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Contents

Interpreting the Miracle Stories

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Matthew says the Bethlehem star led the Wise Men to the manger where Jesus lay (2:9). Mark states that Jesus speaks to the wind and makes it calm (4:39). Matthew, Mark, and Luke all attribute epilepsy to demons. These seem incredible to us, who have a twenty-first century understanding of such events, and can shape the science-religion divide. How, then, can we today interpret these stories in our sacred text?

To begin resolving this problem, we need to make a clear division between (a) meanings conveyed through narratives and (b) physical processes observed through science as well as events studied by the field of history. The two – narratives/meaning and science/history – use different methods and produce different conclusions. Narratives, such as these New Testament stories, are designed to produce certain meanings, and they do this by employing the cultural elements of their day. If we want to "hear the author's voice," we must read the text as the author expected. The author expected readers to draw on the culture of their time. The Gospel writers were informed by first-century culture, and people in that culture believed storms were caused by angels, gods, and demons. The meaning of the story in Mark, about Jesus calming the wind, is that Jesus is stronger than the forces of evil, however each culture understands "forces of evil" (and each culture understands such forces differently). This is the likely meaning the author intended for readers to find.

Next, let us turn to the question of science, that is, which "science" to use as we read the events in these stories. Ancient "science," such as it was in rural Judea,

understood storms to be caused by spiritual forces, so that the "storm at sea" fits into their general understanding of "demonic winds." For the ancient world, Jesus exorcising the wind demon made perfect sense. The star stopping over the house in Bethlehem was really a spiritual power of some kind (e.g., an angel), and this was probably how people of that time understood it. After all, they thought that all the stars and planets were powerful spiritual beings. The healing of the epileptic (Matt. 17) occurred through an exorcism, which was in keeping with how such conditions were comprehended then. The uncontrolled shaking was "obviously" the result of some evil force that had taken control of the boy. Indeed, to say that epilepsy was caused by a "brain disorder" would have made no sense then. The meaning of these stories is that God is at work, defeating the powers of evil and leading people to God's messiah.

Still, if we read these stories informed by modern science, we run into problems. Our conceptions of science and nature have vastly changed since the time of Christ. We understand winds to be caused by physical forces, so the meaning of the Mark passage may change to: "Jesus controls the physical forces of the winds." Viewed this way, however, there is nothing of the original meaning about "controlling evil." We understand stars to be giant bodies of gas undergoing thermonuclear reactions, so the meaning for us of the passage from Matthew is that God moves and then stops physical bodies in the sky – a miracle in itself – to lead people to the manger. Here we still see the original meaning about leading people, but without the sense that God has control over all spiritual powers. We understand epilepsy to be caused by a disorder in the brain, so today the meaning of Gospel texts pertaining to epilepsy become "Jesus controls the brain." However, this lacks much of the initial meaning.

So, which meaning should we choose? The authors expected and intended for these passages to be read in light of first-century culture and for readers to find meaning in them about evil forces, which the first century encoded as "demons." That is the **first concept** to keep in mind as we read these stories. They provided ancient readers with a sense of God's protection against a very real spiritual power.

Stories function as mental simulations

A **second concept** is that stories function as mental simulations. All stories create mental simulations we run in our heads, with characters and events that seem to really exist and happen, even though they do not actually exist or happen as we read the stories. This is also true for biographies, for events recounted in them don't occur as we read, but are simulations constructed by our minds. Sometimes these simulations are about events that we know are not real, as in fantasy and science fiction novels. When we read a Harry Potter book, the events may seem real, even though we don't believe that wand-waving can create a wind or repair glasses. The simulation creates meaning for us, whether the events could or could not have happened.

In like manner, when we read these New Testament stories, they seem real to the reader of the story world, even though today's reader may have questions. In the story world, the reader experiences the fear of demonic intrusion, and feels the very real threat of death.

Returning to the story of epilepsy in Matthew 17: when reading through the eyes of first-century culture, we come to verse 15, which states that the boy is "an epileptic" (NRSV). Only that is not what the Greek text says. It states the boy was "moonstruck," because in first-century culture, seizures were thought to be caused by the moon, and the moon was controlled by demonic spiritual powers. So, this child needs an exorcism, which Jesus proceeds to do.

Except here the story diverges from first-century understanding. Humans, by themselves, weren't thought to have the authority or the power to control demons. Rather, exorcists relied on "outside powers," usually in the form of amulets, incantations, special roots, and the like. But Jesus doesn't use any of these. He simply commands the demon on his own authority. This shows the first-century reader that Jesus is more than a man: he has divine authority. Hence, this story is designed to tell such readers something about Jesus, which would cause them to be in awe, and wonder exactly who he is. It also shows that Jesus breaks the power of evil forces that harm humans.

We get a similar meaning with the "great windstorm" at sea. First-century readers would have been confused by Jesus commanding the wind-demon, because humans don't have the power or authority to control demons. Then Jesus tells the demon to "be quiet, be muzzled" (a better translation than the NRSV's "Peace! Be still!"), which would have been even more shocking! Humans can't do that. Clearly, Jesus is more than just a man. He acts with divine authority. He breaks the power of evil forces. It is no wonder that the story ends noting that the disciples are "filled with a great awe" (v. 41).

In a similar way, in the first century the star would be seen as a spiritual being, who is leading the wise men to the manger. The reader of that time feels awe that God is both acting in their world and leading people to a special event.

The **third concept** to keep in mind is that the *meaning* is the point of the story, not the *cultural clothing* that encodes it. That is, the storm at sea event is about how Jesus controls the powers of evil, but is not validating cultural notions that demons cause storms. Culture is the way of conveying the meaning of the text, but once the meaning is communicated, it can be separated from its cultural clothing. Again, consider a Harry Potter novel. The meaning is conveyed through the means of magic, but the novel isn't validating that magic happens in our world. Similarly, the Bethlehem Star is conveying the notion that God leads God's people toward a great new event, but it is not validating the notion that stars move and then stop. Likewise, Matthew 17:14-20 is not confirming the notion that epilepsy is caused by the moon/demons, but that Jesus has greater authority than the powers of evil.

A **fourth concept** involves bringing the meaning intended by the author into the twenty-first century. God communicated the New Testament in the culture of first-century people. But in these examples, there are core meanings hinted at throughout this article, as where I describe demons as powers of evil, however each age understands that. We have no difficulty in grasping the core meaning of "powers of evil," but we would encode this meaning differently in our culture.

Here we might consider the contemporary notion of body image. Negative body images can cause people to be miserable about themselves, possibly resulting in bulimia, anorexia nervosa, or worse. Similarly, consider ideologies harmful to those who hold them and outsiders, such as Nazism or nativism. Or an obsession with buying more and more things. All of these are "outside" evils that afflict people, potentially controlling and ruining lives. To all of these, the stories considered here promise deliverance, as do other biblical stories. God has delivered us a radical new freedom. We can choose to hold on to the old Kingdom of the Earth, or embrace the new Kingdom of God.

In the final analysis, such stories convey meanings designed for humans, no matter which age they live in. The meaning remains relevant, for the human condition is surprisingly similar across times and cultures. All of us struggle with greed, exclusivism, tribalism, anger, hate, revenge, and so on. We all have neighbors and outsiders. God speaks into our world with miracle stories that shine a light into these darkest corners of our souls, and promise a way out.

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The Persistence of Design Language

E. Harold Breitenberg, Jr.

SciTech† Editor

A curious persistence of design language is evident in contemporary descriptions of biological evolution. While this occurs most often in reports about recent scientific findings that appear in newspapers, magazines, websites, and the popular press, design language also occasionally shows up in academic writing.

This article explores the widespread use of design language in both mass market and scientific publications. Although these kinds of descriptions may be accounted for as imprecise terminology, intended to convey information in ways that can be understood by non-specialists, the persistence of design language can also create an impression of intentionality, purpose, and goal in biological evolution. Such use of design language is odd, therefore, since evolutionary theory does not allow for any purpose, goal, design, or intention in evolution.

To highlight the extent and durability of such terminology, I call attention to numerous descriptions of biological evolution that employ the language of design, purpose, and intention. This widespread usage raises the question whether design language may give rise to misconceptions about evolution while also reflecting the continued intuition of purpose in creation – that resonates with religious beliefs and tenets – but in ways that are significantly different from the perspectives advanced by proponents of Intelligent Design (ID).

The start of my interest in this curious aspect of publications about biological evolution occurred several years ago, when I was reading a *New York Times* article titled "Plants Can't Talk. But Some Fruits Say 'Eat Me' to Animals." The article's subtitle caught my attention: "Two national parks in Uganda and Madagascar presented researchers with a natural experiment to understand how **plants have adapted to appeal to animals** that spread their seeds." The words "adapted to appeal to animals" seem to imply intention on the part of plants. While this simply might have been a way for the subtitle to attract the attention

of potential readers, some text in the body of the article also appeared to convey the notion of intent:

> Over millions of years of natural selection, **these plants have developed ways to communicate with animals** through their fruits, new research suggests, saying something like "choose me." With traits evolved to match each animal's sensory capacities or physical abilities, fruits can signal dinner time in the jungle, and further their plant's survival as a species. [emphasis added, here and throughout]
>
> Dr. Valenta and her colleague Omer Nevo, an evolutionary ecologist at the University of Ulm in Germany … are working to understand how **plants have adapted to appeal to animals** that spread their seeds.
>
> In a similar way, **many flowers tailor their petal shape, color, texture or nectar's scent or flavor to attract often a single pollinating species**.

A few months later I read the article, "A Man Kept One of the 'World's Most Dangerous' Birds on his Farm. Then it Killed Him," about someone who, tragically, was killed by the cassowary he kept on his farm. Cassowaries, which can grow as tall as a human and are related to rheas, emus, and ostriches, are sometimes referred to by ornithologists as the world's most dangerous bird, due to the long, sharp, pointed nails on their feet. The article quoted Eric Slovak, assistant curator of birds at Washington, D.C.'s National Zoo, who said, "It's just kind of a big, 200-pound, six-foot bird roaming around eating fruit all day," and also noted that "their deadly nail was **probably developed to help them move through the dense forests**." Strangely, his description – "probably developed to help them" – attributes purpose to the evolution of a distinctive physical trait.

My suspicion that the use of such language, implying purpose, design, or intention, was not simply a rare instance of careless writing, was reinforced when I read an article published by National Public Radio, titled "Golden Arches: Human Feet More Flexible Than We Thought." The article began by commenting that "The notion that sport shoes and inserts should keep the human arch stiffly supported is a decades-old assumption that could use some rethinking …." And concluded with this statement:

> Robin Huw Crompton, a physical anthropologist at the University of Liverpool's Institute of Ageing and Chronic Disease, says his findings suggest the outer arch of the healthy human foot is actually much more flexible than previously thought. … "A sports shoe with a lot of arch support might not be such a great idea," he says. A bit of cushioning is fine. "But I'd look for a shoe that lets your toes wiggle and doesn't constrain foot motion. You want your foot to be able to move and flatten because **that's what it's designed to do**."

Design language also appears in "Your Body Knows You're Burned Out," published in *The New York Times*. Quoting Christina Maslach, a social psychologist at the University of California, Berkeley, the article notes that "**Our bodies were 'not designed for the kinds of stressors that we face today'**."

Plants have adapted to appeal to animals

Another National Public Radio broadcast, titled "A Musical Brain May Help Us Understand Language and Appreciate Tchaikovsky," calls attention to differences in how humans and macaque monkeys hear sound. According to the broadcast's creator, Jon Hamilton,

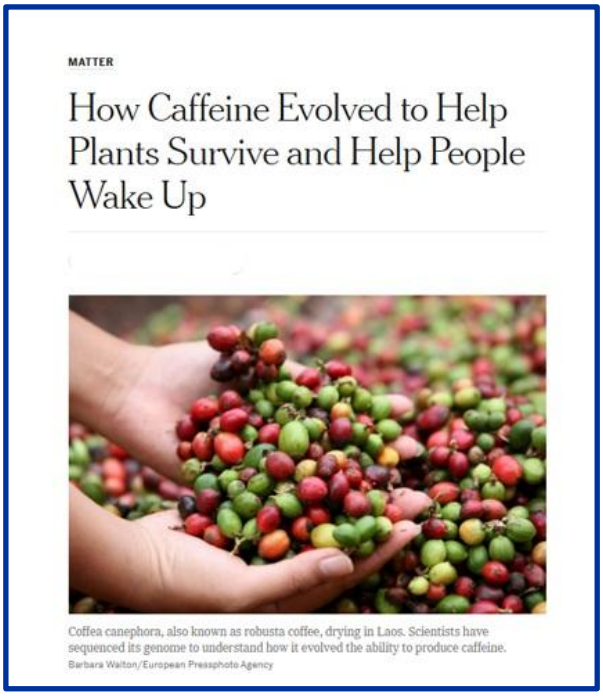
> What sounds like music to us may just be noise to a macaque monkey. That's because a monkey's brain appears to lack critical circuits that are highly sensitive to a sound's pitch, a team reported Monday in the journal *Nature Neuroscience*. The finding suggests that **humans may have developed brain areas** that are sensitive to pitch and tone **in order to process the sounds** associated with speech and music.

Purpose terminology appears in the title of the *New York Times* article, "How Caffeine Evolved to Help Plants Survive and Help People Wake Up." Drawing on the report, "The Coffee Genome Provides Insight into the Convergent Evolution of Caffeine Biosynthesis," published in the journal *Science*, the *Times* article's author, Carl Zimmer, incorporates the language of purpose and intent in various ways. According to him,

> Despite our huge appetite for caffeine … scientists know little about how and why plants make it. … The new study … sheds light on how **plants evolved to make caffeine as a way to control the behavior of animals –** and, indirectly, us. … When coffee leaves die and fall to the ground, they contaminate the soil with caffeine, which makes it difficult for other plants to germinate. Coffee may thus use caffeine to kill off the competition. … **Plants make nectar to feed insects and other animals so they'll spread their pollen**. When insects feed on caffeine-spiked nectar, they get a beneficial buzz: they become much more likely to

remember the scent of the flower. This enhanced memory may make it more likely that the insect will revisit the flower and spread its pollen further.

The *New York Times* piece, "Why Do Americans Refrigerate Their Eggs?" explains why people in the United States refrigerate eggs while those in Europe,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How Caffeine Evolved to Help Plants Survive and Help People Wake Up

Coffea canephora, also known as robusta coffee, drying in Laos. Scientists have sequenced its genome to understand how it evolved the ability to produce caffeine.
Barbara Walton/European Pressphoto Agency

Asia, and elsewhere typically leave eggs unrefrigerated. The author, Kim Severson, notes that US egg producers, with 3,000 or more laying hens, are required to wash their eggs. "But – and here is the big piece of the puzzle – washing the eggs also cleans off a thin, protective cuticle **devised by nature** to protect bacteria from getting inside the egg in the first place."

In an online article from the US edition of *The Guardian*, titled "The Secret Life of Plants: How They Memorise, Communicate, Problem Solve and Socialize," the author reports on an interview she conducted via Skype, with plant neurobiologist Stefano Mancuso, during the early weeks of the COVID-19 pandemic. Mancuso, who studies intelligence and behavior in plants at the University of Florence, stated that "In a plant, a single brain would be a fatal flaw because **they have evolved to be lunch**. '**Plants use a very different strategy** …'."

Similarly, the author of the *New York Times* article, "Why You Procrastinate (It Has Nothing to Do With Self-Control)," draws on design language in explaining why humans often put off doing things until later. The article's author, Charlotte Lieberman, comments that "Procrastination is a perfect example of present bias, our hard-wired tendency to prioritize short-term needs ahead of long-term ones." She then quotes from Dr. Hal Hershfield, a professor of marketing at the U.C.L.A. Anderson School of Management: "**We really weren't designed to think ahead** into the further future because we needed to focus on providing for ourselves in the here and now."

Although terms that convey notions of purpose, intent, and design most often appear in materials written for newspapers, websites, and the other publications intended for a general audience, such language is also at times used in academic publications. For example, *Science, Evolution, and Creationism*, published by the National Academy of Sciences (USA), includes a description of microevolution. The authors write,

> Another example of microevolutionary change comes from an experiment on the guppies that live in the Aripo River on the island of Trinidad. Guppies that live in the river are eaten by a larger species of fish that eats both juveniles and adults, while guppies that live in the small streams feeding into the river are eaten by a smaller fish that preys primarily on small juveniles. **The guppies in the river mature faster, are smaller, and give birth to more and smaller offspring** than the guppies in the streams do **because guppies with these traits are better able to avoid their predator in the river** than are larger guppies.

Plants have evolved to be lunch

According to Becky Ferreira, author of a *New York Times* article titled "When Snakes Had Use for a Pair of Legs," snakes with hind legs,

> such as the Najash group, did not represent a short-lived evolutionary phase. Instead, snakes retaining two of their legs were **a successful body plan** that sufficed for eons until most snakes transitioned into fully limbless slitherers during the latter half of the Cretaceous period.

Citing Michael Caldwell, a vertebrate paleontologist at the University of Alberta and co-author of a study published in *Science Advance*, Ferreira writes: "**Snakes probably were one of the first lizard groups to start experimenting with limb-lessness** …."

Moreover, the language of a successful body plan appears in the *Science Advance* research article itself:

> This indicates that … (ii) the "forelimb-absent and hindlimb-reduced" morphology was **a stable and**

> **successful body plan**, rather than a transient phase between limbed and limbless conditions ….

The *New York Times* article, "Watch Bees Surf to Safety on Waves They Create," highlights the ability of honeybees to ride on the surface of water. Characterizing honeybees as "world-class surfers," the author, Emma Goldberg, uses information from the journal article, "Honeybees Use Their Wings for Water Surface Locomotion," published in *Proceedings of the National Academy of Sciences of the U.S.A*. (*PNAS*) Goldberg wrote:

> The researchers said the surf-like motion [of honey bees] hasn't been documented in other insects and most semiaquatic insects use their legs for propulsion, what's known as water-walking. It **may have evolved in bees**, they speculate, **so the workers could collect fluid** without getting stuck in the water and dying.

Later in the article, Goldberg quotes from Howard Stone, who teaches mechanical and aerospace engineering at Princeton University. According to Goldberg, Stone "said nature is a helpful guide for technological innovation because [according to him,] **'evolution has had lots of years to try out solutions'** to common physical problems."

Intent and purpose apparently extend to bacteria. As reported in the article "Deadly Superbugs Pose Greater Threat than Previously Estimated," published in *The Washington Post*, author Lena H. Sun notes that "More pathogens are developing new ways of fending off drugs designed to kill them, and infections are spreading more widely outside of hospitals." She then cites Helen Boucher, chief of infectious diseases at Tufts Medical Center, as saying,

> We want to have diagnostic tools and medical treatments for problems we know we're going to have … But we also need to prepare for the kind of resistance that we could never predict. We know from history that **bacteria and Mother Nature are smarter than we are**.

Sun later comments that "**Bacteria are constantly evolving to fend off the drugs used to kill them**."

In the *Washington Post* article, "Newly Discovered Gecko Has a Quick-Release Mechanism for Escaping Predators," the author, Jason Bittel, draws from a publication titled "Off the Scale: A New Species of Fish-Scale Gecko (Squamata: Gekkonidae: *Geckolepis*) with Exceptionally Large Scales," published in the journal *PeerJ*. Bittel begins his article with this:

> Lizards are famous for their ability to detach their tail when a predator grabs it, but a newfound species of gecko from Madagascar takes this ability to the extreme. When a predator goes to take a bite, *Geckolepis megalepis* gives it a mouthful of scales and flesh instead.

Later in the article, Bittel writes that "**The skin** [of this species], in other words, **is built to be torn away**. The geckos don't even bleed." He quotes a herpetologist, Mark Scherz, lead author of the *PeerJ* article, who works at Munich's Bavarian State Collection for Zoology, as saying, "It is reasonable to infer that **this is a good escape strategy, or else it is unlikely to have evolved**."

In the National Public Radio article, "For Humans, Slow and Steady Running Won the Race," correspondent Christopher Joyce generously employs the language of purpose, design, and intent. In discussing the evolutionary transition of humans to walking on two legs, Joyce relies on Dan Lieberman, a biologist and anthropology professor at Harvard University, who claims "Humans invented something better than speed: endurance running. It allowed us to hunt faster animals, and that changed the course of evolution." Joyce continues,

> "**Most animals are designed for speed, for power, not for endurance**," Lieberman explains … "And we are a special species in having been selected for endurance, not speed. **So we grew longer legs and lighter feet; the joints in the legs and pelvis got bigger to absorb a lot of impact; and we grew a bigger butt muscle."**

Commenting on one of Lieberman's projects, Joyce notes, "Lieberman is creating a computer model of how we run. He thinks it will tell him how **the earliest humans evolved to run**. He believes running made us what we are." Additionally, Joyce remarks, "Maybe what Lieberman sees as the body's 'running' adaptations were just for better walking," while also stressing the emphasis Lieberman places on running as exercise. According to Joyce, Lieberman maintains "running is the purest form of exercise," and then

quotes Lieberman as saying "Adding information about how **we evolved to exercise** and how exercise is actually woven into our body's natural selection, in a special way, I think, adds extra relevance."

The earliest humans evolved to run

Another article about the human body, titled "'Selfie Elbow' Is the Latest in a Long Line of Tech-Related Injuries," discusses biological evolution in terms of design. Describing this recent condition experienced by many humans, in which the tendon extending from a person's elbow to their hand becomes inflamed, the author, Hayley Tsukayama, cites a spokeswoman for the American Physical Therapy Association, Mary Ann Wilmarth, a doctor of physical therapy, as saying "Inflammation from taking selfies … happens because you're extending your arm but also trying to keep a firm grip on your phone as you do — something that **the body just isn't designed to do often**."

Citing a research article titled "Tree Crickets Optimize the Acoustics of Baffles to Exaggerate their Mate-Attraction Signal," published in the journal *eLife*, *New York Times* reporter, Katherine J. Wu, authored "He's Too Quiet for His Mate to Hear Him. So He Makes a Megaphone." In the article, Wu writes that

> To stay competitive, the study finds, [male] crickets with quieter voices or tiny bodies will fashion mini-megaphones out of leaves to amplify their calls, coaxing females into mating with them longer and more frequently than they otherwise would.

Wu then quotes Rittik Deb, a biologist at the National Center for Biological Sciences in Bangalore, India, as saying "'We humans boast about loudspeakers, but **[male tree crickets] have evolved to make such a simple structure**,' said Dr. Deb, a co-author of a paper on baffling that was published on Wednesday in the journal *Proceedings of the Royal Society B*."

According to another report, titled "The Big Toe Developed Last so Humans Could Still Climb Trees," Chrissy Sexton, a staff writer for the website earth.com, drew on research published in the *Proceedings of the National Academy of Sciences*. Citing what the authors of that study wrote, Sexton claims that

> **The primate foot** functions as a grasping organ … As such, its bones, soft tissues, and joints **evolved to maximize power and stability** in a variety of grasping configurations. **Humans** are the obvious exception to this primate pattern, with **feet that evolved to support the unique bio-mechanical demands of bipedal locomotion**.

Returning to *The New York Times*, in an opinion piece titled "Is Listening to a Book the Same Thing as Reading It?" the author, a psychologist at the University of Virginia, notes: "Writing is less than 6,000 years old, insufficient time for the evolution of specialized mental processes devoted to reading. We use **the mental mechanism that evolved to understand oral language** to support the comprehension of written language."

Our brains have been designed for locomotion

Finally, a *National Geographic* article, "Why You Move the Way You Do," by Simon Worrall, indicates its focus through the article's subtitle: "Animals – including humans – **evolved to get from place to place**." The article primarily consists of an interview Worrall conducted with Cambridge evolutionary biologist Matt Wilkinson, author of *Restless Creatures: The Story of Life in Ten Movements*. Worrall writes, "You hint at an interesting connection between our love of storytelling and the way **our brains have been designed for locomotion**. Unpack that idea for us." In response, Wilkinson states "This is me speculating, but it refers to how **our psychology has been adapted for locomotion**. Just as **our bodies have been clearly adapted for locomotion**, so, too, have our minds." Continuing, Wilkinson notes,

> Cars … break our link with our biological heritage. The idea of connecting to our ancestral past **requires us to locomote as we are evolved to do**, using our senses and making sure the mind and body are in union.

If I am correct about the peculiar persistence of design language in writings about biological evolution, then what can we make of it, or how can we account for it? The work of Michael Ruse may give a clue. In his 2003 book, *Darwin and Design: Does Evolution Have a Purpose?* Ruse explores the history of the concept of design, as it relates to biological evolution. Noting that animals and plants both have adaptations, Ruse claims that, traditionally, both humans and God were seen as having intentions, which are the reason for adaptations. "Adaptations are God's handiwork, fashioned to help organisms (including humans) to function down here on earth. … Or so it went until 1859, when the English biologist Charles Robert Darwin published *On the Origin of Species by Means of Natural Selection*" (6). Continuing in this line of thought, Ruse notes that Darwin's theory "seemed to

sound the death knell for a forward-looking way of regarding the living world" (7). Yet, Ruse points out, "we all – biologists included – still use function-talk" (7). Furthermore, Ruse says, "We speak of the purpose of the stegosaurus's plates and the function of the eye or the hand. We still say that the finch has a strong stubby beak in order to crack nuts. In other words, we still use the language that theists used in Darwin's day." Moreover, Ruse notes, "Richard Dawkins – a brilliant science writer and fervent atheist – positively boasts of his commitment to the teleological way of thought" (7). Much later in the book, in a chapter titled "From Function to Design," Ruse remarks,

> We are faced with what we have been calling, in as neutral a way as possible, "organized complexity" – although … at a minimum one should rather speak of "seemingly organized complexity." Whatever you call it, this complexity allows for and indeed calls for understanding in human terms of intentionality, of purpose, of design (265).

Furthermore, he argues, "Whether or not organisms really are designed, thanks to natural selection they … seem as if designed (for the ends of survival and reproduction)" (265). Summing up, Ruse writes, "End-directed thinking – teleological thinking – is appropriate in biology because, and only because, organisms seem as if they were manufactured, as if they had been created by an intelligence and put to work" (268). In short, he says, "Where we are today fits very comfortably with the Western tradition of thinking about organisms and final causes" (270).

Reflecting on Ruse's position, and in light of the persistence of the language of design, purpose, and intent in writings about biological evolution, I am reminded of an observation, almost made in passing, by Philip Clayton, Professor of Theology at Claremont School of Theology. In the second edition of *Religion and Science: The Basics*, he offers an intriguing question and response within the context of commenting on Intelligent Design. "Could it be, then, that the real insight of ID [i.e., intelligent design] is this intuition of design, this experience of sensing order in the universe? If that's right, then the painful mistake of ID is the attempt to turn the intuition of divine order into a new kind of empirical science" (20).

An earlier version of this article was presented via Zoom for the Science and Religion Forum's 50th Anniversary Conference, May 29, 2025 (https://www.srforum.org/). Due to space limitations, citations are not provided here but appear as endnotes in the article's online version: https://pastcf.org/scitech/

President's Column

A President's Agenda for the PASTCF

Mark Douglas

This is my first official "President's Column" because this is the first *SciTech†* edition to come out since I was elected president of PASTCF. And I chose to devote the inaugural column written in my new role to laying out some directions that I hope PASTCF will continue to move toward over the next few years. These directions will not be surprising.

One obvious reason they will not be surprising is that they align with the directions in which PASTCF and, more importantly, my immediate predecessor as president, Arnold Rots, have been going. Another obvious reason they will not be surprising is that the need to move in these directions has become, increasingly … well … obvious. And perhaps a slightly less obvious – but hopefully not surprising – reason to continue to move in these directions is that the tensions within and between these directions put on display some of the paradoxes housed within any organization that would explore "science, technology, and the Christian faith" in these complicated times.

So what are these directions? Let me name two: (1) deepening the way we are "Presbyterian" and (2) responding to the ways science and technology are rapidly reshaping the world. Those two directions may feel distinct (and maybe even a bit overwhelming) but, as I hope to show below, they are coming together in increasingly interesting ways that can also meaningfully shape PASTCF's work.

First, PASTCF needs to continue to build out its connections to the Presbyterian Church (USA) at the same time it also strengthens its relationships to ecumenical (and perhaps even interreligious) partners. Changes in the structure of the denomination, coupled with economic stressors and concerns about declining membership, have led to an understandable turn inward within leadership in Louisville (where the denomination is headquartered) and no little amount of hand-wringing there and elsewhere. These changes have also made it harder for PASTCF to find purchase in denominational offices. With whom do we align when one of the offices that has been cut is the Office of Theology and Worship? And how do we advertise when earlier practices, such as hosting a meal for

commissioners at General Assembly, are no longer possible?

One piece of good news in the midst of these changes is that, hopefully, denominational structures are stabilizing within the new Unified Agency. As the work of that body becomes clearer, so too – I hope – will the means through which denominationally-affiliated organizations such as PASTCF connect to the PC(USA). Perhaps an even better piece of good news is that the long slide in membership seems to be abating. Indeed, the denomination is actually growing – rapidly, in some areas – including ones with large international populations and among younger generations. And at least a good portion of such populations bring both an interest in the relationships between science and religion and also a fairly well-founded suspicion about typical ways those relationships have been understood.

I have the good fortune of teaching at one of the denomination's larger theological seminaries and seeing where its future leaders are coming from. That same role has, over the past few decades, allowed me to build relationships with a wide range of leaders within the denomination: pastors, denominational staff, directors of denominationally linked institutions and interest groups, and others. I hope that I may be able to leverage my connections in order to give rise to opportunities for PASTCF not only to become more visible and grow but also to serve the denomination through resources we can provide from within the peculiar little niche of PC(USA)-types that is our membership.

And even as we deepen our connections to the denomination, we need also to broaden our connections to persons and groups from the wider ecumenical world. We are fortunate to already have a strong connection to the Lutheran Alliance for Faith, Science, and Technology. And we are, I think, building out (or, in some cases, rebuilding) our connections to other denominations, including, more recently, the Roman Catholic Church. Moreover, since one of the marks of Reformed theology is that it is ecumenical by nature (we Presbyterians just don't think that the only way to be church is our way), we should see these connections to other denominations as a way that we actually display how to be Presbyterian. And since PASTCF's job isn't to figure out how to keep the wheels on the denomination during these times of change, we may actually be better located to display this "Presbyterian-ness" than are many bodies whose work focuses on the denomination itself.

One reason to broaden these connections is that the wider church's witness is stronger when people do not see it as riven by division or sundered into many small fiefdoms. We need not agree on all matters of doctrine and we certainly won't agree on how faith, science, and technology interact. But the power of religious voices to offer a thoughtful and at least semi-coherent vision of a world large enough to contain both science and religion (not to mention a God large enough to operate in all such spheres) grows when more Christians are engaged in joining their voices to offer such visions.

This moves toward the second direction in which I think PASTCF should continue going: responding to the way science and technology are reshaping the world. And here, the magnitude of such changes is so great that we can lose sight of the way they have come about. It's been only a little over 120 years since the introduction of plastics into the world (and half the plastic that has ever existed has been produced within roughly the past twenty years). Yet plastics now exist not only in every corner of the earth but in every sentient body that moves upon that earth. It's really been only about fifty years since the internet came into existence, about two decades since the explosive advent of social media, and about two years since generative Artificial Intelligence hit the scene. It's also been about fifty years since the beginnings of recombinant DNA technology and barely over a decade since CRISPR technology has allowed for gene-editing. Nuclear technology is about eighty years old, as are widespread vaccination protocols. Space flight is less than seventy years old. Scientific consensus about anthropogenic climate change is just a few decades old.

Put differently, there are people alive today who can remember a time before almost everything I have described in the previous paragraph existed but there is nobody alive today whose life has not been dramatically altered by those things. All these changes (and far more) reveal the power of science and technology to both alter the world and complicate the way we make sense (or, sometimes, nonsense) of that altered world.

So not only the speed but the depth of such changes invites – even demands – thoughtful engagement with science and technology. And, sadly, much of what passes for engagement with science and technology is not only unthoughtful but unwise. In addition, the forces of unwise engagement now have access to unparalleled political and social power.

The current forces of climate-denial, vaccine hesitancy, and techno-utopianism are certainly markers of confusions about science and technology, which confusions need to be addressed. Their power, though, is also funded by science and technology. Social media

allow for the widespread dissemination of mis- and disinformation. Powerful computing systems allow for the kinds of niche targeting that not only leaves us more vulnerable to market forces but also further isolates us from each other and distorts democracy. Advances in drilling technologies make fossil fuels more accessible and more likely to be burned. So science and technology can not only be weaponized (which truth we've known for ages); they also can be weaponized against science and technology. And many of the very bodies that drive such weaponization are at least tinted with religious overtones: for example, Christian nationalism.

This at least starts to suggest that old and clichéd tropes such as "science and religion are in conflict" or "science and religion function in non-overlapping magisteria" are not only illusory; they distract from the very places where persons of thoughtful faith most need to engage with the powers of science and technology. They suck all the oxygen from rooms where thoughtful conversations need to happen.

Those are the rooms that PASTCF needs to be in. They are the rooms that its members need to occupy, speaking truth to nonsense and putting the misuse of science and technology on display, such that better uses of science and technology might be revealed. They are the rooms in which persons of faith need to find each other and align their voices so that they can be heard over the clamor of artifice-based combat and the din of loudly misplaced loyalties.

Now more than ever, PASTCF is being called to play its role in teaching people to think more wisely about the complex relationships between science, technology, and the Christian faith: in advocating for thoughtful policies about engaging science and technology both within and beyond the PC(USA); in modeling what can happen when scientists, ministers, and other interested persons come together to engage each other in faith, curiosity, and charity; in bearing witness to a vision of the world that is bigger than any current crisis and shaped by a commitment to a sovereign God whose will, revealed most clearly in Jesus Christ, is for the flourishing and transformation of creation.

It's a big agenda.

Fortunately, PASTCF has been pursuing this agenda for the whole of its existence. Even more fortunately, the success of that agenda does not rely on the charisms or abilities of any particular set of its leaders, current ones included. And most fortunately of all, it has never pursued that agenda alone.

Book Reviews

The Road to Wisdom: On Truth, Science, Faith, and Trust

Francis S. Collins

Little, Brown and Company, 2024. 288 pages

Reviewed by William Galloway

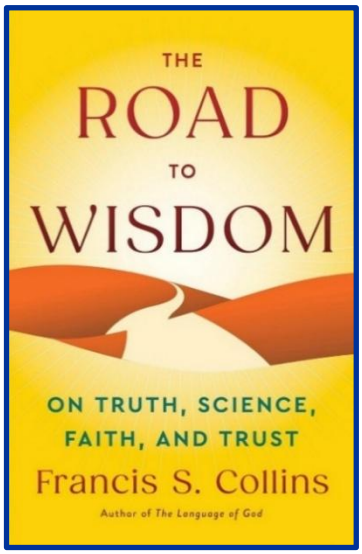
SciTech† Editorial Board

Francis Collins became a well-known scientist as head of the Human Genome Project and then as longest-serving director of the National Institutes of Health. He also authored, almost twenty years ago, *The Language of God*, a best-selling book drawing on his personal religious beliefs and professional career in medical research to argue for the compatibility of fact-based science and Christian faith.

Collins's new book is his attempt, as a scientist and devout Christian, to address the continued deterioration of both understanding and acceptance of scientific reality and the concurrent decline in active religious belief in our social and political culture. Because it is personal to him, he discusses in detail the emergence, especially among his fellow Evangelicals, of resistance to medical recommendations and then to the newly developed vaccine during the COVID-19 crisis. He cites the calculation by the Kaiser Family Foundation that an estimated 230,000 Americans likely died unnecessarily due to refusal to accept the highly effective mRNA COVID-19 vaccine, which was developed, tested, and produced in a near miraculous six months under NIH support. "We are in serious trouble when some believe that their faith requires them to distrust science, or when others believe that their political allegiances are a better source of wisdom than truth, faith, or science" (14). He reviews published data and expert critiques to describe how we remain mired in a crisis of truth and trust, compounded by the emergence of various social media as primary sources of information and by the political amplification of extremism and animosity.

Following the brief discussion of the problem – our society's loss of wisdom as a guide to living and decision making – Collins identifies four "bedrock" sources of wisdom. "The premise of this book is that by reclaiming the solid ground of truth, science, faith, and trust we can find ourselves back on the road to wisdom …." (32). The remaining four chapters discuss each bedrock in turn.

Collins proposes a simple understanding of truth, "… that there is a reality that exists independently of us and that statements or beliefs about that reality are true when they accurately describe it …" (33) and that truth matters in our personal and communal life. He pictures information as four concentric layers. At the core are necessary truths. Firmly established facts, uncertain information, and subjective opinions form the progressively outward layers. Much scientific knowledge lies in the firmly established layer. Collins points to the corrosive impact of postmodernism, which denies the reality of objective truths, thus removing any need to support alternative truths with confirmatory facts. Given the abundance of untruths, Collins proposes a six-fold categorization of it: ignorance, falsehood, lie, delusion, bull****, and propaganda. The English language provides a wealth of terms for different types of untruth, and this categorization works wonderfully well as I peruse the day's news. The chapter ends with a more serious philosophical discussion of how, as humans, our judgement of truths is inherently biased by our personal experiences, beliefs, and culture. Collins pictures this matrix as a spider web of threads, some close to the center and forming our core beliefs, others on the distant edges. New inputs tug at multiple threads, some transmitting, some amplifying, and some dampening the final input to the center. The chapter ends with discussion of negative influences and positive approaches to discerning truth.



As one might expect in a book written by a career scientist, Chapter 3, Science, is the longest chapter. Early pages recount Collins's journey from a PhD in chemistry, to medical school, to postdoctoral research in medical genetics, to manager of a global research initiative, and finally to director of the NIH. Along the way he participated in and then managed several lines of research that led to breakthrough diagnoses and treatments of cystic fibrosis and sickle cell disease among others. Beyond medical applications, the Human Genome project also demonstrated that all races are members of a single family, derived from a common ancestor, a conclusion that counters a long history of racism. He notes, however, that medical science, like all human endeavors, is subject to error, misuse, and ethical issues, providing avenues that can be and have been used to challenge and deny medical realities. Collins summarizes in some detail how this played out during the evolving COVID-19 pandemic. He candidly discusses instances when NIH and the CDC (Centers for Disease Control and Prevention) communicated contradictory or changing guidelines. That said, the politization of and church-based resistance to social distancing, masking, and, finally, use of the mRNA vaccine reflected our long history of growing rejection of scientific truths. To Collins, the more than two hundred thousand avoidable deaths, which probably were a consequence of that widespread denial, are tragic. Similar resistance to established science continues in the ongoing denial of global climate change and its origin in human use of fossil fuels. Collins offers no far-reaching solutions. Medical and global climate science exemplify critical areas where an abundance of "firmly established facts" are contested by the full array of untruths, ranging from ignorance to propaganda. Wisdom is lost.

Chapter 6 discusses the status of faith, particularly traditional Christian faith, in American culture and the consequent impact on our communal search for wisdom. Among recent trends he introduces are the increasing anger with the concomitant rise of Christian nationalism in many congregations, the ongoing conflict between religious conservatives and many facets of modern science, and the rise of Nones, Dones, and Ums (people who claim nothing in particular when polled about their faith or lack thereof). As in the science chapter, Collins traces his own journey of faith, which paralleled his journey as a scientist, from None to committed but questioning Evangelical. Initially his approach was that of a trained scientist: he did extensive research into various religions and faith traditions. An intellectual acceptance of Christianity evolved, with times of personal crisis and mystery at critical junctures along the way. The discussion then moves on to the interplay between scientific truths and Christianity, an interplay that has been and remains both contentious and synergistic. Notably, for Collins, scientific understanding has been an important foundation of his faith. He is frank in his concern about the disconnect between scientific truth and religious dogma, held by many American Christian communities, as well as the distortion of Christian belief by fear, anger, and politics. Yet he remains hopeful that a positive, Beatitudes-based Christianity, which respects and incorporates modern science, can reclaim many from the Nones and Ums camps and help to heal a divided culture.

The discussion of the final cornerstone, Trust, may be the weakest of the four chapters devoted to what he

sees as the four bedrock sources of wisdom. This is understandable, as trust is a quality that is difficult to define, measure, and build (or rebuild) in our modern culture. Polls regularly document the sense of falling trust in all our institutions, public and private. Again, COVID-19 and its aftermath compounded an already declining sense of trust. In our information-clogged world, decisions about the reliability of individuals and sources must regularly be made. Collins presents and describes a simple matrix of four elements that may aid such decision making: integrity of the source, competence of the source, humility of the source (does the source note its limits, admit mistakes, and honestly address opposing facts and opinions), and our aligned values with the source. These are useful elements to differentiate. However, to apply them to important issues can take hard work and much time. The real difficulty comes with assessing aligned values. They can provide a basis for building trust but also serve as blinders to truths not supporting our own beliefs or not popular within our tribe, political party, religious affiliation, or profession. Collins provides two case histories to illustrate use of the criteria: (1) the proposal that cell phone use causes cancer and (2) the issue of voter fraud in the 2020 presidential election. I'll leave Collins's conclusions for readers to discover.

As I read through the book, I was struck by the echoes of Old Testament laments – the sense of loss and exile – in Collins's writing about our crisis of truth and trust (and consequent loss of guiding wisdom). But, having acknowledged and discussed realities of our "wilderness," Collins, like the biblical writers of ancient Isreal, ends with a message of hope, and with a prescription for recovery of wisdom. "Let's begin with a fundamental principle. There is such a thing as truth and that really matters" (219). Facts that are necessarily true, such as mathematics, and concepts that are firmly supported by objective evidence, such as well-documented historical events, require our acceptance. Questions still under investigation that may change and evolve, and opinions that will likely always remain so, allow personal discernment. He continues: our culture must reconnect with shared human values. As individuals, we must make the effort to discern facts from fakes and personal opinion. Here Collins suggests "mental immunization" against the modern barrage of ignorance, falsehood, lie, delusion, bull****, and propaganda, and dependence on multiple, tested, and trusted sources. We need to engage with others. We must help the kids by reclaiming unstructured, play-based childhood and limiting immersion in digital media. As individuals and as groups we need to reengage with our larger communities. There are no surprises here if you have followed ongoing discussions, including several popular books noted by Collins, on the impacts of technology and lifestyle on mental and emotional wellbeing.

This is a thoughtful and useful book for general readers interested in understanding and navigating the state of our twenty-first century society. Collins, as always, writes clear, straightforward prose. His explanations of medical and scientific concepts, technologies, and methodologies are informative and readily comprehensible to the layman. The book covers a spectrum of topics that bridge the state of religious faith, the ongoing breakdown of trust, the proliferation of false information at the expense of factual knowledge, and the dearth of truth in Western democracies. Discussions of each topic are short and general; there are, after all, many topics to be covered in a book on wisdom. He provides simple illustrations and language that helped me better organize my own understanding and daily experiences. Collins intersperses case histories and personal stories to make generalities meaningful at the individual level, and to describe experiences and introduce the people, religious and scientific, who have molded his own thinking.

Appropriately, Collins ends with a benediction: "May we all be blessed by enough foolishness to do what others claim cannot be done: to travel down this road to wisdom with joy, and to help catalyze the reemergence of a loving, civil, compassionate, optimistic, and visionary democratic society. Come, my friends, and be part of that dream" (241).

True Awakening: The Highs, Lows, and Mess of Spiritual Transformation

Kerra Becker English

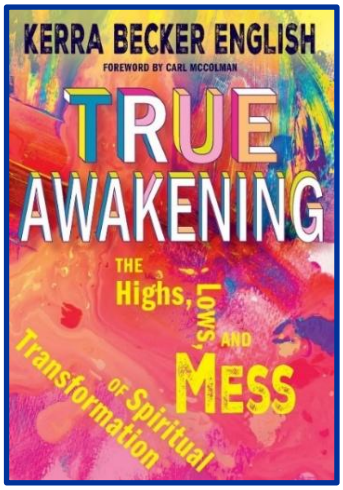
Orbis Books, 2025. 208 pages

Reviewed by Sarah Dennis

True Awakening, by Kerra Becker English, is a deeply thoughtful and beautifully written journey into faith, doubt, and discovering one's truest self in God. English's storytelling is compelling, woven with honesty, vulnerability, humor, and theological depth that never feels forced or forceful. She invites readers to wrestle with big questions while offering comfort and clarity through real human experience.

What struck me most was her ability to balance intellect and heart. The book reads like a conversation with a wise friend: reflective, challenging, and full of grace. English centers the transformative power of awakening to God's presence in everyday life,

encouraging readers to move from passive belief into vibrant spiritual engagement. In my current ministry, we often talk about thin spaces, the places where we can see God at work. This book is a thin space.



It is also perfect for anyone seeking fresh language for faith, or simply longing for a reminder that God's Spirit is still creating, stirring, and awakening us today. After reading it I came away encouraged, inspired, and more rooted in my own spiritual story.

A truly meaningful book that will stay with you long after the last page.

Sarah Dennis, an ordained minister of Word and Sacrament in the PC(USA), is Director of Student Ministry at University Methodist Church, San Antonio, Texas.

From the Editor's Desk

E. Harold Breitenberg, Jr.

Eric Douglass's article starts this first 2026 issue of *SciTech†*, which also marks the journal's 35th year of publication. His piece is followed by my reflection on the curious, widespread, and ongoing use of design language – the language of purpose and intention – in writings about biological evolution. *SciTech†* readers are likely familiar with Mark Douglas's many contributions to the publication and this issue includes his inaugural column as PASTCF's new President. The *SciTech†* editorial board's goal of including book reviews as a regular feature continues, with a review of Francis Collins's latest book, *The Road to Wisdom: On Truth, Science, Faith, and Trust*, and remarks about a recently published book, *True Awakening: The Highs, the Lows, and the Mess of Spiritual Transformation*, written by PASTCF and *SciTech†* editorial board member, Kerra Becker English. Closing out this issue, we again include an article for which there was not enough space in the August 2025 issue, focused on the 100th anniversary of the *Scopes* trial. Here, Jim Miller reflects on aspects of the trial and its legacy, along with remembrances about John Scopes from his sons, and proposes reasons why PASTCF members and others should care about these things.

"He Did Not Care"

Jim Miller

SciTech† Treasurer

From July 10-21, 1925, much of the world was riveted by events in the small town of Dayton, Tennessee. A twenty-four-year-old high school football coach and substitute biology teacher, John Thomas Scopes (1900-1970), was on trial for violating Tennessee's Butler Act.

Today many people know about the events surrounding the trial from the play, later movie, *Inherit the Wind*. Unfortunately, this work adds unhistorical melodrama to the actual story of the trial. The artistic creation was not so much about the *Scopes* trial as it was a critique of McCarthyism, the 1950s anti-communist movement that was ruining people's careers and reputations by making unsubstantiated accusations of treason and subversion. I say "unfortunately" because Scopes's life, the trial, and its aftermath have rich significance for understanding America's past, present, and future. Together they also illuminate the complex relationships among science, religion, and public policy.

With the passage in 1925 of the Butler Act in Tennessee, the American Civil Liberties Union, recently formed in 1920, sought a test case, which it would finance, to challenge the law's constitutionality, on the basis of the freedom of religion clauses of the US Constitution. Learning of this, Dayton's "town fathers" thought that having such a trial there would be good publicity. This was a case of "be careful what you wish for."

It is unclear that Scopes ever taught about evolution. While the textbook he used, *Civic Biology* by George Winter Hunter, included a chapter on evolution, Scopes initially said he skipped it. Nevertheless, the town leaders finally persuaded him to plead guilty to violating the Butler Act.

The ACLU defense team was led by Clarence Darrow, who had gained national attention the previous year by virtue of his successful defense of Nathan Leopold, Jr. and Richard Loeb (ages 19 and 18, respectively) for their kidnapping and murder of 14-year-old Bobby Franks. Darrow succeeded in getting Leopold and Loeb sentenced to life imprisonment rather than death.

The prosecution was led by William Jennings Bryant, three-time candidate for President of the United States, Secretary of State under Woodrow Wilson, renowned

orator and public lecturer, and anti-evolution activist. While Bryant was identified as a "fundamentalist" due to his views on evolution, he was not a young-Earth creationist. During the trial, under examination Bryant acknowledged that the "days" of creation in the Genesis account could actually be long periods of time.

As the trial went on, it became less about what Scopes may have done and more about a clash between the populist and religious traditionalist, Bryant, and the civil libertarian and agnostic, Darrow. When the trial ended, the jury found Scopes guilty and the judge fined him $100. The defense appealed the decision to the Tennessee Supreme Court, hoping the judgment would be upheld so they could argue the unconstitutionality of the Butler Act before the US Supreme Court. However, while the Tennessee Court upheld the constitutionality of the Act, it reversed the conviction of Scopes on a technicality.

While many Americans cheered the overturning of Scopes's conviction and relished Darrow's arguments on behalf of Scopes, other states passed similar laws. The Butler Act stood until 1967, when it was repealed due to a class action suit led by biology teacher Gary L. Scott, calling for a permanent injunction against the Butler Act's enforcement. Still, as the National Center for Science Education (NCSE, https://ncse.ngo) chronicles, there has been an ongoing religiously motivated effort to remove teaching the theory of evolution from public school classrooms, or yoke it with teaching a literal six-day creationism, or adopt unscientific creationism's progeny, "intelligent design." The NCSE provides references to more than 30 court cases, where teaching of the scientific theory of evolution in the public schools or in public museums has been challenged. (https://ncse.ngo/creationism-and-law-0)

More recently, climate science has also become a similar target in public education, for ideological reasons often associated with fundamentalist conservative Christian communities.

Since 1967, when Scott's suit resulted in repeal of the Butler Act, there have been numerous court cases variously testing the teaching of evolution in public schools. Perhaps of most note are these four:

Epperson v. Kansas (1968) – This Supreme Court case essentially put an end to all state laws that sought to ban the teaching of evolution in public schools.

McLean v. Arkansas (1981) – The Arkansas case was about the scientific status of so-called "creation science" and whether it should or could be taught as an alternative to the scientific theory of evolution. The decision in this case only applied to Arkansas.

Edwards v. Aguillard (1987) – This case was similar to *McLean v. Arkansas* but was appealed to the US Supreme Court, so the high court's decision, that so-called "creation science" was in fact an expression of a particular religion, applied nation-wide.

Kitzmiller v. Dover Area School District (2005) – In this US District Court case, the Dover Area School District (Pennsylvania) had adopted as a reference book, *Of Pandas and People*, that was originally developed by the "creation science" community. The school district also required public school teachers to read a statement in class, undermining the scientific status of evolutionary theory and promoting "intelligent design," and citing the above book as a resource. In *Of Pandas and People's* Dover edition, "intelligent design" (ID) was substituted where "creation science" had previously been mentioned. This was the first test case of the scientific status of so-called "intelligent design." ID claims that there are features of the natural world, especially biological aspects, that could not have been produced by evolutionary processes. Additionally, that some biological structures or processes are "irreducibly complex" or exhibit "complex specified information" that could not be produced by random processes and, hence, imply a "designer." ID does not specify who the "designer" might be, though, again by implication, it would be a transcendent being or God. In its judgment, the court found that the Dover Board had acted with religious intent in requiring its statement to be read in class and that ID was a religious proposal, not a scientific one.

Climate science has become a similar target

On July 12 and 13 of 2025, Vanderbilt University's Evolution Studies Initiative, in collaboration with the NCSE, hosted a "Scopes 'Monkey' Trial Centennial Symposium." The gathering covered the *Scopes* trial, modern challenges to teaching evolution, evolution today, the long reach of evolution, teaching evolution, and the relationship of evolution and religion. Its opening presentation is available online (https://www.youtube.com/watch?v=Lhu9xTX0aFw)

Edward Larson, who won a Pulitzer Prize for his book *Summer for the Gods*, provided a summary of the trial and surrounding events. Randy Moore, author of *John Thomas Scopes: A Biography* (2023), gave insights to Scopes, the man. He was the first of Scopes's biographers to spend significant time interviewing Scopes's sons and friends.

Prior to the 1925 trial, Scopes earned a bachelor's degree from the University of Kentucky, majoring in law and minoring in geology. Following the trial, he chose to pursue neither teaching nor the legal profession. Instead, Scopes entered the University of Chicago on scholarship to study geology. He did not

have sufficient funds to complete his degree and was hired by Gulf Oil as a geologist to work in Venezuela. There he met and married his wife, Mildred. In 1930 they returned to the US and Scopes completed his master's in geology at the University of Chicago. Unemployed, he returned to his hometown of Paducah, Kentucky, where he ran for congress as a member of the Socialist Party. Unelected, he eventually moved to Texas where he worked as an oil expert for what later became Pennzoil.

My father didn't know anything about evolution and didn't care anything about it

Though he was reluctant to speak about his Dayton trial experience, even with his two sons, he was present when *Inherit the Wind* premiered in Paducah. He subsequently helped promote the film, though he admitted that he had never read the script. In 1967, the same year of Gary Scott's successful challenge of the Butler Act, *Center of the Storm: Memoirs of John T. Scopes* was published, co-written by James Presley. Scopes spent the last years of his life in Shreveport, Louisianna, dying in 1970.

Although Scopes had been raised in the Catholic tradition, he was described as an agnostic. When his sons were asked, "Did your father ever study or talk about evolution?" his son Bill answered simply, "No. Never." His other son, John Jr., answered, "No. My father didn't know anything about evolution and didn't care anything about it. He was interested in people being able to teach and learn new things. He couldn't have cared less about evolution."

"He couldn't have cared less." There is an irony that the man whose name is forever linked in American history to the "trial of the century," to the first trial ever live broadcast on the radio, to an iconic and mythical demonstration of conflict between science and religion, "couldn't have cared less." But in closing, I suggest three reasons that PASTCF readers, members of the PC(USA), and Christians in general should care.

First, the evolutionary explanation for the cosmos, from the Big Bang to bacteria, is the most challenging scientific finding for traditional Christian theology. Yet its foundational impact has been largely sublimated by a cultural dualism that separates science from theology. The late Holmes Rolston III noted the nature of the challenge: "The religion that is married to science today will be a widow tomorrow. … But the religion that is divorced from science today will leave no offspring tomorrow" (*Science and Religion: A Critical Survey*. Temple Univ. Press, 1st ed., 1987, vi and ix).

Second, in the fifth century Augustine described how, in principle, the failure of the theological tradition to take into account the legitimacy of an authentic understanding of creation resulted in disaster for the religious tradition:

> Usually, even a non-Christian knows something about the earth, the heavens … the cycles of the years and the seasons, about the kinds of animals, shrubs, stones, and so forth, and this knowledge he holds to as being certain from reason and experience. Now, it is a disgraceful and dangerous thing for an infidel to hear a Christian, presumably giving the meaning of Holy Scripture, talking non-sense on these topics; and we should take all means to prevent such an embarrassing situation, in which people show up vast ignorance in a Christian and laugh it to scorn. (*On the Literal Meaning of Genesis*, I, xix, 39).

Third, the Christian community has an obligation not only to support but also to theologically celebrate the findings of the various sciences. I concur with a statement attributed to Nicolas Copernicus:

> To know the mighty works of God, comprehend His wisdom and majesty and power, to appreciate in degree the wonderful working of His laws, surely all this must be a pleasing and acceptable mode of worship to the Most High to whom ignorance cannot be more grateful than knowledge. … Let me repeat … ignorance cannot be more grateful than knowledge." (Attributed to Copernicus, in *Poland: The Knight Among Nations*, Louis E. Van Norman, Fleming H. Revell, New York, 1908, 3rd ed, 290.)

Finally, we should care particularly with respect to evolutionary science, not just for intellectual reasons but for moral ones as well. I share Alfred North Whitehead's perspective: "Where attainable knowledge could have changed the issue, ignorance has the guilt of vice" (*The Aims of Education*, 1929, 26).

As we live in a time of "alternative facts," prevarication that undermines "attainable knowledge," and political abandonment of the search for such knowledge, I believe the Christian community at all levels has a moral obligation not simply to call out such mendaciousness, but to do all that it can to encourage, support, and apply such knowledge in the effort to "love God through loving our neighbors as ourselves."

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Presbyterian Association on Science, Technology and the Christian Faith

Our Mission: As an association related to the Presbyterian Church (USA), it is our mission:

- To point the Presbyterian Church (USA) to scientific and technological developments as they provoke Christian theological reformation, stimulate ethical reflection, and affect the moral actions of the Christian community.
- To call upon the Presbyterian Church (USA) to incorporate the discoveries of science and the capabilities of science-based technologies in its worship, education, and mission of service in the world.
- To affirm Christians for whom science and technology are calls upon their lives and to encourage their distinctive responsibilities in the Body of Christ.