	Charles Darwin sets out on his journey aboard the <i>Beagle</i> .
<b>1836</b>	Darwin returns to Britain and becomes close friends with Lyell, who was during that time one of the most prominent opponents of biological evolution.
<b>1858</b>	Charles Darwin and Alfred Russel Wallace publish their respective work. By this time, the idea that species evolve had been widely discussed for over a century. Both scientists, particularly Darwin with his publication of <i>On the Origin of Species by Means of Natural Selection</i> in 1859, put forth strong arguments and extensive empirical evidence for evolution, and postulated that natural selection was the primary mechanism through which evolution occurred. Initially, the impact of his work was mixed, but he soon achieved fame for his work, and acceptance of evolution became widespread in the following decades. Even Lyell became convinced of the veracity of evolution.
<b>Early 1880s</b>	Around the time of Darwin's death, the biologist August Weismann began publishing research on heredity. The combination of Weismann's work with Darwin and Wallace's ideas led to a new conception of evolution by natural selection without inheritance of acquired characteristics.
<b>1907</b>	Around a dozen theories of evolution were still influential.
<b>1920-1950</b>	Mendel's rediscovered ideas of inheritance were integrated with Darwin's ideas of evolution by natural selection [11]. Scientists such as Theodosius Dobzhansky and E. B. Ford provided significant empirical support for, and enrichment of, the theorized mathematical relationships between Mendelian genetics and evolution by natural selection [12] [13]. Empirical and theoretical work of scientists from around the world continued to converge on this new version of evolution by natural selection that had been combined with modern notions of Mendelian genetics, resulting in what is now known as the "synthetic theory of evolution" [13]. Many of the concerns that had held natural selection back during Darwin's time (e.g., 1-4 above) could finally be adequately answered. The evidence supporting biological evolution became overwhelming.

**Table 1.** Changing understanding of Earth's geology and diversity of life from the late-18th to early 19th centuries.



### NATURE OF SCIENCE CONNECTIONS

Methodological naturalism is the idea that science ideas can only use natural factors, as opposed to supernatural ones. Far from representing unfair prejudice against religion, methodological naturalism is a necessary constraint that is self-imposed by scientists. This is done because science seeks to understand nature in a way that humans can comprehend and leverage to advance science and technology development. Ideas that invoke the supernatural do not provide the kind of understanding to achieve those ends. The history of science provides many examples of natural phenomena that appeared to be beyond human understanding and were attributed to the supernatural. But holding to the view that a natural explanation could be developed has resulted in scientific and technological advancements that would otherwise not have occurred. These gains have been made by both deeply religious scientists and those rejecting a supernatural being. Scientists can be deeply religious and reject philosophical materialism (i.e., the view that nothing but physical entities and forces exist), yet avoid appeals to supernatural explanations within science. A meteorologist may still believe that a deity is ultimately behind the weather, but does not seek or invoke such explanations while engaging in science.

synthesis led to the rise of evolutionary biology as a professional discipline, and consensus regarding natural selection as the primary mechanism of evolution due to converging lines of evidence from numerous scientific fields. For those who viewed evolution as a threat to their worldview, the ascendancy of evolutionary biology was seen as a cause for concern.

In 1961, John Whitcomb and Henry Morris, both young-earth creationists, published *The Genesis Flood*. Bypassing the scientific peer-review process, the book rejected uniformitarianism and many other aspects of modern geology that were incompatible with young earth views. The authors argued for a return to 19<sup>th</sup> century catastrophism, with the biblical flood again being used to explain the distribution of fossils. Neither Whitcomb (a theologian) nor Morris (a hydraulic engineer) had expertise in geology or biological evolution. The book received little attention from scientists (Scott, 1997), but “creation science” resonated with antievolutionists who sought to use the ideas to try to question the soundness of the scientific underpinnings of evolution (e.g., evolution by natural selection requires an old Earth to account for all life on earth sharing a common ancestor).



### RED FLAG

#### **Lack of necessary scientific expertise & Inability to publish in peer-reviewed sources**

John Whitcomb and Henry Morris are considered to be the founders of creation science. However, Whitcomb was a theologian with a limited background in the sciences. Morris was a credible hydraulic engineer, but did not possess needed expertise in geology or biological evolution. The fact that Whitcomb and Morris were contesting the age of the earth, yet lacked needed expertise in geology was a red flag for creation “science” from its very beginning. Moreover, while sound scholarship can and does appear in books, a common tactic used in science mis/ disinformation efforts is to evade the science journal peer-review process and instead publish misleading or false information in outlets, such as books, that avoid expert vetting of ideas.

After a 1968 U.S. Supreme Court decision brought an end to efforts to ban the teaching of evolution, a new strategy arose: instead of seeking to ban the teaching of evolution, effort would be directed at portraying creation “science” as a valid, scientific alternative worthy of inclusion in the school

curriculum (Binder, 2007). To promote such ends, Henry Morris in 1970 helped to found the Institute for Creation Research (ICR) that presents itself as a scientific research organization dedicated to young-earth creationism. Their website states (ICR, 2022):

Our research is conducted within a biblical worldview, since ICR is committed to the absolute authority of the inerrant Word of God. The real facts of science will always agree with biblical revelation because the God who made the world of God inspired the Word of God. ... ICR holds that the biblical record of primeval history in Genesis 1–11 is factual, historical, and clearly understandable and, therefore, that all things were created and made in six literal days. ... Further, the biblical Flood was global and cataclysmic, and its after-effects therefore explain most of the stratigraphic and fossil evidence found in the earth's crust. It is within this framework that ICR research is conducted.



### RED FLAG

#### **Pretense of larger support in science & Fabrication of a fake scientific controversy**

Notice how the name of the Institute for Creation Research (ICR) portrays a legitimate scientific research organization. However, a group of scientists visiting the ICR concluded that, “no member of the resident faculty of the ICR has continued an active and published research program since arrival at the ICR. The Institute for Creation Research can therefore not be considered to be a scientific research institution” (Wills et al., 1990, p.22, as cited in Scott, 1997). Such use of official sounding organizations and journals is a common strategy to sow confusion among the public regarding which groups actually represent the scientific community. Other examples of official sounding creationist organizations include the Center for Science and Culture (CSC), the Access Research Network (ARN), and the Intelligent Design Undergraduate Research Center (IDURC).

### QUESTION 1

Why is a pretense of larger support in science and the fabrication of a fake science controversy so easy to accomplish by those spreading misinformation/disinformation?

The ICR plainly asserts its agenda to derive scientific data that conforms to their religious beliefs (<https://www.icr.org/tenets>), but the public largely lacks the understanding necessary to accurately



assess the nature of creation “science” research. Creation “science” articles often attempted to undermine evolution and other well-established scientific ideas by focusing their arguments on isolated details (Scott, 1997). While scientists rebut these arguments, non-experts do not possess sufficient knowledge to evaluate the science being challenged and the discredited creation-science arguments (Scott, 1997). Publications in peer-reviewed scientific journals are therefore unsurprisingly rare, and are heavily criticized by the scientific community. Scott (1997) bluntly states that “[c]reation science was readily shown to be factually wrong, conceptually confused, and based on deplorable principles of scholarship” (p.275), while de Pomerai and Harris (2017) similarly argue that:

Young earth creationism fails dismally as an empirical science. ... Young earth creationism makes claims (hypotheses) that are open to empirical testing ... but these have been shown to be entirely false by the mainstream empirical sciences countless times, and yet young earth creationism persists in making these claims. (p. 13)



## RED FLAG

### **Neglect of refuting information**

The ICR and other creation “science” proponents openly admit to rejecting scientific knowledge that they perceive as conflicting with their literal interpretation of the Bible. They reiterate views about Earth's age and evolution that directly conflict with an overwhelming body of scientific work across science disciplines and over decades. Creation “science” also has a notable lack of scientific publications in peer-reviewed scientific journals. This means that they are not truly pitting their work against the vast work supporting the scientific consensus positions. Their neglect of refuting information is a common characteristic of misinformation/ disinformation efforts.

### **QUESTION 2**

Many well-established science ideas face anomalies — phenomena that are unexplained or appear to be at odds with the accepted scientific idea. How is that different than neglecting of refuting information?

The efforts of Morris and the ICR have had virtually no impact on the fields of geology or evolutionary

biology. Politically, however, proponents of creation “science” managed to pass bills in 27 states by the early 1980s that required evolution to be taught alongside creation “science” in public schools (Branch & Scott, 2009). Courts have consistently ruled against creationists political efforts. In 1986, one such law in Louisiana was challenged in the Supreme Court of the United States in the case of *Edwards v. Aguillard*. The law prohibited the teaching of evolution, but only if creation “science” was not also presented as a competing scientific viewpoint. In ruling upon the case in 1987, the Supreme Court determined that creation “science” was a religious idea, and that it was unconstitutional based on the Establishment Clause of the First Amendment. Scott (1997) notes that “academics concluded that *Edwards* sounded the death knell for creation science”, but that in reality the ruling simply caused proponents to adapt and modify their language.

Those opposed to the teaching of biological evolution realized that neither the banning evolution education or mandating the teaching of creation “science” would withstand legal challenge. In 1988, a new term arose that would become significant in the next disinformation/misinformation tactic: intelligent design (Forrest, 2007). Intelligent design (ID) is a renewal of an ancient idea that had previously been popularized by the English theologian and philosopher William Paley in 1803 (Greener, 2007). Paley had argued that just as a watch suggests the existence of an intelligent designer, so too does the universe through its order (Greener, 2007). ID made the same argument, but did so by claiming that particular subcellular structures and biochemical pathways could not have arisen by natural means (Palevitz, 2002).

Central to the ID movement was biochemist Michael Behe's concept of irreducible complexity that he introduced in 1996 (Boudry et al., 2010). Behe was vague in what exactly he actually meant by irreducible complexity, but the most consequential interpretation of his idea was that complex biological systems (e.g., bacterial flagellum and the inner ear) existed where the removal of a single component would result in the system and its parts no longer functioning in any context, making the evolution of those systems implausible (Boudry et al., 2010). If irreducible complexity existed, it would *not* alone have meant rejecting the theory of evolution (an overwhelming body of evidence from many scientific disciplines coalesce in support of the theory), but it

would have been a serious anomaly that demanded the full attention of the scientific community. But the idea of irreducible complexity did not withstand scientific scrutiny. In fact, early 20<sup>th</sup> century geneticist Herman Muller had already proposed how the individual components of a complex system could have originally possessed different functions, and only over time did they become dependent on one another and take on new roles within the larger system (Boudry et al., 2010). Biologist Kenneth Miller has pointed out just such a system with the inner ear, where the mallens, incus, and stapes evolved from parts of the reptilian jaw, where they once possessed different functions (Boudry et al., 2010). Similarly, scientists have published an abundance of peer reviewed studies refuting claims about the irreducible complexity of the flagellum, vertebrate blood clotting cascade, etc. (Miller, 2005).

Despite the scientific setbacks that doomed irreducible complexity, the political movement continued. That was the case because the issue of irreducible complexity, like creation “science”, was not a scientific issue, but rather an ideological one. This lack of actual focus on science has been evident by the dearth of scientific publications by irreducible complexity proponents. Palevitz (2002) notes:

I once challenged Dembski to produce just one paper in the peer-reviewed literature containing positive evidence in favor of ID. He punted by arguing that mainstream scientists conspire to deny IDers access to the literature, and insisted that an unnamed colleague in Cambridge, U.K., has data but is afraid to go public, fearing retribution. (pp. 1718-1719)



### RED FLAG

#### ***Inability to publish in peer-reviewed sources & Promoting conspiracy explanations***

Note how Dembski resorted to accusations of a conspiracy to suppress ID when confronted with the absence of any peer-reviewed articles supporting the idea. An inability to publish in peer-reviewed sources and the use of conspiracy theories are both classic warning signs of misinformation/disinformation efforts.

The motives of the ID movement were exposed in the leak of a Discovery Institute document known as “The Wedge.” Unlike creation “science”, ID was generally portrayed as being more secular and academic. This was crucial to avoid court rulings like those against creationism based on the

Establishment Clause (Palevitz, 2002). However, in “The Wedge”, the Discovery Institute openly referenced God, and detailed the ideological aims of ID—specifically, to defeat scientific naturalism and materialism. The document describes how materialism could be seen as a tree that could be felled if a wedge were used to split its trunk (Discovery Institute, 1999):

We are building on this momentum, broadening the wedge with a positive scientific alternative to materialistic scientific theories, which has come to be called the theory of intelligent design (ID). Design theory promises to reverse the stifling dominance of the materialist worldview, and to replace it with a science consonant with Christian and theistic convictions.



### RED FLAG

#### ***Perceived threat to worldview***

The Wedge clearly articulates the underlying motivations that have been behind both creation “science” and ID: evolution is blamed for promoting scientific naturalism and philosophical materialism that are viewed as insidious threats to religious worldviews (Pennock, 2010). But, as noted earlier, many scientists—including famous evolutionary scientists—have a strong faith in God while accepting the veracity of biological evolution. The perception that a science idea threatens a worldview is a classic misinformation/disinformation red flag.

### QUESTION 3

How does “The Wedge” strategy show that creation science and intelligent design are not genuine efforts to improve understanding of the natural world?

The ID movement reached a pivotal moment in 2004 when the Dover Area School District school board in southeastern Pennsylvania voted 6-3 in favor of a resolution that required science teachers to read a statement to their ninth-grade biology students that included the following (Kitzmiller v. Dover, 2004, p.2):

Because Darwin's Theory is a theory, it is still being tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations.

Intelligent design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People* is available for students to see if they would like to explore this view in an effort to gain an understanding of what intelligent design actually involves. As is true with any theory, students are encouraged to keep an open mind.

## NATURE OF SCIENCE CONNECTIONS

Scientific theories are “a well-tested explanation that unifies a broad range of observations”, but the first three sentences above emphasize uncertainty. A common misconception is that scientific theories, with sufficient evidence, eventually become scientific laws. This is incorrect because scientific theories and laws serve different purposes. Scientific theories explain scientific laws; thus, theories never become laws. For example, Atomic Theory is fundamental to understanding of matter, yet it will never become “Atomic Law.” Likewise, the core ideas of biological evolution are well-established. The word “theory” denotes the explanatory and unifying function of the knowledge, not the level of confidence in it.

During the legal challenge to the school board resolution (*Kitzmiller v. Dover Area School District*), numerous experts including biologists, paleontologists, philosophers, and theologians testified that ID did not qualify as a scientific idea. Philosophy professor Barbara Forrest delivered some of the most devastating testimony by showing how drafts of the ID textbook *Of Pandas and People* had merely substituted creationism language with references to ID (Branch, 2007). The simple replacement of the words was evidence that ID was merely another form of creationism. In December of 2005, Judge Jones ruled that ID failed to qualify as science, that it was instead a form of creationism, and that the Dover school board's resolution was unconstitutional under the Establishment Clause of the first amendment (Burt, 2008).

Within the scientific community, court cases do not decide what is or is not science—scientists do.

However, the *Kitzmiller* ruling accurately reflected the consensus viewpoints of philosophers of science, historians of science, and scientists themselves: neither ID nor creation “science” are legitimate science ideas. Proponents of ID and creation “science” have failed to establish productive scientific research agendas, publish significant work in established scientific journals, or otherwise advance understanding of the natural world. The rejection of methodological naturalism displayed by these ideological movements makes such advances nearly impossible, and leaves them with few options beyond continued attempts to attack evolution. However, modern evolutionary theory is the product of research efforts, arguments, and overwhelming evidence that converge from many science disciplines. Research from genetics, paleontology, geology, and numerous other fields underpin the synthetic theory of evolution as one of the most well-supported ideas in science. Principles of evolution are now even fruitfully being used in numerous practical, applied contexts, such as medicine, agriculture, natural resource management, and conservation biology (Hendry et al., 2011). But anti-evolution efforts persist. In 2021, a bill designed to allow the teaching of ID in science classrooms was passed 72-21 in the Arkansas House of Representative, but was stopped in a state senate committee (Branch, 2021).

Faith is a foundation for many people, including many scientists (Ecklund, 2010), but it need not and should not be separated from reason. Science values careful reasoning guided by a structured framework to recognize what does and does not constitute valid scientific evidence. This same strategy is needed to recognize and call out science mis/disinformation.

### QUESTION 4

Identify two ways that misinformation/disinformation efforts interfere with rationale thinking?

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