ACTS & FACTS

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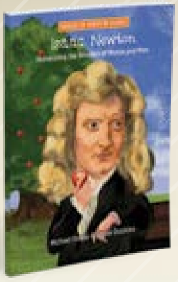

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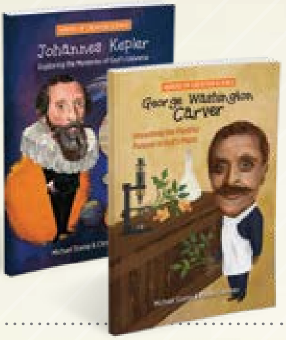

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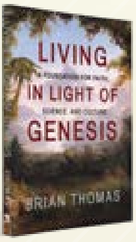

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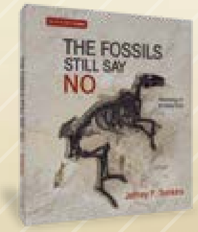

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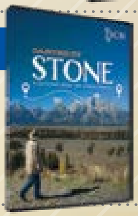

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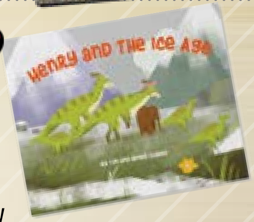

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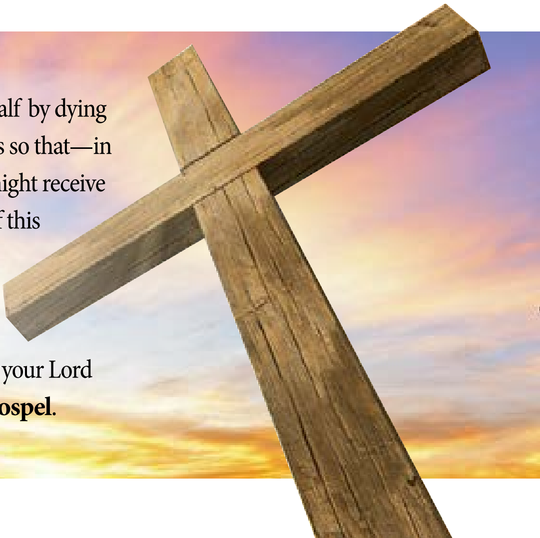

You are deeply loved by God! This certain truth is expressed in a Scripture that sums up the gospel of Jesus Christ: "For God so loved the world that He gave His only begotten Son, that whoever believes in Him should not perish but have everlasting life" (John 3:16). We all need Jesus as our Savior because we are all sinners and can't by our own efforts fulfill the requirements of God's justice. But Jesus Christ, our Creator, could satisfy the Father's holiness, so He suffered the punishment for sin on our behalf by dying on the cross. Jesus was made to be sin for us so that—in the most remarkable exchange ever—we might receive the righteousness of God. We can be sure of this because Jesus rose again from the dead. What a gift of love! You can have the promise of everlasting life when you turn from your sin and believe in Jesus Christ as your Lord and Savior. To learn more, visit **ICR.org/gospel**.

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DESIGNER
Dennis Davidson

[Jesus Christ] is the image of the invisible God, the firstborn over all creation. For by Him all things were created that are in heaven and that are on earth, visible and invisible, whether thrones or dominions or principalities or powers. All things were created through Him and for Him. And He is before all things, and in Him all things consist. And He is the head of the body, the church, who is the beginning, the firstborn from the dead, that in all things He may have the preeminence. For it pleased the Father that in Him all the fullness should dwell, and by Him to reconcile all things to Himself, by Him, whether things on earth or things in heaven, having made peace through the blood of His cross.
(Colossians 1:15-20)

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All Scripture quotations are from the New King James Version unless otherwise indicated.

Front cover: Saber-toothed tiger skull
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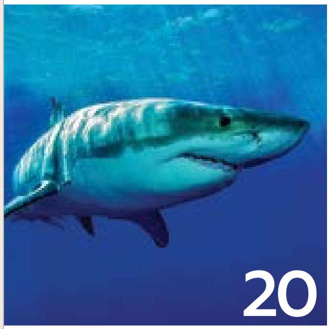
park series

impact



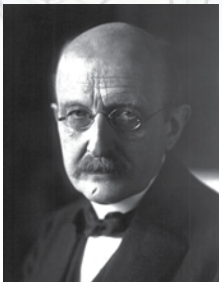
research

stewardship

creation kids

WHY BIOLOGY NEEDS A THEORY OF BIOLOGICAL DESIGN PART 4

RANDY J. GULIUZZA, P.E., M.D.



Nobel Prize-winning German physicist Max Planck perceptively observed that "if you change the way you look at things, the things you look at change."[1] That pithy statement sums up one reason why scientific theories are crafted. Theories shape the way people look at, think about, or understand things in nature.

ICR and other researchers who are developing an engineering-based, organism-focused theory of biological design (TOBD) have a straightforward goal. We want to initiate a much-overdue conceptual catharsis in biological literature. This will involve replacing Darwinian selectionism with a scientifically superior model that's powerful enough to "change the way" people "look at" biology. This will have groundbreaking benefits.

Benefit 1: Mysticism Out and Objectivity In

Evolutionists saturate their functional explanations with mysticism, with "just so" stories and "phantom breeders [and] ghosts in Darwinism"[2] that produce "the kinds of speculative flights associated with Darwinian theory."[3] They employ an elaborate mental construct of imaginative scenarios cloaked in hazy jargon such as selection event (unobserved); unit/object of selection (unidentifiable); selection pressure (unquantifiable); random (untestable); favored, acted on, under selection (personifications); and other ill-defined lingo.

These are crucial concepts to the evolutionary narrative, but they're not conducive to objective assessments. The conventional selection-based explanation of biological adaptation is not a description of real, observable events or a cause of any phenomena. It's simply the verbiage Darwinists use to express the concepts underlying their anti-design way of looking at creatures.

An engineering-based approach is invaluable to biological science. Engineers only include quantifiable objects and tangible causes in their explanations. The objectivity of a TOBD improves biology by using engineering-based methodologies to bring objectivity, precision, and clarity to explanations. These are the disciplines biology needs to clean up the misleading concepts of selectionism.

Benefit 2: A Restored Appreciation of Creatures

Scientific theories can have profound theological implications. Darwin shrewdly crafted his theory to point people toward atheism without using derogatory words directly against God. He first changed the way people thought about creatures, which then precipitated into radically changed perceptions about God and life.

Darwin used the phenomenon that people will draw conclusions about the Creator from what they think about creation. He and his followers changed the way people thought about God in an extraordinarily devalued way by writing a new narrative that changed their thinking about His handiwork.

Darwin closed *The Origin* by summing up his worldview as one that necessitates

> a Struggle for Life, and…Natural Selection, entailing…the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. *There is grandeur in this view of life.*[4]

What assumptions underlie this grisly narrative? Selectionism portrays creatures as a hodgepodge of parts that are always incomplete and often broken or vestigial. They get cobbled together from the bottom up without any purposeful intent by the hit-and-miss sorting of random genetic mistakes (mutations) via deadly struggles to survive. No wonder that when people buy into Darwin's way of looking at creatures, their view of God changes for the worse. If God's creatures look bad, then God looks bad.

The assumptions about creatures made by an engineering-based approach are a radical about-face from selectionism's. A TOBD is not only engineering-based, but it *must* also be organism-focused because of the way the engineering process works. Engineers produce designed entities and focus on them until they're completed products (system, machine, etc.) with features operating within specified parameters. The capabilities the engineers design into the entity circumscribe all that it can/cannot do. In the biological sciences, creatures are those entities.

How does this influence how creatures are perceived? A TOBD assumes that any creature is a completed product. It assumes (with a super-accumulation of ongoing confirmatory observations) that its development, along with the myriad of systems and parts produced thereby, was purposeful and highly regulated. It predicts intricate and unified systems. It assumes that organisms will be active, problem-solving entities as they relate to their environment. The TOBD's assumptions are far more likely to be accurate to reality and result in a high view of creatures and thus a high view of God.

Benefit 3: The Accuracy of Internalism Replaces Externalism

Internalism was the way researchers thought about how organisms worked prior to Darwin. He introduced a revolutionary perspective called externalism to interpret biological adaptation.[5] The scientific view of creatures changed from their being designed to adjust themselves to fit changing environments to those environments slowly constructing them over time. As Harvard's famed geneticist Richard Lewontin put it, "It is from this view of environment as the *cause of organism* that the entire corpus of modern biology arises."[6] The vocabulary and everything biology teaches is now wholly given over to externalism.

However, the organism-environment relationship can be extremely tight. How do you tease apart what's causing what? It has always looked like environments change first and then organisms respond—though we now know of many exceptions.[7] Selectionists describe ecology and geology as "driving" and "shaping" passive organisms, where exposures are depicted as "inducing" creatures and their sensors are pictured as "receptors." A few lucky ones survive while most die out.

This overly simplistic and, thus, misleading narrative took hold because in Darwin's day the way a creature adapted internally was a "black box" and out of view. But, there's no reason to mistakenly see adaptation as externalistic today. Molecular biology reveals that masses of sensors and control systems *innate to creatures* regulate adaptation. An engineering approach shows that it was a huge mistake to see an event's temporality as driving change and not the highly engineered innate biology that really produces the response.

Externalism is only a way of looking at creatures, but its influence cannot be overstated. When someone is trained to think within externalism as if it's reality, it is exceedingly hard for them to look at creatures from the opposite perspective. That other perspective must involve more than seeing complexity in creatures or indicators of agency. Evolutionists recognize complexity and agency as well, but they chalk it up to their all-powerful selector, nature.

Instead, we need to change the way that we see how creatures themselves operate. Darwin taught us to see nature *working on* organisms. When we start seeing creatures *work out* of their engineered features and crediting those features in causal explanations, we'll be thinking from a design perspective. The accuracy of internalism will return.

What It Means to Look at Organisms Within a TOBD

The internalistic perspective naturally focuses on organisms to explain their operation. Internalism seeks to answer the basic question "how?" Knowing how something works is the best way to move causal explanations from mysticism to objective reality.

Design engineering is fundamentally an internalistic activity. The basic design and potential modifications *all focus on the designed entity* to ensure that it will relate to the conditions it must operate in as purposed. Internalism is the basis for the objective, organism-focused way of seeing an organism as a distinct, engineered entity.

An internalistic approach fully understands that creatures work together, relate to external conditions, and sometimes suffer loss of control to, or absorption by, another organism. But in general when describing how two entities work together, they each control their own actions. Thus, internalism recognizes that what an organism can successfully accomplish is due to innate capabilities that must be present even for multi-organism experiences like cooperation, mutualism, or symbiosis.

The next step is to put internalism into practice. How do we begin to fundamentally look at creatures differently from an internalistic perspective within a TOBD? Besides abandoning selectionist verbiage, we think about a creature as an active, problem-solving agent instead of passive modeling clay.

First, we approach researching and describing the operation of a creature in the same way we would any intricate, human-engineered entity that must relate to wide-ranging external conditions. Second, if any underlying concepts or descriptions would sound silly when applied to the operation of man-made things, then we don't apply them to biological things. Third, though nature is full of living things, it is not a living, thinking entity. Nature exists as a mindless, impartial, and unconscious temporal space.

Therefore, internalistic research programs, predictions, interpretations of biological observations, or causal explanations would be expressed within the context of the following assumptions.

1. An organism's biological functions are expected to operate through identifiable, innate, information-based control systems,

which should be the principle focus in causal descriptions.

2. The organism is the directing program for all purposeful outcomes and cannot be reduced below the level of self; e.g., DNA and its machinery are a subsystem of the organism.
3. Goal-directed activity on an organism-wide basis is expected at every research level.
4. Engineered, upfront capability is expected and investigated and should be the principle focus in causal explanations. Descriptions should emphasize that a) the organisms' abilities to solve environmental challenges are not "due to" the challenge (selection pressure) but rather precede it; and b) any ability an organism has to adapt to, or learn from, experiences must be front-loaded since it cannot gain this ability through experience.
5. An organism's traits determine *all* of its capabilities. As in the descriptions of all engineered solutions, traits should be credited with the success of resolving an environmental challenge (i.e., this trait solved that challenge, not that it was "favored" by the environment).
6. It's a creature's internal programming or traits that specify a) which conditions will be stimuli, b) which conditions are favorable or unfavorable, and c) which conditions will constitute its niche. Organisms relate to an identical condition differently based on their traits. Conditions are variables to which creatures are exposed, and a creature's innate logic uses the variable data as an input to its programming to dictate its response. Organisms sense exposures and extract data; environments can't "send instructions." Exposures are not "drivers," and no condition in-and-of-itself is a stimulus.
7. The actual triggers initiating all self-adjustments by organisms are *integrated* sensors tuned to detect variable conditions. Thus, no condition in-and-of-itself is an inducer or trigger.
8. Adaptation is the engineered control of the organism-environment relationship by the organism. Individuals and populations of organisms optimize the suitability of their traits to the environment through their innate, engineered control of the organism-environment relationship.

9. Two independent entities will not "naturally" work together. Each must have an engineered system with an element that will connect to some characteristic of the other entity.

An engineering-based approach shows that switching perspectives is not simply a change in semantics. Consider the space shuttle *Columbia*, which suffered a heart-wrenching loss in 2003 while traversing the atmosphere on reentry. Any NASA engineer would lose his job if he explained that the heat-friction failure was because the shuttle wasn't favored or the atmosphere selected against it.

The cause lay with the shuttle—not the atmosphere. The shuttle's traits could be traced back to a specific engineering design, and thus design-based thinking could lead to tangible explanations for its performance. Engineers know that an entity's traits determine all of its capabilities and should be identified with its success/failure of resolving environmental challenges.

The same is true for organisms. So, to look at creatures differently means to focus on their traits when thinking about *how* they work out their operation. When considering adaptation, look for all of the system elements (sensor/trigger, logic, etc.) that must exist between exposure and response.

There's no magic; they have to be there. Dig into the scientific literature or do original research to identify them. Emphasize these traits when explaining how a creature self-adjusts to changed conditions. This is what it means to think from a design perspective in biology.

Conclusion

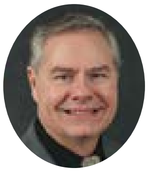
We need a conceptual catharsis of our understanding of how organisms relate to their environment. A TOBD offers objectivity, accuracy, and clarity of concepts and definitions with major benefits to biology. ICR's recent *Acts & Facts* series on why biology needs a theory of biological design urges readers to open their minds, get current on the implications of today's biological insights, and adopt a framework for interpreting biological observations that focuses on a creature's innate capabilities and is guided by objective engineering principles.[8]

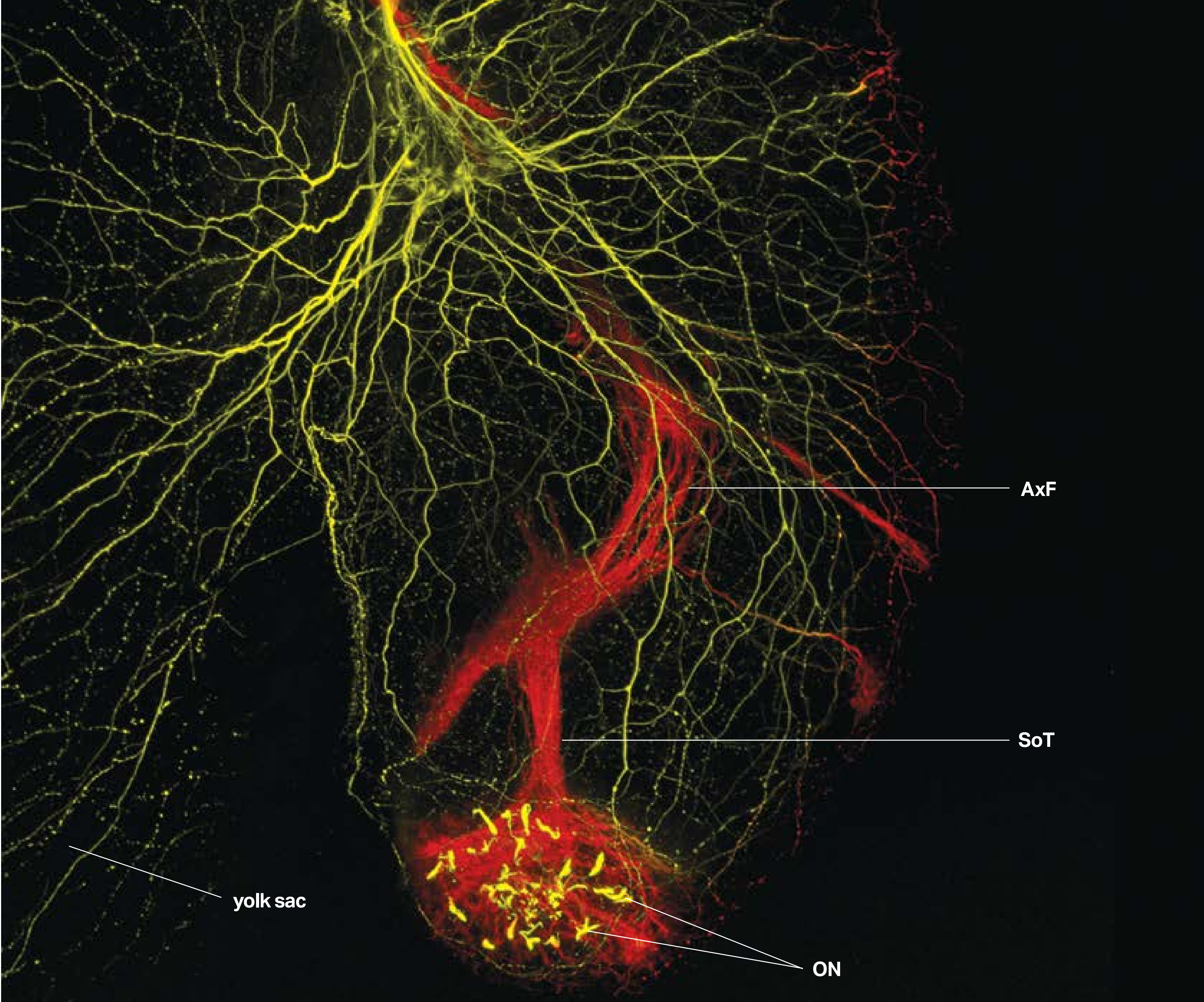
When researchers change the way they look at creatures, they'll begin asking previously inconceivable questions, make new predictions, and, in essence, build different research programs. But most importantly, the new organism-focused emphasis in explanations offers a restored and profoundly nobler appreciation of the marvels engineered into creatures—and of their Creator, the Lord Jesus Christ.

References

1. Joachim P. Sturmberg, "*If You Change the Way You Look at Things, Things You Look at Change.* Max Planck's Challenge for Health, Health Care, and the Healthcare System," in *Embracing Complexity in Health: The Transformation of Science, Practice, and Policy*, ed. Joachim P. Sturmberg (New York, NY: Springer, 2019), 3–44.
2. Jerry Fodor and Massimo Piattelli-Palmarini, *What Darwin Got Wrong* (New York, NY: Farrar, Straus and Giroux, 2010), 162–163.
3. Neil Thomas, *Taking Leave of Darwin: A Longtime Agnostic Discovers the Case for Design* (Seattle, WA: Discovery Institute Press, 2021), 124.
4. Charles Darwin, *The Origin of Species by Means of Natural Selection* (London: John Murray, 1859), 429. Emphasis added.
5. We previously detailed the history of externalism in Randy J. Guliuzza, "Adaptability Via Nature or Design: What Evolutionists Say," *Acts & Facts*, September 2017, 17–19.
6. Richard C. Lewontin, "Gene, Organism, and Environment," in *Evolution from Molecules to Man*, ed. D. S. Bendall (Cambridge: Cambridge University Press, 1983), 274. Emphasis added.
7. Randy J. Guliuzza, "Engineered Adaptability: Creatures' Anticipatory Systems Forecast and Track Changes," *Acts & Facts*, March 2019, 16–18.
8. See the March/April, May/June, July/August, and September/October 2024 issues of *Acts & Facts*.

Dr. Guliuzza is president of the Institute for Creation Research. He earned his doctor of medicine from the University of Minnesota, his master of public health from Harvard University, and received an honorary doctor of divinity from Southern California Seminary. He served in the U.S. Air Force as 28th Bomb Wing flight surgeon and chief of aerospace medicine. Dr. Guliuzza is also a registered professional engineer and holds a B.A. in theology from Moody Bible Institute.





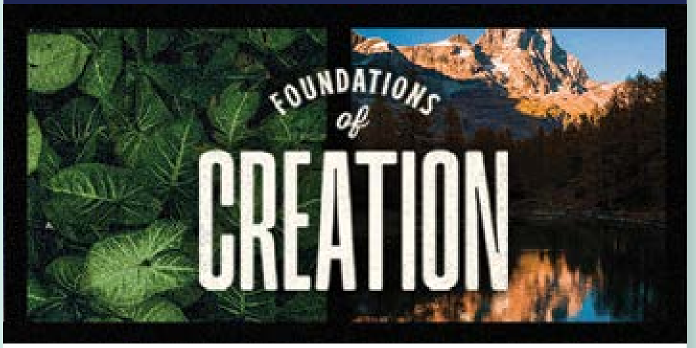
"But now ask the beasts, and they will teach you;
and the birds of the air, and they will tell you;
or speak to the earth, and it will teach you;
and the fish of the sea will explain to you."

— JOB 12:7-8 —

Anterior neural architecture of brain (red) and body (yellow) in Astyanax mexicanus *at 36 hours of development. AxF, axon fascicles; ON, olfactory neurons; SoT, supraoptic tract*

Image credit: Micrograph captured and edited by Michael J. Boyle, Ph.D., The William B. Dean, MD Imaging Center of the Institute for Creation Research

SEPTEMBER 13–15



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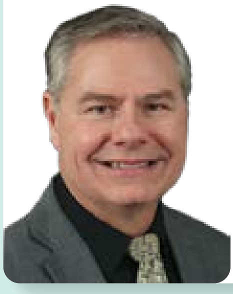

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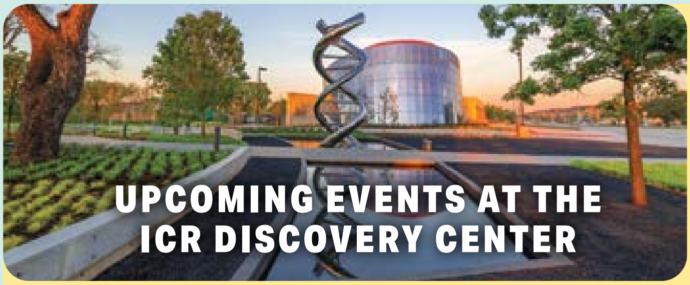

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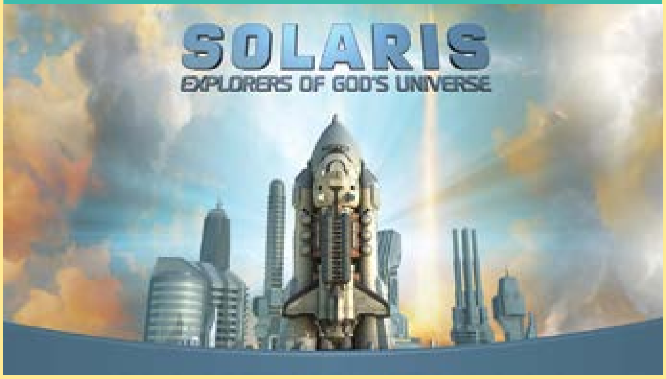

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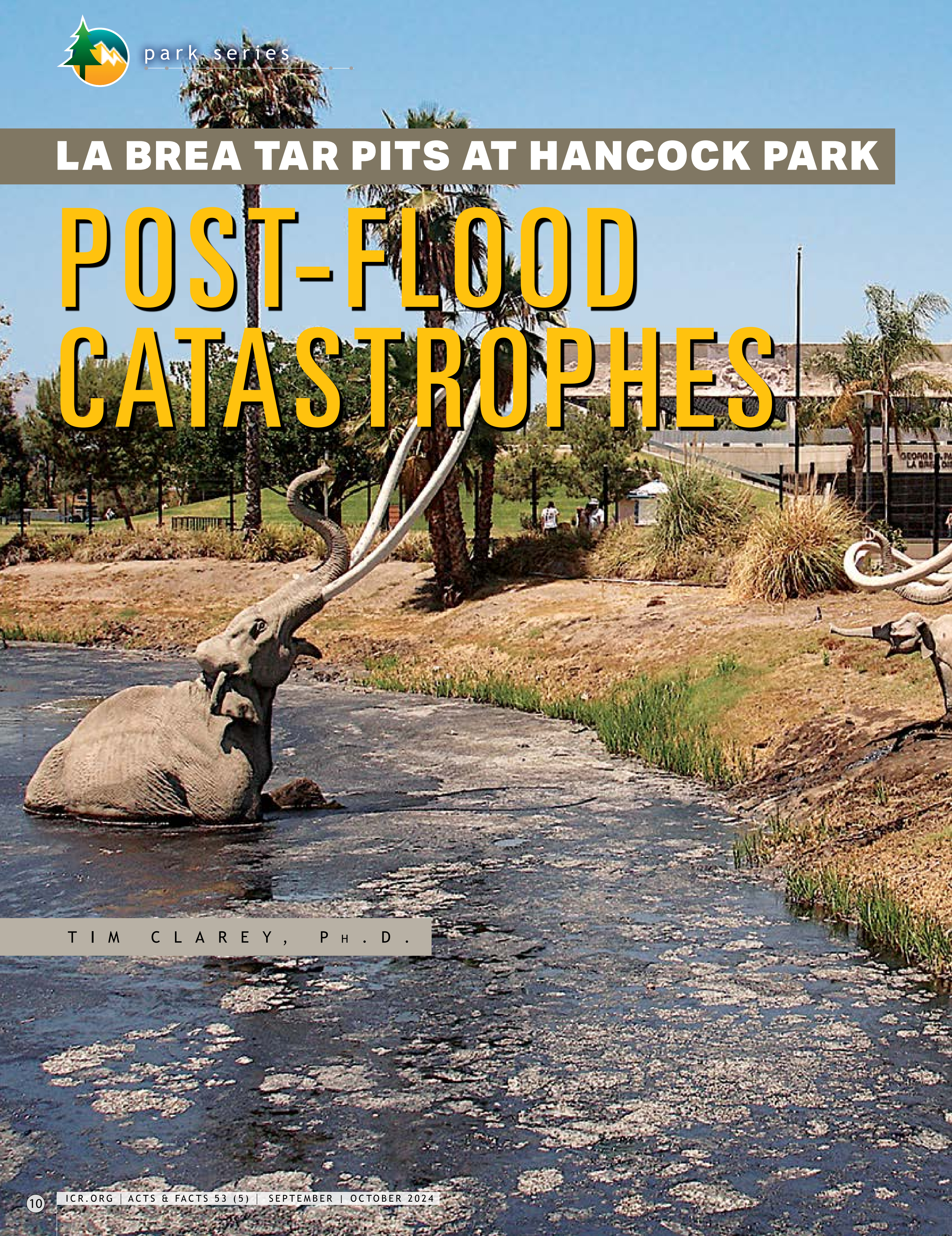
LA BREA TAR PITS AT HANCOCK PARK

POST-FLOOD CATASTROPHES



TIM CLAREY, Ph.D.

One of over 2,200 saber-toothed cat fossils from La Brea

The La Brea Tar Pits have fascinated visitors ever since Spanish explorer Gaspar de Portolá chronicled the site in 1769.[1] But even before that, humans had likely used the "tar" for several thousand years. Using land donated to the County of Los Angeles by George Allan Hancock in 1924, Hancock Park has produced over one million mammal fossils and one human skeleton from the tar pits near downtown Los Angeles.

The oil for the tar comes from the Salt Lake oil field, about 1,000 feet below the park.[1] Since oil is more buoyant than groundwater, it rises to the surface along fractures and faults near the crest of the oil field and then degrades over time. Bacterial action and surface evaporation remove the lightest components to leave a thick, sticky tar behind.

Tar-covered animal bones found in the nearly 100 pits include those from mammoths, mastodons, saber-toothed cats, dire wolves, sloths, camels, horses, smaller animals, insects, and even birds. Remains of plants and pollen have also been found. Overall, the bones come from 600 species. About 3.5 million specimens have been extracted from the pits over the last 100-plus years.[2] The pits preserve a time capsule of animal and plant life that existed most likely near the end of the Ice Age.

The conventional story is that near the end of the last Ice Age, many animals got stuck in the tar over thousands of years. Their struggles attracted predators, and they, too, were trapped in the tar. Over time, they sank and became fossils. Animals today avoid such pits, casting doubt on that story. But observations at La Brea cause even more doubt.

Four Unusual Observations

Four odd observations call for the popular story to be revised. First, very few articulated or complete specimens have been found.[1] Instead, the bones are separated. Most are mixed with many other species and

article highlights

- The La Brea Tar Pits have produced over three million Ice Age fossils from 600 species.
- The conventional story is that creatures stumbled into the tar pits and sank to their deaths, but observations cast doubt on this scenario.
- Unlike other fossil sites, these specimens are a mixture of worn bones, and few are complete skeletons.
- Most of the large fossils are predatory animals like saber-toothed cats and dire wolves.
- Evidence indicates these creatures drowned in Ice Age floods rather than suffocated in tar, which seeped in years later and covered the fossils.

Ground sloths grew to around 10 feet in height and weighed over a ton are jumbled in tight masses in the pits.

Individual specimens on display in Hancock Park are composed of bones from many different individuals, making "composite skeletons." Some conventional scientists have suggested that bubbles of methane moving through the tar stirred up the bones. But how such gentle bubbles could so thoroughly dismember and mix these animals is a mystery to them.[1]

Second, many of the bones show "pits and grooves" from bone rubbing against bone.[1] This has been labeled "pit wear." Exactly how the bones could rub against each other once embedded in sticky tar is also poorly explained.

ICR's Dave Napier studies some of the 4,000 dire wolf skulls excavated from the pits.
Image credit: Tim Clarey

Judging by the skull, dire wolves were larger than today's gray wolves

Bison antiquus

A third observation is the overwhelming number of carnivore remains found in the pits compared to herbivores. About 4,000 dire wolves and 2,200 saber-toothed cats were excavated.[1] Contrast that with 36 mammoths, 60 sloths, 220 horses, 300 bison, and 36 camels.[1] Most of the bones were from predators, not prey![1] Conventional scientists claim this may be due to the biases of the early excavators who concentrated on the biggest bones. However, that claim is not a sufficient explanation because both the predators and prey have sizable bones.

Finally, the geology and paleontology of the site reflect massive flooding events. Excavators readily admit that some of the fossils were transported by moving water via stream channels and were deposited in the asphalt pits. A nearly complete adult Columbian mammoth named "Zed" was washed into the pits by stream flow where it became entombed in tar.[1]

Columbian mammoth

There are also reports of four to eight feet of clay in some of the pits, with gravel and sand beds mixed in. These were most likely from river flow, consistent with regional flooding.[3] Furthermore, test cores revealed four distinct layers of floodplain (river) deposits surrounding the pits. The cores showed weathered and rounded gravels plus the sand and clay that typify today's river deposits.[4] Even water-saturated plants have been excavated, including part of a cypress tree from Pit 3.[3] These, too, indicate a waterborne origin at La Brea. How else could water later enter the oily tar pits and saturate the wood?

In spite of these four observations that cast doubt upon the tar entrapment theory, it is still generally accepted by the scientific community, and this is what the museum on site illustrates in its displays.

Saber-toothed cat attacking a Harlan's ground sloth at the La Brea Tar Pits Museum
Image credit: Tim Clarey

A Better Explanation

The conventional story of animals becoming trapped and slowly sinking in tar was initially questioned when the size of the pits and the size of the animals became known.[4] Pit 36 had an opening of four feet by two feet and was only 11 feet deep, yet it contained six sizable carnivore fossils. The pits likely formed as methane gas associated with the oil collected in small, narrow openings resembling "blow-holes."[5]

Some conventional and creationist scientists agree that water must have initially killed the animals rather than the tar itself. Water concentrated the fossils at the La Brea Tar Pits.[6] Where could so much water come from after the Flood?

At the end of the Ice Age, rapid melting of nearby mountain ice and snow and heavy rains likely provided catastrophic water flow. This could have transported animal remains into the tar pit openings and deposited the bones in tight, jumbled masses. Such floods would likely have torn the animals apart and also caused the pits and grooves on the bones.

The entrapment theory only survives as myth, perpetuated by those not familiar with the geological evidence. It's most likely that catastrophic rainfall and flooding during the late stages of the Ice Age provide a better explanation for the fossils at La Brea. And the Ice Age is best explained by the conditions created by the global Flood.[7]

Saber-toothed cat skull

References

1. *Rancho La Brea: Treasures of the Tar Pits*, 3rd ed., ed. Emily L. Lindsey (Los Angeles, CA: Los Angeles County Museum of Natural History Foundation, 2018).
2. William Weston, "La Brea Tar Pits: Evidence of a Catastrophic Flood," *Creation Research Society Quarterly* 40, no. 1 (2003): 25–33.
3. William Weston, "La Brea Tar Pits: A Critique of Animal Entrapment Theories," *Creation Research Society Quarterly* 39, no. 4 (2002): 160–167.
4. Geoffrey D. Woodward and Leslie F. Marcus, "Rancho La Brea Fossil Deposits: A Re-evaluation From Stratigraphic and Geological Evidence," *Journal of Paleontology* 47, no. 1 (1973): 54–68.
5. John Morris and Timothy Clarey, "The La Brea Tar Pits Mystery," *Acts & Facts*, June 2013, 14–15.
6. Jeremy Auldaney, "Catastrophic Fluvial Deposition at the Asphalt Seeps of Rancho La Brea, California," *Proceedings of the International Conference on Creationism* 3 (1994), 25–35.
7. Jake Hebert, "The Bible Best Explains the Ice Age," *Acts & Facts*, November 2018, 10–13.
8. Rachel Schnalzer, "The La Brea Tar Pits are full of mysteries. Here are three of the most puzzling," *Los Angeles Times*, November 22, 2022, https://www.yahoo.com/news/la-brea-tar-pits-full-150953540.html.

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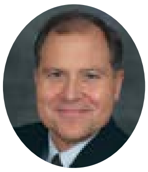


Methane gas bubbles at La Brea Tar Pits

The Lone Human

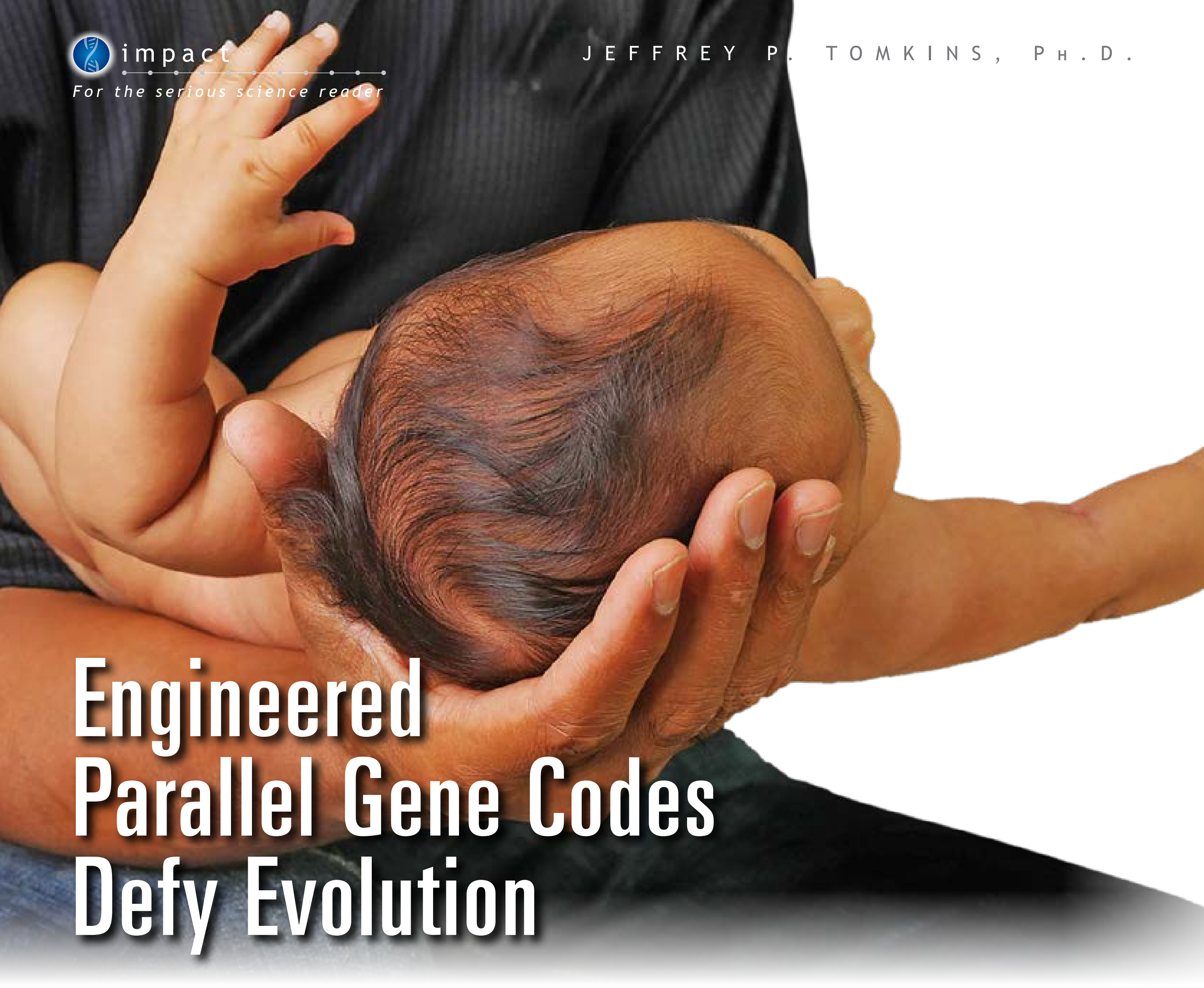
A partial human skeleton, nicknamed La Brea Woman, was found in 1914. The fractured skull led some to speculate she was a victim of murder. One puzzle is why she's even there at all.

In a 2022 *Los Angeles Times* article, La Brea Tar Pits and Museum Associate Curator and Excavation Site Director Emily Lindsey asked, "Humans were here, but why don't we find any evidence of them at the La Brea Tar pits?" Maybe the people of that time had a healthy sense of self-preservation. The article goes on to say, "Lindsey notes that the absence of ancient humans could point to their reticence at hunting nearby saber-toothed cats and other dangerous animals."[8]

Or perhaps the lack of human evidence is due to other factors entirely, such as humans not being caught in the water flows that washed the animal remains into what would become the tar pits. La Brea Woman's presence at the pits could be a clue that people were avoiding this area by that point in the Ice Age, but the circumstances behind her ending up in Pit 10 will likely remain a mystery.

La Brea Woman, the only human fossil from La Brea

JEFFREY P. TOMKINS, Ph.D.



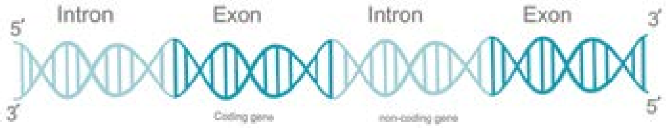
Engineered Parallel Gene Codes Defy Evolution

Researchers over the past decade have been characterizing new, previously hidden genetic codes embedded within the same sections of genes that code for proteins—utterly defying all naturalistic explanations for their existence. This same linear sequence of genetic information that encodes multiple programming languages with different instructions is truly evidence of supernatural engineering that can only be ascribed to the all-powerful and all-wise Creator.

In addition to supplying many different types of genetic code that regulate function, the genome also provides highly complex coded templates for making a wide diversity of functional RNA molecules and proteins. Protein-coding genes contain key information to make proteins and contain the most studied type of genetic code. Some of the most important chunks of code in protein-coding genes, called exons, are those segments that specify the actual template for protein sequences.

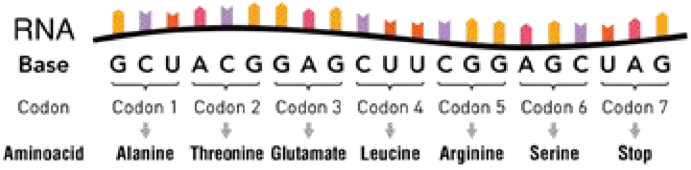
article highlights

- Some genes contain lines of intricate instructive code that are literally superimposed within existing code.
- A codon is a three-base unit of code that specifies an amino acid within a protein-coding gene. Conventional science originally thought that the third base in codons could mutate and allow creatures to evolve.
- New studies show that multiple layers of functional code exist in many codon sequences, and mutations in these would be harmful.
- Expert human computer programmers can't come close to matching our genetic code's incredible information density and complexity.
- These multilayer genetic code findings defy evolutionary expectations about mutation and natural selection. Only an all-knowing and all-powerful Creator with unimaginable abilities could have engineered our complex genome.



An illustration of exons (coding regions) and introns (non-coding regions) in a DNA molecule

In exons, three consecutive DNA letters form what is called a codon, and each codon corresponds to a specific amino acid in a protein. Long sets of codons in genes contain the protein-making information that ends up being represented in an RNA copy of the gene used to translate (create) entire proteins, which may be hundreds of amino acids in length, using cellular machinery (ribosomes).



RNA consists of triplets of nucleic acids that translate into amino acids

In the early days of molecular biology, when the genetic code was being deciphered, codons initially appeared to possess some redundancy. This was because there are 61 codons in contrast to only 20 amino acids. As far as specifying a particular amino acid, the first two bases in the codon structure are the same, but the third base can vary.

For example, the codons GGU, GGC, GGA, and GGG all encode the same amino acid called glycine. When scientists first discovered this phenomenon, they called the variation in the third base a "wobble" and, out of ignorance, simply relegated the variability as redundant or degenerate. In other words, they assumed that all the different codon variants for a given amino acid were functionally equivalent.

Until recently, scientists believed that the protein-coding regions of genes had mysterious signals other than codons that told the cell machinery how to regulate and process the RNA transcripts (copies of genes) prior to making the protein. Researchers originally thought that these regulatory codes and the protein template codes containing the codons operated independently of each other, but they no longer think this. These codes are embedded in the "wobble" base.

The Discovery of Duons

Transcription factors are specialized protein machinery that bind in and around genes at specific sites called regulatory regions to turn them on and regulate how fast they run and how much product they produce. In transcription, messenger RNAs (mRNAs) are produced from genes—some of which are used to make templates for proteins, while others are used to make functional or structural RNAs (called long non-coding RNAs).

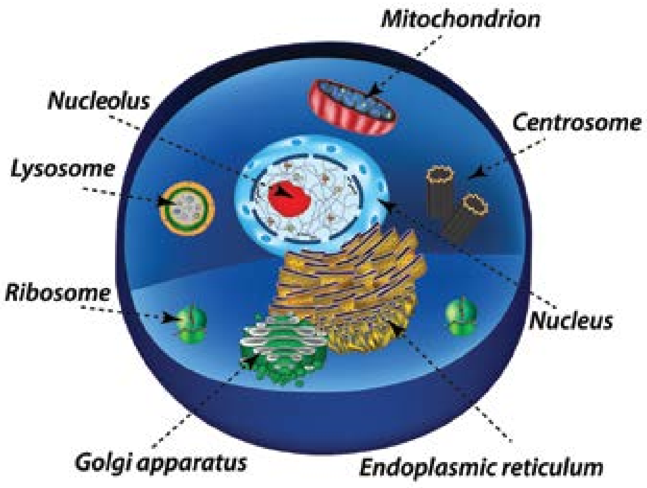
In 2013, a study was published in which researchers mapped the locations of where transcription factors were binding in active genes.[1] They were surprised to discover that a significant proportion of the binding sites contained codons and that the third base in a codon contained information for the binding of a specific type of transcription factor in addition to coding for an amino acid. This initial discovery of a dual-use codon was labeled a duon. In humans, they discovered that about 15% of codons were dual-use codons, or duons.

This research showed that multiple overlapping or parallel codes in exons not only exist but also that these codes actually work both separately and together.[1] While one set of codons specifies the order of amino acids for a protein, the very same sequence of DNA letters also specifies where necessary cellular machinery (transcription factors) are to bind to the gene to make the RNA transcript that codes for a protein.

To summarize this remarkable discovery, the researchers said, "Our results indicate that simultaneous encoding of amino acid and regulatory information within exons is a major functional feature of complex genomes," and the "information architecture of the received genetic code is optimized for superimposition of additional information."[1]

Dual Codon Codes and Translational Pausing

As an mRNA transcript copy of a gene is used to make a protein using ribosomes (located outside the cell nucleus), periodic pauses occur as the protein is produced and funneled out of a tunnel-like structure in the ribosome.[2] The specific sequence and rate of pausing is critical to the folding of the protein into its proper three-dimensional shape, which occurs during the assembly process at the ribosome.



Structure of the human cell

Many different types of cellular machines aid in this folding process, including the ribosome tunnel through which the proteins under production pass as they are being synthesized. Because the translation and folding of the protein are linked together, the processes are called cotranslational.

In an important 2014 study elucidating the idea that codon specificity is cotranslational in its effect, researchers demonstrated that the variability in the third base of codons is nonredundant for a specific, engineered purpose.[2] In this respect, it was found that specificity in the codon's third base provides an explicit type of cellular language that is interpreted by the ribosome as telling it when to pause and how to regulate the rate at which the protein is made. This ultimately has an effect on the folding of the protein into its proper three-dimensional shape.

So, not only does a codon provide the information for which specific amino acid to add in the making of a protein, but the variant of that codon also influences the information needed to regulate its folding at multiple levels. Thus, you have two different sets of information encoded in different languages in the same section of DNA. The researchers of the translation pausing paper note, "Dual interpretations enable the assembly of the protein's primary structure while enabling additional folding controls via pausing of the translation process."[2] What was once thought to be meaningless redundancy or wobble has now been proven to be exactly the opposite. In fact, the researchers said, "The functionality of codon redundancy denies the ill-advised label of 'degeneracy.'"[2]

The authors of this research report also marveled at such obvious ingenuity and unwittingly stated their findings within the context of sophisticated intelligent design. They said,

> Redundancy in the primary genetic code allows for additional independent codes. Coupled with the appropriate interpreters and algorithmic processors, multiple dimensions of meaning, and function can be instantiated into the same codon string.[2]

This type of jargon essentially describes a highly complex, interpretive, computer-like machine—something designed and engineered by a super-intelligent mind and certainly not the result of random processes.

Codon Codes Regulate Transcription Rates

Another discovery in 2016 showed that the third base of codons regulates rates of gene transcription, levels of mRNA copies made from a gene, and the corresponding amounts of protein produced.[3] In other words, the amount of mRNA output produced from a gene is directly related to the specific DNA sequence in codons.

Gene output must be highly controlled and regulated in the cell, just like a cruise control mechanism in a car regulates its speed. If genes are not properly regulated, cellular dysfunction would result in disease or death. In addition to the many other types of DNA codes in and around genes that control transcription, now it is known that the specific sequence of codons, including the third base, plays a key role in gene regulation by controlling the rate of transcription.

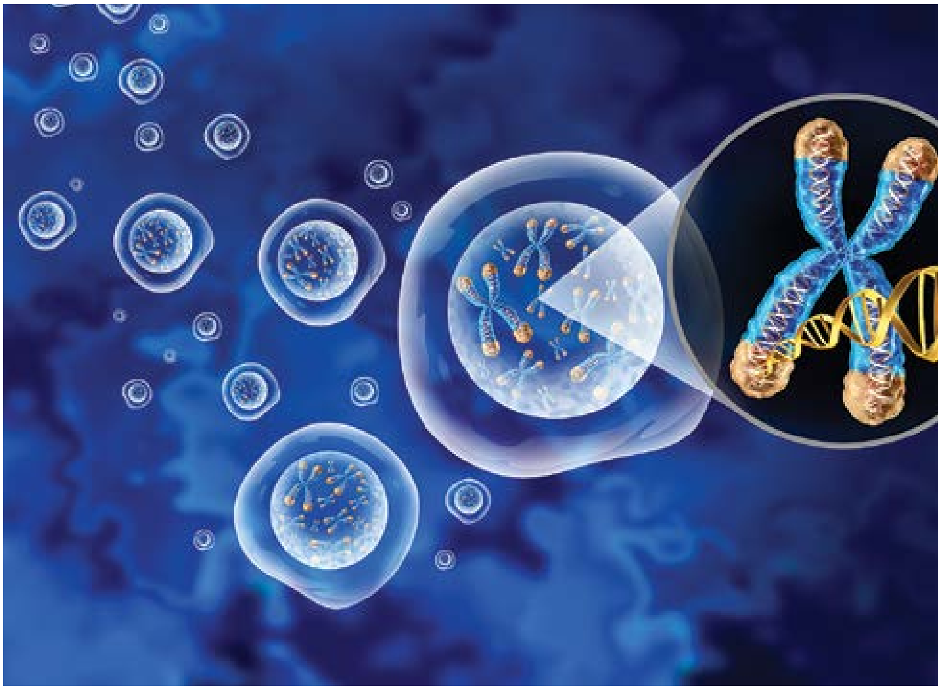
Also, a specific epigenetic mark in a histone protein that the DNA is packaged with, called H3K9me3, is an interactive mechanism that contributes to the effect of codon usage on transcription. Thus, the histone epigenetic code, which I discussed in an earlier article in this series, interfaces with specific codons in genes to influence the rate of transcription.[4]

But what was even more amazing to the scientists that published this study was the fact that codon specificity and usage in the genome affects two entirely different, yet connected, cellular processes—transcription and translation. The authors said:

> Codon usage is adapted to both translation and transcription processes; codon information is also read by the transcription machinery in forms of DNA elements, which are used to suppress or activate transcription. Although most known transcriptional regulatory elements reside in the promoter regions, our results demonstrate that the coding sequences can also play a major role in transcriptional regulation.[3]

Codon Codes Regulate Translation Rates

Not only do overlapping codes in codons affect transcription rates as genes are being copied into mRNAs, but they also affect translation rates (protein production). Researchers in 2018 reported another set of overlapping codon codes that control the rate of protein manufacturing at the ribosomal machinery.[5]



This research showed that an additional code in the third base of codons is related to the overall efficiency of the cells' protein production. Since many proteins from many genes are made at once, the fundamental resources allocated to each type of protein are critical. One of these fundamental resources is called transfer RNA or tRNA.

Transfer RNAs (tRNAs) are specialized adaptor molecules composed of RNA, typically 76 to 90 nucleotides in length, that serve as the physical link between the mRNA and the amino acid sequence of proteins. The tRNAs do this by carrying a specified amino acid to the protein-synthesizing machinery—the ribosome. The complementation of a three-nucleotide codon in an mRNA by a three-nucleotide anticodon in the tRNA attached to the specified amino acid enables protein synthesis at the ribosome based on the mRNA code.

Like factories that make multiple products, all the assembly lines need a steady supply of the correct parts, and the processes involved in doing that need to be perfectly orchestrated. The tRNAs are the key parts in the protein assembly process that provide the correct amino acids at the ribosome when a protein is being synthesized. This complex coordination and resource distribution is affected by the third base in codons. Thus, the third base of a codon must be accurately coded or fine-tuned to produce the correct amount of a specified protein.

As it turns out, protein-coding genes that are highly expressed utilize optimal codons for high translation speeds, while those genes that are expressed at lower levels use codons that limit or downregulate the protein assembly process. The overall effect is that protein production in the cell becomes very optimized and efficient according to the available tRNA and amino acid resources. In fact, the authors of the paper call this overall response "proteome-wide translation efficiency," with the term "proteome" referring to the entire protein complement of a cell at any given time.[5]

Conclusion

One of evolution's main claims is that certain types of DNA sequences freely mutate and develop new functions that allow creatures to evolve, the consequences of which nature, as a mysterious agent, favors or rejects. This rather mystical concept has been traditionally applied to the protein-coding regions of genes in the third base of codons. When scientists first discovered variation in the third base of codons, they simply dismissed the variability as redundant—leading to the idea of codon degeneracy.

More importantly, they thought this alleged degeneracy was a mechanistic location in genes for evolution to occur. If the third base of a codon could be neutral to the final outcome—i.e., the third base was somewhat nonfunctional—perhaps it was free to mutate and evolve. In fact, this idea laid the foundation for what was termed the neutral model theory of evolution.[6]

However, this whole idea of codon degeneracy is now thoroughly debunked since at least four different layers of specified code can be embedded in a codon, including the third base. As a result, if mutations were to actually occur in the third base of a codon, the disruption of these previously unknown codes would be harmful, and thus mutations are not tolerated.

What was labeled in hopeful evolutionary ignorance as redundant/degenerate and promoted for years as a viable mechanism for evolution has been thoroughly discredited through a series of amazing discoveries that highlight the incredible ingenuity of our Creator, the Lord Jesus Christ. As it turns out, the third base in codons cannot be randomly variable because other codes are embedded within it. One set of codes tells cell machinery (called transcription factors) that regulates the expression of genes where to bind to the DNA inside genes and can also specify the rate of mRNA transcript production. Yet another set of codon codes specifically determines the rate of protein production (translation) at the ribosomes and the proper folding of the protein as it is produced and exits the ribosome tunnel. And yet another codon code allows for amino acid resource optimization in protein production.

The human mind struggles to comprehend the overall complexity of genetic code. And now it has been revealed that many genes in their protein-coding regions have areas that contain multiple overlapping codes within the very same sequence. Even the most advanced human computer programmers can't come close to matching the genetic code's incredible information density and bewildering complexity. Expert human computer programmers can only write a line of code with a single directive.

An all-powerful and all-wise Creator is the only explanation for genetic code that has up to four different layers of instruction in the same sequence of information—and maybe more.

References

1. Andrew B. Stergachis et al. "Exonic Transcription Factor Binding Directs Codon Choice and Affects Protein Evolution," *Science* 342, no. 6164 (2013): 1367–1372.
2. David J. D'Onofrio and David L. Abel, "Redundancy of the Genetic Code Enables Translational Pausing," *Frontiers in Genetics* 5, no. 140 (2014).
3. Zhipeng Zhou et al., "Codon Usage is an Important Determinant of Gene Expression Levels Largely Through Its Effects on Transcription," *Proceedings of the National Academy of Sciences of the United States of America* 113, no. 41 (2016): E6117–E6125.
4. Jeffrey P. Tomkins, "Epigenetic Mechanisms: Adaptive Master Regulators of the Genome," *Acts & Facts*, July/August 2023, 14–17.
5. Idan Frumkin et al., "Codon Usage of Highly Expressed Genes Affects Proteome-Wide Translation Efficiency," *Proceedings of the National Academy of Sciences* 115, no. 21 (2018): E4940–E4949.
6. Jeffrey P. Tomkins and Jerry Bergman, "Neutral Model, Genetic Drift and the Third Way - A Synopsis of the Self-Inflicted Demise of the Evolutionary Paradigm," *Journal of Creation* 31, no. 3 (2017): 94–102.

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Proclaiming Christ in Paradise
An Interview with Dr. Brian Thomas

For more than 50 years, the Institute for Creation Research has investigated the evidence showing how science supports the Bible's account of a recent creation. The Lord Jesus Christ created the universe in only six days, and though it's now cursed with sin and death, He promises eternal life for all who trust in Him as their Savior. While ICR isn't a global missions-based organization, its employees have ministered in many different countries when the opportunities arose.

Earlier this year, ICR Research Scientist Dr. Brian Thomas had a unique opportunity to proclaim the message of Jesus Christ as Creator and Savior in the island nation of Fiji. We asked him to share about his team's impactful outreach in this tropical paradise.


Students at Dudley High School react to a humorous moment during a creation science assembly
Image credit: Search for the Truth Ministries. Used by permission.

Dr. Thomas, what led to your involvement in this mission?

I heard some years ago that Fiji's Ministry of Education approved the Creation Science Association of Fiji to conduct science assemblies at high schools. Fijian schools have more autonomy than U.S. public schools, so each school could decide if it wanted to host this one-hour assembly, allow students to receive free copies of the creation-affirming book *Pearls in Paradise*, and/or hear the gospel.

ICR President Dr. Randy Guliuzza wanted to support this outreach by sending an ICR scientist. With ICR's backing, my wife, Michele, and I agreed to teach and serve. It was the opportunity of a lifetime!

How did God bring the team members to this unique ministry?

The Lord wove together separate life stories into this one wonderful mission. First, a native Fijian whom mission team members call Sister Lagi (pronounced "lawn-gee") retired from a government administrative role where she knew every high school principal in the country. Sister Lagi then asked the Lord what else He had for her to do. She soon learned about school assemblies that would show how science supports the gospel, and she knew this was "it." Sister Lagi became the key to unlocking this unique ministry.

Meanwhile, an American missionary nicknamed Fiji Fred had been working to bring a Christian character program to Fijian high schools. His efforts helped in setting up science assemblies, which opens doors for the program. At the same time, longtime mission worker Dr. Carl Baugh recruited Bruce and Robin Malone of Search for the Truth Ministries to join the work. Carl then connected Bruce with Pastor Ben from Fiji and his family.

During our week of ministry, Sister Lagi introduced creation science teams to school principals. Fred led one team of speakers while Bruce led another. Ben's family and other locals transported hundreds of cases of books each day. Team members, including Michele and me, spoke in the school assemblies, where students learned how science supports biblical creation and the Flood. Most importantly, they heard about Jesus' offer of everlasting life for everyone who believes in Him as Savior. It's marvelous to see how the Lord prepared individual lives to weave together like threads in His loom for this purpose.


Week one team members
Image credit: Search for the Truth Ministries. Used by permission.


Dr. Thomas shares Flood fossil facts in Fiji
Image credit: Institute for Creation Research

What surprised you most about Fiji?

Most people, including the high school students, were warm and welcoming despite having little financial means. One student told Bruce that she had waited five years for a copy of *Pearls in Paradise*. What a blessing!

Where did you stay, and what were your days like?

We shared a rental house. Days were busy with traveling, setting up the screen and props for each assembly, and speaking at usually two schools per day. The schools there don't have air conditioning, so we sweated the whole time. Team members scrambled for showers and the washing machine in the evenings. We prayed, played, and ate together. Sometimes we loaded more books and then showered again!

Did you face any opposition about speaking in public schools?

Various religious groups own most Fijian school facilities. One Hindu school opted for the science parts of our assembly but not the gospel. Most Muslim schools wanted neither, but many schools were glad for our visit and for the books.

Students attend a creation science assembly at Ratu Sukuna Memorial School in Suva, Fiji

Image credit: Search for the Truth Ministries. Used by permission.

What topics did you cover, and how did students respond to your teaching?

Our assembly covered some science basics. For example, the first law of thermodynamics says that matter and energy never emerge from nothing. So, where did it all come from? Not nothing—a Creator. God's design is everywhere. Bird flight, for example, is so precise and effective that humans copy it, like the Wright brothers did. Rock layers and their fossils don't form anywhere today, but they did on every continent in the past—just as we would expect from Noah's global Flood.

The students were attentive. Some felt challenged, since their evolutionary curriculum omits these basics. Others were thrilled to hear that science really does support Genesis, and still others understood for the first time that the Creator paid our sin debt so we can know and enjoy Him forever.

As an ICR scientist, you've spoken in many different places. How did Fiji compare?

I would say that in contrast to American audiences, which are mostly friendly but sometimes treat the creation message lightly, Fijian students and even some teachers were eager to learn what motivated us to make the effort to visit them. The answer? Jesus!

Why is it important that Christians—or really anyone—take Genesis literally?

Genesis creation lays the foundation for the gospel. If there were no actual Adam and no original sin, then the Genesis 3 curse of death never happened either—the very death that the Lord Jesus suffered in our place to pay for our sins.

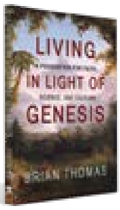
What encouragement would you give to a Christian student who's struggling with evolutionary teaching?

When thinking back on how I turned from believing evolution to creation, I would say the most important factors for me were taking my questions to the Lord and learning from people who walked with Him daily. The Lord used those Christian friends to share ICR materials that helped resolve my origins questions. It's easier to find the truth when we humbly seek Him.

What would you like for people to learn from your time in Fiji?

The Lord loves Fijians just as He loves everyone! Pray that this door for the gospel will stay open. Remember that some believers, like Sister Lagi, can spend most of their lifetimes in preparation for wonderful plans that only the Lord knows will happen. Proverbs 3:6 says, "In all your ways acknowledge Him, and He shall direct your paths." We can trust Him to guide our steps.

To learn more about Dr. Thomas' creation conversion, you can find his story online at ICR.org/article/8233. A more extensive account is given in his book *Living in Light of Genesis*, available at **ICR.org/store.**



Dr. Thomas explains to 1,000 high school students at Dudley High School why fossils came from Noah's Flood

Image credit: Search for the Truth Ministries. Used by permission.

JAKE HEBERT, Ph.D.

Fossil Sharks Show Signs of Greater Past Longevity

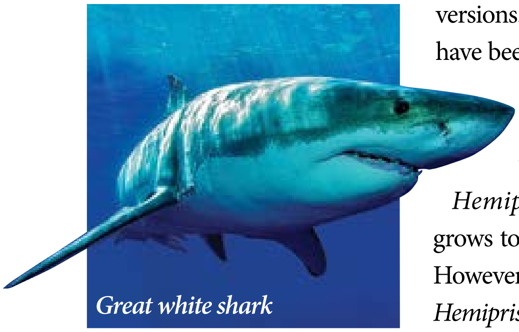

Gray reef shark

Some fossil sharks grew very large.[1] Researchers estimate *Otodus megalodon*, popularized by the *Meg* movies, was at least 46 feet long and possibly more than 66 feet. By way of comparison, the largest known extant great white shark is thought to be 20 feet in length. Sharks in the fossil genus *Ptychodus*, considered to be somewhat similar to today's nurse and bullhead sharks, might have attained body lengths of 32 feet or more. And a *Cretodus* fossil shark from Italy is believed to have measured between 31 and 37 feet.

article highlights

- The large bodies and apparent delayed maturation of some fossil sharks suggest they lived longer than today's sharks.
- This matches similar trends in *Crassostrea* oyster fossils and is consistent with the predictions of earlier creation researchers.
- More research is needed, but the growth rate results of recent studies should be encouraging to those who accept the long pre-Flood lifespans recorded in Genesis.

A fossil version of today's bluntnose sixgill shark (*Hexanchus griseus*) was given the species name *H. gigas* (*gigas* means "giant"). Conventional paleontologists have acknowledged that size is the *only* convincing difference between the teeth of the fossil and living versions. Thus, *H. gigas* seems to have been a giant fossil version of the bluntnose sixgill.


Great white shark

Likewise, the extant snaggletooth shark *Hemipristis elongata* usually grows to less than eight feet long. However, the extinct snaggletooth *Hemipristis serra* is estimated to have had a length of almost 20 feet.

Finally, the largest living thresher shark, *Alopias vulpinus*, can be between 10 and 20 feet long, and its teeth are 0.7 inches long. But teeth of the fossil thresher *A. palatasi* can measure 1.6 inches. Teeth from the fossil thresher shark *"Alopias" Trigonotodus grandis* have been described as "highly enlarged versions of thresher teeth."[1]

Because shark vertebrae are composed of cartilage, fossil shark vertebrae generally do not preserve well and are relatively rare. However, the vertebrae are sometimes calcified. Scientists can count growth bands within such preserved vertebrae to estimate the shark's age at the time of its death. These fossil age estimates are uncertain because some sharks show evidence of twice-yearly growth rings during at least parts of their lives, and the number of growth rings can vary in different vertebrae from the same shark. Nevertheless, researchers generally assume growth bands are annual as a first approximation.

Given this assumption, growth ring spacings within a *Ptychodus* vertebrae indicate it was still growing rapidly at 30 years of age. Likewise, growth rings in a megalodon vertebrae indicate it was still rapidly growing at 46 years old. Normally, growth rates slow down as creatures mature. That these sharks were still undergoing rapid, juvenile-like growth at these advanced ages suggests they were taking a long time to reach adulthood. Similarly, researchers estimate the fossil *Cretodus* shark from Italy would have taken 64 years to reach 95% of its adult body length. By way of comparison, one study of great white sharks indicated they do the same in about 33 years or less.[2]

Studies show that long-lived animals often have larger adult body sizes and take longer to mature than animals with shorter lifespans.[3] Thus, the large adult body sizes and delayed maturation of fossil sharks are indirect evidence that at least some of these sharks lived longer than today's sharks. This is consistent with patterns seen in fossilized *Crassostrea* oysters as well as predictions made by earlier creation researchers.[3,4]


Megalodon shark tooth

Since humans in the pre-Flood and start of the post-Flood worlds also experienced much greater longevity (see Genesis 5 and 11), there could be a connection. Additional research may reveal much more and possibly better validate these patterns. These growth rate results should be very encouraging to Bible-believing Christians who accept the great ages of the pre-Flood patriarchs recorded in Genesis.

References

1. For details and sources for these ages and lengths, see Jake Hebert, "Giantism and Delayed Maturation in Fossil Sharks, Evidence for Extreme Longevity?" *Creation Research Society Quarterly* 60, no. 4 (2024): 267–283.
2. Lisa J. Natanson and Gregory B. Skomal, "Age and Growth of the White Shark, *Carcharodon carcharias*, in the Western North Atlantic Ocean," *Marine and Freshwater Research* 66, no. 5 (2014): 387–398.
3. Jake Hebert, Richard Overman, and Frank J. Sherwin, "*Crassostrea* Oyster Fossils Show Evidence of Extreme Longevity," *Creation Research Society Quarterly* 60, no. 3 (2024): 171–190.
4. Jake Hebert, "Living to 900?" *Acts & Facts*, January/February 2024, 17.

Dr. Hebert is a research scientist at the Institute for Creation Research and earned his Ph.D. in physics from the University of Texas at Dallas.

WILLIAM WEST, M.C.Ed.

Sharing Our Creator's Truth

My name is Bill, and I'm the information technology manager at the Institute for Creation Research. I keep everything technical running and make sure everyone here at ICR has what they need to do research, publish books, make content, host events, and share the message of our Creator's truth with anyone who will listen.

For many years, I was in the camp of those who believe the Bible doesn't line up with science. Since it was "written by men," I thought it was flawed and shouldn't be trusted as history. I believed it when scientists said the earth was 4.5 billion years old. Who would question someone they think is smarter than they are?

In the garden, the serpent was able to deceive with one simple question. I think that with other simple questions, deceptions can be unraveled. One day, a hole was poked in my belief that science has it all figured out. I watched an online video that showed how the billions-of-years age assignment for Earth is full of assumptions. I never thought to question how scientists knew the starting mineral composition of the rocks they used for radiometric dating. I really never knew how they dated rocks. I just accepted their results.

Since then, I've studied a lot, and I want to help get this information out there. I believe that a personal relationship with Jesus Christ is life-changing, and I want everyone to experience it. I think many people are stuck like I was. They've been exposed to only one side of the story. So, I want to share what I've learned in hopes that it may poke a hole in a belief system that they never even tried to question.

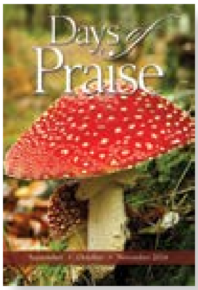
One way I do this is by handing out ICR resources. Many of our smaller books are perfect for sharing. Some of my favorites are *Dinosaurs and the Bible, Human Origins, Creation Q&A,* and *Creatures by Design*. People are always shocked to hear that dinosaurs lived at the same time as humans, and they're even more shocked to learn that there's a lot of evidence supporting that claim.

I have given many books to people at my church over the years, and they often come back with difficult questions. It's a testament to the amazing things that God is doing through ICR. He knows the questions that you need answered, and He prepares people to answer them as well as others like myself who help those people in their work.

Do you know about ICR's School of Biblical Apologetics (SOBA)? I earned my master's degree there, and it can equip you, too, in learning to unravel the deceptions of the serpent. You can find out more at **ICR.edu**.

So, I'd like to give a big thank you to all of you who support ICR's ministry. It's those generous donations and those widows' mites that keep us going. I am always grateful to God to work at a place like this—and even more grateful to have been able to learn as much as I have.

Mr. West is the information technology manager at the Institute for Creation Research.



I praise the Lord for ICR and the DOP [*Days of Praise*] devotional! **The devo is full of "meat," and I have thoroughly enjoyed the study in Jude!** Besides my pastor…this little tool has helped me grow in the Lord through the years. And the *Acts & Facts* magazine! Oh, my goodness, what a faith-building tool! My prayer for ICR is for the Lord to meet all the financial needs, keep you spiritually pure and proclaiming the gospel of Jesus Christ till He comes!

— M. M.

I must congratulate you on the way that [the *Days of Praise* podcast] is read. **Your young rep who does the reading is excellent!** He really does a great job. Nobody could do it better than him. Please congratulate him on a job well done to the glory of God.

— V. M. F.

Editor's note: ICR Director of Media & Marketing Michael Hansen is the reader for the *Days of Praise* podcast. You can hear this and other ICR online programs by visiting **ICR.org/podcasts**.

I read *Acts & Facts* to my wife as she fixes breakfast. We look forward to and enjoy them. We especially appreciated the park series feature on Colorado's Great Sand Dunes in your March/April issue. **I can't imagine a more lucid article than Dr. Guliuzza's feature "[Why Biology Needs] a Theory of Biological Design" [in the same issue]. It was amazing.** We are thrilled at the new ground you're breaking. Keep up the work! Here is my contribution to help you continue that work. We hope it can be more in the future.

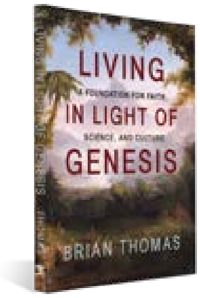
— Anonymous

Randy's part 3 article [in the "Why Biology Needs a Theory of Biological Design" series, July/August 2024 *Acts & Facts*] is magnificent, and it goes into some details that I had not considered previously. It will help me respond (according to Scripture) to people (either students or friends) who ask questions of me related to this topic. Thank you.

— D. P.

This is the second copy [of *Living in Light of Genesis*] I have bought because of the wear and tear on the first copy! I think the book is a superb overview. But most of all, every chapter has the name Genesis and applies Genesis across the board. This is a unique book, just the right size. The "ages" on page 84 are very useful. Tooth 1 and Tooth 2 have the most incredible dental chronology. I assume they must be from the same Mr. Naledi? No wonder that evolutionists need millions of years. I could go on and on, but those of us must thank you all for the marvelous work you do. We now have a fantastic resource of material, we put your resources to good use here in Cornwall.

— L. C.



Dear Brian [Thomas], I just finished your new book, *Living in Light of Genesis*. I received the Lord Jesus Christ as my personal Savior over 40 years ago. I have always believed the Genesis account as it was told. Your book has given me a much greater appreciation for the God I love and His eyewitness account of what happened in the beginning.

— B. G.

Have a comment?
Email Editor@ICR.org or write to
Editor, P. O. Box 59029, Dallas, TX 75229.
Unfortunately, ICR is unable to respond to all correspondence or accept unsolicited manuscripts, books, email attachments, or other materials.

Written by Michael Stamp, illustrated by Lori Fausak

Creation Kids

Geysers

Geysers are one of the hottest topics in science! These explosive features are a type of hot spring where the water is heated by shallow, molten rock below the surface. As the temperature rises, the pressure builds until the boiling water needs a place to escape. Then, the geyser erupts as a mineral-rich fountain—sometimes hundreds of feet into the air! Did you also know...

- ✓ The word geyser comes from an Icelandic term meaning "to gush or rage."
- ✓ Geysers often erupt on a cycle, which allows scientists to predict their activity.
- ✓ There are geysers located outside Earth, too! Saturn's moon Enceladus has over 100.

Did You Know?

Old Faithful is one of the most famous geysers. Located in Yellowstone National Park, it can shoot water and steam over 180 feet high.

Geyser Word Search

GEYSER
HOT SPRING
PRESSURE
HEAT
STEAM
WATER

P	D	B	A	E	H	X	I	H	U
O	Q	Z	J	L	W	J	Y	O	C
X	G	C	O	Q	R	M	J	T	E
I	T	P	V	S	X	G	E	S	R
W	X	R	T	T	E	X	H	P	U
K	C	E	A	X	A	T	M	R	S
R	A	G	E	Y	S	E	R	I	S
M	E	F	I	H	D	Y	H	N	E
R	E	T	A	W	Z	U	V	G	R
C	D	T	N	Y	B	I	W	B	P

Word Scramble

What countries have most of the world's geysers?

1. dteniu atsets ____________________
2. sarius ____________________
3. hclei ____________________
4. wne lzdnaea ____________________
5. naceidl ____________________

Geyser experiment supplies: diet cola or other soda, Mentos, paper, scissors, and tape

1. Cut a sheet of paper in two, roll half into a tube, and tape the seam.
2. Open the soda bottle, place the flat paper on top, and stand the tube on it over the opening.
3. Drop Mentos into the tube.
4. Pull the paper away so the mints drop into the soda.
5. Run and enjoy your geyser!

Scan to see a video of the experiment.

Word Scramble Answers: United States, Russia, Chile, New Zealand, Iceland

BY RENÉE DUSSEAU AND SUSAN WINDSOR

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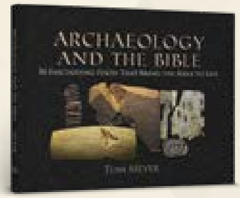

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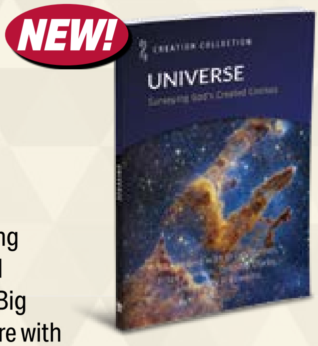

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