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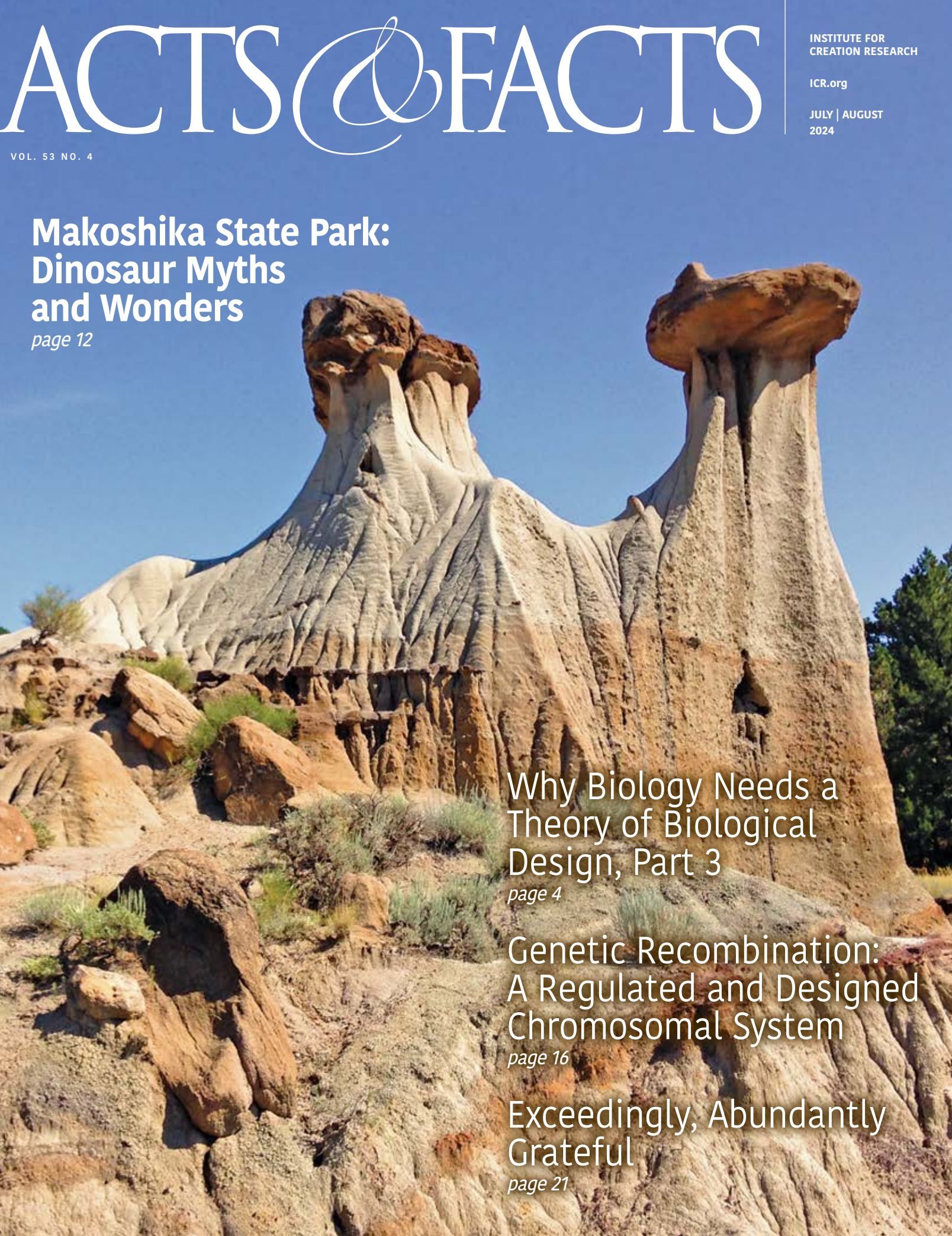

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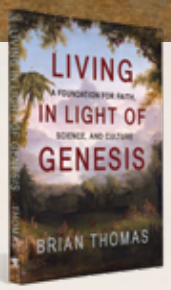

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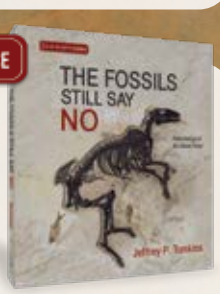

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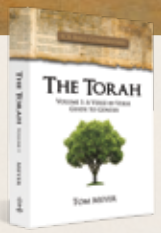

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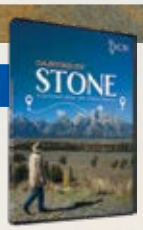

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DESIGNER
Dennis Davidson

[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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Front cover: Makoshika State Park
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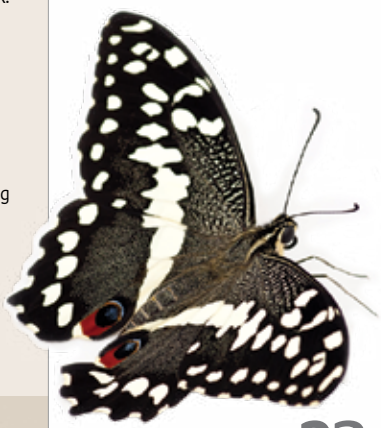

WHY BIOLOGY NEEDS A THEORY OF BIOLOGICAL DESIGN

PART 3

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

Have you ever been reading a story when it dawns on you that the author merely took a biblical account and reset it to modern times with renamed characters? This isn't uncommon, but at times biblical figures get recast with personalities that are the opposite of their true characters. In these twists, good becomes evil, and evil is good.

Charles Darwin was a master of exploiting the power of a familiar narrative while at the same time flipping the script. Before developing evolutionary theory, he was an astute student of both the design process and 19th-century theologian William Paley's arguments for creatures being intelligently crafted by God. Darwin knew that the first step in supplanting a theory was to thoroughly understand it.

Likewise, creationists and intelligent design (ID) advocates need to thoroughly understand Darwinian selectionism as *the central feature* of Darwin's theory—and particularly how it decisively "inverts the explanation" of origins.[1]

Darwin's Strategy: Maintain Paley's Observations (the Framework) but Invert the Cause

The exquisite engineering seen in biology has always been the big question that needs to be explained. Darwin could have tackled it in several ways. One tactic would be to simply deny any design by claiming that creatures really show overwhelmingly shoddy workmanship, engineering mistakes, or accumulated "junk."

Some evolutionists have taken up this kludge of thinking when reacting to ID advocates. Yet, Darwin rejected this "argument from ignorance." He knew that many people would intuitively conclude that such talk is foolish. Besides, it would most certainly be overturned by future research.

Darwin would have none of that and took a cleverer approach that readily acknowledged features of design. First, he rolled into his narrative familiar perceptions about the operation of engineered entities. Thus, his narrative requires more discernment to understand its true implications. It's mentally difficult to disentangle his causation from all others—even design-based ones.

Second, Darwin fully granted that organisms *do* show exceptional characteristics that are indicative of highly intelligent engineering. But instead of attributing biological design to the agency of a (1) supernatural, (2) conscious, and (3) loving (4) God, Darwin's narrative flips everything around and tells of a (-1) totally natural, (-2) unconscious, and (-3) cruel process that (-4) enables nature to exercise godlike agency. Stephen Jay Gould gives this insightful history:

> [Darwin] holds that this order, the very basis of Paley's inference about the nature of God, arises…as a side-consequence of a causal principle [natural selection] of entirely *opposite* import…. Could any argument be more subversive? One accepts the conventional observation, but then offers an explanation that *not only inverts* orthodoxy, but seems to mock the standard interpretation….This more radical version lies at the core of Darwin's argument for natural selection.[2]

A New Theory Is Needed, Not Just *Positive* Evidence for Biological Design

Darwin's narrative makes it very hard to reject it—in ways that design advocates seem to miss. Consider how his story affects typical positive arguments for design. When promoters of design build an impressive list of complicated anatomical and physiological features, in effect Darwinians say, "Bring it on."

Even when biology displays telltale characteristics of an intel-

ligent agent, selectionists respond, "Our unconscious—yet creative—process mirrors intelligent agency." So, when design advocates also project agency to "selection" by saying, "All selection can do is…" or "Selection can only act on…," they reinforce the selectionist's assertion that selection mimics the characteristics of intelligent agents.

That's because another Darwinian causal inversion treats *nature* as the creative agent—not as the product of a creative agent. Darwinists project onto nature the same selective characteristics as a human agent (i.e., intelligence and volition). They simultaneously hold that there's *no purpose* in the grand scheme, especially for random mutations.

Their story gets away with inserting messy purposelessness because nature's agency is up to the task of "sorting" through organisms' randomly appearing traits[3]—albeit through an arbitrary trial-and-error process—and it inevitably sees, selects, saves, and builds from the best. In this way, blind "Mother Nature" creatively cobbles together creatures[3] and slowly refines their traits to look like a brilliant engineer made them. "Thus, according to Darwin, nature itself constitutes the supreme animal breeder that shapes the path of life."[4]

Amassing positive evidence for biological design can't jettison evolutionary theory. Darwin's narrative absorbs a seemingly endless tally of features in organisms that definitively characterize engineering or agency (e.g., specified complexity, irreducible complexity, optimization, etc.).

Per the scientific method, documenting the abundant scientific weaknesses of evolution should've sufficed for rejection, even without a replacement theory.[5] But that isn't reality. Even counterintuitive theories that can barely tread water scientifically will continue to do so…until an alternative theory arises. Listing engineered features that clearly infer design doesn't constitute a theory because it doesn't do the work of a real theory—setting a research agenda, making predictions, and framing interpretations of observations.

What's needed is a new engineering-based theory of biological design (TOBD), a synopsis of which is given in Table 1. Across the top are foundational assumptions, and on the left underneath are its tenets. The table's main focus is the white section. This details significant research predictions or guides how observations are interpreted by those assumptions and tenets. These all reverse the major transpositions of thinking introduced by selectionism.

Readers should view Table 1 as a way to launch new thinking—akin to taping a preliminary chart to a wall in a planning meeting—where additional input from engaged readers and others will modify it over time.

TOBD Assumptions Set the Course for Real and Accurate Explanations

Darwin's counterintuitive narrative relies on enormous helpings of imagination, illegitimate analogies, and exaggerated metaphors to sound believable. We saw in the part 2 article that the narrative props themselves became key assumptions in evolutionary theory.[6] These assumptions lead to explanations that amount to "just so" stories, "Mother Nature…free floating intentions…phantom breeders [and] ghosts in Darwinism"[7] that produce "the kinds of speculative flights associated with Darwinian theory."[8]

The result? Careful biological research gets framed within a fanciful narrative gloss that transports those explanations away from reality and straight into mystical realms.

The assumptions of a TOBD, accordingly, are fundamentally anti-mystical. They counter the anti-design thrust of selectionism by reversing causality in cause-effect associations. This provides an initial trajectory for biological explanations that enhances their likelihood of being realistic and accurate. TOBD hypothesizes that the *best explanation* for why creatures look engineered is that they *are* engineered. Therefore, two major tenets guide its prediction of findings and interpretation of observations:

1. Basic research of biological functions and technical applications are both within the domain of engineering practice.
2. Biological functions can only be accurately explained by models developed utilizing engineering principles since these are essential to make correct cause-effect associations.

For clarity, these assumptions refer to the tangible, specific biological functions of reproduction, growth, metabolism, and adaptation. All living things manifest these in various ways. Engineered biology doesn't deal with other characteristics of many living things like consciousness or "life" itself.

There are objective reasons to see biology as a discipline of engineering. Engineering principles are increasingly recognized in and applied to biology. At its core, basic biological research is reverse engineering, and currently this can be done with all known biological systems. Consistent with engineered biology, no biological function has yet eluded an actual or conceptual explanation by engineering principles, and the known consistency is broad between human-engineered systems and biological systems.

Just like man-made things, biomolecular, physiological, and anatomical functions operate within natural laws. The correspondence between human engineering and biology has aided inventions such as aircraft designs based on studying birds. Yet, the benefit of a TOBD to biology goes the other direction: it shows that analyzing human engineering practices can inform predictions and point researchers to accurate characterizations of biological phenomena.

TOBD's Top Priority: Undo Darwin's Inversion of Causes and Assumptions

In building a TOBD, the strategic importance of reversing Darwin's cause-effect inversions must be understood at the outset. If they aren't restored to their pre-Darwin engineering-based understanding, then the TOBD will be off track from the outset and cannot effectively counter selectionism.

1. Reverse "Life Emerges from Biological Operations" to "Life *Is What* Enables Ongoing Biological Operations"

In contrast to engineered biology, evolutionists have faith in a bevy of counterintuitive beliefs like nonliving chemicals giving rise to living cells, purposeless interactions producing purposeful systems, and non-agency making organisms with agency. Similarly, most of them hold that life and consciousness (including our thoughts) are somehow generated strictly by biological operations.

Yet what's fundamentally different about creatures compared to even fully functional bio-systems or human-engineered things can't be explained by either engineered biology or selectionism. That difference is "life."

Life itself seems distinct from the material things we're familiar with. No one has held a beaker of life, developed a sensor that detects life within creatures, or identified how it emerges from biological operations. We only observe when something has life. Some biological operations even persist after life departs until fuel in the cells is exhausted.

Thus far, life hasn't been explained—or generated by—biological operations *or* engineering principles. Likewise, there are no definitive studies identifying how consciousness or agency arise from the actions of neurons. These are objective and important observations indicating that life, like consciousness, seems *immaterial*. If so, then life must be imparted to creatures from a source of life. The Bible says that source is God.

How this reversion influences research and interpretations: Recognize that efforts to explain life solely in terms of chemistry, physics, or even engineering principles are likely misguided. Evolutionary biology is constrained to explain life materially, but engineered biology intentionally makes no attempt to explain life. Instead, a TOBD focuses on explaining tangible biological functions with engineering principles.

2. Reverse "Nature is Like a Human Breeder Who Favors Selected Entities" to "Engineering Causality Eliminates Mystical Steps in Causal Explanations"

Darwin's narrative not only interprets observations with inverted causes but also relies heavily on the illegitimate analogy likening unconscious nature with intelligent and volitional human breeders.[9] Through this spurious comparison, he infused into evolutionary biology three anti-scientific practices—circular thinking, imagination, and personification of nature—that continuously breed mystical biological agents.[10] Richard Dawkins' theory of "selfish genes"is a wholesale magical explanation inspired by Darwin's personification of nature.[11]

Imaginary causes are essentially nonexistent in engineering literature. Engineering causality is distinguished by clarity, objectivity, and thoroughness. Engineers only include verifiable elements—and don't omit vital elements—in causal chains. Thus, biology benefits greatly from the precision that a TOBD brings to explaining the cause of an observation.

How this reversion influences research and interpretations: Engineered causality rejects inserting into causal explanations any unobserved "selection events," nonquantifiable "selection pressures," and nonidentifiable "objects/units of selection" as misleading thinking due to their inherent mysticism. On the other hand, it searches for *all* system elements involved in organisms' detection of environmental exposures and their conditioned self-adjustments.

Engineering causation focuses on whole systems—not exclusively on individual elements. When key system elements are all needed for a result, then no single element is declared to be causal (e.g., genes aren't "the cause" of traits).

3. Reverse "Pointless, Random Genetic Mutations" to "Purposeful, Goal-Oriented Actions Indicative of Top-Down Planning"

My part 2 series article explained why randomness figures so heavily in the anti-design objective of selectionism.[6] It's the counterview to purposeful actions. Even at a 2016 meeting convened to debate revisions to evolutionary theory, evolutionists circled the wagons against innate, purposeful biological activity. Perry Marshall spells this out.

> [Attendees were] towing the standard Neo-Darwinian line, which insists that in the end, all comes down to "selection, selection, selection."…But in the Neo-Darwinian view, for any cell to evolve purposefully is *unthinkable*. So of course "natural selection" always ends up being the answer.[12]

A tenet of a TOBD is that it's *intentionalistic*. Goal-directed activity on an organism-wide basis is expected at *every* research level. When purposeful biological activity is observed, there's no pressure to concoct stories to explain purpose away.

How this reversion influences research and interpretations: When an epigenetic/genetic change is identified related to a trait that's observed to solve an environmental challenge, the default interpretation will be that these changes are purposeful/directed and not random unless evidence confirms randomness.

This is where a TOBD shines in guiding research. In contrast to the fundamental evolutionary assumption that selection is purposeless with respect to future needs of organisms, engineered biology predicts discovering valuable biological systems and suggests what elements to search for.

For example, a TOBD expects to find biological anticipatory systems in some organisms that produce innate models that step forward in time to handle predicted future needs by directing upfront responses now. TOBD-guided research suggests experiments to test for antici-

patory controls and information that integrate knowledge of present conditions, past experiences, and probabilities of future conditions.

4. Reverse "Passive Organisms Shaped by Active External Conditions" to "Active Organisms Engineered with the Innate Capacity to Shape Themselves"

When environments change, it seems organisms often change in purposeful ways to fit that change. How does that happen? In a view called externalism, Darwin and his followers believe that the environment "drives" these changes as passive organisms are molded by "selective pressure." Gould notes that Darwin understood the importance of an externalistic theory far better than others, saying,

> Darwin's theory, in strong and revolutionary contrast, presents a first "externalist" account of evolution…Darwin overturned all previous traditions by thus granting the external environment a *causal* and *controlling* role in the direction of evolutionary change.[13]

Engineering analysis shows that externalism is nonsense. Why? Because the function of any engineered entity must be explained in terms of its internal capability. Some claim externalism versus internalism is a logical false dichotomy, but these are two diametrically opposing views. The best way to understand internalism is to meticulously run through the mental exercise of designing an entity that adapts to its environment. You'll see that all the capability the entity will ever have must be designed into it upfront—even any ability to learn from experiences.

A tenet of a TOBD is that it's *internalistic*. Identifiable control systems within organisms are the true cause for all operations, including adaptations. Engineered solutions to problems must precede the problem; they aren't "due to" the problem. In populations, varieties of traits in individuals represent potential *engineered* solutions to problems that may succeed; problems don't "select" their solutions.

How this reversion influences research and interpretations: Suppose an aircraft flying on autopilot and terrain-following radar approaches and then automatically flies over a mountain. Externalists claim the mountain played an obvious causal role. Internalists say the aircraft caused its own change in altitude, and the mountain is a variable that's either present or not. As the aircraft circles around for a second pass over the mountain, its terrain-following radar is turned off. Mountains

a. Synopsis of a biological research program conducted within an engineering-based framework					
b. Research assumptions of a TOBD as applied to biology:	1. Integrated. Both basic research of biological functions and associated technical applications are within the domain of engineering practice.				
	2. Comprehensive. All biological systems related to development, metabolism, reproduction, and adaptation can be reverse-engineered.				
	3. Instructive. Biological functions will only be accurately explained by models developed utilizing engineering principles.				
	4. Directive. Analyzing human engineering practices will inform predictions and point researchers to accurate characterizations of biological phenomena.				
c. TOBD basic tenets	d. Resulting expectations of findings or interpretations of observations				e. Inferences
Intentionalistic Purpose Goal-directed activity on an organism-wide basis is expected at every research level.	Directed Activity of systems is efficiently directed toward need-fulfilling ends. Embrace the reality of purpose.	Coherent Coherence is pervasive. Explore for system elements functioning simultaneously as both ends and means.	Foresighted Presume traits that function to attain goal-oriented states are indicators of experience-based planning.	Proactive Expect anticipatory planning that integrates knowledge of present conditions, past experiences, and probability of future conditions to produce models that step forward in time to direct upfront responses now to handle needs.	Since systems are always engineered top-down, then purposeful systems linking all biological functions are expected. Deterministic outcomes are evidence of purpose, e.g., repeated, self-regulated attainments of a "final state" from a single cell *are* scientific data.
Internalistic Operation Identifiable control systems within an organism are the true cause for all operations, including adaptations.	Unity 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.	Precedence An organism's traits determine all of its capabilities. The traits, not external exposures, should be credited with success or failure.	Triggers The actual triggers initiating all self-adjustments by organisms are integrated sensors to detect variable conditions.	Information Organisms sense exposures and extract data. Environments can't send instructions.	Adaptation Organisms optimize the suitability of their traits to the environment through their innate engineered control of the organism-environment relationship.	Corresponding elements are expected between human-designed contrivances and biological systems performing similar functions. Engineering causality eliminates in-observable external interventions. Both internal form and adaptability are governed by innate systems.
Individualistic Agency Autonomous organisms are delineated by a definite "self" boundary and operationally are not to be conflated with "non-self."	Stimuli Internal programming will specify any condition "to be" a stimulus. No condition in and of itself is a "stimulus." Organisms have sensors tuned to each specified condition.	Interfaces Individuals will relate to environments through identifiable interfaces. For two or more independent entities to work together, they must be connected by an interface. Biological interfaces have one to three subsystems: authentication, communication protocols, a common medium.	Organisms as Elements Organisms themselves are discreet elements working together in broader systems. They are not absorbed into a collective. Individuality isn't abolished. "Seamless" operations always have identifiable seams.			Engineered controls will regulate organism–environment relationships. Entangling individual causal operation produces confused explanations. Information explaining ecosystems and interfaces is inferred—it isn't found in information of the elements.

Table 1. *Condensed outline of a theory of biological design (TOBD) that hypothesizes that the best explanation for why creatures look engineered is that they are engineered.*

(a) How a TOBD functions as an interpretive framework of biological phenomena and guides a research program. (b) Research within a TOBD assumes that basic research of biological functions is within the domain of engineering practice and that utilizing engineering principles is necessary to precisely explain biological functions. (c) Three descriptive tenets of any engineered entity that are essential to frame accurate explanations of biological operation. (d) The table's central focus is how TOBD assumptions and tenets guide the interpretation of biological observations (e.g., the default interpretation of an observed genetic change that's adaptive is "directed," not random; causal "precedence" is conferred to an organism's traits, not external exposure) or predicted findings in research (e.g., identifiable "interfaces" enabling independent organisms to work together). (e) These are the major inferences constraining explanations within a TOBD.

don't cause aircraft to climb. Similarly, a TOBD interprets all biological causality on the basis of trait capability—not external exposures.

5. Reverse "Mystical Forces Controlling Interrelated Biological Operations" to "Organisms are *Discreet*, Operative Elements of Whole Ecosystems"

An engineering-based approach is essential in attempts to track an ecosystem's many moving parts. Selectionism currently jumbles materialism, externalism, and personifications of nature into an utterly confused story. A TOBD clarifies causality by teasing apart this tangle.

Organisms respond to numerous exposures in ecosystems, and sometimes these relationships are so close they're termed "seamless." Since evolutionists shun an engineered approach, they're confounded as to what's causing what.

For instance, some operations between bacteria and humans are so interdependent and exquisitely tuned to each other that many researchers see a *single* human–microbe amalgam or "supra-organism." Or we'll read something like, "Flowers evolved a clever strategy for controlling bees by sending them signals." Are these explanations true? No, they entangle individual causal operation, which produces mystical explanations.

Causal explanations are further muddled within selectionism by another bungle that's hard to spot. We detect within bee-flower relationships a *higher* level of information that isn't found in either organism alone. *How* they relate together is only inferred by an outside observer of their mutual fit. This corresponds to a human-engineered communication system in which the information involved in the system as a whole is at a higher level than the information underlying the individual transmitter and receiver.

Selectionism is constructed to reject the existence of such higher information. But myriads of purposeful ecological relationships need explaining—and agent-causation is hard to duck. Again, personification of nature is an external pseudo-agent that's inserted in technical literature with explanations like "the environment directly instructs the organism how to vary" or "the environment is giving instructive information as well as selective pressures."[14] Other evolutionary biologists don't catch these mystical insertions, even though no sensor exists to detect some external "inducer" of organisms or environments sending instructions.[15]

A tenet of a TOBD is that it's *individualistic*. Organisms are autonomous entities delineated by a definite "self" boundary. Innate, engineered control systems regulate organism-environment relationships. The TOBD explanation that organisms are discreet, operative, purposefully arranged elements of ecosystems contrasts with unverifiable stories like "coevolution," appeals to extreme serendipity, or the idea that creatures are absorbed into the collective offered by evolutionists.

How this reversion influences research and interpretations: TOBD interpretations flow from the engineering principle that for two or more independent entities to work together, they must be connected by an interface. Engineers expend considerable work designing ways for complex things to work together through the *identifiable* elements of interfaces. So, researchers would develop more useful explanations of ecosystems with experiments designed to characterize how those essential elements are uniquely expressed between interrelated creatures.

Engineering principles demonstrate that no external condition in and of itself is a "stimulus," "cue," "inducer," etc., but rather internal programing within entities must specify conditions to be a stimulus.

Conclusion

If we're open to the possibility that our training has conditioned us to interpret biological observations in the opposite way from an engineering-based framework, then we'll be able to appreciate biology in a fundamentally different way. Make no mistake, Darwin's theory heads toward a nontheistic goal, but his idea to concede design—but invert the cause—avoids making an overtly offensive attack directly against God's existence. Darwin simply lets people conclude that God isn't needed.

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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.

ICR Veteran Don Barber Retires

After 34 years with the Institute for Creation Research, Don Barber retired on March 31, 2024. His eventful life leading up to ICR uniquely equipped him with skills and strengths that helped the ministry weather many challenges and changes.

Don grew up in a Christian home and came to the Lord when he was very young. In high school, he became involved in scientific research and was one of six students to receive an Award of Excellence from Richard Nixon in the President's Environmental Merit Award Program that year. Don also joined the NJROTC with a plan to fly for the Navy and then retire to be a missionary pilot.

After a year and a half at Saddleback College, Don learned about Christian Heritage College (CHC) when Dr. John Morris spoke at his church about the search for Noah's Ark on Mount Ararat. Drs. Henry Morris and Tim LaHaye founded CHC in San Diego, California, in 1970, and its Creation Science Research Center became the Institute for Creation Research.

Don and Rebecca Barber

CHC offered a flight program that would let Don skip the Navy and go straight into missions. While there, he met his future wife, Rebecca Morris, and had classes with her father, Dr. Henry Morris, and Dr. Duane Gish. Don was building computers for himself, so he helped CHC with theirs. Thus began his computer network knowledge.

After marrying in 1976, Don and Rebecca spent time in missions, and then Don became the director of a Christian camp. They maintained a number of animals, including a python named Julius Squeezer. Their menagerie opened doors in schools, churches, and elsewhere for Don to showcase God's amazing creation. He also took animals to ICR to participate in Dr. Richard Bliss' Good Science program, and ICR sent students to his camp.

Don and Julius Squeezer

During this time, John Morris thought Don would be a good addition to the Mount Ararat expeditions searching for the Ark since Don was an EMT and had several rescue certifications. Don joined two Ararat trips in the 1980s. He said going to a place where the Ark might have landed 4,500 years before brought a sense of clarity that this was a real thing that reflected real consequences.

Mount Ararat expedition

In 1990, Don and Rebecca joined ICR. Don first worked on the new Santee museum and then on building ICR's donor base, handling the IT side. He was instrumental in establishing ICR's computer networks and first web pages. Today, **ICR.org** offers thousands of science articles, online editions of *Acts & Facts* and *Days of Praise*, podcasts and other digital media, and more. Don was also an integral part of the planning and construction of the ICR Discovery Center.

Don and Rebecca Barber with daughters Ann and Katy and son Ben

Don's steady involvement and varied skills have made a profound difference in the growth and strength of ICR's ministry. When asked which experiences at ICR have meant the most to him, Don replied:

> First, Rebecca and I had the shared—and ongoing—experience of watching our children grow up with ICR influencing their biblical knowledge of Scripture. Second, being involved in the building of both museums (Santee and Dallas) and various building projects. Third, being a team member of two expeditions to Ararat in search of Noah's Ark. Fourth, guiding groups in the Grand Canyon and Mount St. Helens, which display our Lord's handiwork.

And what would he like for people to learn from his time at ICR? "A worthy ministry is worthy of a long-term commitment." God bless Don and Rebecca in their coming years.

Read the remarkable story of Don's mother in *Anita's War: From Stalin and Hitler to Freedom in Christ* by Rebecca Morris Barber. Anita Friesen experienced a child's-eye view of World War II from Ukraine to Germany to the Americas. Her adventure reaches through the pages into a dark world that desperately needs the hope of Jesus Christ. For more information, visit **ICR.org/store**.

JULY 7

Rockwall, TX
Ridgeview Church Rockwall
Dinosaur Sunday
(B. Thomas, D. Napier, E. Steele)
ICR.org/RockwallTX or 214.615.8306

JULY 8

Dickson, TN
The Wonders Center
(C. Morse)
214.615.8351

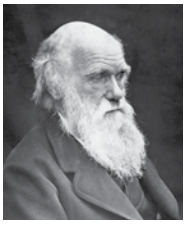
JULY 13

Atascadero, CA
Refuge Church
Uncovering the Truth about Creation
(D. Napier)
ICR.org/AtascaderoCA or 214.615.8333

JULY 13

Grover Beach, CA
Oasis Church
(D. Napier)
ICR.org/GroverBeachCA or 214.615.8333

JULY 19–21



Medora, ND
Medora Community Center
Scopes Monkey Trial: This Is Our Time Conference and Field Trips
(R. Guliuzza, T. Clarey, D. Napier)
IBA777.org or 406.961.7850

JULY 31–AUGUST 4, AUGUST 7–11

Glendive, MT
Glendive Dinosaur and Fossil Museum
Dinosaur Dig Experience
(B. Thomas)
ICR.org/DinoDig

AUGUST 2–7

Fort Qu'Appelle, Saskatchewan, Canada
Creation Science of Saskatchewan
Creation Family Camp
(J. Johnson)
Creation-Science.sk.ca or 306.252.2842

AUGUST 3, 5, & 6

Chicago area (multiple locations)
Midwest Creation Fellowship
(F. Sherwin)
MidwestCreationFellowship.org or 847.223.4730

AUGUST 11, 18, 25, & SEPTEMBER 1

Denton, TX
Denton Bible Church
Foundations of Creation Series
(R. Guliuzza, T. Clarey, J. Hebert, B. Thomas)
ICR.org/DentonTX or 214.615.8325

AUGUST 25–26

Eaton, CO
Eaton Baptist Church
(D. Napier)
ICR.org/EatonCo or 214.615.8333

LANDMARK EVENTS GRAND CANYON ADVENTURE

AUGUST 28–SEPTEMBER 2

(T. Clarey)
LandmarkEvents.org/GrandCanyon or 210.885.9351

SEPTEMBER 3–7

(J. Johnson)
Landmarkevents.org/GC5 or 210.885.9351

SAVE THE DATE

OCTOBER 4–6

Epsom, NH
Epsom Bible Church
New England Creation Conference
(R. Guliuzza, B. Thomas, E. Steele)
ICR.org/EpsomNH or 214.615.8333

OCTOBER 31–NOVEMBER 3

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park series

MAKOSHIKA STATE PARK

DINOSAUR MYTHS AND WONDERS

Makoshika State Park, Montana

article highlights

- Montana's Makoshika State Park is loaded with dinosaur fossils.
- A thin clay layer in the park contains iridium, an element found in meteorites.
- Many geologists claim a meteorite killed off the dinosaurs, leaving this iridium marker, but evidence suggests the layer was deposited during Noah's Flood.
- *T. rex*, *Triceratops*, and *Edmontosaurus* bones discovered in the same layers as those seen in the park contain soft tissue that couldn't have lasted millions of years.
- Features found in Makoshika State Park challenge conventional theories and are best explained by Noah's Flood.

BRIAN THOMAS, PH.D., AND TOMMY LOHMAN

Makoshika State Park, located just southeast of Glendive, Montana, became a state park in 1939. Its badlands feature steep-sided, rugged terrain carved from rock strata by extensive erosion. In fact, the park gets its name from the Lakota term *mako sica*, meaning "bad land."

These lands expose the Hell Creek Formation—a loosely cemented sandstone containing many dinosaur fossils. The layers found here reveal a variety of features that challenge conventional theories about evolution, dinosaur extinction, and ancient ages. They instead support a historical catastrophic flood like the one recorded in Genesis.

Edmontosaurus *neck vertebrae*
Image credit: Tommy Lohman

Digging for Dinosaurs

Have you ever been on a fossil dig? It's the ultimate treasure hunt. I (Tommy) have supervised many digs over 13 summers at the Glendive Dinosaur and Fossil Museum property next to Makoshika State Park. It never gets old. These fossils are reminders of the Genesis Flood's impact on the earth.

The sedimentary rock layers of the Hell Creek Formation (HCF) contain fossils of *Tyrannosaurus rex*, *Triceratops*, *Edmontosaurus*, and other well-known dinosaurs. Within these same layers are also "living fossils" such as crocodilians, turtles, fish (including gar and sharks), small mammals, and remains of modern plants like fern and sequoia. Each of these fossil forms has a living look-alike that shows no evidence of evolution or the millions of years imagined for it to occur. This matches the biblical report in Genesis 1 that God made separate, distinct creature kinds.

A lot of HCF fossils contain minerals from the burial process, but the detail in many of the bones is still pristine. Blood vessel grooves, foramina, attachment points for tendons/muscles, evidence of cartilage, and the neural canal where the spinal cord once ran are all visible. Since a dead animal's bones soon lose these details today, rapid burial by the Flood helps explain why they exist in these fossils.

The Flood is also a fitting explanation for the park itself. The depositional phase laid down multiple stratified layers, catastrophically burying broken and twisted bones of creatures that perished in the cataclysm. The later runoff phase carved valleys, as would be expected from Genesis 7–8. According to ICR's Flood model, the mud and sand from fast-moving flows found at Makoshika were deposited close to the peak of flooding, when "the waters prevailed on the earth one hundred and fifty days."[1]

Tommy Lohman prepares a dinosaur fossil for display

Iridium and Dinosaur Extinction

Geologists take interest in a thin clay/coal seam in Makoshika State Park. It appears that this same clay extends for hundreds of miles. It forms a thin, dark line known as the K-Pg (Cretaceous-Paleogene) boundary between the tall, tan sediments of the Hell Creek Formation below and the Fort Union Formation above. This clay contains the element iridium, which is also evident in meteorites. Park signs assert that no dinosaurs were buried above this clay line.

The line shows a K-Pg boundary example near Makoshika State Park. Noah's Flood accounts for these sediments.
Image credit: Brian Thomas

Conventional scientists wove these clues into what has become the most popular dinosaur extinction story. It goes something like this: a meteorite impact killed the dinosaurs eons ago. The collision caused a colossal tsunami that spread clay with iridium like a coat of paint for hundreds of miles. The impact left the 110-mile-wide Chicxulub crater that's now deep underground at Mexico's Yucatán Peninsula.

Certain observations run counter to this story. First, Chicxulub isn't a crater—just a gravity signature based on rock density differences. Second, iridium is largely *missing* from Chicxulub rocks, even though that was the point of the meteorite's supposed impact! Finally, any impact that could have wiped out all or most of the dinosaurs should have erased frogs and other creatures, but there are still frog fossils below and above the clay. For all we know, magma intrusion or tectonic forces formed the Chicxulub gravity anomaly.[2]

Pocket knife provides scale for the thin coal layer that marks the K-Pg boundary inside Makoshika State Park—a vagary of Flood deposition
Image credit: Brian Thomas

Volcanism during Noah's Flood makes sense of the iridium, since volcanic deposits can have high iridium content. The region's rocks have volcanic debris sprinkled throughout. According to Scripture, the floodwaters "took [or 'carried off']…all" from the land.[3] When "all the fountains of the great deep were broken up," liquid water and steam mixed within magma made their way up through Earth's crust—through colossal volcanoes in some places.[4]

Teasing apart fragments of partially demineralized Hell Creek Formation Triceratops *bone reveals flexible connective tissue, seen here as thin filaments*
Image credit: Creation Research Society

Additionally, the reason dinosaur fossils occur in these particular layers could stem from *where* they lived in the pre-Flood world, not *when* they lived in imagined evolutionary time. In other words, as the Flood waters progressed during the Flood year, they would have eventually reached dinosaur areas and buried those creatures before moving farther inland and upland to bury large mammals in upper layers.[5]

Dinosaur Blood Vessels

Some dinosaur fossils from HCF have still-flexible tissues, including blood vessels found inside the bones. Researchers' first description of the colors, shapes, and chemistry of proteins and tissues from HCF was based on material from a *T. rex* femur.[6] The Museum of the Rockies houses the bones, nicknamed B-rex after its discoverer, Bob Harmon. A sign there says, "It was the femur of B-rex (MOR 1125) that yielded…soft tissue blood vessels and cells." The age assigned to these fossils is 67 million years, but decay studies limit protein lifespans to fewer than a million years at today's temperatures.[7] How could such short-lived materials persist for so long?

And B-rex is not a standalone example of soft tissues found in HCF fossils. One article revealed a still-flexible sheet of connective tissue inside a *Triceratops* horn core.[8] Yet another team described blood vessels in six of 20 *Edmontosaurus* samples.[9] These studies fit with over 120 reports of original-looking material from fossils found around the world.[10]

Dr. Brian Thomas beside the skull of MOR 1125, the T. rex *from whose femur blood vessels were discovered*

To deny the reality of the blood vessels and their proteins is to ignore clear data. Similarly, denying the results of decay rate studies turns a blind eye on equally clear data.[11] Although we would not say that dinosaur blood vessels and similar finds "prove" the Bible, assigning these rocks and fossils to the Bible's age for Noah's Flood at about 4,500 years ago makes sense of both data sets.

Visitors to Makoshika State Park can feel confident that the Flood, not some meteorite impact, killed and buried these creatures in blanketing sediments. They can even touch the very rocks that contained the first popular discoveries of tissue-bearing fossils that fit the timing of Noah's Flood so well.

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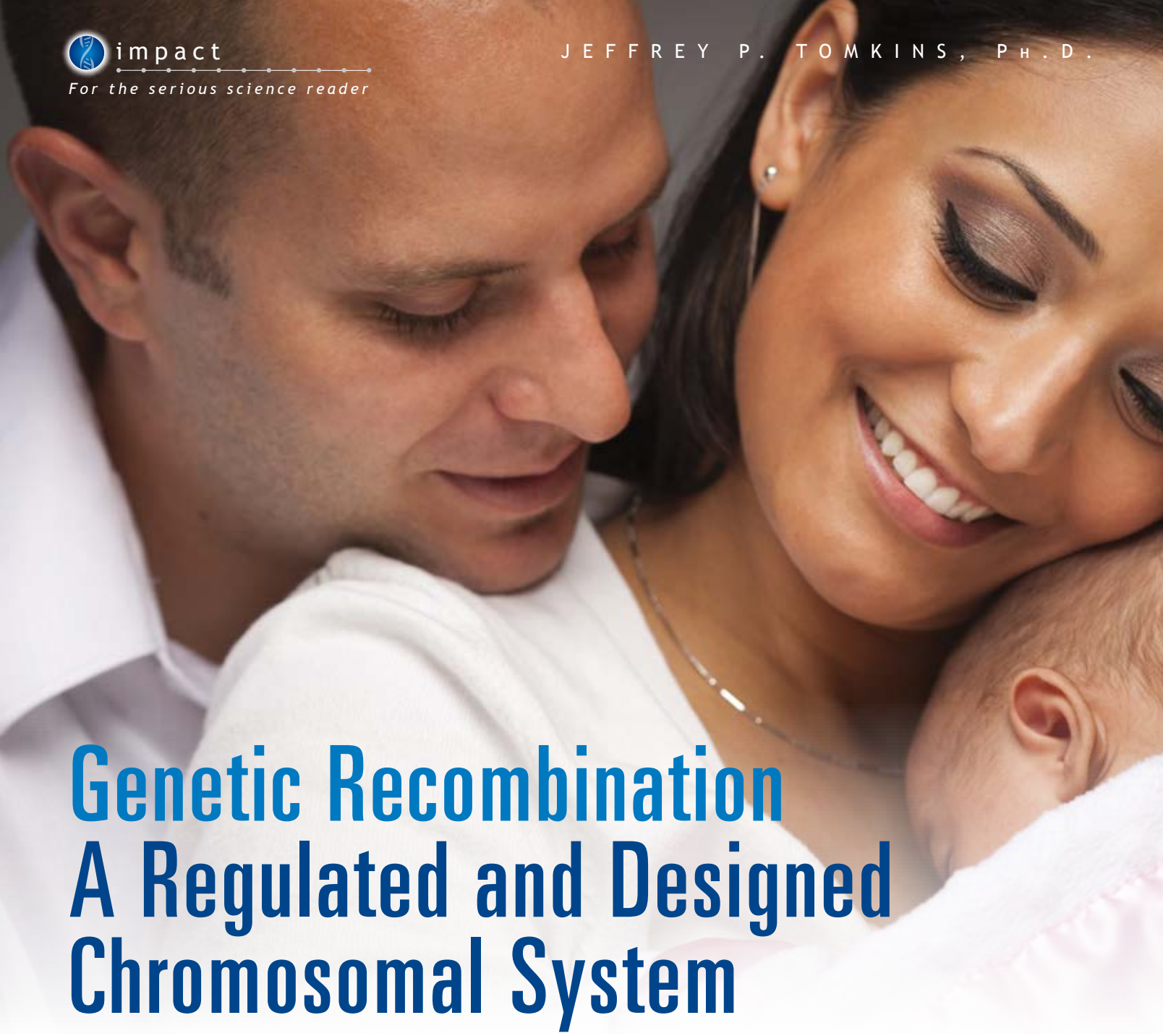
Dr. Thomas is a research scientist at the Institute for Creation Research and earned his Ph.D. in paleobiochemistry from the University of Liverpool. Tommy Lohman and his wife, Martha, serve as dig supervisors for Glendive Dinosaur and Fossil Museum.

One of the unusual rock formations in Makoshika State Park

JEFFREY P. TOMKINS, PH.D.



Genetic Recombination A Regulated and Designed Chromosomal System

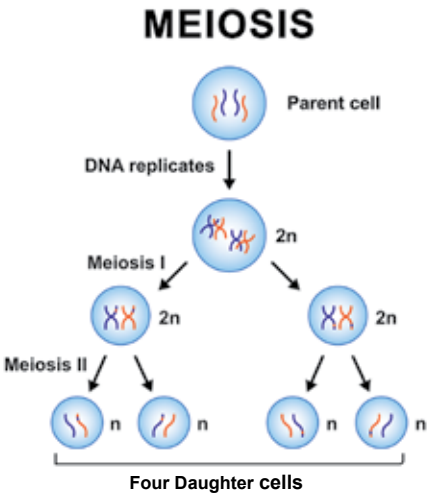
According to the evolutionary paradigm, complex genetic information in the form of genes and regulatory DNA can randomly evolve through mutations and selection. But this erroneous idea becomes more untenable with every new discovery in the field of genomics.

For example, research on meiosis, a type of cell division that produces genetic variation when sperm and egg cells form, is creating major roadblocks for conventional evolutionary theory. Genetic recombination, a key event during meiosis, is proving to be especially problematic for the mutation-selection myth. The precise regulation of this process, once thought to be largely random, involves an amazing amount of engineering.

Meiosis, an Introduction

For sexually reproducing organisms, the cellular division process of meiosis plays a vital role in generating genetic diversity. This is not to be confused with mitosis, which involves replication of body (somatic) cells during normal growth and development.[1]

Meiosis essentially has two missions



in facilitating gametogenesis (sperm and egg production). The first is genome reduction, in which the normal cellular chromosome content—diploid (2n) in most cases, with two complete sets of chromosomes—is reduced to a haploid (1n) with one set of chromosomes. When a haploid egg and a haploid sperm combine in fertilization, the diploid or 2n normal state of the genome is reconstituted. This is why people have two sets of chromosomes, one from the father (paternal genome) and one from the mother (maternal genome).

article highlights

- Meiosis is a process using several types of chromosomal randomization that occurs in reproductive cells to create a diversity of sperm and eggs that are each genetically unique.
- One of the main randomization processes creates new chromosome combinations using cellular machinery that shuffles and precisely recombines DNA segments.
- Genome variability in a healthy and diverse population of creatures is facilitated by the precise genius of meiosis and genetic recombination.
- Overwhelming scientific data show the process of recombination isn't haphazard at all but is a highly complex and regulated system engineered by the Creator, Christ Jesus.

This article will focus on the second goal of meiosis: creating genetic variation in offspring. Creating genetic diversity or variation is a key feature in maintaining animal and human health. The opposite of this concept is demonstrated by the higher rate of birth defects that are commonly observed when genetic diversity is lost due to inbreeding.

The way that meiosis generates this genetic variation is actually quite an ingenious and intriguing process since it involves two separate types of randomization/shuffling.

The first phase of randomization is a form of literally shuffling the genome like a deck of cards on a massive scale. Called recombination, this absolutely amazing event could be completely fraught with extreme hazard if governed by anything short of the most precise engineering. It first involves the pairing of homologous chromosomes. In other words, chromosome 1 inherited from the father pairs with chromosome 1 inherited from the mother, and so on.

In the human genome, 22 regular chromosomes (autosomes) pair up in a perfect fashion. Once this is done, the homologous chromosomes literally begin "crossing over" each other in the recombination process. Highly efficient cell machinery slices, dices, and reconnects fragments of DNA back and forth between the paired chromosomes in what is thought to be a random but controlled manner.

The end result is that the maternal and paternal chromosomes become new chimeric or recombined chromosomes, having exchanged numerous segments with each other. Although the genes and various other DNA features have been exchanged/recombined, the linear order and integrity of these components are preserved throughout the whole process. This is one of recombination's remarkable but necessary attributes that maintain genome stability and function.

The second level of genetic variation immediately follows recombination. In this phase, the chromosomes are pulled apart to form two separate sets in a process called independent assortment. This means a newly recombined chromosome has a 50% chance of ending up in one set or the other. It offers an additional level of randomization, helping to increase and maximize the available genetic diversity that the process can generate. The randomization from shuffling the genetic deck of cards twice is the reason most siblings look different from each other even though they have the same parents.

Meiosis is basically a one-way continuous process. It's not part of a stop-and-go cell cycle system like mitosis. In addition, meiosis only takes place in the reproductive organs of plants and animals, not in the other tissues. Its entire goal is to create new genome combinations and promote the genetic diversity needed to safeguard against the effects of inbreeding.

Asian water buffalo

Recombination or crossover frequency is typically determined by DNA sequencing the haploid genomes of gametes. For example, a recent study in water buffalo involved the DNA sequencing of 78 sperm cells from a single buffalo. The researchers were then able to identify 1,956 crossovers with an average of 25.1 per sperm cell, which is similar to human studies.[2]

Recombination, a Highly Engineered System

One of the initial molecular findings about recombination was that it is not random but instead occurs in a highly regulated manner. First, researchers discovered that recombination events tend to be unevenly distributed around the genome and frequently occur in small, specified genomic regions termed recombination hotspots.[3] Interestingly, these regions are characterized by several DNA signatures.

For example, these sections have a higher-than-average amount of guanine (G) and cytosine (C) DNA bases compared to the amount of adenine (A) and tyrosine (T)—known as GC content. In addition to an elevated GC content, these areas are commonly associated with a DNA feature called transposable elements (TEs), which I've discussed in previous articles.[4,5] There is typically a negative association between recombination and TEs because the more TEs that are present in a chromosomal region, the less recombination tends to occur.

Finally, a specialized DNA binding protein called PRDM9 has been found to localize almost all meiotic recombination sites in humans and mice, but most PRDM9-bound DNA segments themselves do not become recombination hotspots.[6] However, the oddity of many different creatures either having or not having a functional PRDM9 protein is a complete evolutionary enigma.[7]

For example, while mice and humans have PRDM9, platypuses and dogs do not. Other examples are found among types of ray-finned fish, amphibians, reptiles, and birds. In other words, PRDM9 is an important protein for regulating recombination in some creatures, but in others it's not utilized. Its presence or absence in the scheme of life negates evolution and supports the specificity of creature kinds by divine creation.

Mouse

Gene Control Regions Are Protected, Negating Evolution

Recombination hotspots among mammals are poorly conserved. This means their locations in the genome and DNA sequence structure are unique to creature kinds and don't support the evolutionary theory of one fundamental creature kind morphing into another.[8] The common house mouse (*Mus musculus*) is one of the best mammalian models for studying recombination. Recombination hotspots have been mapped all over the mouse genome.[8,9]

One key research finding is that genetic recombination is directed away from sensitive parts of the genome that contain genetic control elements and features.[10] These parts of the genome carefully regulate how genes are turned off and on and how they function in precisely regulated networks.

In creatures that lack the PRDM9 protein, though, recombination does occur in regulatory regions of genes. Researchers think this is facilitated by the fact that such regions tend to naturally contain open and active DNA. Furthermore, the chromosomes in many bird genomes are very small and compact, lacking large amounts of transposable elements as well as the PRDM9 protein.[7] And while recombination occurs consistently in regulatory regions in genomes that lack PRDM9, it does not occur within the gene bodies themselves.

Epigenetics and Transposable Elements

Epigenetics is one of the major factors that regulate and control recombination.[11] I discussed the basic systems of epigenetics in previous articles: DNA methylation, histone modifications, and small RNAs.[12,13] Epigenetic modifications strongly regulate crossover positioning by altering the accessibility of DNA to the recombination machinery. The process of homologous chromosome pairing during meiosis prior to recombination also influences the positioning of crossovers.

Transposable elements (TEs) also help govern recombination.[4] As briefly noted above, one of the most striking patterns of genome structure is the strong, typically negative association between TEs and recombination rates. In other words, the denser a region of a genome is in TEs, the less recombination occurs. While this appears to be a

Chimpanzee

common feature of eukaryotic genomes, the mechanisms driving the strong correlation between TEs and recombination are poorly understood.

In addition, and more rarely, this association can be totally reversed, a phenomenon typically associated with the types of TEs involved. For example, there is contrasting evidence in humans depending on TE type. One type, called L1 LINEs, is negatively correlated with recombination rates, while another type of TE, called Alu elements, tends to predominate in gene-rich, high-recombination regions.

Recombination and Environmental Cues

Interestingly, recombination is responsive to both intrinsic and environmental factors. Intrinsic factors include the sex and age of the organism. In many plants and animals, including mice and humans, females tend to have higher rates of recombination than males.[14] As organisms grow older, recombination rates tend to decline. In humans, mice, fruit flies (*Drosophila*), and nematodes (*Caenorhabditis elegans*), the effects of sex and age intersect with recombination rates decreasing with maternal age.

Red-legged grasshopper

In regard to environmental responses, the most well-studied paradigm is recombination effects due to changes in temperature.[14] In a wide variety of organisms—e.g., *Arabidopsis thaliana* (a small weedy plant), *Hordeum vulgare* (barley), nematodes, grasshoppers (*Melanoplus femurrubrum*), and *Hyacinthus orientalis* (an ornamental garden plant)—an increase in recombination frequency with increasing temperature is well documented. However, the temperature response has built-in thresholds in which meiosis is shut down when the temperature gets too cold or too hot.

Conclusion

Evolutionists have speculated for years that mutation combined with homologous recombination is one of the key mechanisms of evolutionary change. They claim it operates as some sort of mystical tinkering mechanism that miraculously generates novel genes that somehow become fully and precisely integrated into the genome's functional networks. The emerging concept that homologous recombination is a controlled feature of the genome limited to specific hotspots contradicts the idea of random evolutionary processes being able to produce new genes and regulatory DNA sequences.

There is even an anti-evolutionary angle to this when it comes to the human-ape DNA nonsimilarity issue. When researchers compared recombination in chimpanzees to that in humans, they found that "chimpanzee recombination is dominated by hotspots, which show no overlap with humans even though rates are similarly elevated around CpG islands and decreased within genes."[15] This is to be expected because the chimpanzee and human genomes are turning out to be much more different than scientists originally predicted—negating evolution.[16, 17]

Overwhelming scientific data show that the entire process of gamete formation, including recombination, is a highly engineered and precisely governed system that speaks directly to its all-wise and all-powerful Creator, the Lord Jesus Christ.

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Dr. Tomkins is a research scientist at the Institute for Creation Research and earned his Ph.D. in genetics from Clemson University.

"The grass withers, the flower fades,
But the word of our God stands forever."
—— Isaiah 40:8 ——

Flower bud of thale cress
(Arabidopsis thaliana)

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

EMILY F. STEELE

Exceedingly, Abundantly GRATEFUL

As I finished another year of teaching in the spring of 2023, I knew the Lord was preparing me for something different in my career—I just didn't know what it was. For the past seven years, I had taught high school students and sponsored an organization for future educators. I loved my job and my students, yet I felt convinced that God was writing a new chapter in my story. I began seeking His guidance on what that next stage would look like. My prayer was that Jesus would open the doors for where He wanted me to be.

Meanwhile, at the Institute for Creation Research, my now-boss was looking to expand his team and had been praying for someone with a unique skillset. Never could I have imagined how God would incorporate three of my favorite things—children's ministry, creation science, and event planning—into a career opportunity. Ephesians 3:20 says that God does "exceedingly abundantly above all that we ask or think," and He certainly did that with my job at ICR! It's amazing to see how He brought all the pieces together. I praise Jesus for a family that inspired a passion for creation science, for a dear friend who shared the job posting, and for my boss' vision to develop additional ICR offerings for kids.

That June, I moved to the Dallas/Fort Worth area and started work as the children's education specialist and an event coordinator with ICR. During the past year, I have been blessed to speak in schools and churches across the country as well as help launch our brand-new junior scientist club, Kids on Mission. This online program is comprised of a series of six-week minicourses in which children earn patches as they learn about creation science.*

Today's children are bombarded with false messages that lead them to doubt the reliability of Scripture. This attack of the enemy isn't new. In fact, it's as old as the Garden of Eden, where the serpent asked, "Has God indeed said…?" (Genesis 3:1). Our prayer is that God will use ICR's ministry to equip the next generation with scientific evidence that supports the biblical account. We want them to have confidence in the truth of God's Word from the beginning of creation to the last chapter of Revelation. Above all, we desire to proclaim Jesus as Creator, Savior, and coming King, and we're honored to share the hope of the gospel with all ages through our scientific outreach.

I want to thank each one of you who partners with us, both financially and in prayer. Because of your support, we've reached thousands of kids through our current initiatives. We're also seeking ways to expand our impact with a mobile science unit that would make additional STEAM (STEM and art) activities, scientific demonstrations, and ICR resources available to our local community.

We ask you to pray that God will continue to provide exceedingly and abundantly for our ministry. May the Lord Jesus richly bless you in proclaiming His creation truth to the next generation and beyond.

Ms. Steele is the children's education specialist and an event coordinator at the Institute for Creation Research.

*To learn more about ICR's new children's science club, visit **ICR.org/kids-on-mission**.

Emily Steele interviews Apollo 16 astronaut General Charlie Duke and his wife, Dotty, during the April 6 Countdown to the Great American Solar Eclipse event in Forney, Texas

UPCOMING MEET AND GREET EVENTS

Free event • registration required • limited seating

- September 8—Medora Community Bible Church, Hutchinson, KS
- September 15—First Baptist Church, Ness City, KS
- September 27–28—Victory Baptist Church, Marysville, KS

Come meet with ICR Director of Donor Relations Chas Morse to hear the latest updates on ICR's research and vision for the future. For more information, email **ICRmeetandgreet@icr.org**.

I don't often reach out to ministries just to say thank you, but I will today.…I opened [the ICR letter I received], and the first words I saw were "I will praise You, O Lord, with my whole heart; I will tell of all Your marvelous works. I will be glad and rejoice in You; I will sing praise to Your name, O Most High."

I know you have received far better donations than mine this year or your financial troubles would be worse than my own. **Praise God! I was given encouragement and a reminder of God's providence when I needed it most.** I am blessed by your *Acts & Facts* and the podcasts that you give freely without a paid subscription, and today I was blessed by the way you turned a simple tax report into a reminder to thank God and to remember the many blessings He gives, even during difficult years.

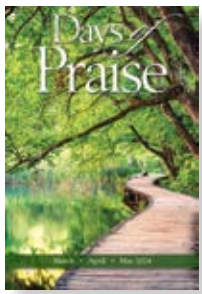
— P.

I've been reading your books and magazine for years and viewing many of your YouTubes. **Now I'm enjoying the live lectures you give at the churches by viewing their livestream broadcasts since you advertise your speaking schedules in *Acts & Facts*.** I'll tell everyone of this great opportunity!

— A. B.

I just finished reading "Why Biology Needs a Theory of Biological Design, Part 1" [in the March/April 2024 *Acts & Facts*] and would like to send you an encouraging regard. Your approach to combating evolution and natural selection is one that should be applauded. **ICR's depth of long-term strategic thinking and biblically accurate approach to today's scientific philosophies (Christian and secular) are nothing short of remarkable**.…I find ICR's Christ-centered material in regard to the creation vs. evolution debate to be unequaled.…Thank you for not only communicating that Jesus alone gets the glory but also working toward a God-honoring worldview of science that gives people a framework for thinking clearly.

— M. S.



I had been wrestling with my Christian beliefs for a while. We traveled…[and] I put the latest, March/April/May 2024, copy of *Days of Praise* in my jacket pocket for the flight. Unfortunately, I did not get to start reading it until Good Friday. I read through the first four pages for March, jumped ahead to Maundy Thursday, Good Friday, and Easter—the first three days of the section [in] April. **All of the articles touched my spirit, and my belief became stronger. Humans [*sic.*] beings cannot dilute God's Word nor His presence. My faith is back, and my desire to dig through Scripture has grown back.** Thank you.

— G. P.

[I] was in charge of bringing my school's 5th and 6th grade teachers and students to the [April 8, 2024, eclipse] event.…I'm writing to express my deepest appreciation for you hosting the event. The highlights were the activities you all brought, praise music to set the mood, and the eclipse countdown app that was broadcast on the loudspeaker. **Thank you, thank you, thank you for putting this on and welcoming us! My students couldn't stop talking about it today. Many said it was their "favorite field trip ever"!** All to God's glory.

— C. S.

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

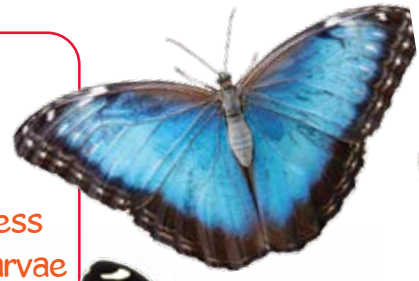
Creation Kids

Butterflies

ICR INSTITUTE FOR CREATION RESEARCH

The Lord Jesus created all kinds of buzzworthy insects—like butterflies! These eye-catching creatures are famous for their brilliant wings, but they're actually born as caterpillars. Through a process called metamorphosis (met-ah-MOR-fuh-sis), the larvae form a hard shell, or chrysalis, around themselves. Before long, they emerge as the butterflies that fill our world today! Did you also know...

- ✔ Butterflies are found on every continent except Antarctica.
- ✔ As they flutter from flower to flower for nectar (a sugary liquid), butterflies leave pollen behind. Pollination helps create seeds for other plants to grow.
- ✔ The wings of a butterfly are covered in tiny scales that protect it from getting too hot or wet.
- ✔ Some butterflies fly on seasonal journeys known as migration. Monarch butterflies travel as far as 3,000 miles south to escape northern winters. Another generation migrates north in the spring.



a. Blue Morpho

b. Clouded Yellow

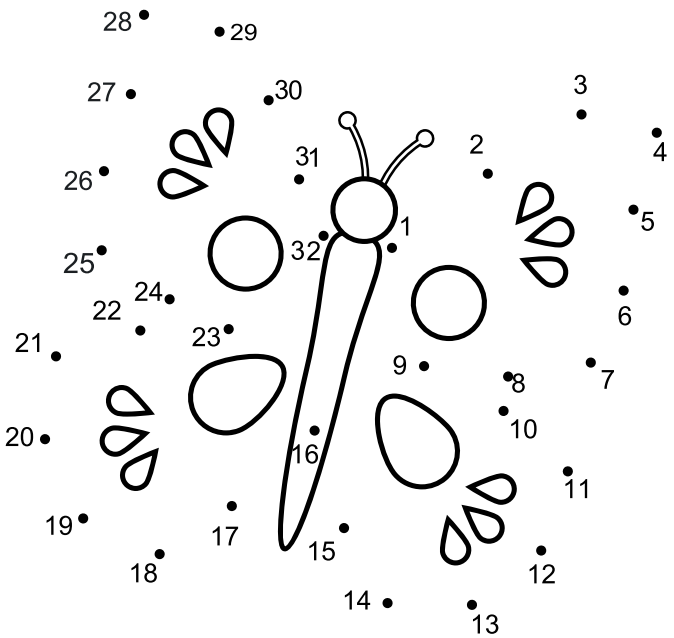
c. Citrus Swallowtail

d. Emerald Swallowtail

e. Monarch

f. Cairns Birdwing

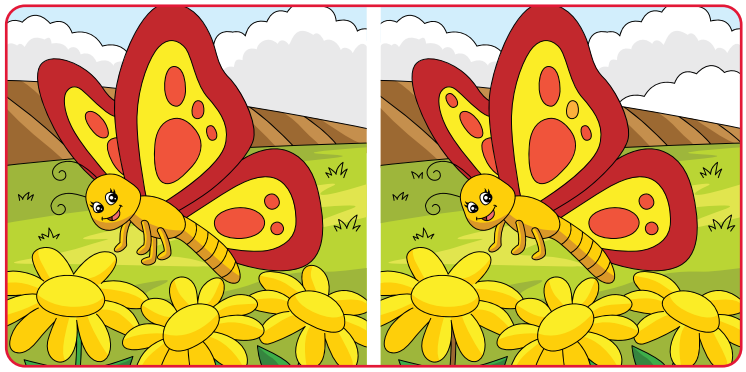
Connect the dots and color what you find.



Match each butterfly with its home region.

____ 1. North America	____ 4. Australia
____ 2. Europe and North Africa	____ 5. Asia
____ 3. Central and South America	____ 6. Africa

Circle the 8 differences between the pictures below.



Butterfly Home Answers: 1. e, 2. b, 3. a, 4. f, 5. d, 6. c

DESIGNED BY SUSAN WINDSOR

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