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OCTOBER
2026

VOL. 55 NO. 6

Did Sauropod Dinosaurs Live for Centuries?

page 4

The Land of Truffula Trees

page 10

The Cambrian Layer: Explosion or Burial?

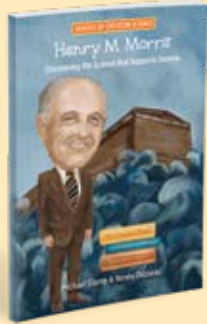
page 20

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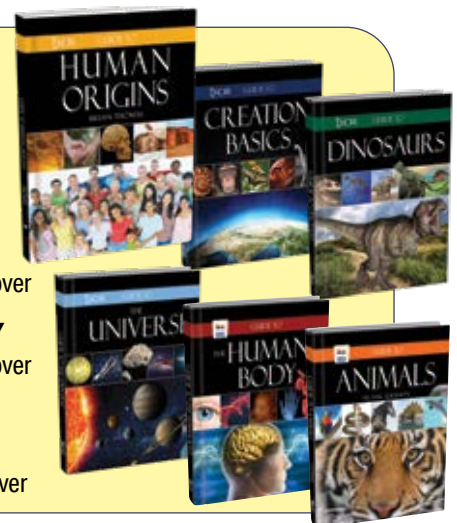
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DESIGNER
Dennis Davidson

[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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Institute for Creation Research
ISSN (print): 1094-8562
ISSN (online): 2833-2806

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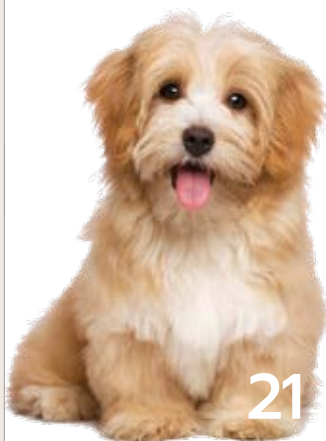
Front cover: Joshua Tree desert landscape
Image credit: iStock | Schropstschop



4



10



21



23

impact

4 Did Sauropod Dinosaurs Live for Centuries?

JAKE HEBERT, PH.D.

park series

10 The Land of Truffula Trees

JOEL BROWN, PH.D.

stewardship

19 My Sheep Hear My Voice

JAMES GADBERRY

back to genesis

20 The Cambrian Layer: Explosion or Burial?

GABRIELA HAYNES, PH.D.

essential training

21 What Is True and False?

PATRICK C. MARKS, D.MIN., AND
BRIAN THOMAS, PH.D.

creation kids

23 Fungi

BETHANY TRIMBLE AND SUSAN WINDSOR

article highlights

- Pre-Flood humans lived for many centuries. This suggests that at least some pre-Flood animals also had longer lives.
- Scientists counted conspicuous growth bands in four sauropod dinosaurs to estimate their ages at maturity.
- The fastest growing sauropod apparently reached maturity in about 44 years, while the slowest growing one did so in about 127 years.
- Although these ages at maturity are uncertain, they are consistent with biblical expectations: long-living animals generally take a long time to mature.

Humans living before Noah's Flood routinely had 900-year lifespans (Genesis 5). The Bible gives no hint that this longevity was in any way miraculous. And it is very difficult to imagine a mechanism or mechanisms, whether genetic or environmental, that would promote extreme longevity in humans that would not *also* promote extreme longevity in animals. So, it would make sense that pre-Flood animals also experienced great longevity. Since nearly all the world's fossils, including those of dinosaurs, are the remains of creatures that perished in the Genesis Flood, their fossils might contain clues hinting at very long lifespans. Longevity studies in living animals have repeatedly confirmed that creatures that take a long time to mature tend to live longer than those that mature more quickly.¹

Did Sauropod Dinosaurs Live for Centuries?





Apatosaurus

Could this have been the case for dinosaurs as well?

Larger animals generally live longer than smaller animals. Obviously, some dinosaurs were very large. This is especially true of the sauropods, the long-necked, long-tailed giants like *Apatosaurus*. Creationists have long speculated that these dinosaurs had very lengthy

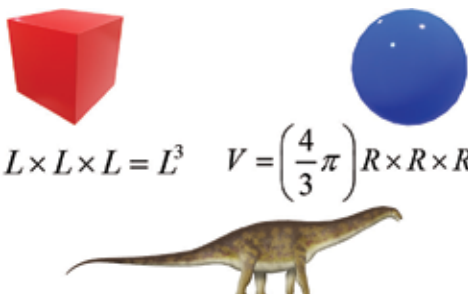
lifespans, and preliminary data may be starting to confirm this expectation.

Estimating Dinosaur Age

Scientists infer dinosaur ages by counting the growth bands, or rings, in their bones. The bones used for such studies are often, but not always, weight-bearing long bones like the femur or humerus. However, damage to the fossil can make it difficult or impossible to count the rings. On top of that issue, the innermost growth bands can also be “erased” due to a process called secondary bone remodeling. It’s challenging to determine what age to assign to the first remaining, still visible growth band.

Estimating Dinosaur Volume

Body mass depends directly on the body’s volume. The formula for volume is usually a constant multiplied by a length dimension that has been raised to the third power, or cubed (Figure 1). For a perfect cube, this constant is one. For a sphere, this constant is $\frac{4}{3}\pi$ or about 4.19.



$$V = L \times L \times L = L^3 \quad V = \left(\frac{4}{3}\pi\right) R \times R \times R = \frac{4}{3}\pi R^3$$

$$V = \text{constant} \times L \times L \times L$$

$$= \text{constant} \times L^3$$

Figure 1. Object volumes are the cube of a length multiplied by a constant. This is true even for complicated shapes like dinosaur bodies. The total dinosaur length L , in turn, is thought to be a constant multiplied by the length of a prominent bone, often the humerus or femur.

Image credit: CC BY 1.0, TotalDino

In principle, a similar formula can be used for finding the volume of more complex objects, like dinosaurs. The volume of the dinosaur is the cube of its total body length multiplied by some constant. And the length of a prominent bone, like a femur, is assumed to be a stand-in for the total body length. Based on this assumption, a sauropod dinosaur twice as long as another member of the same species would have a femur twice as long as the other sauropod’s femur.

Fast-Growing Dinosaurs?

In 2001, scientists counted 14 growth rings in two scapulae—shoulder blades—from two subadult *Apatosaurus* fossils. The growth bands ranged in size from 22% to 56% of the estimated adult scapula

length. The researchers concluded that *Apatosaurus* reached adulthood in about 15 years.^{2,3}

Such a short growth interval would imply amazingly rapid growth, with a peak growth rate of 5.5 tons per year.^{2,3} Also, assuming that the total body length was proportional to the scapula length, it should have taken the *Apatosaurus* 14 years just to go from 22% to 56% of its adult length. Yet ages at maturity tend to increase with increasing body mass or weight.⁴ *Apatosaurus* was one of the largest land animals to have ever lived. Hence it would seem very strange if it reached adulthood so quickly.

An Expression for Body Weight

Often, large animal body lengths increase with age according to the equation,

$$(1) \quad L(t) = L_{adult} - (L_{adult} - L_{hatch})e^{-bt}$$

where L_{adult} is the adult length, L_{hatch} is the length at hatching, e is a number called Euler's constant (about 2.71828), b is a constant that controls how quickly the animal grows, and t is the age in years.⁵ Since equation (1) gives dinosaur body length, the cube of equation (1) should be directly related to dinosaur volume $V(t)$ as shown in Figure 1:

$$(2) \quad V(t) = \text{constant} \times L(t) \times L(t) \times L(t) \\ = \text{constant} \times L^3(t)$$

The t in equation (2) is included as a reminder that both length and volume change as the dinosaur grows. And since volume is directly related to mass, and mass is directly related to body weight, equation (2) should be directly related to the dinosaur's weight. Inserting the cube of equation (1) into equation (2) results in a complicated, messy expression, but we can simplify it.

Even the largest sauropod dinosaurs hatched from eggs the length of a football. But the adult body size was so large that the body weight at hatching was negligible compared to the final adult body weight, which we call W_{adult} . So, we can simplify our expression for body weight so that we just have:

$$(3) \quad w(t) = W_{adult} (1 - e^{-bt})^3$$

Here, $w(t)$ is body weight at some age t . W_{adult} is estimated from the largest known fossil specimen, presumed to be a full-grown adult. The body weight starts at zero, increases, and then eventually levels off to become a nearly flat, horizontal line. The four curves in Figure 3 have this general shape.

Dividing both sides of equation (3) by W_{adult} and multiplying by 100% gives the percentage of adult body weight at an age t :

$$(4) \quad \% \text{ adult body weight} = 100 \times (1 - e^{-bt})^3$$

As mentioned earlier, a sauropod's total body length was assumed to be directly related to the length of one of its bones. So, doubling the bone length would presumably correspond to a doubling

of total body length. Remember also that body weight depends on volume, and volume depends on the cube of a length. During those 14 years of growth, the *Apatosaurus* body weight started at $(0.22)^3 = 0.01 = 1\%$ of its final value, and ended at $(0.56)^3 = 0.18 = 18\%$ of its final value. But to construct a growth curve, what ages should be assigned to these percentages? And what is the value of b in equations (3) and (4)?

A Clever Approach

Paleontologists Thomas Lehman and Holly (Woodward) Ballard used a clever approach to determine the age that should be assigned to the first visible *Apatosaurus* growth ring.³ They experimented with different possible starting ages (one, two, three, four, five years, etc.) for the first ring. The age assigned to the first ring automatically determined the ages to be assigned to the other 13 consecutive data points. For each trial, a computer found the value of b that gave the best-fitting curve to the 14 data points. One of the test curves gave a better overall fit to the data than the other trials. That best-fitting curve indicated the age that should be assigned to the first growth band. This is illustrated in Figure 2.

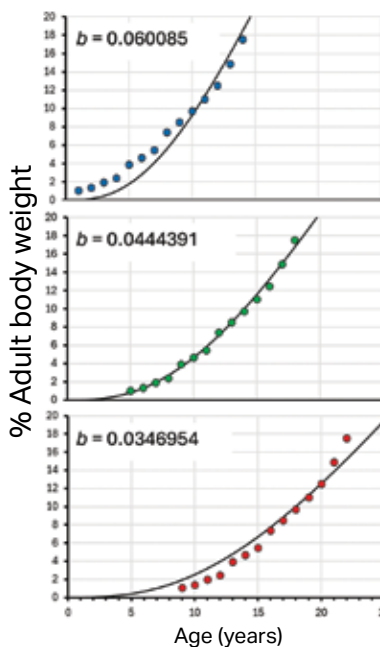


Figure 2. A computer finds the value of b that gives the best fit of equation (4) to the 14 body mass percentages shown. In each case, the computer finds the value of b that gives the best fit to the growth curve, but the alignment will still be poor if the first visible growth band is assigned the wrong age. The very best fit to the *Apatosaurus* data is obtained when the first visible band is assigned an age of five years (middle graph) and the value of b is 0.044. The full growth curve is the green curve in Figure 3.

The 14 weight percentages are exactly the same in the top, middle, and bottom graphs. But different trial ages were assigned to the first percentage in all three cases. The value of b in all three instances is the value that gave the best-fitting curve to those 14 percentages for that particular trial. When the first weight percentage was assigned an age of one year (top of Figure 2), the percentages, represented by the blue dots, generally fell *above* the plot of equation (4). When the first percentage was assigned an age of nine years (bottom of Figure 2), the red dots tended to fall *below* equation (4). But there was a “sweet spot” (middle of Figure 2) when the first ring was assigned an age of five years, at which the weight percentages fit very tightly to the growth curve, as illustrated by the green dots. Lehman and Ballard concluded

that the first growth band should be assigned an age of five years. This automatically determined the value of b to use for the *Apatosaurus* growth curve. They reported the best fit to the data when $b = 0.045$, which is very close to the value of $b = 0.044$ that I obtained in Figure 2.

Results

With b known, Lehman and Ballard could construct the full *Apatosaurus* growth curve. They used the same method to find growth curves based on an *Alamosaurus* humerus, a *Janenschia* femur, and the pubis of an unknown sauropod from the Northampton Sands in England. The resulting growth curves, after expressing them in terms of body weight, are shown in Figure 3. The data points used to obtain the curves, the implied peak growth rates, and the ages at maturity (99% of adult body weight) are depicted as well.

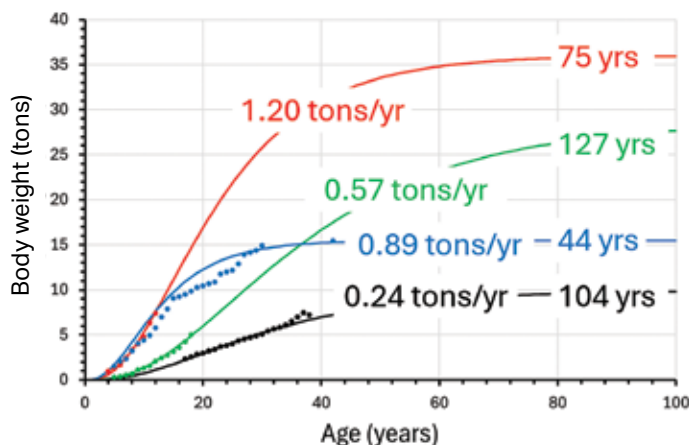


Figure 3. Estimated growth curves, maximum growth rates, and ages at maturity for *Alamosaurus* (red), *Apatosaurus* (green), *Janenschia* (blue), and an unidentified sauropod from England's Northampton Sands (black). Reconstructed from figures 1–4 in reference 3. Lehman and Ballard obtained a likely range of b values for each dinosaur. To keep from cluttering the graph, for each sauropod I used a value of b close to the midpoint between their reported extremes. Also shown are the estimated body percentage data (after converting to weight in tons) used to obtain each curve.

In today's world, contrary to what we see in Figure 3, very few vertebrate land animals take more than 40 years to stop growing, with the notable exceptions of long-living Galápagos giant tortoises and African bush elephants.⁶ Yet the lowest estimated sauropod age at maturity is 44 years, and some of these ages may have exceeded a century.

Admittedly, there is uncertainty in these numbers. For *Apatosaurus* and *Alamosaurus*, we have only a very small percentage of all their potential growth data. Moreover, dinosaur body weight estimates obtained from femur and humerus bones are considered more trustworthy than estimates from other bones like the pubis and scapula.⁷ Likewise, the discovery of a larger, more mature sauropod might reveal an unexpected change in growth trajectory that could either increase or decrease these estimated ages at maturity. But without such

a change in trajectory, the discovery of a larger bone would increase the age at maturity. Taking that and the number of data points into consideration, the *Janenschia* curve (blue) is probably the most reliable, the *Apatosaurus* curve (green) is the least reliable, and the reliability of the *Alamosaurus* (red) and Northampton sauropod (black) curves fall somewhere in the middle.

In their research, Lehman and Ballard counted only the most prominent sauropod growth bands.³ Ballard recently collaborated with renowned paleontologist John “Jack” Horner and determined that *T. rex* likely took at least 40 years to reach its full size. But this *T. rex* result was obtained after including less prominent growth bands in the count.⁸ This raises the possibility that less conspicuous growth bands should *also* have been included in this sauropod study. That would make the sauropod ages at maturity, and presumably their full lifespans, higher than those reported here.

Conclusion

If at least some sauropod dinosaurs took a long time, possibly a century or more, to mature, their full lifespans were likely much longer. This is hardly surprising, since humans in the pre-Flood world also lived for centuries.

Dinosaur and other fossils are the remains of animals that were buried and entombed in a global watery cataclysm that occurred thousands of years ago.⁹ And many of these fossil creatures, including the sauropod dinosaurs, had very long lifespans compared to living creatures today.^{1,10–12} That sounds . . . biblical! 📖

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Project Artifact: The Spear

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Written by Trey Bowling
Illustrated by Lori Fausak



In AD 2257, scientist Dr. Gideon Gates believes he's found the key to unlocking Earth's past: an AI-powered initiative called Project Artifact. When he examines an ancient spear, the software provides an unexpected background, leading him to question everything. Join Gates in his perilous quest for the truth in the midst of injustice, top-level secrecy, and unforeseen enemies. Will the truth prevail?



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OCTOBER 14

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DAY4 ASTRONOMY MEETING

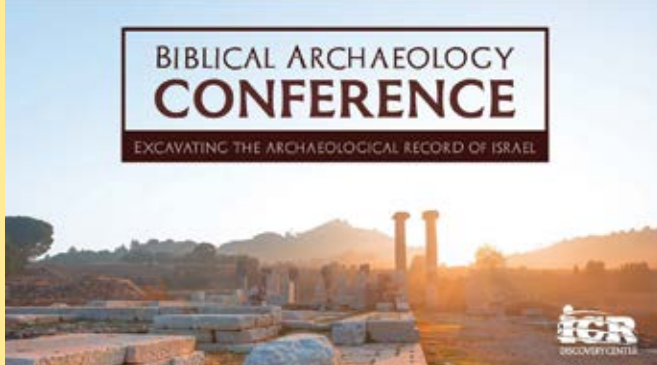
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The Land of Truffula Trees

article highlights

- Desert environments appear too harsh to host much life, but they are home to a remarkable community of creatures.
- Joshua Tree National Park spans two distinct desert regions—the higher elevation Mojave and the lower Sonoran.
- The Joshua tree yuccas have a profoundly symbiotic relationship with the yucca moth, so much so that one scientist exclaimed they were “made for each other.”²
- Assuming yucca plants survived the Flood as seeds, the moth had to wait years before the yucca plants flowered. The moth can go dormant in a state called diapause for up to 30 years. Their partnership was likely postponed for several years while the yuccas regrew.

The iconic Joshua tree yucca

Deserts are often viewed as barren wastelands, yet they boast some of the most captivating organisms on Earth. You have to be unusual to live in a desert, and the Joshua trees of Joshua Tree National Park are no exception. Resembling Dr. Seuss’s truffula trees, these distinct plants raise intriguing questions about how desert ecosystems developed and were colonized in the post-Flood world.

Of the 12 U.S. national parks in desert regions, Joshua Tree is unique because it straddles the boundary between two major ecosystems: the higher elevation Mojave Desert and the lower elevation Sonoran Desert. Located about 130 miles east of Los Angeles, this almost 800,000-acre wilderness was designated as a national monument in 1936 and a national park in 1994 to protect its rich biological communities.



Cholla cacti, a.k.a. teddy-bear cholla

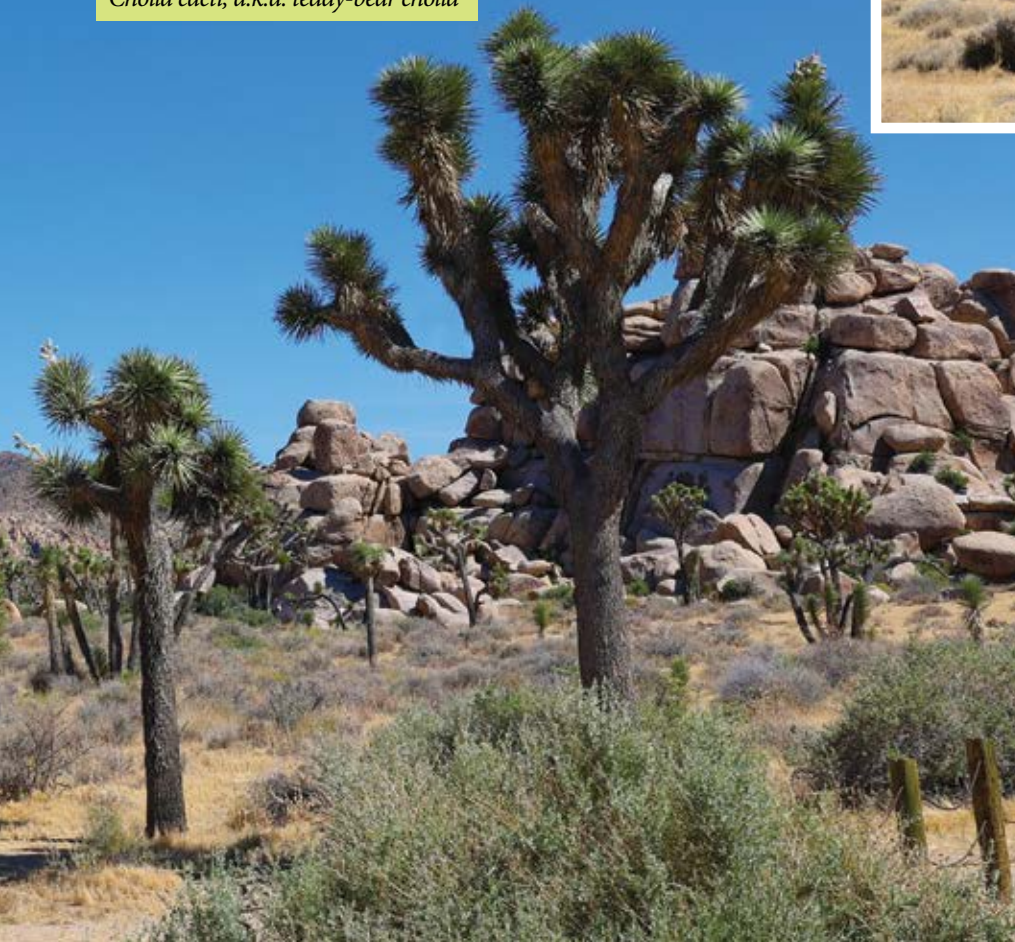


Figure 1



Left: the renowned Joshua tree—an indicator species of the Mojave Desert and abundant throughout the upper portion of Joshua Tree National Park

Image credit: Joel Brown

Top right: maturing Joshua tree fruit, resulting from pollination by a yucca moth

Image credit: Joel Brown

*Bottom right: a yucca moth (*Tegeticula synthetica*) visiting a Joshua tree flower*

Image credit: Joshua Tree National Park, CC BY 2.0

The Upper Desert

Driving from Los Angeles towards the west entrance to the park, you'll notice a climb in elevation. The plants are your barometer. As you move steadily upward past unimpressive desert scrub, something almost magical occurs. First there's one, then another, then as far as the eye can see, hundreds of odd-looking "somethings"—you are now entering the realm of the Joshua tree (Figure 1).

Named by early Mormon settlers for their resemblance to the biblical Joshua pointing the way across the wilderness (I don't see it), these organisms are actually yuccas. Most yucca species grow in low clumps near the ground, but the Joshua tree hoists its foliage high on long stems. Rather than producing annual growth rings, its trunks slowly stiffen through lignification—a process where woody polymers reinforce

It All Starts with the Landscape

To appreciate any ecosystem, you must understand its underlying geology. Tucked behind the San Bernardino Mountains, Joshua Tree National Park is a classic rain shadow desert. Warm, moist air from the Pacific Ocean is forced upward by the mountains, cooling and dropping its rain on the ocean-facing slopes. As the dried air

proceeds over the mountains, it descends and warms, creating exceptionally arid conditions across the interior region: the Mojave Desert.

The parched environment is the most important factor affecting which plants you will encounter at Joshua Tree, but it's the less obvious change in elevation that leaves nerdy ecologists oohing and aahing as they pass through the distinct plant communities of this region.

internal tissue. Because they lack rings, precise ages are difficult to determine, though the trees are estimated to live between 150 and 300 years.

Joshua trees, like all yuccas, share a tight symbiotic relationship with the yucca moth.¹ The female moth intentionally pollinates the flowers, ensuring the plant produces seeds. She then lays her eggs in the flower, allowing her larvae to feed on a portion of the developing seeds while leaving enough for the tree to reproduce. The moth even marks visited flowers with a pheromone, or chemical substance, to signal to other yucca moths, “This flower is taken.” Yucca moths are the sole pollinators of yuccas, and yuccas are the exclusive food source for yucca moth larvae.

This symbiotic relationship is so close that conventional biologist Christopher Irwin Smith says it’s “almost as if the moth and the tree were made for each other.”² Hmm. From a creationist perspective, such intricate interdependency makes sense as an engineered system, though it raises an interesting question: how did this partnership survive an event as disruptive as the global Flood of Genesis? You can ponder this question as you leave the upper desert and begin the descent into the lower Colorado division of Joshua Tree, considered the western part of the larger Sonoran Desert.

The Lower Desert

While seeing the quirky Joshua trees may be the highlight of the park, those who venture down to the less trafficked

lower desert will experience a remarkable transition between two desert ecosystems (Figure 2).

As you meander down Pinto Basin Road through the heart of the park, the plants again will reveal your change in elevation. Descending below 3,000 feet, you say goodbye to the Joshua tree and stumble into another forest of the not-so-cuddly teddy-bear cholla (pronounced “choy-yah” in the Spanish fashion). Joshua Tree National Park brings together just the right environmental conditions that lead to an unbelievable number of these plants growing at Cholla Cactus Garden.

Figure 3



Left: teddy-bear chollas; right: Cholla Cactus Garden



Ocotillo

Continue a mile down the road and the chollas give way to the dead-looking ocotillo, which quickly turns into an endless sea of creosote bushes. While not known for their beauty, each of these unique plants is designed to tolerate the harsh conditions of the lower desert (Figure 3).³

Driving through Joshua Tree shows how certain plants prefer and thrive in specific environments. But it also makes you wonder how these plants came to populate this dry wilderness in the first place.



Cholla cacti at sunset

Figure 2



The desertscapes of Joshua Tree National Park vary from Joshua tree forests in the upper park (left), to thousands of teddy-bear chollas at Cholla Cactus Garden (middle), to the barren creosote bush lowlands (right).

Image credit: Joel Brown

Deserts in a Post-Flood World

Would a “drive” through the pre-Flood world reveal the same landscapes and plant communities we see in Joshua Tree National Park today? Perhaps, yet Scripture and the geologic record suggest the pre-Flood world was different, characterized by a more equitable climate and lush vegetation. The mountain ranges we see today came from catastrophic upheaval during the Flood. Before the Flood, without large mountain ranges, rain shadows would



be less severe and deserts rare.

In His wisdom, God engineered plants that were able to thrive in arid environments, but this skill set was probably underutilized in the verdant pre-Flood world. This is supported by the fact that yuccas and cacti are rare in the fossil record. Even conventional biologists recognize the recent success enjoyed by desert-loving plants. According to botanist Isaac Lichter-Marck, “When the deserts emerged, those plants that had the necessary preadaptations to take advan-

tage of new conditions were the ones that thrived.”⁴ Arid-engineered plants had to patiently wait for an ecological disturbance that would expose new environmental niches in which they could thrive. That came, ironically, in the form of a flood.

As seeds and propagules—parts of a parent plant able to start growing when detached and planted on their own, like bulbs or seedlings—began to germinate after the Flood, they faced a changed landscape: barren land stripped of vegetation, bordered by new mountain ranges blocking rain. This was the opportunity arid-engineered plants had been waiting for. Rather than avoiding extreme conditions, they were preloaded with a core set of traits and adaptability that allowed them to make these extremes their home. For instance, the long stems of Joshua trees are probably a post-Flood adaptive trait within the yucca kind that allowed them to elevate their leaves away from extreme desert floor heat during the summer and protect them from the ground-hugging cold of winter.

The yucca plant/yucca moth mutualism is also interesting to consider from a flood perspective. If the yucca plant survived the Flood as a seed, the moth would need to wait several years after the waters subsided before yucca plants were again producing flo-

ral nurseries for its young. The answer to this conundrum probably lies in the yucca moth’s ability to “sleep” for a very long time—a state called diapause. Yucca moths have gone up to 30 years in a dormant pupal state, emerging only when they sense that conditions are right.⁵ To survive the Flood, this partnership was likely put on hold for several years while yuccas regrew and yucca moths “slept” the time away, tucked safely in cocoons buried in post-Flood vegetation mats.

Traversing Joshua Tree National Park offers a view of an environment changed after the Flood—and fosters an appreciation for incredibly engineered plants and animals designed to adapt in an ever-changing world. 🌵🦋

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Dr. Brown is the director of the Creation Research Society and an associate professor of biology at Arizona Christian University. He earned his Ph.D. in molecular biology from Cornell University.



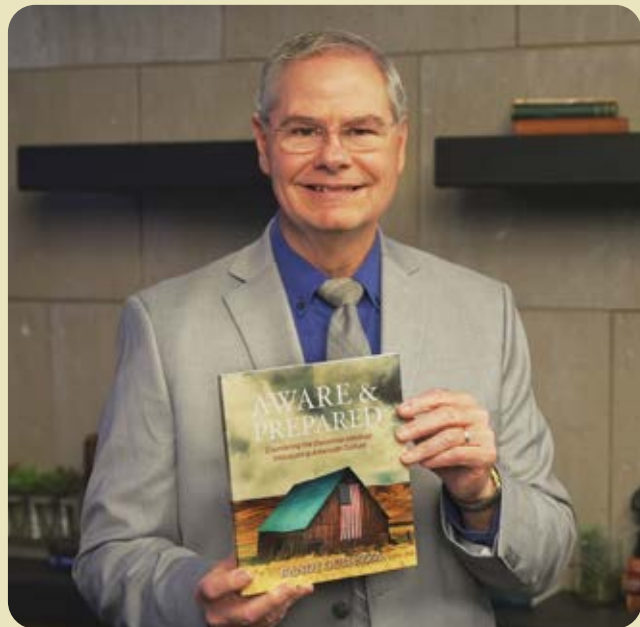
Joshua trees and boulders

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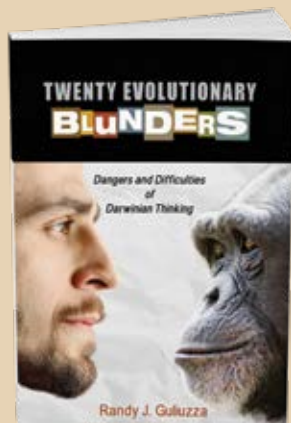
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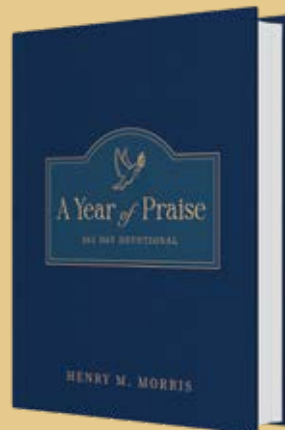
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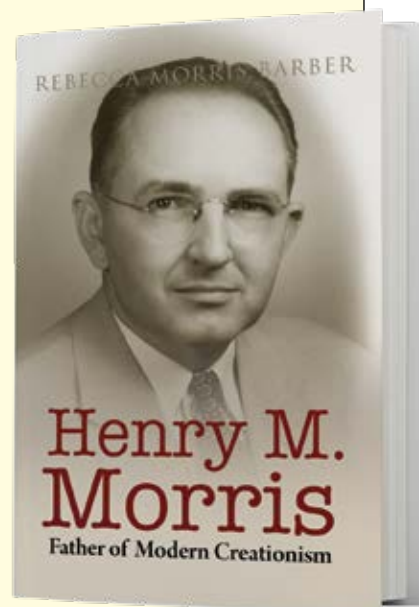
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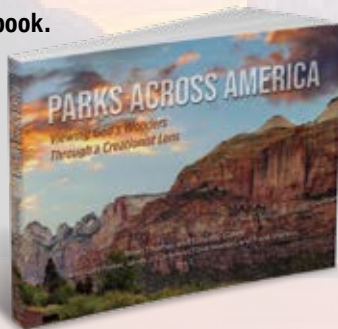
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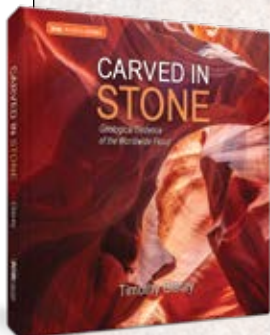
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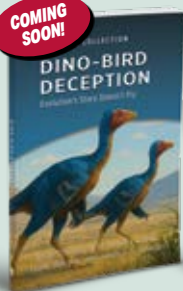


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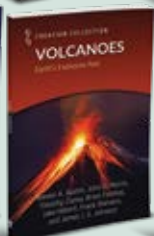
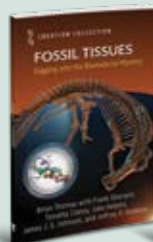
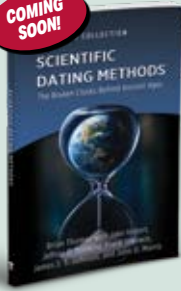


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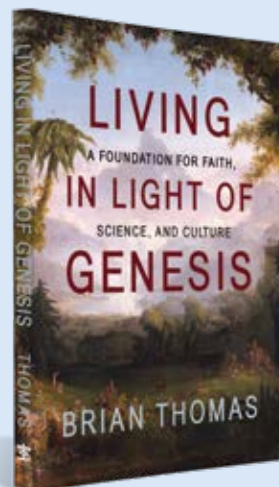
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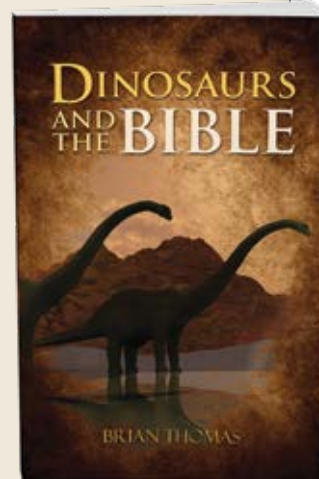
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On Thin Ice

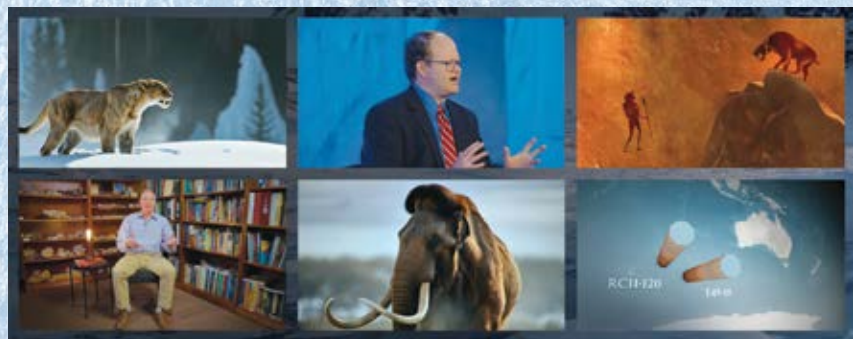
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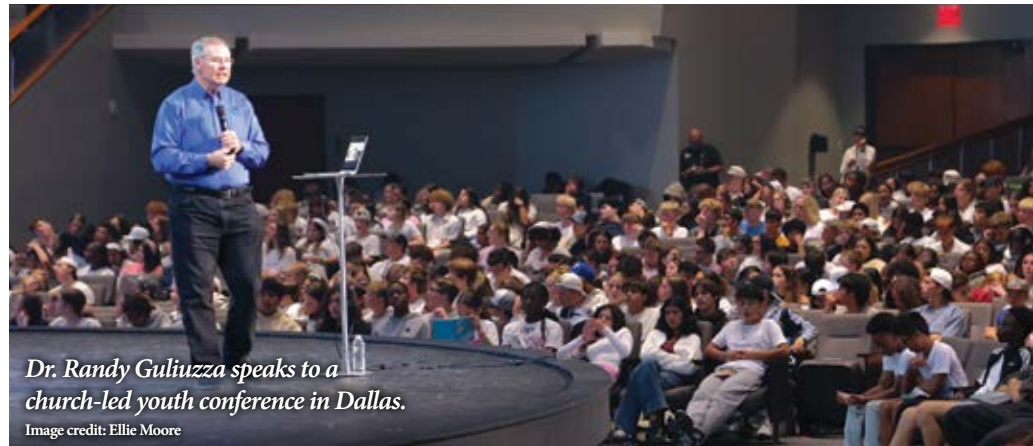
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My Sheep Hear My Voice

Young people today can access more information in a matter of days than many people could acquire in an entire lifetime just a century ago. Smartphones, high-speed Internet, social media, search engines, and artificial intelligence place an unprecedented amount of information at their fingertips. As a boy, I felt fortunate to have encyclopedias and books available to me. Today, this unparalleled wealth of information brings equally significant problems. Information overload, misinformation, disinformation, constant distractions, and difficulty distinguishing reliable sources from unreliable ones confront young people every day. The defining challenge of this generation is no longer procuring information, but discerning which of it is true.

The Lord Jesus addressed this issue at its deepest level when He said, “My sheep hear My voice, and I know them, and they follow Me” (John 10:27). The fundamental question facing young people today is whether they can recognize the voice of truth amid the noise.

Thanks to ICR’s generous supporters, our events team enables us to effectively carry out our mission to equip church leaders. We will engage more than 80 churches, schools, conferences, and research institutions this year alone. At one recent event, Dr. Brian Thomas and Dr. Randy Guliuzza had the privilege of speaking to more than 1,500 teenagers for a workshop at what may be the largest church-led youth conference in the nation. The engagement and questions from these students were thoughtful and honest. There was a genuine desire for truth. Eagerly leaning into the content, many of these



Dr. Randy Guliuzza speaks to a church-led youth conference in Dallas.

Image credit: Ellie Moore

students took careful notes. Dr. Guliuzza delivered his closing statement with intentionality and care, urging the young people to read their Bibles and trust that by giving the words their normal meaning in context, the Lord’s voice is clearly understandable through His written Word.

For more than five decades, ICR scientists have conducted important research. Their findings have consistently upheld the historical accuracy of Scripture. Today, this includes developing a foundational framework to think about biology from an engineering perspective and engineering-based models to explain biological adaptation. Other research findings, such as consistent sedimentary rock layers on every continent, Ice Age remnants that fit biblical history, and fossil evidence indicating rapid burial and catastrophic processes, strongly point to the global Genesis Flood. Original soft tissues discovered in dinosaur fossils challenge assumptions about deep time, and ICR’s longevity studies explore evidence consistent with the remarkable lifespans recorded before the days of Noah.

These endeavors are not merely academic. They help remove intellectual barriers

that often prevent people from taking God’s Word as serious truth. They demonstrate that biblical faith is not contrary to scientific investigation; rather, the evidence increasingly corroborates the reliability of Scripture.

As the battle for the hearts and minds of the next generation intensifies, we are increasing our commitment to scientific research of the highest caliber with the expectation that our results will strengthen the church’s confidence in recognizing the truthful voice of our Lord Jesus through His Word. We are adding to our ongoing engineered biology investigations by outfitting a new mass spectrometry laboratory. With these efforts, we are expanding our ability to address the questions young people ask. ICR’s most significant contributions are yet to come. Thank you for your faithful prayers and generous financial support. Your partnership enables this vital work and helps ensure that future generations hear the Creator’s voice above the noise of an increasingly confused world. 

Mr. Gadberry is the director of development and donor relations at the Institute for Creation Research.



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The Cambrian Layer: Explosion or Burial?

The lowest sedimentary layer, rich in hard-shelled fossils, is known as the Cambrian record. Beneath it is the Precambrian, which contains far fewer fossil remains. What distinguishes the Cambrian is not merely the presence of fossils, but their diversity, anatomical complexity, completeness, and abundance. These numerous distinct organisms appear abruptly, without documented ancestors or transitional intermediates.^{1,2}

None of the organisms in the lower-level Precambrian can be confidently identified as evolutionary precursors to the complex forms found in the Cambrian—presenting a significant difficulty for Darwinian evolution.³ It's not just one or two Cambrian discoveries that lack transitional forms: approximately 35 major animal groups have been found in the Cambrian record without identifiable ancestors.⁴ After over 160 years of scientific investigation, the so-called Cambrian Explosion remains a persistent challenge for the evolutionary scenario.¹

How do conventional scientists address this event? Some prefer to redefine the “explosion” as rapid but not instantaneous.⁵ However, even rapid evolutionary change requires a biological explanation and should have produced transitional forms.

Others suggest that ancestral organisms did exist and were simply not preserved. Scientists have since found that this was not true; the burial conditions were similar both before and during the Cambrian Explosion.⁵ So, while possible in principle, this proposal functions largely as an expectation rather than a demonstrated solution. Additional hypotheses appeal to genetic “switches” that, once activated, supposedly triggered rapid biological innovation.⁶ But these raise further questions about the origin and activation of such regulatory systems.

Some propose that early organisms possessed potential for later diversification.⁷ Yet that proposition assumes the prior exist-



Olenoides superbus trilobite, Middle Cambrian

Image credit: Daderot, CC BY 1.0 public domain

tence of highly complex biological systems, an assumption that itself lacks fossil confirmation. Another commonly cited explanation is punctuated equilibrium, which suggests that evolution proceeded in short bursts separated by long intervals of stability.⁸ However, this concept merely attempts to describe the pattern. It fails to explain how new body plans could have developed or why extended periods of stasis (no change in creature appearance) dominate the fossil record. In effect, punctuated equilibrium appeals to processes that are neither directly observable nor adequately testable since the crucial data is, by definition, missing. The model asserts bursts of change but leaves no sufficient explanation for the cause behind the bursts. The arbitrary and inconsistent interpretations offered illustrate how problematic the Cambrian Explosion remains within the evolutionary framework. Even some conventional scientists acknowledge that no reasonable solution has decidedly resolved the issue.

From a biblical perspective, the Cambrian record is understood differently. The fossils in it are exclusively marine organisms—an observation consistent with the early stages of the global Flood described in Genesis 6–8. Genesis 7:11 records that “the fountains of

the great deep” were broken open, indicating catastrophic geological events, including the release of subterranean waters and volcanic activity along ocean floors.

The resulting sediment deposition would have first buried marine ecosystems. Thus, the Cambrian fossils record not evolutionary development but *catastrophic burial*. They do not demonstrate when “primitive,” “basal” life began. Instead, they preserve fully formed, complex, and functional organisms created by the Lord Jesus during creation week. Such burial stemmed from divine judgment upon human wickedness (Genesis 6:5).

Viewing Earth's history through a biblical lens provides clarity and consistency. Rather than relying on speculative and shifting explanations proposed by finite and fallen men, we can turn to the testimony of the One who witnessed these events firsthand. Trusting God's Word grounds our understanding of the past in reliable truth.

As we learn and embrace God's revealed truth, we gain confidence—not only in understanding Earth's history, but in recognizing that the same righteous God who judges sin has graciously provided salvation through His Son, Jesus Christ. 🙏

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Dr. Haynes is a research scientist at the Institute for Creation Research and earned her Ph.D. in paleontology from Universidade Federal do Ceará in conjunction with the University of Kentucky.



WHAT IS TRUE AND FALSE?

PATRICK C. MARKS, D.MIN., AND BRIAN THOMAS, PH.D.



In the first article of this series, we explained that truth—that which matches reality—is something we can know, and any attempts to deny it are futile. The next step is to recognize truth. We need the law of noncontradiction for that.

This law states that two opposite ideas can't both be true at the same time and in the same relationship. For example, the two prevalent views about our origins, creation and evolution, cannot both be the correct view of history. Why? They oppose each other.

Evolution describes our origins through entirely *natural* processes. The creation account as found in Genesis is instead *supernatural*, as two verses illustrate: “In the beginning God created the heavens and the earth” (Genesis 1:1). “And the LORD God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living being” (Genesis 2:7). The idea that evolution somehow created life-forms opposes biblical creation in more ways than just denying the supernatural.

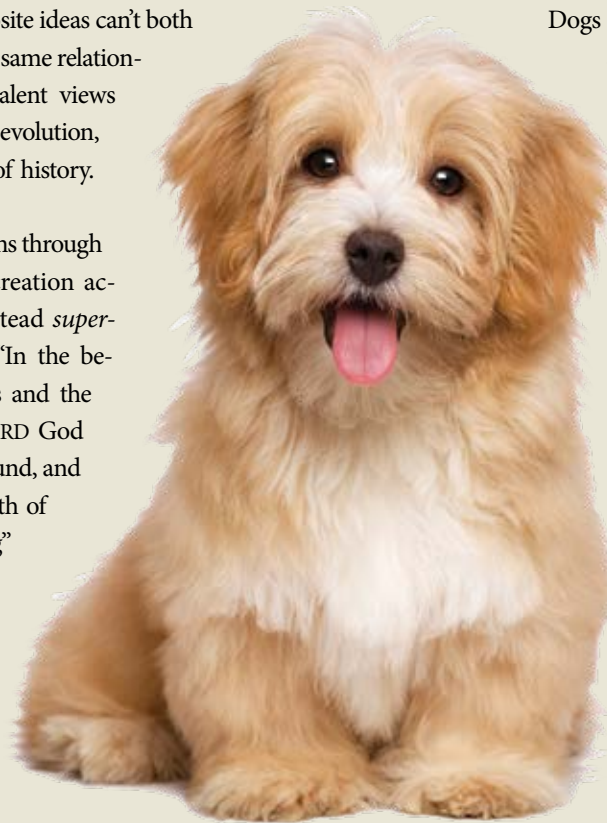
If evolution were true, billions of years of death involving countless unfit animals changed life-forms all the way from fish to philosophers. In contrast, Genesis explains that death entered the world because of and after Adam and Eve's disobedience to God. Either death entered creation after and because of sin, or death existed long before and not because of sin. Both cannot be true.

Additionally, Genesis 1 says that God created creatures to reproduce *according to their kinds*. As a case in point, changes in the many dog trait variations—like body size, fur length, and coat colors—never altered the basic dog body plan that all healthy dogs share.

Dogs don't and won't turn into any other kind, like a pig. In opposition to this, evolution teaches that as animals reproduced, they slowly built different basic body plans. One might align with evolution's reproduction *between* kinds or biblical creation's reproduction *according to* kinds, but to merge these two is not a logical option. They clearly contradict each other.

Some well-meaning Christians wonder if God might have created using an evolutionary process. However, as we have seen, this is an attempt to merge opposite concepts. According to the law of noncontradiction, it's either one or the other. You can't have both. But the law of noncontradiction cannot tell us by itself if either evolution or creation is true. So where does that leave us?

Each view should be examined to determine how well it holds up against the evidence. Our next article will start to examine the evidence for creation. 



Dr. Marks is the senior pastor at Calvary Chapel FourteenSix in Surprise, Arizona, and earned a D.Min. in apologetics from Veritas International University. Dr. Thomas is a research scientist at the Institute for Creation Research and earned his Ph.D. in paleobiochemistry from the University of Liverpool.





My boyfriend planned a surprise museum day for me and this [ICR's Discovery Center] was one of our stops. **We're both atheists, but I love learning about religion and it was really cool to see a more scientific approach with Christianity.** It definitely made me think and was very immersive. The staff was super, super friendly and helpful. The giftshop was really nice too, I got some stuff to give to my Christian family members and some things for myself. Even if you're not of this faith, it's definitely worth the trip if you have an open mind and love learning.

—D. L.

Editor's note: Plan your own trip to the ICR Discovery Center by visiting ICRDiscoveryCenter.org.



Thanks for your great article, "Criticizing a Perfectly Engineered Eye" [May/June 2026 *Acts & Facts*]. Apparently, Dawkins and other evolutionists are blind to the design that engineers build into satellite dish antennas, radar dish sets, and reflecting optical telescopes (with a mirror). **All of these have their detectors pointing backwards from the direction of the incoming signal or light, usually with wires or a strut in front of that, all which cause a "blind-spot" and yet function superbly.**

—B. H., aerospace engineer



Image credit: NASA, public domain



I read with interest both the Guliuzza and the Sherwin articles in the May/June 2026 *Acts & Facts* issue. I have been an ardent student of creationism for decades and have appreciated the manifold information from ICR. **As an ophthalmologist, specifically a retinal specialist, I commend both of you for the accuracy of your articles.** Too often articles undermine their impact with only partially correct aspects.

In fact, the mammalian eye has the best eye resolution (e.g.,

raptors are about 20/5). **The apparent "upside down" retinal design is ingenious as it also allows some filtering of the incoming light (through xanthophyll pigment) so the fovea [is] not [susceptible to] blinding phototoxicity.** The photo-receptors have high metabolic needs to be capable of providing such fine acuity and, as designed, the underlying retinal pigment epithelium is perfectly postured to provide that and a multitude of integral functions (as you mentioned). The argument about the optic nerve opening is ludicrous as the brain seamlessly ignores that eccentric deficit, even in one-eyed people.



Image credit: Mikael Häggström, public domain

Dr. Sherwin's shorter article contrasting evolutionists' concept that there is a continuum from the photosensitive dots of unicellular organisms to the incredibly well integrated binocular system we enjoy defies logic.

—W. S., M.D.

Thank you for the latest magazine about the complexity of the eye and how that disproves evolution. I found it fascinating and think the magazine did a great job explaining complex concepts in a simple form that were easy to understand . . . **Thank you to the editor and everyone at *Acts & Facts* for always making such great magazines every month.**

—G. O.



Days of Praise and *Acts & Facts* have been of immeasurable spiritual blessing to me . . . I want to especially say a big beautiful thank you to Dr. Randy Guliuzza for this article "Are Biblical Truth and Authority Less Important Than 'Salvation Issues?'" After reading this article, I felt better prepared to "give an answer" in such discussions.

—B. F.

Have a comment?

Email Editor@ICR.org or write to

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Written by Michael Stamp, illustrated by Melissa Marquez

God created living things that fill the earth and sky. But when it comes to fungi, there's more than meets the eye! Many of these organisms, like mushrooms, are hidden in forests and grasslands. They sprout from an underground network of long, thin structures called mycelium (my-SEE-lee-uhm). This "fungi highway" brings nutrients to the soil and swaps them across plants, which helps ecosystems thrive! Did you also know . . .

- ✓ Scientists estimate there are millions of fungi species.
- ✓ Fungi can signal threats like drought, insects, and disease.
- ✓ Many fungi are decomposers, breaking down leaves, wood, and other decaying material.
- ✓ One of the world's largest organisms is the Humongous Fungus, located in Oregon. It covers about 3.5 square miles!



Did You Know?

A few types of fungi are bioluminescent, or glow in the dark!

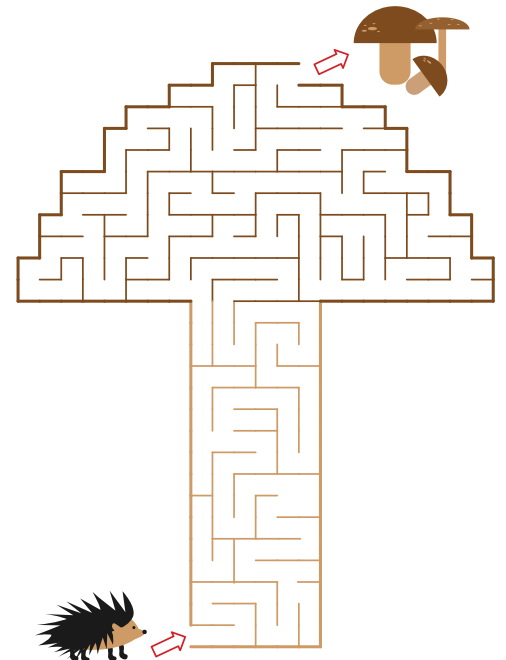
Many fungi have silly names. Circle the option below that isn't a variety of fungi.

jelly ear
giant puffball
oyster mushroom

chicken of the woods
turkey tail
porcelain fungus

lion's mane
green elf cup
buttons crimini

Find the 10 differences in the pictures below.



Answer to silly name: buttons crimini

COMING IN OCTOBER!

THE LONG-AWAITED BOOK
THAT SETS THE RECORD STRAIGHT

IF IT WALKS LIKE A BIRD

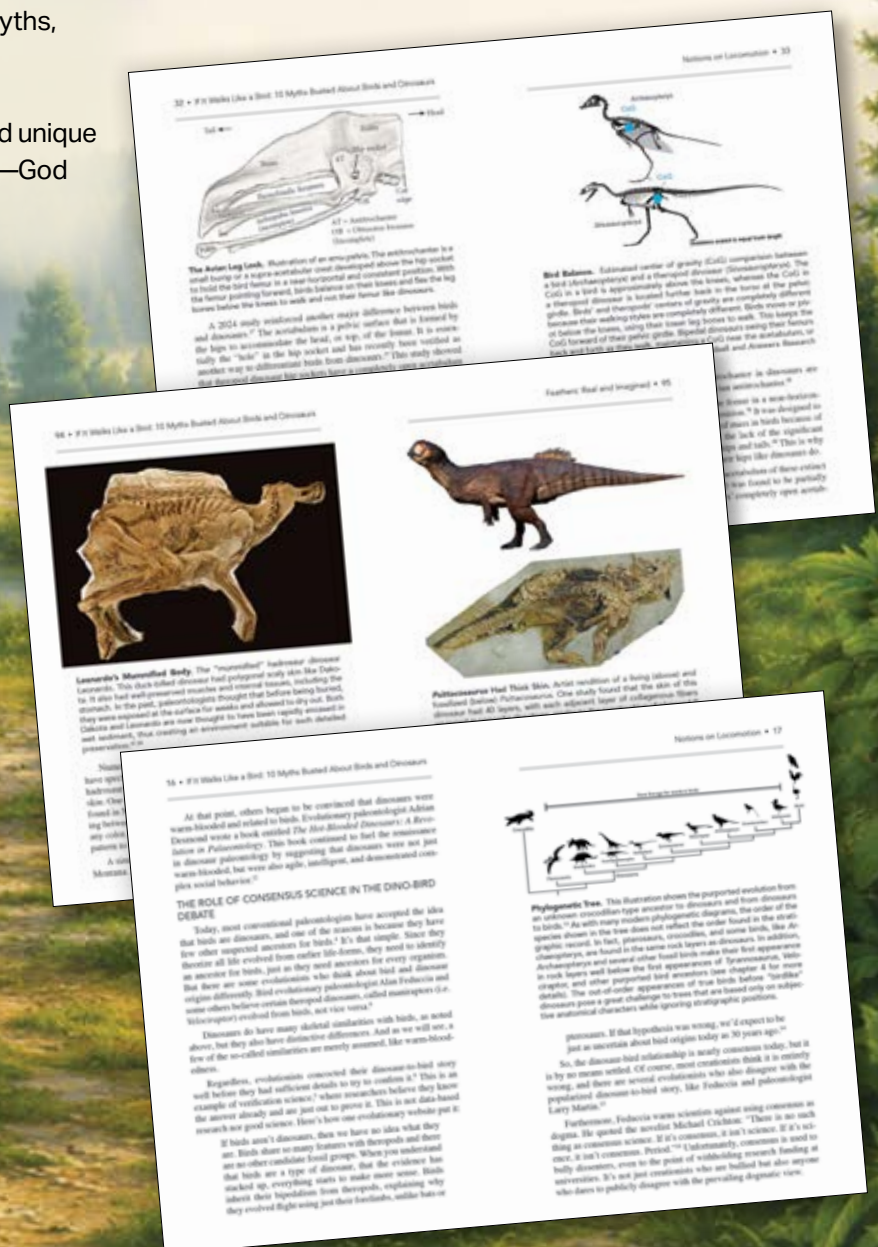
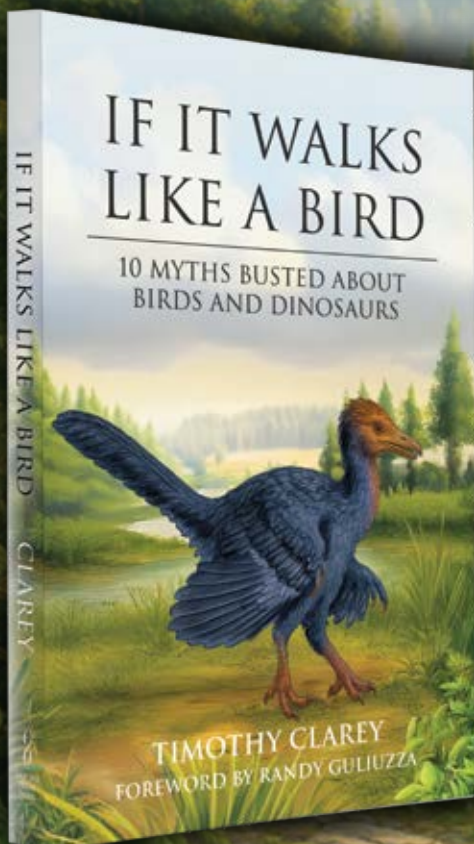
10 MYTHS BUSTED ABOUT BIRDS AND DINOSAURS

For too long, we've been told that birds evolved from dinosaurs. But what does the fossil evidence really say? In *If It Walks Like a Bird*, author Timothy Clarey examines the science, challenges the myths, and reveals the astonishing truth: **BIRDS HAVE ALWAYS BEEN BIRDS.**

Discover how the fossil record, anatomy, and unique design confirm what the Bible has said all along—God created each creature according to its kind.



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