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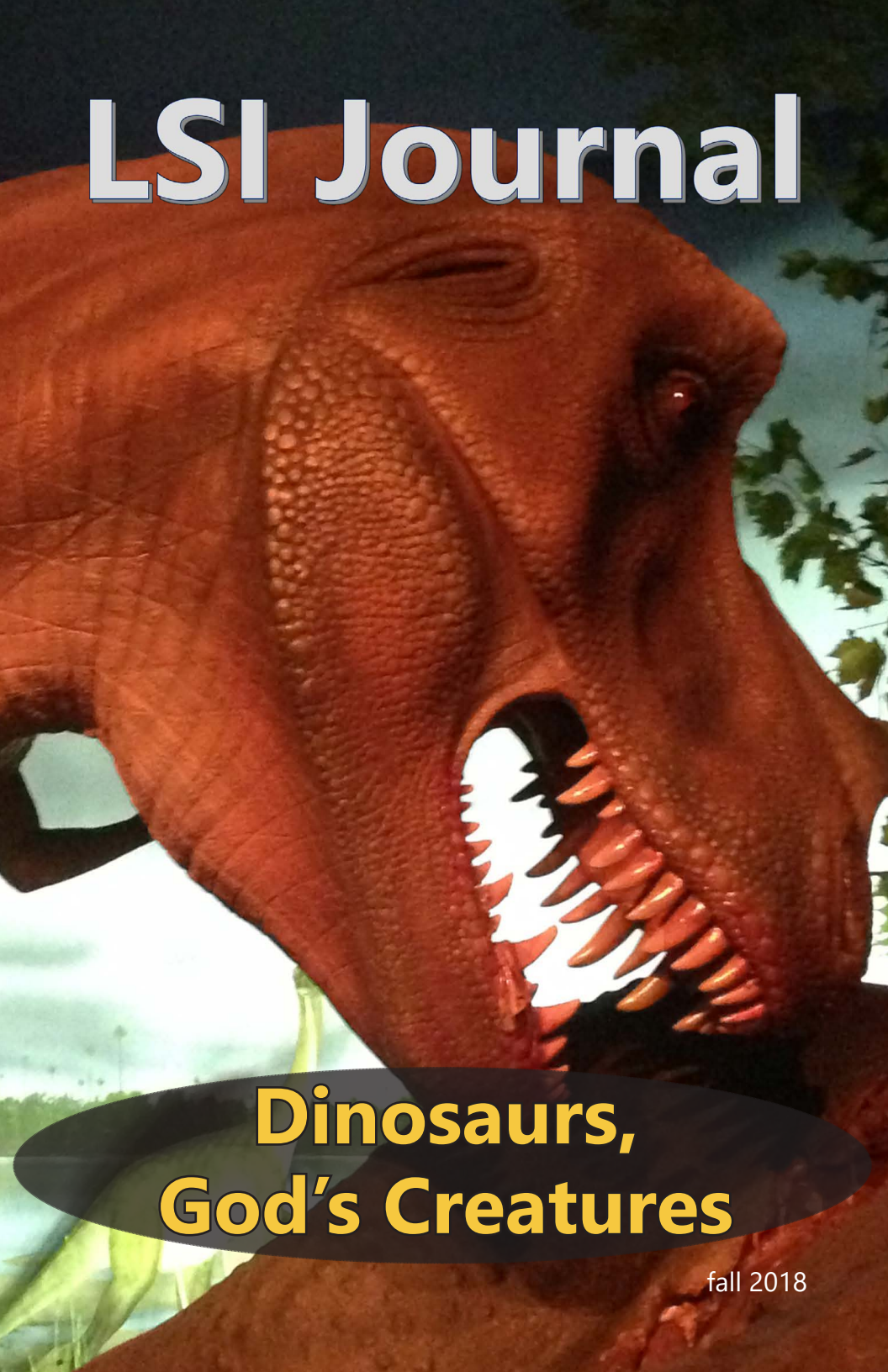

Dinosaurs, God's Creatures

fall 2018

Lutheran Science Institute

Creation / Evolution: a Confessional Lutheran view

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Daily Reminder

David Barkow

When do you give someone a lot of reminders? Sometimes it might be because we don't have a lot of confidence a particular person will remember what we told them. Hopefully it is not always the case! Most of the time we give someone a lot of reminders when there is an important truth we want them to remember.

Do you know that God gives each of us a daily reminder? He points that out to us in Psalm 19 where he says,

The heavens tell about the glory of God. The expanse of the sky proclaims the work of his hands. Day after day they pour out speech. Night after night they display knowledge. They do not speak. They say no words. Their voice is not heard. Their voice goes out into all the earth, and their word reaches the end of the world. Psalm 19:1-4 EHV

God says there is a clear message when you look at the heavens and at all creation. God is glorious! God has created wondrous things! And this is not something God tells us only once. This reminder is there day after day. Night after night knowledge of a creator is displayed. Everyone can see this silent proclamation of God's creation. Its voice goes out into all the earth, to the ends of the world. Day by day all people can see a sermon of God's glory in creation.

The psalm goes on to give a specific example of this, the sun in the sky, which "sets out from one end of the heavens. It runs until it reaches the other end. There is nowhere to hide from its heat."

But as wondrous as the daily reminder of creation is, it is only meant to call us to listen to an even greater message of who the Lord is. This is why David moves from this daily reminder to the wondrous nature of God's Word. It is perfect and revives us. It is trustworthy and makes us wise. It is radiant and gives light to our eyes. Ultimately this message

credit: Pixabay CC0

of God makes us wise for salvation because it shows us how God forgives our sins and our hidden faults.

What blessing is ours when the daily, visible reminder of God's glory leads us to turn our attention to where the God who created the universe in its vast array reveals himself as the one who redeems us from all our sins! Then we will be reminded through his Word that we are blameless and innocent of transgression, for God makes us new creations in Christ.

We Pray:
Lord you are glorious! Your glory is on display every day and every night in the world you made. Your "eternal power and divine nature—have been clearly seen since the creation of the world" (Romans 1:20, EHV). Thank you for these daily reminders of your glory. Lead us to also daily hear, read, and contemplate the much greater revelation found in your Word, the Bible, where you reveal your amazing love for us, and the good news of our Savior, Jesus Christ. Amen.

David Barkow serves as pastor at Christ the Lord Lutheran Church in Cottage Grove, Minnesota.

DINOSAURS, GOD'S CREATURES

Paul R. Boehlke

This 1991 article has stood the test of time and continues to be very popular. It was first published in the Lutheran Educator[1] in two parts. Both parts are presented here along with an update article from the same author. LSI thanks the publisher, Martin Luther College, for granting permission to republish. This article is republished in its original wording. Note that it follows a different reference convention than is normally followed in the LSI Journal.

How do we fit dinosaurs into a Christian view of history and science? We do not have all the answers. Scripture does not detail the issue; the Bible deals with the more important matters of faith and salvation. History has forgotten these ancient beasts, and science cannot claim the truth for this area of study. Yet there are things that can and should be said. Dinosaurs are valid subject matter for the Christian classroom. These huge land animals declare the glory of God. The subject can also serve to foster a better understanding of science and our world.

God made them and they were good. One source (Dixon 1988) calls the *Brachiosaurus*: "a masterpiece of engineering–a lightweight framework, made of immensely strong, yet flexible, vertebrae, each angled and articulated to provide maximum strength along the lines of stress." But sadly, when mankind sinned, dinosaurs suffered along with all of the creation. Now what remains are fossilized bones, claws, footprints, dung, eggs, teeth, spikes, horns, bony plates, gizzard stones, rare imprints of skin and (very rarely) stomach contents.

Dinosaurs may be described in the Bible (Job 40:15-19). Of course, the Bible is not a science book; and such identification will have to remain uncertain. Yet the images of behemoth and leviathan are enticing. "Look at the behemoth, which I made along with you and which feeds on grass like an ox. What strength he has in his loins, what power in the muscles of his belly! His tail sways like a cedar; the sinews of his thighs are close-knit. His bones are tubes of bronze, his limbs like rods of iron. He

1 Paul R. Boehlke, DINOSAURS, GOD'S CREATURES, *The Lutheran Educator*, 31 no. 3 and 4 (February and May 1991).

ranks first among the works of God..." (NIV-84). Behemoth means kingly, gigantic beast. In the following chapter, Scripture refers to a second formidable creature, perhaps a plesiosaur. Leviathan is detailed as a fearsome beast that cannot be tamed or captured. If he takes your bait, you cannot pull him out of the water. Consider that the first fossils of dinosaurs were found only in 1820. Hence Bible commentators suggested that behemoth was an elephant, a water ox or a hippopotamus and that leviathan might be a crocodile. These inferences have continued (cf. Kretzmann, *Popular Commentary of the Bible*, 1924, or Beck's *An American Translation*, 1976). One cannot fault the writers of these older commentaries, but the cedar-like tail of behemoth suggests an animal no longer on this earth. A hippopotamus does not have much of a tail. Furthermore, the strength and habits of a leviathan suggest much more than a crocodile or a whale. Captured crocodiles were known in the ancient world. Herodotus reports that the Egyptians *did* pull crocodiles from the water on a hook and tame them. The hippopotamus was apparently also captured, and its skin may have been used for weapons (de Selincort 1954). It seems not required, but reasonable, that God is referring to creatures far more difficult to manage.

When fossils of the "terrible lizards" were first found, Lutheran teachers apparently often rejected the reports and displays because of associations with evolutionary theory. In the 1940s (and even more recently) well-meaning Christian teachers taught that the bones of dinosaurs must have been put together incorrectly and that such huge animals could not have fit on the ark. This was an unfortunate over-reaction. Interestingly, Alfred Rehwinkel's 1951 landmark book, *The Flood*, courageously acknowledged dinosaurs as real creatures. He claimed that changes in the post-flood world caused their eventual extinction.

Nevertheless, recently in *Christian News*, John Drickamer commented on a host of issues that bother him. He says,

> Personally, I am sick and tired of seeing and hearing so much about dinosaurs. They are all over the place–especially for their commercial value. Children love something about dinosaurs. It is probably just that they can believe that monsters are real–

but at a safe distance in time, being securely extinct by now. Dinosaurs also figure prominently in the 'science' education of younger children in public schools. *It is really just a ploy to get the children interested in and believing in the myth of evolution, which is directly contrary to the whole Christian faith* [my emphasis] (1980, 21).

Nonsense. If we are to hide the dinosaurs from our children, Scripture should guide us to do that. If science and the Bible are in conflict, Scripture must be correct. We, of course, must be careful that we have understood and applied Scripture correctly. Lutherans do not make doctrines by inference; they search for things plainly taught. They teach what Scripture teaches. There is no reason in Scripture to reject dinosaurs. Our failure to recognize dinosaurs as possible extinct creatures is unnecessary and unwise. Furthermore, the real issue is not their existence. The issue was and still is an issue of *time*. To this Scripture speaks. As land animals they were made on the sixth day of Creation.

There were no *prehistoric* times or creatures in the sense that the term is usually used

Christians can over-react against evolution. If species go extinct, that is evolution. If the frequency of genes in a population changes, that is evolution. Those things happen. The Bible says that creatures reproduce after their own kind. That makes sense but does not preclude all changes in the offspring and the gene pool. Genes do mutate, and selection can occur. We need to remind ourselves that the crux of the issue is that we are not here on this earth by such natural processes–even if it would happen that the processes are built into the creation. The real concern is our origin. Who made us? Scripture plainly teaches that in spite of what you see around you, God made mankind on the sixth day of Creation. The acknowledgment of the existence of many different types of creatures who are now extinct does not prove mega-evolution. It confirms the Scriptural teaching that the whole creation is suffering.

Job may be the oldest book in the Bible. Interestingly, the awesome animals described there may be dinosaurs. They may have been still alive, and Job may have known of them. Of course, this is a guess. But even if this is a bad guess, the dinosaurs must have lived with humans–not before, as evolutionary theory supposes, for God made the animals and mankind on the same day. There were no *prehistoric* times or creatures in the sense that the term is usually used.

A warning is in place. One should not become so interested in the true identities of behemoth and leviathan that the thesis of the book of Job is forgotten. That would be an ironic and terrible price to pay. The message of Job is so important to those who want answers. It tells us that we should be humble; we do not know everything. There are many spiritual and physical things we will not understand while we are alive. We must trust God. Job admitted that he questioned things beyond his understanding. We were not there when God created everything; there are many things we do not know and cannot figure out. God's message was that there were animals that Job could not control; there were also many other matters beyond his knowledge, especially in nature. Interestingly, even at the end of the story, Job is still not told why he suffered. Perhaps it is best that we are left to puzzle about the identities of the two wonderful beasts that God made.

The other side of the coin is that it is not wrong to inquire. So long as our motives are not to support God's Word with our reason and we acknowledge that we could be wrong, we may use our reason. As the Dr. Martin Luther College catalog states, "…we view the study of man and his culture, together with the pursuit of other knowledge, as not only beneficial but obligatory" (1990, 12). To be good stewards of the earth, we must try to understand as much as we can about the creation and its processes.

Children have always had a natural fascination with these strange beasts and may know more about them than the average adult. In addition, the work of a new generation of scientists is challenging some of the early ideas in this young science about old beasts. New displays, television programs and books are coming out.

Recent discoveries in the Gobi Desert indicate that many North American dinosaurs had close relatives in Asia. Now-submerged northern land bridges may have allowed gene flow (Lessem 1989). A small dinosaur found in Antarctica indicates that South America may have been linked to the smallest continent. Some species, however, remain unique. So far, no horned dinosaurs have been found in the Gobi but they are numerous in North America. *Triceratops* once roamed the western plains like the buffalo (but not 65 million years ago according to evolutionary theory). Other discoveries are more revolutionary, challenging the ways in which scientists and others think of dinosaurs. A new understanding is that not all dinosaurs were massive beasts. The sizes of the dinosaurs varied; some were only as big as chickens.

Science does not generate truth but rather, useful explanations

There are thousands of names for dinosaurs. For several reasons it is still not clear how many different dinosaurs there really were. Skulls have been found for only 250 dinosaur species. "*Brontosaurus*" apparently was given the wrong head when the discovered specimen was named as a new dinosaur. (The head was faked by an over-competitive scientist who wanted to be the first to find many new species. Scientists do not condone such unprofessional behavior.) Later, other scientists decided that the head must be wrong; and the body of *Brontosaurus* was actually the previously discovered, *Apatosaurus*. A U.S. postage stamp was released in 1989 with a picture of an *Apatosaurus* using the name "*Brontosaurus*," and many are upset that the postal service is supporting the error. Children might enjoy finding a picture of "*Brontosaurus*" with the wrong head in a museum (cf. Bakker 1980, 290; Rehwinkel 1951, 227).

Then again, sometimes juveniles and adults of one species have been confused and named as different species, says John Horner (1988), curator of paleontology at the Museum of the Rockies at Bozeman, Montana. Reptiles are born looking like miniature adults, but small dinosaurs had exaggerated features which cause "cuteness." Generally this included

big eyes, short snouts and big feet. Scientists call this cuteness *neoteny*. We sense neoteny when a picture of a baby deer is shown, and the audience reacts to it with a sigh of pity and concern. Stephen Jay Gould (1982) and Konrad Lorenz claimed that neoteny is a mechanism for releasing parental nurturing behavior. But the somewhat different appearance of the young led to confusion. Scientists can make mistakes because of what they expect to find. In this situation, Christian teachers will always want to be very careful not to ridicule the best efforts of men and women which turn out to be wrong. Christian educators should not become proud and start to play the role of having a superior knowledge about all such things (the error of Job's friends). St. Paul said, "For I resolved not to know anything while I was with you except Jesus Christ and him crucified…your faith might not rest on men's wisdom but on God's power" (1 Co 2: 2,5; NIV-84).

The fossils hardly speak for themselves. Phillip Currie has studied concentrations of fossils of *Centrosaurus* in Alberta, Canada. He has found over a hundred in one location. From this he concluded that a herd must have crossed a river. As happens with present day herds (like the wildebeest) crossing rivers, some were trampled and many drowned. Tooth marks on the centrosaur bones indicate that the bodies were eaten by scavengers and then were fossilized. Currie is convinced that large herds of dinosaurs migrated across the land and that the sight would have been awesome.

Another very interesting discovery indicates that some species had rookeries. John Horner is the only person to find extensive dinosaur nesting grounds with fossilized skeletons of baby dinosaurs still in their nests. Baby dinosaur fossils are rare. In his search for duckbilled dinosaur fossils in Montana he discovered that the nests were located in drier areas where fossilization was less likely to happen. Horner found extensive dinosaur nesting grounds with fossilized skeletons of baby dinosaurs in the nests. He found thousands of baby dinosaurs at various ages and more than 300 eggs, some broken, some intact. The rookeries imply the existence of complex social behaviors to allow such groupings and perhaps an annual return to nesting grounds.

Horner's remarkable nest discoveries indicate that some dinosaurs cared for their young. He found that the bones of the young *Maiasaura* in the nests were not smooth on the ends (just like our young nest-bound birds). They would not have been able to move about until the bones matured. The babies of the species stayed in the nest while the parents fed and protected them for several months. He named these duck-billed dinosaurs, *Maiasaura* (MI-ah-saurah) for "good mother lizard" (Gorman 1989).

Martin Sponholz of Dr. Martin Luther College shared an interesting reaction to the fact that Horner's *Maiasaura* rookeries were found in dry areas. Horner humorously supposes that the smell of dinosaur rookeries would have been terrible. Sponholz, who has visited penguin rookeries in Antarctica, offered that the drier locations would cut down on odor and possible infection just as the freezing and drying of penguin guano helps that situation (personal interview, September 29, 1989).

Dinosaur science is typical science

Another major new idea is that dinosaurs must have been warm-blooded, fast and alert –like birds. Scientists are now claiming that birds are their surviving relatives. The spacing of dinosaur tracks indicates relatively fast movement for the larger animals (four miles per hour) which would require high metabolism. Tail tracks are missing when footprints are found indicating that the tails were held high for balance. Bone structure and growth patterns remind scientists of birds. Philip Currie found a braincase from an animal known as *Troodon* (Tro-a-don). Its large middle ear air ducts showed that it was very birdlike. With every breath it cooled its head. The old image of stupid, slow-moving lizard-like creatures has been replaced by one of fast-moving, curious, bird-like animals with a high metabolic rate. No longer are these creatures thought of as crawling reptiles subject to the temperature of the environment. Science changes; new ideas replace the old. Science does not generate truth, but rather, useful explanations. Our students need to know about how science works. Dinosaur science is typical science which shows how mankind creates explanations and picks and organizes facts to fit the current scheme.

DINOSAURS, GOD'S CREATURES
Part II

Paul R. Boehlke

Part 1 of this paper indicated that the topic of dinosaurs has a place in the Christian classroom. To reject the idea is an over-reaction against evolutionary theory. Children often have a strong interest in these beasts, and they can be used to show the wonder of God's creation and also how science changes its ideas about nature. This part of the paper will furnish examples of new ideas that scientists are generating about dinosaurs.

Some dinosaurs likely had more colorful skins than first imagined. The unevenness in fossil impressions of skin may be caused by spots of color. There is no reason to believe that dinosaurs did not have stripes and spots like the other animals made by God. Some colors may have been for camouflage, attracting mates, or frightening off attackers. The actual colors, however, will never be known. Crests and horns also may have been used by dinosaurs to identify their species and to attract mates.

Again while speculating about social behaviors, scientists now believe that some of the duck-billed hadrosaurs communicated with each other with low frequency sounds as elephants do. For example, the head of the *Parasaurolophus* may have allowed vibrations to travel from the throat to the top of the crest, around the corner, and then back down to the nose before being released. Such sounds would have been low pitched and difficult for predators to locate. Yet the *Parasaurolophus* would have been able to communicate with others of his species–perhaps warning the herd or attracting a mate.

Then imagine two long-necked dinosaurs batting each other with their long necks for the establishment of dominance. Male giraffes spar like this; it is called "necking." Impressive blows can be delivered. Their swings, counter-blows, agile escapes, nimble footwork and complete misses can go on for ten minutes. Injury is rare, but sometimes occurs. A giraffe may be knocked unconscious. But no matter how badly a fight is going, they do not use their primary weapon, kicking. The giraffe can deliver a deadly kick to a predator (Dagg and Foster, 1982).

Scientists believe that dinosaurs probably had similar social behaviors. Scientists believe that there was a massive extinction of dinosaurs at the end of the Mesozoic. The Cretaceous-Tertiary boundary (commonly called the K-T boundary) layer in the strata indicates a sudden change to the scientist. We do not know what happened except we know that the event did not occur seventy million years ago. The real questions about dinosaurs involve time.

The effects of the Flood on the geological record and its real meaning are unclear to us. Could the Flood have caused extensive fossilization? We do not know. The Bible does not deal with such questions. We can say that if dinosaurs lived until the time of the Flood, then their representatives joined the other animals on the ark. "Two of every kind of bird, of every kind of animal and of every kind of creature that moves along the ground will come to you to be kept alive" (Ge 6:20; NIV-84). Kinds are not species and not every possible variation of dinosaur had to join Noah. It is likely that many species were lost. Large numbers may have been fossilized by the Flood. We should be open-minded about the appearance of the animals on the Ark. We do not know what any of the animals on the Ark looked like and what genes were required to produce what we have now. Perhaps the dinosaurs on the ark lived only a while after the Flood, never reaching numbers large enough to make many more fossils. We cannot know. Perhaps the dinosaurs were even extinct *before* the Flood. If mankind was so evil, the environment probably suffered. The easiest way to kill an organism is to change its environment. We cannot tell from the Bible, and any scheme that we might dream up to fit the geological record to the Scriptural record could be proven false in the long run. That would do more harm than good if people foolishly had attempted to support their faith with it.

All science changes, even science done by well-meaning Christians. One may personally think that the K-T boundary has something to do with the Flood but that kind of thinking dare never be placed at the level of Scripture. We must be humble about such ideas and realize that the truth of the matter is probably far more complex. Speculation cannot take the place of preaching the gospel. The Holy Spirit does not work through reasoning, but through the Word itself.

Science is always a *creative* and *selective* use of evidence.

There are many *assumptions.*

Scientists do not think about the effects of a world-wide flood because they cannot imagine a natural cause for such an event. That is part of the nature of modern science and one of its inherent limitations. The content of science excludes the supernatural and the single event. Nobel laureate Luis Alvarez and his son Walter in 1980 proposed that an asteroid about six miles in diameter struck the earth at about 45,000 miles per hour (odds: once in a 100 million years). The massive amounts of dust and debris blocked sunlight for months or years. The climate cooled dramatically. The Alvarez theory is based on a thin stratum of the metal iridium at the K-T boundary. Iridium is common in asteroids but rare on earth. Opponents of the massive impact theory argue that an unusual period of extreme volcanism could have pulled iridium from the interior of the earth. The volcanism could have caused a lethal acid rain (or the same sun-blocking climate changes).

Dawson (1989) cites some conclusions which show how scientists think: 1) Most of the plant life in North Dakota died at the same time the dinosaurs died. Seventy-nine percent of the leaf types in existence at the end of the Cretaceous Period are not found above the K-T boundary. Sudden changes in pollen types at the K-T boundary also support the sudden extinction theory. 2) Furthermore, two-thirds of all species died at the K-T boundary. 3) A large crater of the proper age has been found in central Iowa. The crater is 20 miles wide, not large enough, but perhaps it only represents a piece of the asteroid. Some argue that Cuba was the primary impact site. 4) Advocates of the impact theory argue that quartz of a particular type would have been formed by the impact. That type of quartz has been found at the K-T boundary. 5) Massive amounts of soot have been found in the clays at the K-T boundary. The soot was interpreted to be the result of extensive wild fires touched off by the impact. David Raup (1986), in the spirit of "if it happened once …," believes that there

have been several extinctions caused by comets. He believes that a planet named Nemesis periodically dislodges comets from the Oort cloud which then hit the earth. This has happened every 26 million years, according to his thinking. This hypothesis has caused much controversy among scientists.

By the study of these things, our students can learn that dinosaur science is very typical science. In fact, we are teaching our students little science if we do not let them see hints of its inner workings. Science is always a creative and selective use of evidence to build a reasonable, natural explanation. There are many assumptions. There are many inferences. There are cases of searching until you find what you need to fit and support your favorite ideas. Science is a human construction. James Gorman, who has followed Horner's work, states, "Paleontology exists not primarily in the fossil bones but in the thinking of the paleontologists who collect, organize and interpret these bones. The scientists who study dinosaurs have to construct, within the restraints of theory and evidence, an image of what the dinosaurs were. A bucket of fossils means next to nothing to me or to other laymen. The parts don't come close to adding up to a whole" (Horner and Gorman, 1988, 17). Science is puzzle-solving with most of the pieces missing and many parts out of place. There is no promise of truth. Our understanding of dinosaurs will change as scientists consider different ideas. Science always changes as time goes on. Nevertheless, to do science is a gift of God. To investigate, to explore is human. God blesses us through even the study of dinosaur bones. Discovery can be thrilling and rewarding. The wonder of God's creation awes us and speaks of His wisdom. "Look at Behemoth...He ranks first among the works of God…" (Job 40:15,19; NIV-84).

Dinosaurs are valid subject matter for the Christian school curriculum

Children should certainly study dinosaurs. It should not be difficult for them to see how scientists are arriving at their conclusions. They use selected facts, use information that we accept about existing animals

to compare and build a reasonable story. Our students should not come to ridicule the scientist but to sense the limitations of science and of all our knowledge. Science and other disciplines can be very, very wrong. A good scientist knows this. In their sinless state, Adam and Eve could talk with God in the garden and be the best of scientists. But when *we* get to heaven, God may have to tell us many things–perhaps, among them, that *Parasaurolophus* never made the sounds we supposed.

Science can be very, very wrong. A good scientist knows this.

We need to teach our children that scientists are certainly in error about when these creatures lived. Scripture clearly teaches that wonderful animals were created with mankind and lived with us. We cannot prove that with reason and evidence, but the Spirit works that faith in us.

The large dinosaurs are gone now. We should sense a loss. Extinction is very real and final. Sin has caused the whole creation to suffer. Species with wonderful engineering have become extinct in the past; this is likely to continue unless we change our values and understandings. It has been estimated that we lose four species every hour. Presently the cutting of the rain forests is causing a massive loss of plant and animal species that have not yet even been identified. We are appalled at the Exxon oil spill in Alaska, but then we change the oil in our car and dump it into the street. We must teach our children to respect and guard the creation and the creatures in it (Ge 1:28). God made us and all creatures because he delighted in it. It pleased him to create the world. The reason that Jesus came to live *as a man* and die for us is the same as the reason he created us and all creatures: We are to remain his, he rescues us, restores us, and continues to delight in us. Yes, we are unworthy, but by grace we are his. And the world is still his; he reminds us of this in the Psalms. We must grow more sensitive to caring for his creation. We are caretakers, and we must answer for our stewardship of his creation.

Dinosaurs are valid subject matter for the Christian school curriculum. Because the previous generation may not be accustomed to their inclusion, bulletin boards and teaching materials should clearly indicate that the teacher believes that God made them. The title of a classroom bulletin board, for example, might be the same as this paper's. These extinct creatures show the wonder of the Creation. Children (and even commentator Walter Cronkite) love them. They clearly show the blessings and the limitations of doing science. They remind us that the earth is suffering because of sin. All these things call for the inclusion of dinosaurs in the curriculum of the Christian school.

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DINOSAUR RETROSPECT

Paul R. Boehlke

Dr. Boehlke wrote this article to update LSI Journal readers on developments during the 27 years since he wrote his dinosaur article.

Research on dinosaurs has accelerated with new discoveries and ideas. Victoria Arbour provided a summary in *Science*. New finds include shark-toothed creatures in Africa. Snub-nosed *Abelisaurs* with tiny arms have been found in South America. Those short arms continue to interest everyone. Transylvania, of all places, has yielded a bizarre set of dinosaurs including a new *Velociraptors* with not just one set but two sets of claws on their feet. Finally, China has given us a flood of feathered dinosaurs that encourage linking them with birds.[1]

Basically, dinosaurs are like the proverbial elephant in the room. How should the Christian view these creatures? Recent findings and interpretations have dramatically increased the tension in this field of study for everyone concerned. Notwithstanding, the current situation and its handling of a surprising anomaly does present a fascinating opportunity for understanding the nature of science.

What do the Fossils Really Say?

The fossils are facts but hardly speak for themselves. Marty Sponholz, Jim Wandersee, and I shared an office at Dr. Martin Luther College. One day the topic of Duane Gish's book, *The Fossils Say No!*, came up.[2] One of us quickly quipped, "Fossils can't talk; they're dead!" We laughed, but more seriously we did take issue with the title and agreed that facts, including the fossils, always have to be interpreted. The very structure of a classical graduate thesis recognizes this by requiring the facts or data to be presented in one chapter with the analysis and conclusions waiting until the next chapter.

1 Victoria Arbour, "Results Roll in from The Dinosaur Renaissance," *Science* 360, no 6389 (May 11, 2018) 611.
2 Duane T. Gish, *The Fossils Say No!* (Dallas: ICR Publishing, 1973).

The "Prime Apologetic" for Christians: Put the naturalism assumption on the table when discussing evolution.

Science is a very human enterprise. It is limited by everything that is human. Facts are selected and others ignored. Thomas Kuhn pointed out that science proceeds by viewing nature with a paradigm. Coherence in model building is the goal. The paradigm includes presuppositions and assumptions, understandings and findings that have already been accepted, appropriate methods to use, and qualifications of the investigators. The paradigm is a worldview. If an investigator finds something that challenges the current paradigm, an anomaly; it will meet resistance. Paradigms can change, but an acceptable alternative must be available.[3]

Science Changes

Dinosaur science is typical in revealing how mankind builds and modifies explanations for what is observed and studied in nature. Facts are very important, but they always have to be verified. Furthermore, they must be interpreted and set into place. Scientists are generally aware of this and admit that scientists can be wrong, and even whole areas of science can be overturned.

The history of science shows that it changes.[4] Consider a few examples. The shift from a geocentric to a heliocentric model of the solar system involved refitting all the observations into a new framework. Then again, phlogiston theory, defended at Harvard in its beginning years, has been discarded. Furthermore, spontaneous generation of life, which even Luther accepted, was disproven.[5] And again, Galen's theory of the bal-

3 Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: The University of Chicago, 1962).

4 Martin Sponholz, "Different," in *Discovering God's Creation: A Guidebook to Hands-on Science*, ed. Paul Boehlke, Roger Klockziem, and John Paulsen, (New Ulm: Martin Luther College Print Shop, 1997). (accessed 9-25-18) https://mlc-wels.edu/math-science/discovering-gods-creation/
Sponholz points out that science and nature are different. The history shows that science changes.

5 Martin Luther, *Luther's Works: Lectures on Genesis*, vol. 1, (St. Louis: Concordia,1958), 52.

ance of the four humors (fluids) in the body, that likely hastened the death of George Washington, is no longer practiced.[6] Finally, while alchemy did get some things right, it had to be strongly modified to become the foundation of modern chemistry.[7] Major shifts are not accomplished without resistance.

Within our generation dinosaur science has undergone a major revolution of that sort. What were once thought to be cold-blood, slow moving lizards are now viewed as warm-blooded bird-like creatures complete with social behaviors.[8] Note well, that this very accessible example of changing science is an excellent example that could be used in our schools to demonstrate the nature of science.[9]

Soft Tissues and the Current Dilemma

You are likely aware that a significant case is currently occurring in dinosaur science. Jack Horner, famous for establishing social behaviors in *Maiasaura*, gave his then graduate student, Mary Schweitzer, a fossilized femur from a *T. rex*. When she prepared it, she found medullary bone in it. Birds develop it for laying eggs. It serves as a calcium supply for the eggshell. Thereby she concluded that the *T. rex* was female. Then she used acid to dissolve pieces of the mineralized bone. What should have been bone turned into rock, revealed flexible tissue and the remains of red blood cells.[10] She was reluctant to show the results to Horner. No one expected tissue could remain after millions of years. When she finally did show Horner the slide of the cells, he said, "Prove to me they're not."[11]

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6 Jennie Cohen, "A Brief History of Bloodletting" *History Stories*, https://www.history.com/news/a-brief-history-of-bloodletting (accessed 9-25-18)

7 John Warwick Montgomery, *In Defense of Martin Luther*, (Milwaukee: Northwestern, 1970), 101-113.
Indicates that alchemy had roots in the Reformation. This book has recently been reprinted by NPH.

8 Michael J. Benton, "Ectothermy and the Success of Dinosaurs," *Evolution* 33, no 3 (September, 1979), 983-99.

9 Paul R. Boehlke, "Should the Teaching of Science Encourage Active Consideration of Discarded or Rival Explanations?" a position paper delivered at The University of Iowa, 1979.

10 *There are many pictures of soft dinosaur tissue on the web that the reader will enjoy. YouTube has an interesting video about Mary Schweitzer at* https://www.youtube.com/watch?v=bS6TXh_bx8Q. (accessed 9-25-18)

11 Robert Service. "'I Don't Care What They Say About Me': Paleontologist

Science is best at disproving, but Schweitzer could not disprove what she was seeing. Armed with her doctorate, she published her first report in 2007.[12] This was followed by further investigations that revealed collagen (connective tissue), blood vessels, and osteocytes (bone cells). There was resistance from everyone. How could these tissues have survived more than 80 million years without decay? Critics suggested contamination that formed a biofilm that had the appearance of tissue. A familiar biofilm is dental plaque that is highly organized structurally. Schweitzer then took steps to guard against this, and other investigators began to support Schweitzer. However, the work is still controversial. Replication by others is needed.[13]

Horner warned Schweitzer that the Creationists were going to love her.[14] There was some truth to this. Some Creationists jumped on the findings as obvious support for a young Earth and called on Schweitzer to conclude that dinosaurs were obviously younger than thought. Interestingly, Mary Schweitzer had been an evangelical Christian and had initially rejected macroevolution. As she proceeded to study dinosaurs she changed her views. She came to accept deep time but kept her faith in God. Schweitzer faced a dilemma, but she would not claim that the dinosaurs were young. That would be too much. It would challenge the radiometric dating of the rock from which the fossils were taken.

Stares Down Critics in Her Hunt for Dinosaur Proteins." *Science* (Sep. 13, 2017) http://www.sciencemag.org/news/2017/09/i-don-t-care-what-they-say-about-me-paleontologist-stares-down-critics-her-hunt (accessed 9-25-18)
Horner's comment to try to disprove is the standard scientific approach.

12 Mary Higby Schweitzer, et al., "Analyses of soft tissue from Tyrannosaurus rex suggest the presence of protein." *Science* 316, no 5822 (2007), 277-280. http://science.sciencemag.org/content/316/5822/277 (accessed 9-25-18)

13 David Peters, "Soft Tissue in Cretaceous Dino Bone Still Controversial" *The Pterosaur Heresies* (March 9, 2016) www.LutheranScience.org/WP3-9-16ST (accessed 9-25-18)
David Peters, a well-known dinosaur artist, reviews the controversy. He includes an exchange between Schweitzer and Tom Kaye who claimed she was looking at biofilm.

14 Emily Ruppel and Mary Schweitzer. "Not So Dry Bones: An Interview with Mary Schweitzer," *Biologos* (July 21, 2014) (accessed 9-25-18) https://biologos.org/blogs/archive/not-so-dry-bones-an-interview-with-mary-schweitzer.

How would Schweitzer escape?

What Schweitzer needed was a way to explain how the tissues could have survived. Her work could challenge the existing paradigm of deep time shared by most paleontologists and geologists. However, if she claimed that dinosaurs were only thousands of years old, her work would be rejected out of hand. The entire community would likely claim that her work must be false.

The iron left by the remains of the red blood cells caught her attention. Could it be responsible for the preservation? Perhaps it caused changes in the tissues. Schweitzer set up an experiment using ostrich blood vessels (the bird connection) and concluded that iron caused cross-linking of the collagen and also inhibited microbial action leading to increased preservation for more than two years.[15] Critics obviously were still able to withhold approval, but while she challenged ideas of how fossils form, she remained safe within the evolutionary paradigm. Furthermore, the criticism would be somewhat muted by the suggestion of adding to the understanding of fossilization.

To challenge major aspects of a scientific paradigm is not impossible, but it is not easy. Galileo's mistake in defending Copernicus was that he was up against the existing paradigm. In his case the Catholic Church had accepted the geocentric model and after the Reformation was not about to encourage any further loss of authority.[16] Interestingly, it remained for Lutherans to spread heliocentric theory and for Kepler to convince others that Copernicus had a better model. A major paradigm change requires that an attractive alternative is available. Accepting young dinosaurs and a young Earth challenged basic assumptions.

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15 Mary H. Schweitzer, et al., "A Role for Iron and Oxygen Chemistry in Preserving Soft Tissues, Cells and Molecules from Deep Time," *Proceedings of the Royal Society B: Biological Sciences* 281:1775 (2014): (accessed 9-25-18) http://rspb.royalsocietypublishing.org/content/281/1775/20132741/

16 Wade Rowland, *Galileo's Mistake: A New Look at the Epic Confrontation between Galileo and the Church*, (New York: Arcade, 2011). 6.

So What Does This Mean?

The temptation that confronts the Christian is to support Schweitzer's initial observations of tissue and substitute our own conclusions. We could challenge Schweitzer's follow-up that the iron may have preserved the tissue. Why not just use the soft tissues as such and claim this as support for Scripture?[17]

For Christians to cherry pick and support particular science as true is risky. History shows that science changes. Previous discoveries and claims can be overturned. Schweitzer's work remains controversial and may be falsified. Then if some Christians have placed their faith on her observations, they will be embarrassed.

We need to dig deeper. Rather than critique particular scientific findings to support Scripture, it is better that we recognize that the modern scientific paradigm is causing the problem.[18] The modern scientific paradigm or worldview limits itself to the study of natural causes (methodological naturalism). Carried further it presupposes that there are only natural causes (philosophical naturalism).[19] This assumption rules out any action by God at the very beginning of any reasoning. Naturalism is the problem, and it drives the macroevolutionary worldview. The "Prime Apologetic" for Christians has to be to put the naturalism assumption on the table when discussing evolution.[20]

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17 Calvin Smith, "Dinosaur Soft Tissue," Creation.com. https://creation.com/dinosaur-soft-tissue (accessed 9-25-18) *Makes the point of how the paradigm controls conclusions.*

18 Mark Bergemann, "Can Evolutionists Be Neutral? The Creation Evolution Debate is a Competition Between Two Incompatible Faith-based Worldviews," *LSI Journal* 24, no. 2 (April-June, 2010). www.LutheranScience.org/2010neutral *Rightly points out that science is not objective.* (accessed 9-25-18)

19 Paul R. Boehlke, Laurie M. Knapp, and Rachel L. Kolander, "How Science Works: Putting Presuppositions on the Table." *Zygon: the Journal of Religion and Science* 41, no 2 (June 2006) 415-425.

20 *Was a guest with Dr. Elliot Sober on a call-in talk radio show discussing evolution and creation hosted by Mark Young on WORT-FM in Madison, WI (Nov. 6, 2000). The evolutionary viewpoint was taken by Sober, a well-known professor of philosophy at the University of Wisconsin. We agreed on the nature of science and the assumption of naturalism.*

Furthermore, the assumption that creation will reveal its true age scientifically pulls the Christian back onto a field where natural causes determine what is acceptable knowledge. One cannot do science on miracles. Creation was a miracle and had to include objects and processes with apparent age.[21] It follows that naturalism will deny all miracles. Mary Schweitzer now says that she believes that God used natural processes and deep time to bring everything to its present state.[22] Scripture warns of paradigms that lead us away from Christ.[23] Romans 12:2 (EHV) states, "Also, do not continue to conform to the pattern of this world, but be transformed by the renewal of your mind, so that you test and approve what is the will of God—what is good, pleasing, and perfect."

Dr. Mark Paustian, professor at Martin Luther College, points out that any attempt to buttress God's revelation obscures the mystery and marvel of it. We should not anchor our faith to a particular finding in science that happens to agree with us. Such findings are fragile. "By faith we know that the universe was created by God's word, so that what is seen did not come from visible things." (Hebrews 11:3, EHV).[24]

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21 Paul R. Boehlke, "Contemplating Our Navels: Consideration of Time That Never Was." *Charis* 4, no 2 (Lent 2005), 13-29. (accessed 9-25-18) http://www.charis.wlc.edu/publications/charis_spring05/boehlke.pdf
22 Barry Yeoman, "Schweitzer's Dangerous Discovery," *Discover* 27, no 4, 37–41, 77, (April 2006) http://discovermagazine.com/2006/apr/dinosaur-dna (accessed 9-25-18)
23 See David C. Thompson, *What in the World is Going On? Identifying Hollow and Deceptive Worldviews* (Milwaukee: Northwestern, 2010).
24 Mark Paustian, "Isn't Religion Discredited by Science?" in *More Prepared to Answer* (Milwaukee: Northwestern, 2004) 36-43.

The Nature of Science

Mark Bergemann

Our feature article taught us much about dinosaurs, but its primary theme was not dinosaurs. Its theme was the nature of science. Part I ends with these words,

> Science does not generate truth, but rather, useful explanations. Our students need to know about how science works. Dinosaur science is typical science which shows how mankind creates explanations and picks and organizes facts to fit the current situation.[1]

You may be surprised to learn that many evolutionists talk in similar ways about science. The *LSI Journal* article series, "Evolutionists Say Amazing Things," usually presents one short quote. This time we will examine several quotes. Some quotes are rather lengthy to give you a fuller picture of what these evolutionists are saying. Keep the above dinosaur article quote in mind as you read how evolutionists describe science in similar ways.

Bias in Science

A professor of physics at the University of California writes about the bias in science,

> No one is immune from confirmation bias. And scientists, despite what you may think, are rarely mere gatherers of facts, dispassionately following data wherever it may lead. Scientists are human, often too human. When desire and data are in collision, evidence sometimes loses out to emotion.[2]

1 Paul R. Boehlke, "Dinosaurs, God's Creatures," *LSI Journal*, 32, no. 4 (fall 2018): 12.
2 Brian Keating, *Losing the Nobel Prize -a story of cosmology, ambition, and the perils of science's highest honor* (New York: Norton & Company, 2018) 5.

A recent cover story in Scientific American relates how scientists work to prop up failing theories such as inflationary models of the Big Bang. The italics below is in the original,

> Inflationary cosmology, as we currently understand it, cannot be evaluated using the scientific method. ...Some scientists accept that inflation is untestable but refuse to abandon it. ...A common misconception is that experiments can be used to *falsify* a theory. In practice, a failing theory gets increasingly immunized against experiment by attempts to patch it. The theory becomes more highly tuned and arcane to fit new observations until it reaches a state where its explanatory power diminishes to the point that it is no longer pursued. The explanatory power of a theory is measured by the set of possibilities it excludes. More immunization means less exclusion and less power.[3]

Two leading archaeologists, the Curator of Anthropology at the American Museum of Natural History in New York, and a past president of the Society of American Archaeology, wrote a college textbook on archaeology. They describe how science is a biased, subjective process that may not result in final truth about anything [emphasis in original],

> Science is unavoidably embedded in the scientist's culture and hardly free of cultural biases. The social, cultural, and political context of archaeology influences its theories. …Science offers no ironclad assurance that application of its methods will *necessarily* result in the absolute, final truth about anything; rather, scientists claim only that scientific methods provide a means to determine, more or less, whether the evidence favors the validity of a hypothesis. …But archaeologists are not emotionally or politically neutral data-gathering machines. …In this section we will see why most archaeologists are both scientists and humanists. The primary distinction between scientific and humanistic approaches occurs over the issue of **objectivity**. If you believe that archaeology is "mostly objective," then you probably lean toward the scientific side. …But if you think that archaeology is "mostly subjective," then you are likely more comfortable with

3 Anna Ijjas, Paul J. Steinhardt, Abraham Loeb, "Pop Goes the Universe, *Scientific American*, Feb 2017, 39.

humanistic perspectives, which emphasize that the observer and the observed can never really be separated, that our knowledge of the past mostly depends on who is doing the observing. You probably mistrust conventional science and feel more comfortable with an ideational perspective.[4]

Evolution is a "Historical Narrative" Written Without Using "Laws or Experiments"

Ernst Mayr was a professor of zoology at Harvard. Scientific American calls him "one of the towering figures in the history of evolutionary biology."[5] Mayer writes that evolutionary biology is unlike other fields of science. Other fields of science are based on laws and experiments. The methodology of evolutionary science is to construct "competing historical narratives" based on "concepts." Mayr writes,

> Darwin founded a new branch of life science, evolutionary biology. …Darwin introduced historicity into science. Evolutionary biology, in contrast with physics and chemistry, is a historical science—the evolutionist attempts to explain events and processes that have already taken place. Laws and experiments are inappropriate techniques for the explication of such events and processes. Instead one constructs a historical narrative, consisting of a tentative reconstruction of the particular scenario that led to the events one is trying to explain. …Another aspect of the new philosophy of biology concerns the role of laws. Laws give way to concepts in Darwinism. In the physical sciences, as a rule, theories are based on laws; for example, the laws of motion led to the theory of gravitation. In evolutionary

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4 David Hurst Thomas and Robert L. Kelly, *Archaeology*, 4th ed., (Belmont, CA: Thompson, 2006), 42-43. Author bio on back cover.

5 Ernst Mayr, "Darwin's Influence on Modern Thought," Scientific American website, November 24, 2009. (accessed 9-25-18) https://www.scientificamerican.com/article/darwins-influence-on-modern-thought/ *Mayr died in 2005. SA notes about this 2009 article: "This story, originally published in the July 2000 issue of Scientific American, is being made available due to the 150th anniversary of Charles Darwin's On the Origin of the Species. This article is based on the September 23, 1999, lecture that Mayr delivered in Stockholm on receiving the Crafoord Prize from the Royal Swedish Academy of Science."*

> biology, however, theories are largely based on concepts such as competition, female choice, selection, succession and dominance. These biological concepts, and the theories based on them, cannot be reduced to the laws and theories of the physical sciences. Darwin himself never stated this idea plainly. My assertion of Darwin's importance to modern thought is the result of an analysis of Darwinian theory over the past century. During this period, a pronounced change in the methodology of biology took place. This transformation was not caused exclusively by Darwin, but it was greatly strengthened by developments in evolutionary biology. Observation, comparison and classification, as well as the testing of competing historical narratives, became the methods of evolutionary biology, outweighing experimentation.[6]

Jerry A. Coyne is an evolutionary biologist who wrote the 2009 NY Times best seller, *Why Evolution is True*. In a 2003 book he describes evolution as a "soft science." He places evolution as "closer to phrenology than to physics." Phrenology relates skull shape with mental abilities and character traits. Phrenology was long ago discredited and rejected by the scientific community.

> In science's pecking order, evolutionary biology lurks somewhere near the bottom, far closer to phrenology than to physics. For evolutionary biology is a historical science, laden with history's inevitable imponderables. We evolutionarily biologists cannot generate a Cretaceous Park to observe exactly what killed the dinosaurs; and, unlike "harder" scientists, we usually cannot resolve issues with a simple experiment, such as adding tube A to tube B and noting the color of the mixture. The latest dead weight dragging us closer to phrenology is "evolutionary psychology," or the science formerly known as sociobiology, which studies the evolutionary origin of human behavior. ...Unfortunately, evolutionary psychologists routinely confuse theory with idle speculation. ...If evolutionary biology is a soft science, then evolutionary psychology is its flabby underbelly.[7]

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6 Mayr.

7 Jerry A. Coyne, "Of Vice and Men: A Case Study in Evolutionary Psychology," in *Evolution, Gender, and Rape*, ed. Cheryl Brown Travis (Cambridge MS:

A college textbook on evolution also explains how evolutionary biology brings "historicity into science" and rejects the scientific method of experimentation. Below we read these amazing words, "Biologists continue to undertake evolutionary investigations …whether the methodology is philosophically correct or not."

> One philosophical criticism is that evolutionary explanations (hypotheses) cannot be tested and supported as hypotheses in physics and chemistry. ...Further objections to evolution are that many studies in this area cannot be properly evaluated by scientific method. That is, acceptance or rejection of a scientific hypothesis is generally based on whether events relating to ("testing") that hypotheses refute it or not. Hypotheses constructed so that they can never be refuted ("falsified" according to philosopher Karl Popper) are not considered scientific.
>
> …Nevertheless, crucial as these philosophical objections appear, they have not much influenced the practice of evolutionists. Like studies in geology and astronomy, biologists continue to undertake evolutionary investigations and continue to propose hypotheses despite these objections. Part of the reason for this is simply the profound recognition by "curious" humans that the past has influenced the present, and that an understanding of the past is a highly desirable and satisfying goal, whether the methodology is philosophically correct or not.[8]

While the general public often thinks of science as an unbiased producer of truth, prominent scientists know this is not the case, and they are willing to say so in writing.

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MIT Press, 2003), 171.
8 Monroe W. Strickberger, *Evolution*, 2nd ed. (London: Jones and Bartlett Publishers, 1996), 16-17.

Milwaukee Public Museum Diorama

credit: photo 2016 by Mark Bergemann

Our front cover photo is a close-up of this diorama. The museum sign shown on the bottom left of the photo states,

> In this life-size recreation of a lowland forest floodplain, *Tyrannosaurus* feeds upon a dead three-horned *Triceratops*. Three small *Dromaeosaurus* dinosaurs wait patiently nearby to scavenge their share.
>
> **Tyrannosaurus rex "King Tyrant Lizard"**
> The largest land-dwelling lizard of all time, *Tyrannosaurus* depends on it's powerful hind legs and massive jaws to kill and devour prey. Its forelegs appear too small for weapons, too short to bring food to its mouth. The purpose they serve is unknown.
>
> **Triceratops "Three-Horned Face"**
> This ponderous plant-eater lived in herds and had three sharp horns adapted for defending against predators. *Triceratops* was one of the most numerous of dinosaurs and among the last to become extinct.


WHAT DINOSAURS ATE
DINOTOPIA
James Gurney
STEP INTO READING
THE GOOD DINOSAUR
CRASH, BOOM, ROAR
GOOD NIGHT DINOSAURS
BY JUDY SIERRA
ILLUSTRATED BY VICTORIA CHESS
DINOSAUR VS. BEDTIME
BOB SHEA
RAWR!
Todd H. Doodler
STOMP, DINOSAUR, STOMP!
Margaret Mayo
illustrated by Alex Ayliffe
DINOSAUR BINKIT
BY SANDRA BOYNT
WE'RE BACK!
A DINOSAUR'S STORY
JANE YOLEN & MARK TEAGUE
How Do Dinosaurs Play with Their Friends?
DINOSAUR!
DINOSAUR WOODS
by george mcclements
Children Love Dinosaurs!
Makers of children's books realize this, so they publish many dinosaur themed books. Look for ways to bring dinosaurs into lessons where appropriate.
JANE YOLEN & MARK
How Do Dinosaurs Say I'M MAD?
FIRST BIG BOOK OF DINOSAURS
BY CATHERINE D. HUGHES
FRANCO TEMPESTA
DINOSAURS
Discover with wheels, tabs, and flaps
T-Rex has a Toothache
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Gus, the Dinosaur Bus
Julia Liu
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DINOSAUR DANCE!
STEP INTO READING
JURASSIC WORLD
DINOSAUR
COLORING BOOK FOR KIDS