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# Battlegrounds of Natural History: Actualism

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## Abstract

**Actualism is a fundamental assumption of secular natural history. It replaced the Christian view of causality through providence, and it asserted an absolute physicochemical and geological continuity. Though often confused with uniformity and uniformitarianism due to secular obfuscation, actualism, at root, is a method of geology that limits historical processes and events to observed present-day causes. Actualism fails as an absolute explanation of historical causality: it cannot be precisely defined, it surreptitiously assumes unjustified metaphysical positions, and its secular formulations fail logical and empirical truth tests. Only when justified as a contingent manifestation of providence does it avoid these problems. However, that formulation is of little help in deciphering the rock record, because it was largely shaped by non-actualistic discontinuities.**


## Introduction

George Gaylord Simpson, prominent twentieth-century evolutionist and formidable foe of early creationists, faced an unexpected attack late in life. His neo-Darwinian/Lyellian views were challenged by secular revolutionary views of biohistory (punctuationism) and geohistory (neocatastrophism). In 1970 he published an argument against critiques of uniformitarianism. He failed to slow the new trend but did a service to all by identifying six foundational topics of natural history (Figure 1). Having addressed the first, naturalism (Reed and Williams, 2011), this paper addresses the second, actualism.

Actualism emerged from the optimistic idea of the eighteenth and nineteenth centuries that science (modeled after Newtonian physics) could unlock Earth's past. But today's climate is different. Christians object to its underlying materialist philosophy, and atheist philosophers, who have embraced postmodern relativism, object to its presumed positivism. This situation reinforces the necessity of assessing fundamental assumptions and methods—all serious intellectual battlegrounds. Errors here have led to many misconceptions. The solution lies in a reevaluation of basic axioms. Some creationists have begun this task (Klevberg, 1999; Lisle, 2009; Reed, 2001; Reed et al., 2004; Reed and Williams, 2011), but much remains to be done.

Delayed and weak efforts in this work have resulted in (1) fuzzy positivism, (2) "methodological" naturalism, and (3) "scientific" history. Although positivism as a philosophical school is defunct, its spirit lives on in the smug superiority of today's science. Methodological naturalism is an unnecessary accretion

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| BATTLEGROUND | SIMPSON'S DEFINITION |
|---|---|
| **naturalism** | Basic postulate of science; supernatural excluded from scientific explanation by definition. |
| **actualism** | Synonym of "uniformitarianism" in Lyellian sense. Present processes only options for past explanation. |
| **historicism** | Problems and procedures coming from consideration of state of Earth and cosmos over time. |
| **evolutionism** | "historical model or theory of life as changing directionally and irreversibly in the course of descent." |
| **mode of history** | Fuzzy gradualism; catastrophes occur, but not sudden, great, and worldwide. |
| **methods of scientific history** | Historical inferences are scientific as long as they are based on actualism, naturalism, and evolutionism. |

**Figure 1. Simpson's (1970) six foundations of natural history.**

**Figure 2. Constant Prévost, French naturalist who coined term "actualism."**

that Plantinga (1997, p. 143) has called "provisional atheism." And nature, as a modern secular idol, has swallowed history (Reed, 2000).

Geology was built in the late eighteenth and early nineteenth centuries on the foundation of a vast prehuman prehistory accessible only through scientific study of rocks and fossils. Thus, actualism is linked to deep time. That is why a strain of anti-Christian prejudice permeates geology. Even creationists are not immune; widespread use of the term "origins science" is indicative of this problem; no one discusses "origins history" as distinct from "operations history." Sadly, "origins science" is merely Simpson's (1970) "historical science" with a theistic façade. It is curious that those who reject a lengthy prehistory accept the corollary that the past is accessible primarily by scientific inquiry. The difference between secular and Christian positions is profound: (1) secular natural history explores time *prior to* human civilization, while biblical natural history addresses details not found in a general narrative that covers the entirety of time, and (2) secular views demand an absolute physical continuity, while Christian views acknowledge physical discontinuity in the immediate (direct) acts of God.

Secular natural history developed when Newton's *vera causa* method was extrapolated to history. But that simplistic view ignored significant differences between history and science, specifically between the objects of investigation: universal laws of nature in science and unique, unobserved events in history. That is one reason *actualism* and *uniformitarianism* were so long misused and misunderstood (Reed, 2010a). Even Simpson (1970, p. 61) recognized that: "The term 'actualism' is widely used … but it is ambiguous, particularly in English, unless given special definition."

Some confusion is semantic. The English *actual* is a homophone of the French *actuel*, which was the original term introduced in 1825 by the French naturalist Constant Prévost (though the concept predated him). Prévost (Figure 2) used it to refer to causes observed in the present that he thought were sufficient to explain the rock record. Lyell's subsequent trick of conflating the method and mode of natural history created the fog of uniformitarianism, which is only now dissipating. The crumbling of 150 years of Lyellian gradualism has created a vacuum filled, in the face of Flood geology, by neocatastrophism, which grasps at actualism as a method that is not Lyellian or biblical. After so many years of trumpeting that uniformitarianism disproved catastrophism, geologists

seek to retain a materialistic history, though they still have not reached a satisfactory solution. Reed (2010a) clarified the semantic problems, suggesting that the term "actualism" be retained and all forms of the term "uniformitarianism" be discarded. Having stripped away the substance of Lyellian gradualism, Christians must now address actualism, which is equally invalid.

Actualism as a method was always *theoretically* independent of the steady-state historical models of Hutton and Lyell, the directional gradualism of the later Lyell, Darwin, and today's neocatastrophism (Austin, 1979; Gould, 1965, 1984, 1987; Hooykaas, 1963, 1970; Reed, 2010a; Rudwick, 1971, 1972, 2005; Simpson, 1963, 1970). But however pristine the theory, the historical reality that actualism was used as a disguise for a metaphysical antagonism to orthodox Christianity cannot be ignored, especially given the 150 years geologists were content to ignore problems, just so long as gradualism battled "religion." That willful blindness to the differences between geological and physicochemical causes is remarkable. In application, therefore, actualism is more than a method; it is a part of a worldview opposed to Christianity.

Simpson (1970) fought his own battles against the new revolutionary views that did not need Lyell. He noted the inherent complexity of actualism and scoffed at those who were attempting to reduce uniformitarianism to actualism. He attempted to argue actualism as a synonym to gradualism, but his arguments were as value-laden as his opponents'. He denied that uniformitarianism could be redefined as (1) induction (Gould, 1965), (2) the principle of simplicity (Goodman, 1967), or (3) the method of Prévost (Hooykaas, 1963, 1970). Like those he criticized, Simpson rejected any role for theology, but positivism cannot justify actualism any more than it can justify Lyellian gradualism. Before addressing the problems of actualism, it would he helpful to review its historical development.

## The Road to Actualism

The seventeenth century saw the full flowering of the scientific enterprise that had begun in the medieval universities and culminated in Newton's synthesis. Science was the intellectual golden boy of the age. At the same time, philosophy had metamorphosed from the "handmaid" of theology to its rival. After having driven culture for many centuries, theology was set aside by Descartes' new emphasis on reason. Continental rationalism would have profound implications. It "represent[ed] the revolt of philosophy from theology" (Adler, 1965, p. 258). Reformers like Luther and Calvin insisted that truth was guaranteed by revelation. The new philosophers abandoned that view, with disastrous consequences.

> To make matters worse, the illusion of *epistēmē* [sure and certain knowledge] was now doubly aggravated—on the one hand, by rivalry with the dogmatic certitude claimed by theology; on the other hand, by emulation of the demonstrative rigor attributed to mathematics. Misled by it, Descartes, Leibniz, and Spinoza initiated modern thought with dogmatic systems of philosophy, constructed in a pretentiously rigorous manner (Adler, 1965, p. 259, brackets added).

This illusion of certainty apart from revelation would permeate thinking for centuries, migrating from philosophy to science during the eighteenth and nineteenth centuries. Comte and his followers saw this as a natural evolution; Christians should have seen it as a direct assault. But in their defense, the divorce between science and theology was gradual. As late as the eighteenth century, science was still a way to understand God's world by men who appreciated its theological foundation.

At the same time, the Reformed hermeneutic had sparked new interest in history. Chronology became a rigorous and exact science (Rudwick, 1999), culminating in Ussher's *Annals*. Extending history to the natural world, Steno's diluvial explanation of Tuscany's strata opened the door to speculative natural histories like those of Burnet and Woodward. Rudwick (2005) credited Burnet with originating a new genre, "geotheory," which would become increasingly popular and secularized in the following century.

In the 1600s, reality reflected a pervasive awareness of an ongoing immanent providence. God was the ultimate cause behind phenomena, and His mode of action in maintaining the created space-time continuum followed a regular pattern.

> The Judaeo-Christian view of divine providence … sees God as not only the creator of the universe but also its governor. Historically, the laws of nature had been seen as the law of God. All things live and move and have their being in Him. According to the classic view, all power in this world is derived from the power of God, meaning that the universe does not and cannot function independently from God. The universe is equally dependent on God's power for … its continued existence (Sproul, 2000, p. 91).

Doctrines of creation and providence provided a framework for the axioms essential to science, such as uniformity, the comprehensibility of nature, linear time, and man's status as a transcendent observer (Reed, 2001). Newton's theory of true causes was widely adopted, as was Newton's recognition that explanation ultimately rested on truth guaranteed by Christianity (Figure 3).

Cultural trends elevated science and philosophy over theology by the end of the eighteenth century. British empiricism offered tangible contributions to political and social theory. Heresies

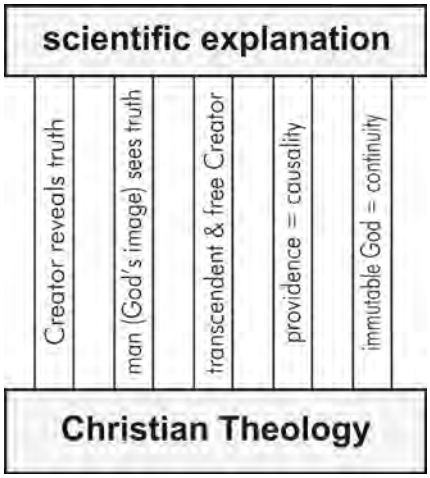


**Figure 3. In the new science, causal explanation emphasized Newton's theory of true causes, which limited explanation to only observed causes. This view was explicitly upheld by pillars linking theological truth to scientific explanation (cf.,. Reed, 2001).**

weakened the church, and the intellectual class of the latter half of the century became the first post-Christian generation, giving a foretaste of today's world in the French Reign of Terror. Skeptics like Rousseau and Voltaire purposefully sought to turn science against Christianity (Stark, 2003). Science waxed and philosophy and theology waned, as weaknesses in both empiricism and rationalism led to the skeptical reaction of Hume. Hume led to Kant, whose system explicitly divorced God from "reality." In a little over a century, Newton's mechanistic method had degraded to materialism. Enlightenment humanists achieved their goal—a schism between science and faith.

As with science, Christianity lost its grip on history. Rather than a frontal assault on the Bible, savants first created an imaginary period of time—prehistory—outside of the Bible. Arguing that the Bible was silent on that subject, they turned to science. Secular intellectuals like Buffon and Hutton (Reed, 2008, 2009) developed "geotheories" undermining Genesis. Eventually, biblical history was discarded—an old Earth was a staple of naturalists (including many Christians) by the late 1700s. Newton's scientific method extended to natural history, and physicochemical uniformity was extrapolated to natural geological causes, although even then the differences between the two were ignored or minimized.

This secularization was cemented by Lyell's uniformitarianism and Darwin's evolutionism. Lyell, following a host of like-minded predecessors, conflated the actualistic method with his sedate past, and Prévost's term was lost to Whewell's "uniformitarianism." Atheism emerged from its cocoon of deism, claiming that natural laws were inherent properties of matter and that the design argument had been refuted by Kant (Figure 4). By 1900, Europe was no longer Christian, and optimism in science reached its zenith in philosophical positivism (Figure 5).

## A Christian Critique

Within a span of 200 years, science mutated from a means of glorifying God to the basis for denying Him. The linchpin of a Christian critique of actualism is that the fundamental axiom of science is not actualism, not even uniformity, but the more basic idea of continuity through time. Discontinuity invalidates absolute uniformity and its derivative actualism, because it calls into question scientific predictability. Orthodox Christianity always placed that continuity in the being of God; secularism, in matter/energy. This underlying continuity is often ignored because materialists emphasize uniformity and "natural laws" as providing predictable cause and effect. In natural history, geological causes must also sustain an inherent predictability across time. Actualism was elevated in importance because secular geology was such a powerful weapon against Christianity. This explains Lyell's tendency toward a static history, his stubbornness in ceding even evolutionism, and geology's vocal defense of gradualism right up to its obvious demise.


**Figure 4. The links between Christianity and science were severed. In their place, autonomous science and an absolute actualism were deemed the only valid ways to truth. Actualism, like other assumptions of science, became absolute out of necessity—there could be no metaphysical justification since Kant had "saved" science by separating it from metaphysics.**

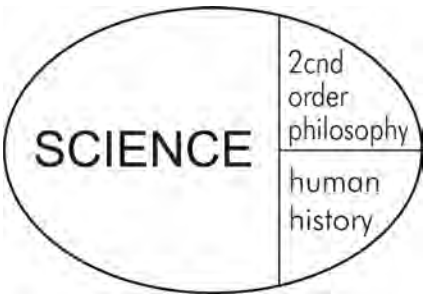


**Figure 5. Having used philosophy to help destroy theology, science turned on philosophy. By the end of the nineteenth century, philosophers had retreated to second-order problems or aped "scientific" methods. History remained but was restricted to the recent past and crushed into the template of evolutionary progress.**

The recent rejection of Lyell has opened a window to analyze actualism on its own merits. Positivism has given way to an uneasy relativism, but science cannot sustain the repudiation of truth. Furthermore, the politicization of science has led to widespread skepticism of its objectivity and integrity. All of these combine to offer an opportunity to untangle the knot of actualism unparalleled for many years.

Creationists have long pointed out technical or theoretical errors of earth scientists, raising doubts that helped lead to the downfall of Lyell. But more is needed. *We must change the rules.* This includes unveiling errors in actualism, while at the same time offering a compelling alternative to finding truth in natural history that will rescue geology from its secular bonds. It is a difficult task because generations of secular thinkers have focused on the wrong questions. For 200 years or more, the main issue was one of *uniformitarianism* versus *catastrophism*. This false dichotomy was created by secular geologists to combat the biblical deluge and later to attack secular opponents like Cuvier, imputing guilt by association with the scriptural geologists.

This false dichotomy has imploded under the weight of its fallacies. Geology has moved beyond that debate but has avoided the painful evaluation of *why* gradualism ruled the science for 150 years and its effects permeated the discipline. The primary error of that dichotomy was an inability to define the terms with precision, since gradualism and catastrophism are essentially *qualitative* descriptions of energy, rate, and scale existing on a continuum. Though the extremes are obviously different, the area in the middle remains undefined—a problem that always precluded resolution of the argument. Even Simpson (1970) offered no resolution.

The misguided focus on that dichotomy is only part of the problem. Another is imprecise definitions. Like uniformitarianism (Reed, 2010a), actualism is a slippery term. Does it address principles of physics or complex geological processes? Clearly, the two are not one and the same. What is their exact relationship? How are they the same? How are they different?

A Christian critique will show that secular formulations of uniformity and actualism are both invalid. It is essential that Christians reject both absolute physical uniformity and actualism. As Reed and Williams (2011) have shown with regard to naturalism, the problem is that the secular worldview diverts us from the real issues. Geologists assume that physicochemical uniformity is an absolute property of matter, and thus their only concern is how to tie actualism to that uniformity. Christians must ignore Kant's proscription and address the issue in the context of a metaphysical basis for both history and science.

However, before delving those depths, it is worth seeing how others have evaluated actualism. Until quite recently, much of it has followed the error of Lyell in conflating the method with a philosophy of history. We will ignore these efforts, which were clearly wrong. On the other hand, the work of Hooykaas (1963, 1970) was pioneering, despite the limited reach of his query. Although he failed to address the foundations of actualism and glossed over metaphysical links binding actualism, earth history, and competing worldviews, he opened a door that arguably led to neocatastrophism. In his defense, he did not enjoy the benefit of recent insights into the history of geology, which strongly suggest that prehistory was an *axiom* of naturalists, not an *empirical conclusion*. Given the close association between actualism and deep time, it is worth noting that actualism was also an assumption.

Despite these shortcomings, Hooykaas did better than most at dissecting the various meanings of actualism, and so we will use his scheme to springboard to a more complete analysis. After describing his scheme, we will show that the solution lies in the recovery of a theological basis for natural history.

## Hooykaas's Approach

Reijer Hooykaas (1963, 1970) was a pioneer in deconstructing the Lyellian tangle that comprised the concept of uniformitarianism. In fact, it would not be too much to say that modern neocatastrophism owes its philosophical roots to his work. Hooykaas first noted that the supposedly "fundamental principle" of geology—uniformitarianism—was a Gordian knot of immense proportions.

> Consequently, the conceptions of the scope and contents of the Principle of Actuality … are widely divergent: they run from strict uniformity of all geological causes (in the Lyellian sense) to such a trivial general verdict as that of the "immutability of the laws of physics…. Nevertheless, however much geologists are forced to adapt their contentions to the facts, generally speaking they all rally around the "Fetish of uniformity", as adherence to it has become a token of scientific respectability. The holy names of Lyell and Darwin are connected with it, and, however widely one may deviate from its original meaning, one has to pay at least lip service to it (Hooykaas, 1970, p. 315).

Simpson, of course, disagreed, and tried to argue that uniformitarianism and actualism were linked.

> Hooykaas, Visotskii, and others have contrasted it with uniformitarianism by confining the latter term to *configurational* aspects [geologic causes] of what is present ("actual") and using actualism to refer only to what is *immanent* [laws of physics]. In that usage, actualism is the postulate or principle that the so-called laws of nature have been and are unchanging…. It is almost always

> implied, although rarely stated, that actualism involves not only that present immanent characteristics have all existed throughout the past (always excepting First Cause or, if one likes, big-bang) but also that past immanent characteristics all exist (with the same exception) and probably are all observable at present. The latter distinct principle might be but, as far as I know has not been, called preteritism…. The two principles are complementary but not necessarily equivalent. There is a good reason for preferring actualism to preteritism: science is necessarily based on the observable; the present is observable; the past is not (Simpson, 1970, p. 62, brackets added).

Then he attempted to defend his position empirically. His desperation is evident in his ignoring Hume's argument that such was impossible to avoid the conclusion that actualism is an "arbitrary axiom."

> Actualism in the full sense of the preceding paragraph is not an obvious *a priori* necessity, for conflicting principles readily can be and in fact have been proposed; but neither is it an arbitrary axiom. There is a large amount of observational evidence bearing on it and agreeing with it, even though in the nature of things its absolute, complete validity cannot be proved. Geologists and paleontologists have now accumulated a truly vast number of observations of recent configurations that have been visibly affected by immanent characteristics over periods up to more than three billion years. These are all consistent with actualism. That is the source and principle support of the canon of actualism, and it is generally taken to justify the acceptance of actualism where relevant in other sciences as well (Simpson, 1970, p. 62).

If that was the strongest case for gradualism, it is little wonder that is has been discarded! The real question is why it took so long to die. Its inherent vagueness probably helped, but we suspect that the role it played in the rejection of orthodox Christianity was significant. The problem for Simpson was that all of his empirical examples were derived by geologists who *assumed* the truth of actualism on the front end, making it ultimately a circular argument. Since he could not successfully define actualism as anything other than Lyellian gradualism, his critique of Hooykaas appears unconvincing.

Hooykaas took a different approach. Instead of attempting to justify gradual-

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

**Figure 6. Hooykaas (1963, 1970) discussed the potential classifications of geological causes with respect to their "kind" and "energy." He was 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 (2010a).**

ism, he evaluated a number of possible logical formulations (Figure 6) using two-valued ("different" and "same") parameters of (1) *kinds* of causes and (2) their *energy*. He included both physical and geological causes, but the differences between them undermine even his careful classification, as do other problems in setting discrete boundaries to the problem.

> 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 are all good questions, echoed in Reed (1998), and illustrate the inherent problems in making the past the domain of science. But first, let us evaluate Hooykaas's work on his own terms. Hooykaas faced a number of problems, some of which have come into clearer focus with the death of gradualism. One example is the need for a clear distinction between causes that are "catastrophic" and those that are not. What makes one event "catastrophic" and another "non-catastrophic"? If it is the energy level, then what is the specific number that differentiates the two? What discriminates physical from geological causes? Are geological causes simple or complex? If the latter, then are all aspects automatically actualistic? Reflecting the confusion that was the legacy of Lyell, Hooykaas debated poorly defined categories, allowing the bias of materialism and positivism to permeate the foundations of natural history. His primary weakness was in failing to address the problem within the domain of philosophy—a testimony to the power of positivism late in the twentieth century.

## Analysis of Hooykaas's Possibilities

There are several general problems with Hooykaas's scheme. Although he defended the Christian roots of science (Hooykaas, 1972), he remained heavily influenced by positivism. For example, he wrote,

> Uniformitarianism and catastrophism already existed alongside each other in the 18th century. The cosmogonic systems of Burnet, Woodward and Whiston bore a strongly catastrophist character. Neither the kind, nor the energy of actual causes were considered sufficient to explain former changes…. Over against them, *less speculative*, *more scientific*, systems, which were based on observations of the crust of the earth … were put forward already in the late 17th and in the 18th century (Hooykaas, 1970, p. 276, emphasis added).

Note that cosmogonies based on Scripture were "speculative" as contrasted with "more scientific" systems of deists and atheists. Note too that he allows the methodological criteria of actualism to take precedence over the *truth* of what happened in the past. This was likely the legacy of geology denying Genesis at any cost—a powerful bias to this day. Hooykaas also misrepresented history; studies in geology began with Steno's *diluvial* interpretations that were firmly anchored in "observations of the crust of the earth."

He did not see the fatal flaw—secularists love to pretend theology is invalid, while masking their theology with science. Asserting that Genesis is wrong is *no less religious* than affirming its truth. Hooykaas showed that blindness in discussing Buffon:

> Buffon…having supposed the earth was detached from the sun by collision with a comet and then cooling off gradually, had no further use for this hypothesis. In his explanation of changes in the surface of the earth, he always referred to the actually existing causes (Hooykass, 1970, p. 276).

Note that Buffon was not consistent; his "actually existing causes" only kicked in *after* he defined a godless system and set its initial conditions. Like the current big bang theory, Buffon's failed because he could not account for those conditions. He could not explain scientifically how a comet striking the sun would create a planet or how the rest of the solar system and its intricate, unified operation would be formed. Instead of "In the beginning, God created…" Buffon proposed, "In the beginning, comet created." Although Buffon claimed to be "actualistic," he was not. But Hooykaas granted weight to his secular fairy tales because Buffon claimed the mantle of actualism.

> In order to have a firmer starting point, he intends himself "to take the earth as it is, to exactly observe all its parts and to conclude by inductions from the present to the past…. He will not be affected by "causes whose effect is rare, violent and sudden", as "they do not belong to the ordinary course of nature", but he will use as "causes and reasons" only "effects which occur every day … constant and always reiterated operations" (Hooykaas, 1970, p. 277).

Buffon's basic errors persist. He masked his metaphysics with science. His observational base for "inductions" was severely limited—violating Socrates' dictum of first knowing what you do not know. He claimed to avoid causes whose effects are "rare," "sudden," and "violent"—all terms that cannot be quantified. Eliminating creation and

providence, Buffon explored a cosmos free from God. Many naïve thinkers have imagined that natural history could be explained like Newtonian mechanics. Finally, Buffon's theory was self-contradictory. His history began with the very "rare, violent, and sudden" event he said was invalid!

If actualism rests on uniformity, which in turn rests on causal continuity through time, every approach that asserts an absolute material uniformity and actualism must resort to special pleading to account for initial conditions. The origin of any finite universe is *by definition* non-actualistic. Deep time shoved that discontinuity far into the past, but logic is timeless. Ironically, it is science, in the form of thermodynamics (Williams, 1981), that joins philosophy in refuting an eternal actualistic universe, because entropy's trend creates a hard limit of absolute efficiency at some point in the past. That leaves only two options: the universe is finite or the rules changed at some point. Either choice destroys absolute uniformity. Like today's cosmogonists, Buffon was an actualist only when it suited him! It is noteworthy that later thinkers like Lyell and Darwin learned from Buffon; they studiously ignored origins, allowing a nebulous (and possibly theistic) creation at some unspecified time in the past to mollify the church and mask the inherent contradictions of their systems.

Hooykaas also ignored the necessity of a metaphysical basis for history. His categories rest on unstated assumptions about God, reality, nature, and man. What is the basis for history? For immutable "laws"? For the application of the scientific method to history? To compound the problem for secularists, the metaphysical realm is precisely the area that Kant proclaimed out of bounds in order to save science from Hume's skepticism! Hooykaas noted the basic issue, but did not follow up.

> When, however, the notion of "actual geological cause" has been widened then so far that it is practically considered as equivalent to "physical cause", systems based on a non-actualistic method become virtually non-existent. Only theories introducing super-natural, that is non-physical, causes would be non-actualistic then (Hooykaas, 1970, p. 275).

Christianity offers a firm foundation but only at the expense of the secular worldview. Uniformity and actualism can be justified but are contingent on an underlying, supraphysical continuity (Figure 7). Thus, uniformity is affirmed but is not absolute, and actualism is of little relevance to the rock record because the God who justifies uniformity employed physical discontinuities—Creation and the Flood. Atheism cannot justify uniformity or actualism any more than it can justify the basic axioms of science (Lisle, 2009; Reed, 2001).

Though we will examine specific problems (Figure 8), these general pitfalls are sufficient to invalidate Hooykaas's scheme.

## Non-actualistic Catastrophism

In non-actualistic catastrophism, geologic causes and their energy levels both vary through time. Hooykaas cited Count Gregor Razumovsky (1759–1837) as a proponent of this view. Actualistic with regards to physicochemical laws, Razumovsky was non-actualistic with regard to geological causes. He believed that the past was characterized by catastrophes caused by geological forces not in effect today but still consistent with laws of physics and chemistry.

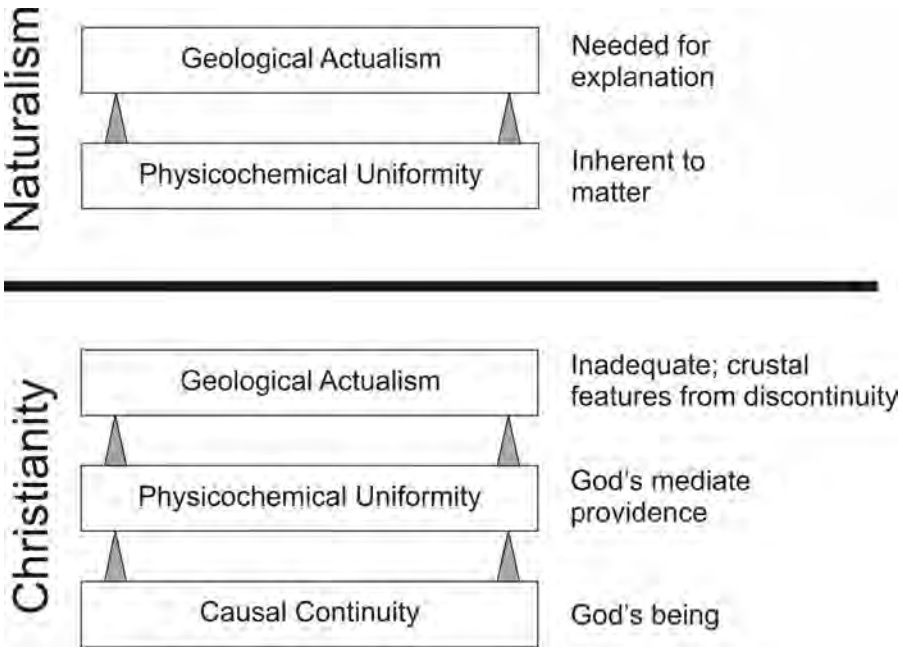


**Figure 7. Secular explanations of cause fall short because they ignore the foundational issue of continuity through time, which underlies both uniformity and actualism. Only Christianity recognizes this relationship and provides adequate justification (right column) for each step. Secular attempts 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.**

| Non-Actualistic Conceptions | Geological Causes | | Problems |
|---|---|---|---|
| | *Kind* | *Energy* | |
| 1. non-actualistic catastrophism | different | different | Geological causes are inadequate; uniformity is required but it cannot be reliably deciphered from rocks. |
| 2. non-actualistic uniformity | different | same | Unlikely. Different causes likely also vary in energy. Also, rocks remain opaque to science because geological causes are uncertain. |
| Actualistic Conceptions | | | |
| 3. actualistic catastrophism | same | different | Assumes that changing energy never changes process per se. Relies on unobserved process to cause events. Incomplete evidence. |
| 4a. strict uniformitarianism | same | same | Gradualism falsified by empirical evidence. |
| 4b. evolutionism | | | Darwinism falsified by empirical evidence; initial conditions assumed, not demonstrated. |
| 5. actual method; not system | same, but not all | same | Must assume initial conditions; certainty diminished since some past causes are unknown and not unique to rock features. |

**Figure 8. Analysis of Hooykaas's possible historical systems shows that none can be justified by rational principles.**

> But he was also an "actualist" in using physical and chemical *causes* which still are at work now for the explanation of "ancient" phenomena, whereas he was a non-actualist as well, in that he believed that these *phenomena* do no longer occur in nature today (Hooykaas, 1970, p. 279).

This highlights the semantic problem: what is "actualism"? Is it uniformity of physicochemical laws, or is it uniformity of geological causes derived from those laws? Like Simpson (1970), Hooykaas is stuck with trying to find equivalence between the two when they clearly are not identical. Ironically, Razumovsky's position is that of modern neocatastrophists and many diluvialists—causes follow physics and chemistry, but distinct varieties of combinations of those "laws" allow many possible, yet unobserved, geologic causes. For example, while maintaining physicochemical uniformity, Brown (2008) proposes the rupture of subcrustal caverns of water, and Baumgardner (2003) accelerated plate motions.

Likewise, Cuvier and De Luc believed that Earth's crust must be explained by past catastrophes with geological causes much different from those observed today. However, they also believed that actual causes were valid when applied to the time since the last catastrophe and even between past catastrophes.

Hooykaas 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 "metaphysics" (Hooykaas, 1970, p. 279).

Note how he also did not question the "catastrophism versus uniformitarianism" meme of Lyell. Besides, it misses the point; catastrophism *per se* may not be metaphysical, but *history* is.

Furthermore, non-actualistic catastrophism precludes meaningful retrodiction. If both the kind and energy of geological causes are unknown, then geologists must be able to discern those unknown causes from the sketchy tes-

timony of the rocks. But most rocks do not demand a unique cause. How can interpretation be verified if the causes cannot? And past catastrophes would erode the preceding record, leaving even less evidence from which to draw conclusions. This problem may well be what pushed Hutton, Lyell, and others toward such a rigid version of the past (Reed, 1998). It is no coincidence that the geological timescale was predicated on gradualism and its greater certainty in retrodiction.

### Non-actualistic Uniformity

The false dichotomy of "catastrophism versus uniformitarianism" makes "non-actualistic uniformity" seem contradictory. However, Hooykaas uses "uniformity" in terms of energy levels and restricts actualism to causes per se. Thus in his analysis, this option is theoretically possible, yet unlikely. It is difficult to imagine that different geological causes will maintain similar energy levels throughout time. Also, if the kinds of causes differ over time, then geologists cannot be certain which causes are even candidates for a given outcrop. As noted above, since the rock record is amenable to multiple feasible interpretations, certainty in this scheme is a chimera.

### Actualistic Catastrophism

This category reflects the old concept of a steadily cooling earth (decreasing energy) generating similar geologic processes with repeated, discontinuous outbursts of catastrophic events having the same underlying cause. Hooykaas points to Jean Baptiste Élie de Beaumont (1798–1874) as an advocate of this position.

> According to his fundamental hypothesis, the irregularities of the crust of the earth, in its outward form as well as in its structure, result from the disappearance of part of the heat that the earth contained when its crust was still in a state of fusion. The "slow and continuous" phenomena of cooling of the earth causes a slow and progressive diminution of its volume, from which ensues the rise of the mountains. This cooling, which acts as a slow and gradual cause, has as its effects violent and sudden cataclysms (Hooykaas, 1970, p. 286).

Like Élie de Beaumont, geologists once attributed tectonics and sedimentation to the gradualistic shrinking of Earth's crust through cooling. Primitive indications of heat flow from mines suggested a general cooling, and geologists extrapolated that cooling into crustal deformation. Like the once-popular diminishing global ocean—what Rudwick (2005) called the "standard model" of the eighteenth century—this simplistic idea made sense but rested on inadequate observation and understanding of the complexities of the planet.

In this model, cooling would have triggered discontinuous earthquakes, volcanism, and mountain building, probably by reaching a threshold, much like an earthquake releases strain. This position would have been congenial to the later thermodynamic arguments of a cooling Earth by Lord Kelvin and persists in the surge tectonics hypothesis (Meyerhoff et al., 1992).

However, this option must posit initial conditions that cannot be determined scientifically. Evidence of planetary cooling might appear reasonable but has not been observed empirically for sufficient time to guarantee the steady trend assumed in this model. Only the *assumption* of actualism *a priori* can validate that set of conditions. Furthermore, the cooling Earth example illustrates the dangers of generalizing from too little data. Modern measurements show heat flow varying widely from place to place. But the ancient trend must be interpreted from the rocks. Again, the evidence is not clear, nor is it unique to this explanation. Increasing knowledge of the mantle suggests that crustal changes are driven by complex phenomena not well understood today. There certainly is no uniform steady contraction like that pictured by Élie de Beaumont.

Today, neocatastrophists employ a variation of this concept; the underlying engine of geological change is plate tectonics—crustal rearrangement, not shrinking. Continuous plate motions create conditions in which both catastrophic and non-catastrophic events occur. Meteorite impacts provide another catastrophic variable—again unpredictable and unclear in the rock record. However, plate tectonics shares a problem with Élie de Beaumont's crustal cooling: it cannot be demonstrated. At best, it is a working hypothesis.

Finally, neocatastrophism has deftly avoided the task of reexamining the influence of the vast body of work done between 1830 and 1980 that is based squarely on Lyellian gradualism. How many of our concepts about geological causes are shaped on even subconscious levels by that body of work?

### Uniformitarianism

Hooykaas (1963, 1970) defined two types of uniformitarianism—steady-state and gradual evolution—well prior to Gould's (1965, 1975, 1984, 1987) discussion of the same topic and the contemporary consensus (Figure 9). Both concepts invoke the same geological causes operating at the same energy throughout Earth's past. The steady-state model was made famous by Buffon (though later rejected) before being advocated by Hutton and explored by Lyell. In fact, Lyell was lampooned by Henry de la Beche for his essentially cyclical history (Figure 10). Though Hutton never let go of his ahistorical cycles, Lyell quickly backtracked to a linear gradualism, which was further altered later by the progressive evolutionary view of Darwin. Hooykaas thus subdivided this approach into a steady-state model and an evolutionary one (Figure 6). The latter was that view argued by Simpson (1970).

| | Gould (1975, 1984) | Rudwick (1971) | Austin (1979) |
|---|---|---|---|
| methodological | *uniformity of law*<br>a priori claim about science; laws same over time, space | *theological status*<br>primary act of God secondary, "naturalistic" manifestation | *methodological uniformitarianism*<br>agreed with Gould that this is an a priori claim about science |
| methodological | *uniformity of process*<br>actualism | *methodological status*<br>past geological causes same as present; "actualistic" vs "non-actualistic" | *causal uniformitarianism*<br>argued for both known present causes, unknown present causes, and unique past causes |
| substantive | *uniformity of rate*<br>gradualism | *rate*<br>gradualistic or saltatory | *actional uniformitarianism*<br>uniformity of process rates |
| substantive | *uniformity of conditions*<br>non-directionalism, dynamic steady state | *"pattern" of past geological cause*<br>steady-state or directional | *configurational uniformitarianism*<br>steady state conditions through time |

**Figure 9. Contemporary views of the modern meanings of "uniformitarianism." From Reed (2010a).**

Both of the "uniformitarian" options have fallen on hard times. They fail because they cannot justify initial conditions or the only viable option: eternal matter. Eternal uniformity fails by the causal logic of the cosmological argument and the thermodynamic argument. Both Hutton and Lyell simply avoided these problems, as do many today; geologists pass the buck to astronomers. But as noted above, metaphysics are unavoidable.

> With uniformitarians, however, no less metaphysical preconceptions and intrusions occurred. Hutton's "Theory of the Earth" … is steeped in them, and even with Lyell they are not wholly absent. But, these two great geologists … were sober-minded enough not to propound an eternal repetition of cycles. They only declared that we find no vestige of a beginning and we see no prospect of an end in the cyclical course of events presented by the geological record (Hooykaas, 1970, p. 309).

Rudwick (2005) disagreed with this interpretation. He asserted that Hutton's theory at least strongly implied an Aristotelian eternalism (Reed, 2010b). Given the profound bias of both men against orthodox Christianity, neither could be termed "sober-minded" (Mortenson, 2006; Reed, 2008). It is both inconsistent and unintellectual to claim scientific knowledge of unique, unobserved past events back to a certain point in the past and then plead ignorance of what happened before, since what happened in that void of that ignorance might have profound causal consequences.

When Hooykaas wrote (1963, 1970), Lyell and Darwin were still the "gods" of natural history. Today, Lyell has been dethroned, and Darwin is tottering on the brink. Gradualism has been widely rejected for neocatastrophism because of widespread evidence in the rock record, and evolutionism is faced with accumulating exceptions to the paradigm that render it much less likely. Hooykaas at least recognized inherent problems with this position, addressing them obliquely by reference to a few individuals who pushed the logic of the position well beyond Lyell.

> Some uniformitarians, however, went much farther and made Uniformity into a kind of religious dogma. G.H. Toulmin (1780) dogmatically excluded the possibility of a beginning or an end of the earth. He tied uniformitarianism to the metaphysical belief in the eternity of Nature…. In Toulmin's and Volger's theories, then, not only the dogmatic but also the a-historic character of Uniformitarianism has reached its extreme (Hooykaas, 1970, pp. 309, 311).

Or perhaps its logical conclusion.

Laudan (1987) makes an important distinction in Lyell's view of actual


**Figure 10. Cartoon of Henry de la Beche lampooning Lyell's steady-state theory. In the endless repeating cycles of history, future ichthyosaurs study human fossils. From www.historyofgeology.blogspot.com.**

causes. He was not strictly actualist in the sense of restricting geological explanation to present-day causes. Instead, he tried to apply Newton's method of true causes (*vera causa*) 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).

In doing so, Lyell followed the positivist path of mandating empirical truth. Note how he equates what can be known to what can be observed.

> In the many cases where the observational handicaps of the geologist were so great that he could not use the method of induction, what reasonable limits should the geologist put on the method of hypothesis? Lyell's answer was that all hypotheses about unobserved causes or effects must be founded squarely on what we have observed. The range of entities upon which geologists can draw to hypothesize about the unknown causes of a known effect are those agencies that have been observed in operation (Laudan, 1987, p. 204).

Christians, of course, would argue that God's revelation is among those things that can be known.

Laudan describes Lyell's views as consistent with his desire to implement

Newtonian method to geology.

> 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 (Laudan, 1987, p. 205).

Upon examination, these are easily shown to be fallacious. The "third" uniformitarianism has fallen to contrary evidence in the rock record of events in earth history of much different scale than that observed today. The second was nothing more than an assumption of method, based on a faulty understanding of the nature of science. Its inherent weakness is seen in the continued default to the "first" uniformitarianism by geologists when pressed as to why the "second" must be true. Finally, physical uniformity is not absolute and not even logically consistent with a secular worldview (Reed, 1998, 2010a).

### Actual Method, Not System

In his final iteration, Hooykaas offers an option in which energy remains constant and kinds of causes change. Causes appear and then disappear. But no one can provide an explanation for the birth or death of these causes; it must be accepted on faith. Thus, geological causes are not all unknown, but the total reservoir of causes exceeds what is needed to interpret a given part of the rock record. Geologists thus face more than the difficulty of inferring causes from tenuous and incomplete evidence in the rock record; they also face the additional problem of sorting through a large menu of causes and finding those applicable to that particular section of the rock record, since only a subset of all causes is needed. The present is not the key to the past in the Lyellian sense; instead, only *some* of the present is the key to the past. But which part?

The difficulty is enhanced by the problem of pinning down the period of time in question independent of interpretation of causes, which does not seem even theoretically possible. No one has shown how a timeline of the rock record and an independent timeline of geological causes can be derived. Actual practice muddles the two, increasing the uncertainty. In reality, since both the distribution of the rocks and geological causes are unknown and not subject to observation, being able to confirm both would be circular.

Furthermore, knowledge of causes is supposedly derived from present-day observation. But if causes change over time, there must be some principle that allows geologists to differentiate the extant and extinct causes. How can we define causes that are not in operation absent observation? The answer does not reside in the rock record because that is the phenomenon to be interpreted in the first place. Hence, at best this approach requires circularity. This leaves geologists with a secular version of the "god-of-the-gaps" accusation. But this time, the shoe is on the other foot; it is now a "cause-of-the-gaps" argument, where unknown geological causes are invoked to plug the gaps left by causes observed in the present that cannot explain particular aspects of the rocks.

## Defining the Real Issues

Unanswered questions and unsolved problems in the options of Hooykaas (1963, 1970) suggest a need to redirect our inquiry. Clearly, the positivist approach is not valid. It is clear that actualism is linked to the secular paradigm of earth history—an extended prehistory accessible only to forensic study. Both are presuppositions, and the latter is the essence of the positivist approach. Actualism is not clearly defined, but the common denominator in all its manifestations is its providing an alternative to Genesis because (1) extended time dismisses the Flood as a significant geological agent, and (2) finding ultimate continuity in matter contradicts the Christian view of causal continuity residing in God. Yet nowhere is actualism proven or justified. Shea's (1982, p. 456) assessment remains:

> In short, my survey of modern geological literature … reveals no consistent difference in meaning between uniformitarianism and actualism, and I consider them to be synonyms…. Sometimes this fallacy manifests itself when a modern author makes a point of describing his model of a geologic process as "actualistic"…. The text of such articles usually explains that "actualistic" processes or conditions are those that have modern analogs. However, as Gould (1965, p. 921) has pointed out, "actualistic" really means nothing but "scientific" and the adjective is, therefore, redundant in a scientific book or journal.

Shea (1982) also noted that geological actualism cannot be asserted solely on the basis of physical uniformity. But the failures of actualism are even more profound. They include:

1. *Imprecise terminology*. Like "uniformitarianism;" fog swirls through any discussion of actualism. It occurs because of (a) differences between the English "actual" and the French "actuel," (b) the longtime confusion of actualism with gradualism, (c) inability to define "geological causes" in terms of physicochemical laws and the resulting confusion between the two, and (d) the inability to quantify or precisely define the terms "catastrophic" and "uniform."

2. *Guilt by association*. Given a strong secular bias, geologists must demonstrate that "actualism" in all of

its semantic flexibility is not a faith-based excuse to exclude the Genesis Flood from history. That will be difficult because geologists since the late 1700s have been saying just that.

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: is it found in nature or in God?

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 and ones ultimately unjustified by logic (Reed, 2001).

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. That is an invalid argument. 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" further forces a conclusion of circularity. The driving force behind secular natural history was its opposition to biblical history. Setting the rules to determine the outcome is neither scientific nor objective. It is simply the arbitrary exercise of intellectual hubris on the part of those who wanted Christianity not to be true.

7. *Inherent uncertainty*. Simpson (1963, 1970) wrestled with the difficulties of defining geological causes in the same manner that chemical laws can be formulated. However, it is likely that a rigid definition of many geological causes in that manner is impossible. Even areas that are well studied, such as sedimentation and fluid mechanics, are hard pressed to provide a unique interpretation to any given formation. Furthermore, as Reed (1998) noted, secular natural history's view of the past and its causes leaves many unanswered questions. What is the present? 1800 on? 1700? 1600? Knowledge of Earth's processes is affected by geography. Processes observed in Europe date back centuries; those in much of the third world a few decades. What geological causes have we not yet observed or defined? Also, what range of energy is allowed, and when does a quantitative change in scale result in a qualitative change in process? The rock record shows events dwarfing anything seen in the "present." How then are we to address the energy levels of those processes? What about the rare event, the common process, and their effect on the rock record? By any stretch of the imagination, actualism fails as a method because it cannot be applied consistently.

A larger problem comes in examining the categories used by Hooykaas. He based his analysis on two factors: (1) *energy levels* and (2) *kinds of causes* (same or different). His scheme left many questions unanswered. Hooykaas assumed the absence of supraphysical events in the past; instead, he assumed physical continuity and uniformity. But, of course, justifying those assumptions requires metaphysics, which is taboo in secular natural history. Hooykaas was unable to supply a precise definition of "geological causes."

All of these problems are linked. They result from the dismissal of Christian theology from serious consideration. Enlightenment thinkers suppressed the traditional view of reality built on the doctrines of creation and providence. This created inconsistencies, since science rests on Christianity. Science requires causal continuity, and secularism requires that continuity to be located within nature. This creates an immediate contradiction unless eternal matter is affirmed. Atheists admit a past physical discontinuity—typically the big bang. Despite being long ago, the chain of causality has been broken. If it happened once, it can happen again, and the absolute certainty of science is shattered on that one fact alone. In that case, the causal continuity of "natural laws" is not absolute and actualism appears less and less certain as a door to the past.

In summary, secular formulations of actualism fail at every turn. In turning their back on metaphysics, its proponents are self-limited from true explanation and a valid foundation of their discipline. The most fundamental aspect—continuity—is not inherent in nature because, like Buffon's cometary collision, there is always some discontinuity in the system, and their methods are revealed as an arbitrary defining of rules to favor their outcome. If continuity and uniformity are not absolute in nature, then another option must be found, or science cannot provide certainty in the present, much less the past. Christianity not only solves these problems but also provides a coherent and consistent framework for understanding nature, past and present.

## Christian Reconstruction of Method

If secular actualism fails, then it is time to change the rules. And if its failures are linked to the dismissal of Christian theology, then it is logical to suppose that the solutions are found in the reassessment of theology. Instead of the "science" paradigm, where history is simply an extension of scientific processes, we need one that is oriented toward discovering truth about past events. If secular method stands in the way of truth, then it is time for a new method.

First, we cannot restrict the pursuit of truth to science. Other disciplines seek truth, and cannot be ignored. The first step in deriving a reliable view of geologic history is to step back from the

lingering effects of the naïve positivism of the eighteenth and nineteenth centuries and understand that natural history is a mixed question (Adler, 1965), if for no other reason than that the most reliable historical text in the world—the Bible—addresses the subject. What are the ingredients of the mix? Since historiography rests on philosophy and theology, and since history rests on narrative, then those disciplines demand a seat at the table. 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 "scientific" answer.

Christianity provides the foundation for natural history by justifying both science and history, as well as by affirming their value. Only Christianity can justify and integrate the various areas of knowledge. After all, the "university" concept was the invention of Christianity. Since Christianity relies on revelation, and since revelation is comprised largely of historical narrative, then clearly that narrative is important to our understanding of natural history (Reed, 2000). This is precisely the opposite of the goal of the early secular naturalists, who sought to divorce revelation and empirical data. That experiment has clearly failed. It is time to correct our course and work to integrate the two once more.

A benefit of this new approach is the solution to the problem with continuity, uniformity, and actualism. Christian theology explains both continuity and discontinuity in the natural world by placing ultimate causal continuity in the person of God. Discontinuity in nature does not, therefore, sever the causal chain but illustrates the importance of reading the past through the lens of God's interactions with His creation. Reed and Williams (2011) show that the doctrine of providence is the antidote to secular assertions that science was inherently naturalistic. Likewise, providence is the antidote to an absolute natural actualism.

Continuity of cause and effect reside in God. That is the essence of the doctrine of creation. God spoke, and physical reality came into existence—*contingent* physical reality. The physical world is an effect, not a cause. Science and other empirical disciplines are possible because providence provides an orderly and predictable basis for knowledge. God's use of mediate (indirect) causes in the operation of the created order allows a contingent natural uniformity, but since God reserves the right to act, it is not absolute. Hence, miracles are real, but miracles do not invalidate science because science does not encompass the totality of truth. There is no inherent contradiction between "natural" and "supernatural" because God is the cause of both. Both reveal different aspects of divine providence and therefore the divine character. God confirms a prerogative to supersede the regular workings of providence in five specific ways: (1) His past work of creation, (2) His past modification of Earth by the Flood, (3) the Incarnation, (4) various "minor" miracles spread throughout history, and (5) the coming re-creation of the cosmos at the end of time.

What does this mean for natural history? First, it shows that actualism misses the point. Hooykaas's scheme comparing the kind and energy of geologic causes is inadequate because it ignores the theistic basis for all causality. A better scheme is one that focuses on continuity and discontinuity in nature, which helps define the places at which pure forensic investigation is preferred and those at which revelatory information is needed (Figure 11).

The consequences of this view are significant. Secular natural history has focused on method and process. Biblical history focuses on truth and meaning. Williams and Reed (2011) noted that the restoration of the theological framework of divine providence is needed to open the door to natural history. God has acted in space and time; therefore His actions cannot be ignored. Some people choose to call that "unscientific," hoping that most will make the emotive leap from "scientific" to "true." However, the implication does not necessarily follow. Knowledge of natural history is possible, but as Christians we recognize a different set of rules. In other words, intellectuals from Buffon to Gould could not find answers because they refused to ask the right questions. Secular geology considers only physical uniformity and actualism, whereas Christianity pushes the door open to supraphysical continuity and physical discontinuity.

Over the past centuries, secular thinkers have been forced by logic and the evidence of the rock record to move from Hutton's static world toward uniformity (not actualism) as the basis for geological interpretation. They have done so grudgingly, resisting every step. And yet today, we are at the point where geologists have finally admitted the disproportionate effects of rare causes (Ager, 1973, 1993). If they continue, and realize that a material uniformity is not possible in a finite universe, then the step back into the metaphysical world will be another in the right direction. Christians should encourage this trend and make sure that our own understanding of natural history does not become truncated by a need to move to meet them.

From the Christian point of view, all the hand-wringing over geologic causes and energy levels is wasted effort. Why come at the problem indirectly when revelation provides general descriptions of actual relevant historical events? Secularists reject the Bible and thus are left stumbling in the dark, unable to make much of the past other than construct imaginative scenarios that cannot stand extended empirical scrutiny. They argue at length over present and past processes and present and past energy levels, when an actual description of events is present in Genesis.

If the goal of our knowledge is truth, we put method in its proper place. It

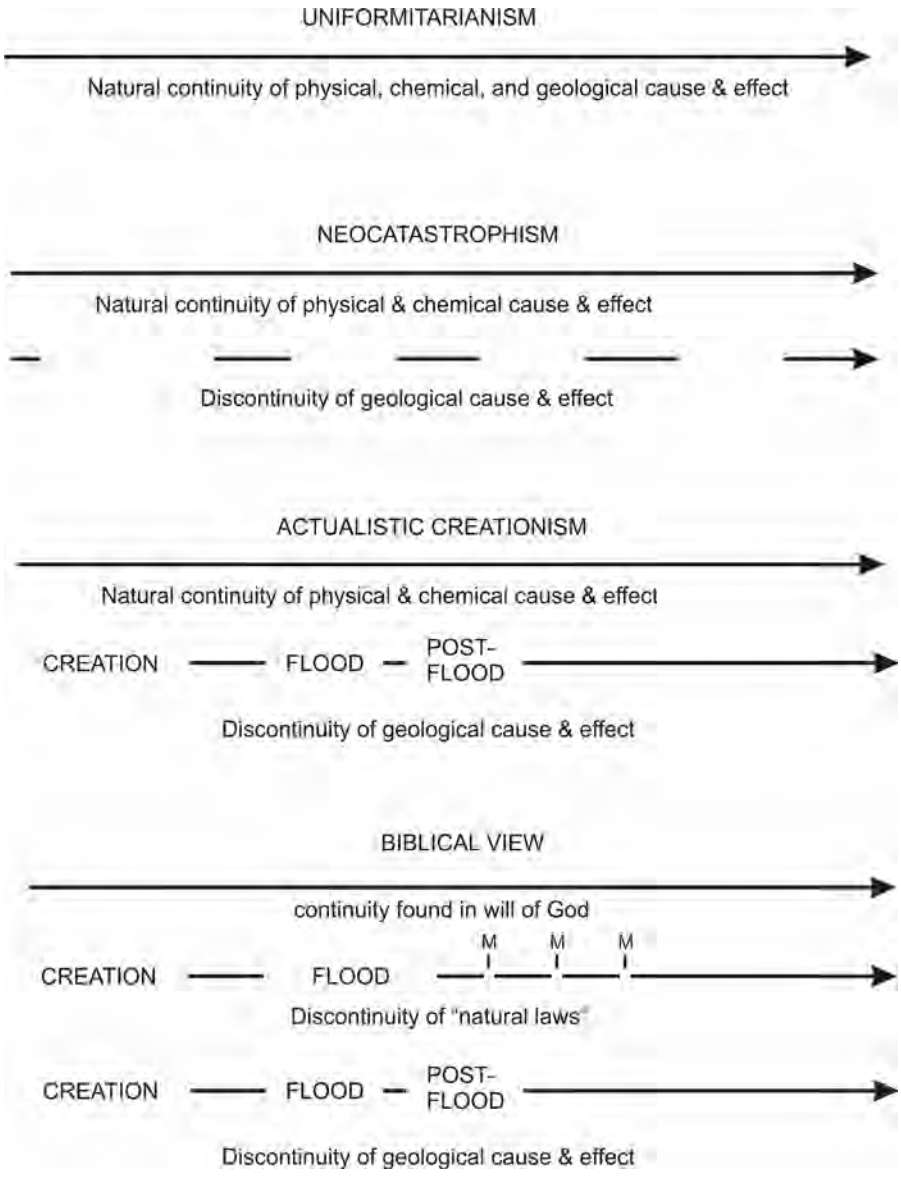


**Figure 11. Options addressing the issue of continuity and discontinuity in nature, modified from Mortenson (2004, p. 34). Various ways of explaining causal continuity over time are shown. Note that all presume linear progressive time—a Christian innovation. The uniformitarian view is that of Simpson (1970), which links causal continuity in both physicochemical and geological senses to nature. Neocatastrophists allow variety and discontinuity of geological causes across time because they believe they are underlain by a material physicochemical causal continuity. Some creationists appear to advocate what we call "actualistic creationism" which affirms the historical discontinuities of Creation and the Flood but with the understanding that God used the underlying physicochemical principles once matter and energy had been created and imbued with its properties. However, the proper biblical view, while affirming the historical discontinuities of Creation, the Flood, miracles (M), the Incarnation, and the end of time, do not demand any underlying causal continuity in the properties of matter but only in the mind and will of God. Thus, aspects of the Flood could have been caused supraphysically and would not then be amenable to scientific explanation.**

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? Method is secondary; reality is primary. If actualism, catastrophism, strict gradualism, or any other method cannot provide a valid interpretation for any given rock body, then we are free to let historical narratives and the rocks (unencumbered by presuppositions like Lyellian gradualism) speak truth. Austin was correct in noting that

> unusual ancient processes, undiscovered processes, and inversions of actualistic reasoning [are] important problems for causal uniformitarianism. The geologist's technique in deciphering ancient processes, they affirm, relies not only on analogies with products of modern geological processes, but on analogies with products of similar ancient processes, on analogies with products from experimental replicas and other non-geological systems, and on logical deductions from theories or scientific laws. Proper interpretations of ancient processes should, they say, involve complex techniques of inference, not just simple one-to-one association of products of modern and ancient processes. By using complex inference techniques, the geologist retains the maximum flexibility when confronted with anomalous facts, the proper perception of which is probably the crucial step in the act of scientific discovery (Austin, 1979, p. 39).

Actually, actualism has a place in biblical history and can be validated by biblical truth. Outside of the supraphysical discontinuities described in Scripture—Creation, Flood, and end of the world—natural processes follow consistent physical "laws" that are the visible expression of God's regular providence. There is still the incomplete understanding of the relationship between physical laws and geological processes, but since natural history need not bear the burden

of hard science, then such uncertainty is acceptable.

Ironically, while this "Christian actualism" is valid for the vast majority of Earth's time, it is unhelpful in understanding the rock and fossil records because these are almost entirely the products of supraphysical discontinuous events. It is not clear that even principles of physics and chemistry apply completely in these events, because the Bible clearly states God as the causal agent of both Creation and the Flood. The question, then, is the relationship between His use of primary and secondary causes in both cases. The former seems more prevalent in the Creation week narrative, but there also are events occurring during the Flood that may well indicate primary causation. While that would invalidate a scientific approach, we must continually remember that the goal is truth, not the expansion of science into the past.

Having seen the failure of the various possible formulations of actualism per Hooykaas, and having roughed out a Christian alternative, how do these two methods compare? We have seen that actualism cannot provide a true and certain means of interpreting natural history. Strong arguments in favor of the reliability of biblical history reinforce that failure. In an objective search for truth, Genesis would have a seat at the table. Even more, it offers advantages to natural history that naturalism cannot. These include:

1. *Openness to empirical data*. We were taught that Lyell and Darwin provided systems that were better than the Bible because they were empirical and scientific. But they only replaced one set of interpretive boundaries with another. Those of the Bible are less restrictive because they do not limit potential geological causes for particular strata but allow a broad range of possibilities within the fundamental limits of natural history. It is time to let rocks tell their story without rational principles of an outmoded eighteenth-century view of science forcing interpretation. In short, diluvialism offers a more empirical stratigraphy (Reed et al., 2006).

2. *Ties up loose ends*. Unlike naturalism, Christianity is self-consistent and able to justify its assumptions. Since that is done by theology, natural history must set itself subordinate to theology, if truth is indeed the object of the exercise. This relationship is illustrated by the doctrines of creation and providence. This theology justifies our investigation of history, justifies a provisional actualism by providence, and describes the discontinuities of the past sufficiently to allow further forensic investigation. Unlike naturalism, Christianity clearly admits its metaphysical foundations. There is no attempt to mask them as "science."

3. *Focuses on goal of truth*. Secular natural history began with a "religious" goal of undercutting biblical authority. It continued in that vein by using a focus on method to distract from the real conflict. Actualism is merely symptomatic; any method is acceptable as long as it falsifies the Deluge and divine creation. The Bible has been considered a reliable historical document for millennia. 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 that promote honesty, objectivity, tolerance, and inquisitiveness.

Given the failure of secular actualism and the benefits of biblical Christianity, it would be foolish to search in any other place. Therefore, we conclude that Christianity alone can adequately define actualism. The price to be paid is the realization that actualism is largely irrelevant to interpreting the rock record.

## Conclusions

Actualism in recent decades has experienced a revival as the fallback position for geologists disenchanted with the obvious failures of gradualism but unwilling to accept biblical history. Like gradualism, actualism faces problems stemming from its assumption of tenets of the secular worldview. It cannot be precisely defined, either semantically or conceptually, and attempts typically become confused, mixing geological processes with physicochemical uniformity. And neither actualism nor uniformity is the ultimate issue; that is reserved for the underlying problem of where we can find casual continuity. Hooykaas (1970) attempted to make careful distinctions between kinds and energy levels of causes, but despite an elegant analysis, he did not resolve the basic problems, because that requires a metaphysical foundation.

Reintroducing Christian theology into the discussion not only eliminates secular pitfalls but also provides a self-consistent basis for truth in history and science. It also mediates between the two in a mixed-question approach by setting boundaries with revelation. 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 at Creation and the Flood. Creationists must re-evaluate their methods, rejecting any absolute actualism, uniformity, or physical continuity in favor of an approach that places causal continuity in the person of God. Revelation is thus strengthened as a primary facet of the mixed question that is natural history.

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