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Actualism: A Paper Tiger

by John K. Reed, PhD

Editor's note: This article is a synopsis of the major work published in the CRSQ by Reed and Williams (2012). Dr. Williams was called home April 21, 2011.

Actualism is a foundational assumption of secular natural history. The term is confusing; originally introduced by Prévost, the French "actuel" means "present day," while the English homophone means "real." Actualism affirms that present geological processes are the only possible explanations for the rocks. Though closely related to "uniformitarianism," the two are not identical (Reed, 2010). Actualism is *theoretically* independent of historical models (Gould, 1965; 1984; Hooykaas, 1963; 1970; Rudwick, 1970; 1972; 2005; Simpson, 1970). It has always been tied to naturalism and despite obvious errors, it still receives uncritical acceptance.

Although geologists argue for actualism based on uniformity, their analysis fails, thanks to blind spots in their worldview. The key to understanding the concept is causality. Actualism replaced divine providence with an absolute continuity of cause and effect. Only a return to that orthodox view can correct this error.

Table 1. Hooykaas (1963; 1970) discussed the potential classifications of geological causes with respect to their "kind" and "energy." He is careful to distinguish between the method of applying observed causes (actualism) and the resulting systems (uniformitarianism, catastrophism, and evolutionism) that can result from applying the actualistic method. From Reed (2010).

Non-Actualistic Conceptions	Actualistic Conceptions	
non-actualistic catastrophism ***geological causes*** *Kind* different *Energy* different	**catastrophist actualism** ***geological causes*** *Kind* same *Energy* different	(1) Diminishing energy over time, e.g., cooling earth. (2) discontinuous outbursts of catastrophes superimposed over continuous processes
(non-actualistic uniformity) ***geological causes*** *Kind* different *Energy* same	**uniformitarianism** ***geological causes*** *Kind* same *Energy* same	**strict uniformitarianism** steady-state condition, events are repeated throughout epochs (Hutton & early Lyell) **evolutionism** uniformity in change of events, not in events themselves (Darwin & later Lyell)
	(actual method; not system) ***geological causes*** *Kind* same (but not all) *Energy* same	new causes appear over time; not all present causes are needed to explain past events, and causes are tied to specific time periods

Brief history

In the 1600s, people possessed a pervasive awareness of providence. Nature's laws were God's mediate works, and everything existed moment to moment by God's power. This view changed in the Enlightenment. By the end of the 1700s, post-Christian intellectuals had turned science against Christianity (Stark, 2003). Avoiding a frontal assault on the Bible, these men created an imaginary prehistory. Since the Bible was silent, they claimed, it must be the

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Testing Creation Cosmologies

by Ronald G. Samec, PhD

More than one creation cosmology has been proposed in recent years. However, few observational tests have been suggested to decide among the possibilities. This is a preliminary report on the use of quasar metallicity as a test of these proposed cosmologies. This was first suggested by Samec (2012) in a letter to the editor, in response to a letter to the editor by Jason Lisle (2012), as a test of Lisle's proposed solution to the distant starlight problem. Dr. Lisle's proposed solution is called Anisotropic Synchrony Convention, which will be referred to as ASC.

In astronomy, an element other than hydrogen or helium is considered to be a metal. The metal content of a star is referred to as its metallicity. Stars are powered by fusion processes which, over time, increase the metallicity of stars. The next generation of stars will thus have greater metallicity than an earlier generation. This increase in metallicity in stars is allowed in the time dilation cosmologies of Hartnett (2007) and Humphreys (2008) .

A prediction can be made about metallicity by the time dilation cosmologies. The farther away the star or galaxy is, the more time dilation has occurred for that object. This means that a star farther away should have a lower metallicity than a star that is closer. That is, metallicity should decrease with distance.

In the matter of cosmological redshift, both the creationists and evolutionists can agree since this is not a matter of time but

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Actualism

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domain of science. Over time, biblical history was discarded in favor of an old Earth, and Newton's physicochemical uniformity was extrapolated to history.

In the manner of many like-minded predecessors, Lyell conflated the actualistic method with gradualism, creating "uniformitarianism." The door was opened for Darwin, and modern atheism claimed that natural laws were inherent properties of random matter. As such, their history had nothing to do with the Bible, and Genesis was abandoned.

Critique

Actualism is not the fundamental axiom of "historical science." Some secular scholars would agree, citing uniformity, though they are unclear on the relationship between physicochemical and geological processes (e.g., Simpson, 1970). But they are wrong. The real cornerstone is the concept of *causal continuity*. Discontinuities in cause and effect invalidate both uniformity and actualism. At issue is the location of ultimate continuity: naturalism places it in matter/energy, Christianity, in God. Actualism is the historical form of that material continuity. That explains Lyell's predilection for static history and geology's stubborn defense of gradualism.

Secular Critique

Secular analyses of actualism fall short, despite heroic efforts (Hooykaas, 1963; 1970). Hooykaas missed the metaphysical connections, though he did open the door to neocatastrophism. He evaluated a range of logical possibilities (Table 1) using "different" and "same" parameters of: (1) *kinds* of causes, and (2) their *energy*. But there were still problems:

> The above classification does not cover all differences of system and method and interpretation in geology. How far can we go back into the past in order to be able to speak of uniformity of the situation, or less stringently, of the applicability of "actual causes" in the explanation thereof? How long ought to be the period of change one takes into account for deciding whether a change is catastrophic or continuous? Moreover, as to the identity of kind or the identity of energy of geological causes, a wide range of interpretation seems to be possible. It is difficult to establish what is meant by geological causes in contradistinction to physical causes. A good deal of confusion may arise through the ambiguity of the term "actual cause" (Hooykaas, 1970, p. 275).

These questions illustrate the underlying problem of confusing science and history (Reed, 2001). But the real flaw that Hooykaas missed was the propensity for secularists to pretend theology is invalid while making theological assertions of their own in the name of "science." Denying Genesis is *no less religious* than affirming it. Enlightenment thought simply masked metaphysics with science.

This problem is unmasked by digging down from actualism to uniformity and finally to continuity of cause and effect. In this light, *every* approach that asserts an absolute material uniformity resorts to special pleading regarding discontinuous initial conditions. *Any* origin of *any* finite universe is *by definition* non-actualistic. Thermodynamics (Williams, 1981) and philosophy refute an eternal actualistic universe; entropy ultimately creates a hard limit of absolute efficiency. Thus, either the universe is finite or the rules have changed at some point, invalidating materialistic uniformity. Regardless, it is instructive to address Hooykaas' options.

1. Non-actualistic catastrophism

In this option, geologic causes and their energy levels both vary through time; continuity is found in physicochemical laws. But Hooykaas (1970, p. 279) failed to see that the denial of Christian theism is a metaphysical position:

> In this connection it is of no importance whether Razumovsky's hypothesis seems phantastic or not. What matters is, that he uses an actualistic method (comparison with phenomena occurring now; recognition of the immutability of physical and chemical laws), and that this leads him to conclusions that are decidedly non-actualistic. Moreover, the absence of any appeal to supernatural causes shows that catastrophism is not necessarily connected with

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"metaphysics."

He also failed to question the "catastrophism vs. uniformitarianism" meme. Furthermore, non-actualistic catastrophism precludes meaningful retrodiction. If both the kind and energy of geological causes are unknown, how can geologists discern them? Finally, catastrophic erosion would eliminate evidence from the rock record.

2. Non-actualistic uniformity

Given the false dichotomy of "catastrophism vs. uniformitarianism," non-actualistic uniformity appears self-contradictory. But Hooykaas restricted "uniformity" to energy levels and actualism to causes *per se*. On those terms this option is logically possible, but unlikely.

3. Actualistic catastrophism

This category reflects the antiquated idea of a steadily-cooling earth generating geologic change with repeated, discontinuous events. Jean Baptiste Élie de Beaumont (1798–1874) was an advocate of this position. He attributed tectonics and sedimentation to crustal shrinking. This simplistic idea rested on inadequate observation and a misunderstanding of the planet's complexities.

However, this option requires unexplained initial conditions and cooling has not been observed long enough to guarantee a steady trend. This illustrates the danger of generalizing from too little data. Also, increasing knowledge of the mantle suggests that crustal changes are driven by complex phenomena. Continuous plate motions create conditions in which both catastrophic and non-catastrophic events occur.

4. Uniformitarianism

Hooykaas defined two uniformitarianisms—steady state and gradual evolution. Both invoke the same geological causes operating at roughly the same energy throughout the past. Both options founder on unknown initial conditions. Both also exhibit semantic and conceptual problems (Reed, 2010).

There was an important distinction in Lyell's view. He imported Newton's method of true causes to natural history:

> Lyell also wanted to develop a geological theory with impeccable methodological credentials. In Lyell's mind there was no better way to accomplish this than to adopt the method favored by Newton himself—the so-called *vera causa* method, or method of true causes—and adapt it to geology…. Lyell's particular genius was to adapt the *vera causa* method to the particular problems posed by geology (Laudan, 1987, p. 203).

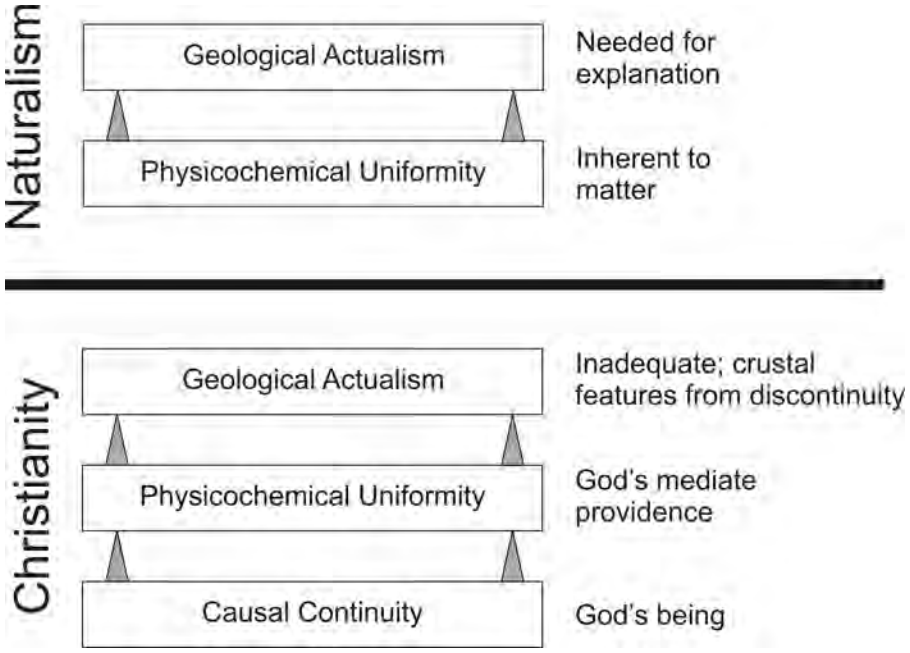

Table 2. Secular explanations of cause fall short because they ignore the foundational issue of continuity through time, which underlies both uniformity and actualism. Only Christianity recognizes this relationship and provides adequate justification for each step. Secular attempts at an absolute material uniformity fail, and no coherent justification can be offered for geological actualism. So, secularists continue to conflate it with uniformity to preserve their scientific prehistory.

Laudan (1987, p. 205) described Lyell's views as this played out:

> The tenets of what William Whewell…called Lyell's "uniformitarianism" were derived directly from the method of true causes. Historians of science have identified three distinct theses within Lyellian uniformitarianism…. The first of these, "law" uniformitarianism, asserts that the laws of nature have not changed over time; the second, "kind" uniformitarianism, that the kinds of geological causes have not changed over time; and the third, "degree" uniformitarianism, that the intensity of geological causes has not changed over time.

All are fallacious. The "third" fails empirical tests. The "second" was based on a faulty understanding of the nature of science, and geologists must default to the "first" when pressed. Finally, physical uniformity is not absolute, and not consistent with naturalism (Reed, 1998; 2010).

5. Actual method; not system

Hooykaas' final iteration presented the option of constant energy and varying kinds of causes. No explanation is given for these changes. Geological causes are not all unknown, but the total exceeds what is needed to interpret any given part of the rock record, and geologists must choose from a large menu of causes that may or may not be applicable to any given stratum. This system also cannot pin down a given time period independently, since there are no independent timelines of the rock record and geological causes. If knowledge of causes is derived from observation, but if causes change over time, how can we define causes not now in operation? This results in a secular version of the "god-of-the-gaps." It is a "cause-of-the-gaps" argument, where unknown geological causes are invoked to plug the gaps that today's causes cannot explain.

Other problems

The failures of actualism are profound. They include:

1. Imprecise terminology. "Actualism" is hard to define because of semantics, the confusion of actualism with gradualism, an inability to define "geological causes" univocally with physicochemical laws, and the inability to quantify "catastrophes" and "uniform processes."
2. Guilt by association. Given a strong secular bias, geologists must dem-

onstrate that "actualism" in all of its semantic flexibility is not a faith-based excuse to exclude Genesis from history—a religious position. That will be hard since geologists have been saying just that for centuries.

3. Misplaced focus. Actualism is a subset of physicochemical uniformity, and there is much discussion of both, but there is virtually no discussion of the fact that both are underlain by the issue of continuity of being.
4. Unjustified assumptions. At the very least, actualism assumes uniformity of both physicochemical processes and geological causes. But that is the question, revealing that actualism is linked to metaphysical assumptions.
5. Circularity. Actualism presupposes what historical geology sets out to demonstrate. Simpson (1970) claimed it was not arbitrary, but his only defense was the congeniality of interpretation using the principle. If one rejects biblical history, assumes deep time, and asserts the sole authority of science in prehistory, then a secular natural history invariably results.
6. Arbitrary. Actualism was introduced as a method of interpretation *prior* to significant investigation of the rock record. Thus Simpson's (1970) empirical "justification" also forces a conclusion that it was done arbitrarily. The driving force behind secular natural history was its opposition to biblical history. Setting the rules to force the outcome is neither scientific nor objective.
7. Inherent uncertainty. Simpson (1970) wrestled with differences between geological causes and chemical laws. A rigid definition of many geological causes in that way is impossible. Even areas like sedimentation and fluid mechanics often do not present a unique solution. A secular view of the past leaves unanswered questions. What is the present? What geological causes have we not yet observed or defined? What range of energy is allowed? The rock record shows events dwarfing anything seen in the "present." How can we address the energy levels of those processes? What about the rare event, the common process, and their effect on the rock record?

A Christian reconstruction

If actualism fails, then it is logical to restore a role to theology. Instead of an emphasis on method, the focus should be on discovering truth. If method stands in the way of truth, then it is time for a new method. We cannot restrict the pursuit of truth to science, since other disciplines seek truth. The most reliable historical text in the world—the Bible—certainly addresses the past. Also, historiography rests on philosophy and theology. A narrative might be read from a rock or a book, but rules of logic determine which will have priority, not an arbitrary default to the "actualistic" answer.

Most importantly, Christianity provides the foundation for natural history by justifying both science and history, and affirming their value. In particular, with regard to actualism, Christianity provides a solution to its failure by addressing the problems of uniformity and continuity. Christian theology explains both continuity and discontinuity in the natural world by transferring ultimate causal continuity from the material to the person of God. Thus, natural discontinuity does not sever the causal chain; it simply illustrates God's role. In short, providence is the antidote to actualism.

Christianity provides a system of ethics and a belief structure which promote honesty, objectivity, tolerance and inquisitiveness.

The traditional doctrines of creation and providence both teach that continuity of cause and effect resides in God. He spoke contingent physical reality into existence and maintains it by His power. The cosmos is an effect, not a cause. Science is possible because divine providence provides an orderly and predictable basis for knowledge. This allows a contingent uniformity, but with the caveat that God can act outside His imposed regularities. Miracles are real, but do not invalidate science because science is contingent too. God confirmed His prerogative to supersede the regular workings of providence in five specific ways: (1) Creation, (2) the Flood, (3) the Incarnation, (4) miracles, and (5) the coming Apocalypse.

Thus, actualism misses the point. Hooykaas' scheme comparing the kind and energy of geologic causes ignores the theistic justification of causality. A better way to approach the issue is that of continuity and discontinuity, which helps define the roles of revelatory information and forensic investigation (Table 2). Secular natural history has focused on method. Biblical history focuses on truth and meaning. Intellectuals from Buffon on failed to ask the right questions. Physical uniformity cannot justify actualism because it too must be justified, and that only by theology.

We have come from Hutton's static world to the point where geologists have finally admitted the disproportionate effects of rare events (e.g., Ager, 1993) and the failure of uniformitarianism. Their journey will find its logical end when they step back into the Christian worldview. For Christians, hand-wringing over geologic causes and energy levels is wasted effort. Instead, we must attack the foundations of secular natural history and restore the role of creation and providence. Secularists cannot justify continuity, uniformity, or actualism. Method is a servant, not a master. What does it matter if truth is found in a rock or a text, as long as it is truth? Establish the foundations, and then where needed, let the rock record speak for itself, unencumbered by the bias of secular science.

Actualism does have a place in biblical history. Outside of God's immediate works, natural processes follow consistent patterns as visible expressions of providence. But while this "Christian actualism" is valid for the vast majority of time, it is unhelpful in understanding the rock and fossil records because they are largely products of bursts of immediate divine action.

So what are the advantages of the Christian position? Actualism cannot provide a true and certain means of interpreting natural history. Genesis offers several advantages to natural history:

1. Openness to empirical data. We were taught that Lyell and Darwin were better than the Bible because they were empirical and scientific. But they only replaced one interpretive framework with another. The Bible is actually less restrictive because the range of explanation

Math Matters

by

Don DeYoung, PhD

Calculus

The word *calculus* comes from the Latin word for pebbles, as used long ago in counting, and the word *calculation* is similarly derived. In dentistry, hardened minerals which accumulate on teeth also are called calculus or tartar.

The vast branch of mathematical calculus was developed by Isaac Newton and Gottfried Wilhelm Leibniz during the mid 1600s. In spite of their independent work, there resulted hard feelings between these men and charges of plagiarism.

Two basic ideas arise in calculus involving change, with operations called the derivative and the integral. Derivatives give the rates of change of variables. As examples, the rate of change of position with time gives velocity, and the rate of change of velocity with time gives acceleration. Distinct from motion, derivatives also occur widely in economics, social sciences, and life sciences. Derivatives also help determine minimum and maximum values of functions.

Integrals are typically used to find quantities when their rates of change are known. For example an object's velocity can be determined from its acceleration, and its position from its velocity. Integration also leads to formulas for areas of surfaces and volumes of solids.

Calculus applications include complex motions (kinematics), forces (dynamics), exponential growth, volumes, curve analysis, engineering design, mathematical modeling, and infinite series. For space craft in particular, calculus is used to find instantaneous positions and velocities.

College math majors typically take two years of study in basic calculus, then move on to specialized courses. The advanced topics include differential, infinitesimal, and tensor calculus.

Mathematics is the language of creation and is embedded throughout the physical universe. In all its depth, consistency and elegance, calculus declares the glory of God.

for strata is much broader, embracing any combination of energy levels and processes. It is time to let rocks tell their story without deductive rational principles of an outmoded 18th century view of science. Diluvialism offers a more empirical stratigraphy (Reed et al., 2006).

2. Ties up Loose Ends. Christianity is self-consistent and able to justify its assumptions. Truth is primary, and so natural history remains subordinate to theology, since theology justifies its assumptions. Theology justifies history, justifies a provisional actualism, and describes past discontinuities with sufficient detail to guide forensic investigation.
3. Focuses on Goal of Truth. Secular natural history began by undercutting biblical authority. It continues that focus on method to distract from the real conflict. Actualism is merely symptomatic; any method would be acceptable that falsified the Flood and Creation. The Bible is a reliable historical document. Dismissing that reality is anti-intellectual.
4. Support System. Most agree that science is in need of better ethical constraints. Christianity provides a system of ethics and a belief structure which promote honesty, objectivity, tolerance and inquisitiveness.

Conclusion

Actualism has experienced a revival as a fallback for geologists disenchanted with gradualism but unwilling to accept biblical history. But actualism also faces problems stemming from its links to naturalism. It cannot be precisely defined, and attempts usually confuse geological processes with physicochemical uniformity. Neither actualism nor uniformity is the ultimate issue; that is reserved for an underlying causal continuity.

Christian theology eliminates secular pitfalls and provides a self-consistent basis for truth in history and science. It even justifies a contingent actualism, although it is less useful for forensic interpretation since the rock and fossil records are largely results of natural and geological discontinuities. This is an avenue of attack that creationists must embrace. It is biblical, it focuses on truth, and it rejects the problems of naturalism at their root, not at their fruit.

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Cosmologies

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of distance. Briefly, suppose a wave of light traveling from quasar 2 has traveled twice as far as the wave traveling from quasar 1. If the Universe were expanding at a constant rate, the wave from quasar 2 has participated in the expansion *twice as long*, so it is redshifted *twice as much.* So, $z \propto r$ where r is the distance to the source and z is the redshift. In this case the Zn I and II lines were used in the analysis.

Now that the background has been provided, we can get to the heart of this article. Figure 1 is adapted from a graph which was presented at the 2005 IAU symposium 199 talks by Dr. Varsha Kulkarni at the University of South Carolina (Williams, et al., 2005). Her team of astronomers probed quasar absorption lines with increasing redshift. The vertical axis is a measure of the metallicity of a galaxy. The horizontal axis is the redshift of a galaxy. The general trend of the graph shows a decrease in the metallicity with distance.

In creation-based time dilation cosmologies, stellar age increases as distance increases. During creation week, earth clocks were at a near standstill while far away clocks were advancing quickly and star populations were aging rapidly making the overall metallicity increase. In the ASC, light came instantaneously, so no such aging should occur, especially with distance. Thus, these results show that the ASC may well be wrong.

Another problem is Hartnett's (2007, pp. 108–118) idea that quasars are creation engines; i.e., they are creating stars and ultimately galaxies. In this case, a new galaxy would be thought to have only light elements and very few heavy ones, so all of Kulkarni's metallicities should be quite low. This does not seem to be the case, as metallicity still increases with age. As far as the *miraculous creation cosmology*, the "mature universe," we can at least reflect. That is, there is no reason for God to create the universe so that the age of the stars decreases with distance other than to simulate and thus affirm the current cosmological models, which makes no sense at all. I imagine the response of the mature universe people would be that this is the way God made it and we cannot question or hypothesize why, since the creation of the universe is not a valid area for scientific inquiry.

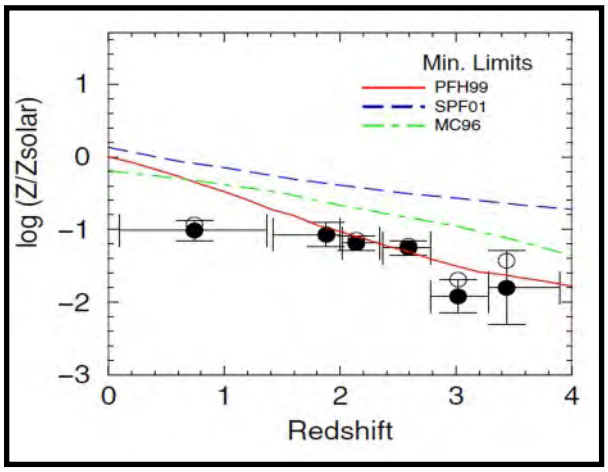

Figure 1. Quasar absorption lines showing change of metallicity with increasing redshift distance. Adapted from presentation by Kulkami at IAU Symposium (Williams, et al., 2005).

Finally, in recent correspondence we have learned that Kulkarni (2013) now has an update with more precise results, which is being refereed for publication. I will report the data as soon as they become available.

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The Board of Directors and research center staff gathered in Dallas, TX on June 13–15.
Left to right: Kevin and Diane Anderson (professional staff), Jean Lightner, Don DeYoung (President), Danny Faulkner (Treasurer), Mark Armitage (Financial Secretary), Mike Oard, Glen Wolfrom (Membership Secretary), Robert Hill, Ron Samec, Gene Chaffin (Vice-President), Russ Humphreys, and Gary Locklair (Recording Secretary). Not pictured, Becky Wolfrom (staff) and John Reed.

2013 CRS Board of Directors and Staff Annual Meeting

...without excuse!

by Timothy R. Stout

Can True Science Prove God?

Almost every university in modern Western culture has the goal of instilling the philosophy of humanism into its students. There are only a few private, Christian universities that are exceptions, and most of them struggle against its influence. The arguments of humanists, which can be powerful and convincing, have turned our country from one which once was characterized by a people who believed the Bible as a standard for morality, to a people who have repudiated both the Bible and the morality it teaches.

As an example of how far our country has fallen under the influence of an educational system under the control of humanism, all one needs to do is go into any video store and look at the spiritual quality of what people choose to watch. It does not represent the historical biblical morality that once characterized our country.

Humanist philosophy is founded on the premise that science has proven that man is the product of natural, unguided evolutionary forces. *Humanist Manifesto II* states, "… science affirms that the human species is an emergence from natural evolutionary forces" (Kurtz and Wilson, 1973). *Humanist Manifesto III* states, "Humans are an integral part of nature, the result of unguided evolutionary change" (Anonymous, 2003). These statements represent the crux of the argument. If for any reason a person concedes that man is the product of natural, unguided evolutionary forces, he has little defense against the subsequent logic of the humanist. Yet, if true science reveals that a living God created the universe and the life that is in it, then humanism completely falls apart. It is a paper tiger. It does more harm than good.

This raises a very critical question. How aggressive can we be in denying the claim of the humanist that science affirms that man is the product of evolution? Can we legitimately proclaim that the evidence of science, truly interpreted, demonstrates that the creation *requires* a Creator, and does so with such force that it thereby renders humanism erroneous? I submit that if we cannot do this, we have lost the argument and have no message for the university student who is repudiating his prior faith because of what he is being taught. So, can we *legitimately* proclaim this?

We need to define what we mean by *proof*. There are various kinds of proofs. Among these are philosophical proof and judicial proof. An absolute philosophical proof is one that does not allow for any possible exception, however remote and unlikely. Such proof does not exist for anything, including the humanist's claim that natural, unguided evolution is sufficient to account for the appearance of man. For instance, many people tell me they do not care how many thousands of zeroes are in the odds against a natural appearance of life. Since life has naturally appeared, we merely beat the odds.

I once presented to a professor of evolutionary biology on a major midwestern campus how the laws of statistics and of chemical equilibrium teach against a natural origin of life — in fact, these laws teach against it so strongly that a person needs to reject them in order to believe in a natural origin. His response? Was he interested in why I said this? No, in response he proceeded to propose an infinite number of parallel universes, with ours happening to be in the one in which the odds were beaten. Somehow, he appeared to have left scientific rationality out of his argument. No amount of evidence can "prove" God to people with this kind of mindset. As long they can find any potential philosophical escape from their responsibility to glorify the Creator and give Him thanksgiving (Romans 1: 21), however remote and weak it may be, that is sufficient for them.

By contrast, judicial proof is one which is sufficient to convict a person in a court of law. An absolute judicial proof is one which is so strong that there is no legitimate defense possible against it. It is absolute judicial proof that God offers of Himself through the things He made. We read in Romans 1:18–20 (NASB),

> For the wrath of God is revealed from heaven against all ungodliness and unrighteousness of men, who suppress the truth in unrighteousness, because that which is known about God is evident within them; for God made it evident to them. For since the creation of the world His invisible attributes, His eternal power and divine nature, have been clearly seen, being understood through what has been made, so that they are without excuse.

God testifies that He made the creation in such a manner that it clearly reveals His person — His eternal power and divine nature. Creation science is nothing more than showing how a detailed study of the creation offers us a detailed demonstration of God's attributes, including His eternal nature, His wisdom, and His power. In an earlier article, this verse was more thoroughly discussed and applied to various observations from science (Stout, 2011). When a person rejects the natural testimony of God provided by the creation, God declares that the problem is with the person, not the evidence.

The above passage is followed by Romans 2:5–6 (NASB):

> But because of your stubbornness and unrepentant heart you are storing up wrath for yourself in the day of wrath and revelation of the righteous judgment of God, who will render to every man according to his deeds….

Thus, there is a proof of God provided by the creation that is so powerful that God counts it sufficient to judicially condemn a person to an eternity in Hell, and for which no defense is available (other than faith in the shed blood of Jesus Christ, which is not the issue here). This is justifiably called "absolute proof." It is important to recognize that God does not allow human philosophers to dictate the standard or the nature of proof He offers them, such that they are justified in their rejection of Him if their standards of proof are not met.

God sets the standard and then says men are accountable to receive it. He is God; they aren't. From God's perspective, the humanist has no excuse for the things he believes and teaches.

> You are worthy, O Lord, to receive glory and honor and power; for You created all things, and by Your will they exist and were created. Revelation 4:11 (NKJV)

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Matters of Fact

by
Jean K. Lightner, DVM, MS

Seeing the Light

Editor's note: You may submit your question to Dr. Jean Lightner at jean@creationresearch.org. It will not be possible to provide an answer for each question, but she will choose those which have a broad appeal and lend themselves to relatively short answers.

Q How do evolutionists explain bioluminescence and our ability to see light?

A Due to the complexity of their design and the particular creatures in which these traits appear, evolutionists are forced to postulate that bioluminescence and vision arose multiple times. This contradicts Darwin's basic notion that traits such as these should be traceable back to a single common ancestor. Additionally, their existence should be explainable by the accumulation of slight, advantageous modifications to the original basic design in the common ancestor.

Bioluminescence is a very interesting trait. Generally, it involves two molecules: a light emitting molecule, known generically as a luciferin, and an enzyme (either a luciferase or photoprotein) to break down the luciferin at a controlled rate so that light is emitted. The specific structure of these molecules varies between taxa. For some predatory creatures, a luciferin may be present in the diet, so only a luciferase needs to be synthesized. The chemical reaction must then be controlled so that light is released at the proper time and place.

In reviewing what is known of bioluminescence, Haddock, et al. (2010) reported that it is found in a haphazard pattern across multiple taxa in a way that defies common ancestry. Based on this pattern, it has been estimated that bioluminescence evolved at least 40, and perhaps 50 or more times in extant creatures. The authors documented the importance of bioluminescence. Their best explanation for how it arose so many times is….because it was important. How naturalistic processes can magically cause a trait to arise just because it is important is left to the reader's imagination! The authors suggested that it must have been "easy" for bioluminescence to appear, but recognized that such an assertion is counter-intuitive.

Of course, bioluminescence isn't valuable if there aren't creatures that can detect the light. The origin of vision is similarly problematic for evolutionists. Vision is vastly more complex and likewise doesn't follow evolutionary predictions. Fernald (2008) pointed out that based on morphology, it has been suggested that eyes have arisen about 40 to 60 times. There are other aspects of vision as well (e.g., biomolecules), which seem to imply different evolutionary scenarios. Further research into the scientific details involving vision should keep evolutionary explanations entertaining. Resources detailing some of the awesome design involved are readily available (Sarfati, 2008; Menton, 2011).

As you can see, the origin of these traits defies the standard neo-Darwinian prediction based on the assumption of shared common ancestry. This is not an uncommon problem for evolutionists; the appendix is believed to have originated in mammals 32 different times (Smith, et al., 2013)! However, evolutionists usually stay committed to their assumption of common ancestry. Therefore, to explain these unexpected patterns, they have coined the term "convergent evolution." Although it sounds like an explanation that fits their model, primarily because it uses the term evolution, it is really a rescuing device (excuse) for data that fall outside the predictions of their model.

We should be able to see the obvious, viz., that something designed for a purpose logically must have a designer, and that the more magnificent the design, the more magnificent is the designer. What is known about bioluminescence and vision clearly points to a magnificent Designer, the God of the Bible, who created creatures according to their kinds and continues to provide for them today.

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Editors note: **The excellent resources by Menton (DVD) and Sarfati (book) mentioned in this article are available from the CRS Bookstore.**

www.crsbooks.org
877-CRS-BOOK

Apology

The editor apologizes for an editing error which occurred on page 11 of the previous issue of *Creation Matters*. In an item under the "Speaking of Science" feature, a quotation taken from a *Nature* article included a vulgarity which is offensive to many of our readers, including your editor.

The inclusion of this statement was missed during our final editing process. Shortly after that issue was published and mailed, one of the board members notified me of the error. The online version was immediately corrected by inserting appropriately placed asterisks.

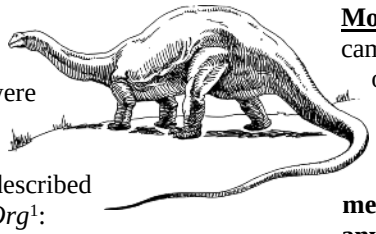
Please be assured that inclusion of the offensive word was not intentional. Thank you.

— Glen Wolfrom

Speaking of Science

Editor's note: Unless otherwise noted, S.O.S. (Speaking of Science) items in this issue are kindly provided by David Coppedge. Opinions expressed herein are his own. Additional commentaries and reviews of news items by David, complete with hyperlinks to cited references, can be seen at: http://crev.info/. Unless otherwise noted, emphasis is added in all quotes.

Intact Dinosaur Skin Found



Some material that flaked off a fossil in Alberta was not stone; it was dinosaur skin. Discoverers were excited and puzzled: how could it last so long? Here's how Mauricio Barbi of the University of Regina described their discovery, according to *PhysOrg*[1]:

> As we excavated the fossil, **I thought that we were looking at a skin impression**. Then I noticed a piece came off and I realized **this is not ordinary — this is real skin**. Everyone involved with the excavation was **incredibly excited** and we started discussing research projects right away.

The reports on *PhysOrg*[1] and on *Nature World News*[2] focused on figuring what color the skin was. Readers who read all the way to the end of the article, though, find out the really big question:

> But perhaps the **greatest question** Barbi is trying to answer … is **how the fossil remained intact for around 70-million years.**
>
> "What's not clear is **what happened** to this dinosaur and how it died," he said. "There is **something special about this fossil and the area** where it was found, and **I am going to find out what it is.**"

The rare fossil, only the third such 3-dimensional dinosaur skin fossil ever discovered, was found in an area described as a "robust bone bed." According to the articles, the skin was preserved "**almost intact**," with tissues that can be analyzed:

> For the experiment, the sample is placed in the path of the infrared beam and light reflects off of it. During the experiment, **chemical bonds of certain compounds** will create different vibrations. For example, **proteins, sugars and fats still found in the skin** will create unique vibrational frequencies that scientists can measure.
>
> "**It is astonishing that we can get information like this from such an old sample**," said Tim May, CLS Mid-IR staff scientist. "Skin has **fat and lots of dead cells** along with many inorganic compounds. We can reflect the infrared beam off the sample and we can analyze the samples to give us very clear characteristics."

They will also be studying melanosomes (pigment cells) in the skin to try to determine what color the hadrosaur was.

1. Canadian Light Source (2013, April 29). Scientists study rare dinosaur skin fossil to determine skin colour for first time. *PhysOrg.* Retrieved June 27, 2013, from http://phys.org/news/2013-04-scientists-rare-dinosaur-skin-fossil.html
2. Foley, J.A. (2013, April 29). What color were dinosaurs? Test of ancient skin sample will reveal final answer. *Nature World News*. Retrieved June 27, 2013, from www.natureworldnews.com/articles/1649/20130429/what-color-dinosaurs-test-ancient-skin-sample-will-reveal-final.htm

Fresh Impacts Viewed on Mars, Moon

New impacts observed on the moon and Mars allow space scientists to learn about crater formation in near real time. What conclusions can be drawn?

Moon: On March 17, a flash was reported on the moon by NASA cameras (see video clip on *Space.com*[1]). The object was the size of a small boulder going 56,000 miles per hour. The crater is estimated to be 65 feet wide. It was the brightest of 300 such impacts seen, by a factor of ten, since NASA began monitoring lunar impacts in 2005. The video clip states, "**Lunar meteor showers** have turned out to be **more common than anyone expected.**" About 55% come from known meteor swarms; the others are random stragglers.

The Earth's atmosphere protects us from many such objects, but the fireball over Russia last Feb. 15 (*Space.com*[2]), made by an object estimated to be 50 feet across (50 times larger than the lunar impactor), made big news as the biggest meteoroid to hit Earth in more than a century.

Mars: Orbiting spacecraft like the Mars Reconnaissance Orbiter (MRO) are allowing planetary scientists to gather "ground truth" data about meteoroid impact rates on another planet. A press release from the University of Arizona[3] discussed the 250 fresh craters detected by the high-resolution camera on MRO, based on before-and-after images. Even though this implies hundreds of hits per year, the rate is lower than expected:

> Taking before and after pictures of Martian terrain, researchers of the UA-led HiRISE imaging experiment have identified almost 250 fresh impact craters on the Red Planet. The **results suggest Mars gets pummeled by space rocks less frequently than previously thought**, as scientists relied on cratering rates of the moon for their estimates.

Can the new data provide any information on the age of Mars? "Estimates of the rate at which new craters appear serve as **scientists' best yardstick for estimating the ages of exposed landscape surfaces on Mars and other worlds**," the article says. There are, however, many variables to consider. Meteoroids span a whole range of sizes, from dust particles to asteroid-size, each with its own probability of impact. Objects above a certain threshold can spawn secondary impacts, making date calculations essentially unreliable.[4]

Today's rates, furthermore, cannot be extrapolated into the distant past without making unverifiable assumptions. So when Alfred McEwen says, "Mars now has the **best-known current rate of cratering in the solar system**," he can only speak authoritatively of knowledge in the observational period of the space program.

1. Moskowitz, C. (2013, May 17). Huge rock crashes into moon, sparks giant explosion. *Space.com*. Retrieved June 29, 2013, from www.space.com/21197-moon-crash-meteor-impact-explosion.html
2. David, L. (2013, February 15). Russia meteor blast is biggest in 100 years. *Space.com*. Retrieved June 29, 2013, from www.space.com/19822-russian-fireball-biggest-explosion-century.html

3. University Communications/Jet Propulsion Laboratory (2013, May 15). UA mars camera reveals hundreds of impacts each year. *UANews*. Retrieved June 29, 2013, from http://uanews.org/story/ua-mars-camera-reveals-hundreds-of-impacts-each-year

4. Xiao, Z. and R. Strom. 2012. Problems determining relative and absolute ages using the small crater population. *Icarus* 220(1):254–267.

Plants Do Arithmetic

For keeping track of their food stores for the next day, plants perform "sophisticated" arithmetical division. The *BBC News*[1] reported a discovery by UK scientists that "astonished" them: "Plants have a **built-in capacity to do maths**, which helps them **regulate food reserves at night**, research suggests."

Researchers were "amazed" to find out that plants perform arithmetic with chemicals:

> Overnight, when the plant cannot use energy from sunlight to convert carbon dioxide into sugars and starch, it **must regulate its starch reserves to ensure they last until dawn**.
>
> Experiments by scientists at the John Innes Centre, Norwich, show that to **adjust its starch consumption so precisely**, the plant must be **performing a mathematical calculation — arithmetic division.**
>
> The inputs to the division are the measures of starch (S) and the biological clock that keeps time (T).
>
> If the S molecules stimulate starch breakdown, while the T molecules prevent this from happening, then the **rate of starch consumption is set by the ratio of S molecules to T molecules. In other words, S divided by T.**
>
> "This is the **first concrete example in biology of such a sophisticated arithmetic calculation**," said mathematical modeller Prof Martin Howard, of the John Innes Centre.

This may be a widespread phenomenon in the living world. Birds, for instance, might use arithmetic to calculate their food stores for long-distance migrations, or for storing energy when deprived of food while incubating eggs. Another researcher indirectly calls this evidence for design:

> Commenting on the research, Dr Richard Buggs of Queen Mary, University of London, said: "This is not evidence for plant intelligence. It simply **suggests that plants have a mechanism designed to automatically regulate** how fast they burn carbohydrates at night. Plants **don't do maths voluntarily and with a purpose in mind like we do."**

1. Briggs, H. (2013, June 23). Plants 'do maths' to control overnight food supplies. *BBC News*. Retrieved June 29, 2013, from www.bbc.co.uk/news/health-22991838

Quantum Secret of Photosynthesis Revealed

The magic of light capture by plants is so small and fast, its secrets are only now being understood. Lightning is slow compared to photosynthesis. A press release from the Institute of Photonic Sciences (ICFO)[1] explains how "antenna proteins" capture photons of sunlight and ferry the energy to reaction centers:

> The **efficient conversion of sunlight** into **useful energy** is one of the challenges which stand in the way of meeting the world's increasing energy demand in a clean, sustainable way without relying on fossil fuels. **Photosynthetic organisms**, such as plants and some bacteria, have **mastered this process**: In **less than a couple of trillionths of a second, 95 percent of the sunlight they absorb is whisked away to drive the metabolic reactions** that provide them with energy. The efficiency of photovoltaic cells currently on the market is around 20 percent. **What hidden mechanism does nature use** to transfer energy so efficiently? Various research groups around the world have shown that **this highly efficient energy transport** is connected to a **quantum-mechanical phenomenon**. However, until now, no one had directly observed the possible impacts of such a quantum transport mechanism at work at room temperature.

The mechanical phenomenon is known as quantum coherence. The way plants use it makes photosynthesis "more robust in the face of environmental influences," the press release said.

> Quantum coherence is manifested in so-called **photosynthetic antenna proteins** that are responsible for absorption of sunlight and energy transport towards the **photochemical reaction centers** where the energy is stored.

ICFO researchers used light flashes at femtosecond speeds (10^{-15} s, one quadrillionth of a second) to monitor the actions of these proteins in their work.

> The **most surprising discovery** was that, while the **transport paths within single proteins vary over time** due to changes in the environmental conditions, the **protein uses the quantum character to adapt for optimal efficiency.** These results show that coherence, a genuine quantum effect of superposition of states, is responsible for **maintaining high levels of transport efficiency** in biological systems, **even while they adapt** their energy transport pathways due to environmental influences.

The press release includes a diagram of one of the antenna proteins, with the caption "**natural quantum machines**." Photosynthesis operates not only in the leaves of plants, but also in algae and some bacteria.

1. Anonymous (2013, June 21). Uncovering nature's quantum secret in *Science*. *ICFO*. Retrieved June 29, 2013, from www.icfo.eu/newsroom/news2.php?id_news=1990&subsection=home

Molecular Motors Put a Spring in Your Step

When you feel a spring in your step, thank God for tiny molecular motors in your muscles and tissues that make it possible. A paper in *Science*[1] by researchers primarily from University of Washington, Seattle, proposed the novel idea that the molecular motors in muscle cells store elastic energy. Observing flight muscles in moths, they deduced that the springiness of these motors provides an additional boost to the power generated by muscles:

> **Muscles not only generate force. They may act as springs, providing energy storage to drive locomotion**. Although extensible myofilaments are implicated as sites of energy storage, we show that intramuscular temperature gradients may enable molecular motors (cross-bridges) to store elastic

strain energy.… These results suggest that cross-bridges can perform functions other than contraction, acting as molecular links for elastic energy storage.

Researchers from Europe, publishing in *PNAS*,[2] found that collagen and fibrin exhibit non-linear strain response upon loading. This is another factor that provides resilience in movement.

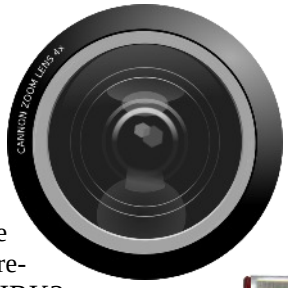
> We show that the **nonlinear mechanical response of networks formed from un–cross-linked fibrin or collagen** type I **continually changes in response to repeated large-strain loading**. We demonstrate that this **dynamic evolution of the mechanical response** arises from a shift of a characteristic nonlinear stress–strain relationship to higher strains. Therefore, the **imposed loading does not weaken the underlying matrices but instead delays the occurrence of the strain stiffening**. Using confocal microscopy, we present direct evidence that this behavior results from **persistent lengthening of individual fibers caused by an interplay between fiber stretching and fiber buckling** when the networks are repeatedly strained.… Thus, a **fibrous architecture** in combination with constituents that exhibit **internal plasticity** creates a material whose **mechanical response adapts to external loading conditions.**

This behavior is so interesting, they pass the news on to biomimetics engineers: "This design principle may be useful to engineer novel materials with this capability."

1. George, N.T., T.C. Irving, C.D. Williams, and T.L. Daniel. 2013. The cross-bridge spring: Can cool muscles store elastic energy. *Science* 340(6137):1217–1220.

2. Munster, S., L.M. Jawerth, B.A. Leslie, J.I. Weitz, B. Fabry, and D. A. Weitz. 2013. Strain history dependence of the nonlinear stress response of fibrin and collagen networks. *PNAS*. Published online before print June 10, 2013, doi: 10.1073/pnas.1222787110

Brain Cells Have a Twist-Open Gate



The structure of an important potassium-ion gate in the membrane of brain cells has been found to open like a camera iris. In *Nature*[1], Eitan Reuveny described a report in the same issue by Whorton and MacKinnon that reveals how an important molecular gate named GIRK2 works in the membranes of brain cells. These gates control the passage of potassium ions (K^+) to the outside of the cell, a process that changes the electrical charge between inside and outside, allowing conduction of electrical signals. His description, "**Ion channel twists to open,**" compares the twisting motion of the components to a camera iris:

> The conformational changes that open the inner helical gate are **comparable to the widening of a lens aperture by hand-rotating the aperture ring.**

But whose hands rotate the ring? The cylindrical channel that allows passage of K^+ ions is surrounded by four complex proteins that lock into the cell membrane. Activation of these "hands" by G-protein coupled receptors makes them turn the channel, opening it just a bit wider, but not enough to allow the ions through. From there, random perturbations may permit the ions to "burst" through the narrow opening as observed in living cells. The channel also contains a "selectivity filter" to ensure that only K^+ ions can make it through.

Reuveny began by explaining the importance of these channels:

> **Ion channels** are the **main units responsible for the electrical activity in our body**. They constitute a **large family of some 400 proteins in humans**. A subfamily of these proteins consists of four GIRK channels, which **specialize in converting chemical signals** — mostly those of neurotransmitter molecules such as acetylcholine, dopamine, serotonin and adrenaline — **into electrical ones in heart cells and neurons.** They are therefore **essential for controlling heart rate** and the **activity of neural circuits.**

Roderick MacKinnon received the Nobel Prize in Chemistry in 2003 for his work on ion channels. This paper contributes to the "**long-awaited crystal structure** of the mammalian GIRK2 channel in complex with two subunits of a G protein (a dimer of the Gβ and Gγ subunits), **providing information about their mechanism** of opening," Reuveny said. Ion channels such as GIRK2 literally "pump" ions against the direction of osmosis in order to set up the voltage necessary for electrical transmission.

It's nice to see MacKinnon still at work uncovering the secrets of these cellular gates a decade after receiving his Nobel. In the past 10 years, has he seen the light of the Darwinists? Has he found evolution essential to explain how these exquisite molecular gates work? Nope. Neither MacKinnon or Reuveny even mentioned it.

Thinking about the action of these gates in slow-motion is amazing enough. Realize, though, that they act lightning-fast, allowing your heart rate to adjust and allowing chemicals and ions to speed through the brain at the speed of thought. Just like in 2002, this is phenomenal evidence for intelligent design.

1. Reuveny, E. 2013. Structural biology: Ion channel twists to open. *Nature* 498:182–183.

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All by Design

Supreme Designer

by Jonathan C. O'Quinn, D.P.M., M.S.

The Creator gives to each living creature the exact traits it needs to live in its own particular environment. Often, these characteristics are quite unique. One such example is the tundra-dwelling collared lemming, found only in Alaska, Northern Canada, and Greenland.

Lemmings are an important source of food for many hungry carnivores, such as brown bears, wolves and Arctic foxes, so staying out of sight is one of the lemming's best survival strategies. Since it pleased the Lord to place them in these habitats, He has given the collared lemmings two special provisions to help them survive. Each autumn, the lemmings molt their multicolored brown, chestnut, and gray coats in exchange for white ones, allowing them to blend in with the coming snows and escape detection by predators in their treeless environment. Secondly, two of the middle claws and corresponding claw pads on each lemming's forefoot undergo tremendous growth, merging and forming a powerful digging tool. Because they have to spend most of their lives underground, the lemmings use this special provision to tunnel rapidly through the snow and permafrost. When spring arrives, their coats change back to the warm weather colors, and the enlarged claws and claw pads gradually return to their smaller size.

How clearly this speaks of the unique and individual ways in which the Lord God is involved with the lives of all His creatures, even lemmings. He has also provided for our spiritual need for salvation by providing His Son to bridge the gap, created between us and the God who is there, by our sins.

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