

Science and the Question of God

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Can science provide substantive insight into the question of God's existence? Theological apologists have long wanted the authority of science to weigh in on the question of God. Philosophical reasoning, as exemplified by Thomas Aquinas, has been the primary path for apologists throughout the ages. With the advent of modern science and the growth in esteem of scientific knowledge, it seems reasonable to appeal to science to add its voice to the most fundamental theological question.

For many centuries, the two-book model has been a useful way to think about God's revelation. The book of God's works and the book of God's Word have historically been seen as God's complementary dual revelation of himself to us. This model is frequently used in discussions of science and faith (Tanzella-Nitti, 2005) (Vandenberg, 2010). The question before us is whether science, the study of the universe and all that is in it, can lead us to an indication of God's existence, independently from the complementary revelation of God's Word.

This article will examine three schools of thought regarding the possibility of detecting God's existence through science: Evolutionism, Creationism, and Intelligent Design. We will then assert, though without formal proof, that science may not be able to lead us to a clear conclusion regarding the existence of God. In harmony with the revelation of God's Word, however, science brings us to a deeper and more profound understanding of God and his works.

Evolutionism

The rise of modern science in the western world brought a mixed relationship to science and Christian faith. On one hand, the basic monotheistic Judeo-Christian concept of one divine Creator of all things was a significant contribution that helped enable and foster scientific ideas and methodology. On the other hand, new scientific knowledge sometimes raised troubling questions. Though Galileo's differences of opinion with the Pope were more complex than a science-faith conflict, the affair did raise fundamental questions of biblical interpretation in light of scientific discoveries as well as of the influence of biblical interpretation on scientific understanding. Less than a century later, Isaac Newton, Rene Descartes, Gottfried Leibniz, and others developed a mathematical framework that was remarkably accurate in describing classical motion of bodies in the heavens as well as those on earth. The invention of the calculus and Newton's basic laws of motion were a seminal breakthrough in scientific understanding but they also led to theological difficulties. How could God's providence and human free will be understood in the light of a deterministic universe?

In the nineteenth century, the debate on God's providence in a deterministic world continued but there was one major discipline that was exempt. Living organisms did not seem to be subject to the simple laws of motion of classical mechanics. Biology was dealing with a different set of concepts. Living entities were subject to God's guidance or perhaps some type of vitalism. Into this environment, Darwin's *Origin of Species* made a powerful impact. The idea of evolution wasn't new but previously it had been on the fringes of science. Darwin's ideas were not all correct. His notion of heredity through pangenesis was one incorrect idea. Some of his ideas that did turn out to be correct, like natural selection, were not immediately accepted. Instead, the shockwave that Darwin sent through the scientific community was that living organisms could be studied systematically and could follow natural laws analogous to those that the rest of the world followed, for example, Newton's laws of motion. Until Darwin, living organisms represented a

possible escape from the philosophical constraints of a mechanistic world. Darwin gave rise to the expectation that life itself was orderly and subject to study. It was not, however, deterministic. The randomness inherent in evolutionary processes prevented determinism and even, in Darwin's opinion, divine control.

Some secularists of the day did not wait for philosophical clarity and accuracy (Bowler, 2001). They seized the chance and proclaimed Darwin's theory of evolution as a triumph of science over classical religious ideas. It seemed to them that the final frontier of science could now, at least in principle, preempt theological explanations. It didn't matter that the details hadn't been worked out. What mattered was that science had a path to answering the question of life without invoking a deity. For secularists who aspired to the status and authority of the clergy but without the cloak of religion, this opportunity was not to be missed. John Tyndall, John Draper, Herbert Spencer, and Andrew Dixon White, among others, led the charge to declare the victory of science over traditional theology, a fate sealed by Darwin's theory of evolution (Lindberg & Numbers, 1987). For most, like Thomas Huxley, the emphasis was more on agnosticism than on atheism, which became more prominent in the twentieth century.

John William Draper and Andrew Dixon White authored two books that had enormous influence in the coming decades. Draper's work, *History of the Conflict Between Religion and Science* (Draper, 1874) was a seminal book on the conflict theory of science and traditional religion (the view that science and religion are and always have been at war). White's *A History of the Warfare of Science with Theology in Christendom* (1896) reflected many of the ideas that Draper had discussed and continued the theme of science's triumph over theology in every confrontation. These works were tremendously influential until the early to mid twentieth century when historians came to realize that the supposed research reported in these books was not sound. Many of their versions of historical conflicts were not supported by independent research and the accounts were slanted to advocate the conflict theory. Recently, Ron Numbers edited *Galileo Goes to Jail, and Other Myths about Science and Religion* (2009) which is a collection of chapters by historians that systematically debunk the myths in works of Draper, White, and others. Nevertheless, the damage was done. A very vocal and influential group of secularists had succeeded in positioning evolution as the ultimate victory of science over religion, extending the mechanistic universe to all of life.

One of the reasons for their success was the concept of "univocal metaphysics" as Mark Noll describes it in his essay *Evangelicals, Creation, and Scripture: An Overview* (Noll). Stemming from a historical perspective of univocity, where there is a single essence of being, and the simplicity of a single explanation in Ockham's razor, the perspective of univocal metaphysics led to the notion that there could be only one explanation for natural phenomena. Theological explanations and scientific explanations were considered to be mutually exclusive. In this way, science could answer the question of God in the negative by finding a naturalistic explanation to replace any theological explanation. Darwin's theory of evolution, while far from complete in its details, provided the expectation that life itself could be explained scientifically without appeal to theistic causes.

Charles Darwin was an astute and observant naturalist. His theory of evolution represented years of careful observations and thoughtful analysis. Yet it may have been inevitable that the scientific idea of evolution quickly moved to the philosophical ideas of *evolutionism*. The scientific observations of how species competed for survival and adapted to environmental conditions quickly moved from descriptive to prescriptive notions. The ideal of progress as inherent in the human destiny was eagerly accepted in society

with scientific evolution as “evidence.” Alas, those ideals were shattered with two major world wars in the twentieth century. Other philosophical aspects of evolutionism waxed and waned but one of the most enduring was that evolution somehow replaced God in the grand scheme of the origin and development of life. To this day, the mutual exclusivity of evolution or divine creation dominates the public’s perception of the conflict between science and faith.

Is this aspect of evolutionism warranted? Has the question of God been answered in the negative? The logic of those proposing this answer does not hold up to scrutiny. God’s creative action and sustenance of all things includes not only the mechanistic characteristics of Newton’s laws and the probabilistic ones of quantum mechanics, but also of evolutionary processes. God can choose his creative path as he wishes and he may do so either in ways we cannot comprehend or in ways that are systematic and subject to our comprehension. As we can see from the rise of modern science, the view of God as the creator with the consequent consistency and order in the natural world is a highly successful perspective. Scientific explanations are not mutually exclusive to God’s creative and constant control. Not even the inherent randomness that we see in nature belies his providence. Despite the strident claims of some late nineteenth century secularists and their modern descendents, science has not disproved the existence of God.

Creationism

In this essay, the term creationism refers not to the doctrine of creation but to the extrapolation of one view of such creation into claims of science. Specifically, it refers to the idea that scientific truths can be found in the Bible and that science properly done will concord with those truths. It is most easily identified with the view that the earth is only about 10,000 years old.

The modern surge of creationism arose in the mid-twentieth century, about a century after Darwin published his ideas. Many factors for its rise have been articulated and three of them merit mention here. First of all, there was the rise of literary higher criticism of the Bible in the early twentieth century. Scholars who analyzed the literary structure of the text prominently called divine inspiration of the Bible into question. The inevitable backlash swung to the opposite extreme of insisting on the infallibility of the literal meaning of every word. The prospect of documenting the truth of the Bible with the authority of science was most attractive.

A second factor was a substantive shift in the scientific understanding of evolution. Prior to Darwin’s work, the concept of evolution was known but somewhat on the fringe. Darwin’s major contributions included making evolution respectable in the scientific community even though many key details were unresolved. In the mid-twentieth century came the so-called neo-Darwinian synthesis wherein the major themes stated by Darwin were connected with the modern understanding of aspects such as genetics and heredity. With that synthesis and the new insight into genetic mutations, came a renewed claim of purposelessness and random chance as inherent in evolution. In other words, the shift in emphasis in evolution made it appear more virulent in its opposition to Christian faith. Moving beyond the mutual exclusivity of scientific vs. theistic explanations, the thrust of evolution was seen to deny any role of God’s providence. The threat of evolution was growing.

The third trigger was launched with Sputnik. The Russian success in reaching space galvanized a dedicated effort of science education in the US. The Biological Sciences Curriculum Study (BSCS) center was established in 1958. The BSCS series of science textbooks was published in 1963 and widely deployed. By

then, evolution was well accepted in the science community but still little known and understood in the public. If it was known at all, it was viewed with suspicion. In 1968 a Supreme Court decision nullified many of the anti-evolution laws that still existed in the country (Larson, 2003). The BSCS textbooks made the teaching of evolution a priority. When the public realized that children were being taught the theory of evolution, sometimes imbued with metaphysical overtones of purposelessness and meaningless chance, the longing for a counterpunch grew rapidly.

Into this environment came *The Genesis Flood* by Henry M Morris and John C Whitcomb (Whitcomb, 1961). Built on ideas by the amateur geologist George McCready Price, whose own ideas were triggered by Ellen White's mid-nineteenth century visions, they wove a story in scientific language of a literal, inerrant Bible supported by scientific observations. Flood geology swept the Christian community like wildfire. Here was a story that could restore confidence in the truth of the Bible to counteract higher criticism, emphasize meaning and purpose through God's providence, and provide a Christian worldview for children's education, all with the apparent authority of science. The message was told in such a convincing manner that fifty years later, polls indicate that as many as 40% of Americans are persuaded by some version of it. The mainstream science community, however, would have none of it. Rather than being convinced, the response was ridicule and quick dismissal. Ultimately scientists were perplexed that the so-called creationism movement survived at all, let alone came to such prominence.

Why was the scientific community unconvinced by the arguments of creationism? First of all, creationism deduces scientific conclusions from the Bible whereas scientific methodology relies on empirical observation interpreted in a paradigm of consistent laws of nature rather than any authoritative text. Secondly, in its attempt to reconcile geological observations with specific biblical interpretations, creationists must declare that God may have modified physical constants at various times in the past. For example, the speed of light may have been much greater or the radioactive decay constants may have been hundreds of millions of times greater than today to explain the abundance of radioactivity. In stark contrast, scientists have been able to measure historical values of such constants, finding no hint of significant changes.

Creationists have spun this difference into a contrast of presuppositions. They claim to be based on a Christian worldview while mainstream science is based on an atheistic worldview. By this they mean that a Christian worldview allows for God to have changed the laws of nature and caused singular catastrophic events in order to enable the time scale in literal biblical history while atheism insists on uniformitarianism, wherein the processes, forces, and constants of nature remain essentially unchanged over time.

In sharp contrast to these claims of creationism, mainstream western science was built on the Judeo-Christian conviction that God's faithfulness and eternal unchanging character led to constancy in nature. The physical constants could be discovered to be, in fact, constants while it was a pagan view that allowed for nature to change at the caprice of the gods. Each side thus claims a Christian basis for its foundation. Creationism therefore deviates significantly from what is considered basic science. Despite the claims of creationism, science has not affirmed the literal geological history that many people feel is written in the Bible, and it has not provided an answer to the question of God.

Intelligent Design

The detection of the trademark of a designer has been a major theme in natural philosophy for centuries. Many people accepted William Paley's early nineteenth century concept of detecting the divine designer until Darwin published his theory. Design lost favor until it was revived in the late 1980s and 1990s

when it blossomed into a widely publicized movement known as Intelligent Design (ID). The essential principle of ID is that there are patterns in nature that are best explained by the action of an indeterminate intelligent designer.

A specific case of that argument is made by Stephen Meyer as an argument from information (Meyer, 2009). He points out that DNA in a living cell operates as the source of information for the production and operation of all proteins and other functioning biomolecules in that cell. By studying other sources of information like computer code, he concludes that information can only be generated by intelligent agents. Hence, he concludes that there must have been some intelligent agent that generated that information. That agent is indeterminate but he reasons that it is logical to think of that agent as God, the Creator. The ID argument therefore only makes a weak claim for answering the question of God. Nevertheless, it makes the claim that there are scientific inferences for the existence of some agent outside of our normal scientific purview.

The ID argument has moved rapidly into the Christian community, appealing to a number of disparate groups. Young-earth creationists eagerly adopt the ID argument because they see it as a powerful addition to their arsenal of apologetics. Old-earth creationists are uncomfortable with flood geology and a claim of a young age of the earth. For them, ID is a most attractive alternative to young-earth creationism that still provides the apologetic base. Some scientists who are uncomfortable with the randomness and purposeless nature of evolution also embrace ID as a means of restoring meaning in life, independent from the theological implications.

Why hasn't the mainstream scientific community embraced ID's line of reasoning? The ID community claims the fundamental reason is an unwillingness to allow consideration of the existence of an indeterminate intelligent being, especially that which could indicate a deity. Why then do many Christians in science also reject ID? The ID community claims it may be because they desire the approval and support of their non-Christian colleagues in order to gain funding, publications, and perhaps tenure. The scientific community has a different answer, including Christians who firmly believe that all that exists was created by an Intelligent Designer. For them, the ID argument simply is not scientifically valid and has no logically coherent basis.

Importantly, the scientific community does embrace the concept of design detection. It is a common practice in many fields of science. However, the use of design to argue for the existence of an otherwise undetectable intelligent being is a very different matter. Stephen Meyer himself points out that historical causal analysis requires the demonstration of causal existence and causal adequacy before one can confidently assert the historical reality of that causal agent (Meyer, 2009).

In the case of an indeterminate intelligent agent being postulated as a cause for the origin of life, Meyer pleads an exception to the requirement for causal existence on the basis of causal uniqueness. But he fails to establish uniqueness, in part because uniqueness still requires independent evidence of existence before it can be a legitimate causal agent. Furthermore, he has not convincingly ruled out evolutionary causes. Evolutionary processes can easily be observed to increase, decrease, or modify DNA and epigenetic information in living cells. This occurs in different ways in the development of every organism, in the reproduction process of every species, and in specific biological processes such as antibody formation (Story, 2009) (Isaac, 2010).

Though humans have developed the capability of some degree of genetic engineering, the dominant mode of information change that we observe in living cells is either through development from

embryo to adult or through reproduction and selection. Thus an intelligent agent is not causally unique as an agent of information change in living cells even if it were to exist.

As for causal adequacy, Meyer asserts that since we know human intelligent agents are necessary to generate information in examples like computer code, therefore an intelligent agent must be able to generate the DNA information in a living cell. However, the small amount of genetic engineering that humans have accomplished is not easily extended to the generation of life from non-life. In addition to intelligence, skillful techniques of biotechnology, which have not existed in the past, are required to modify any DNA information. While it remains to be shown whether there are natural processes adequate for generating life from non-life (akin to those shown to be adequate for increasing, decreasing, or modifying DNA information), such a possibility cannot be ruled out.

In his argument, Meyer relies on the “identity” of the nature of information in computer code with that in living cells. He reasons that since an intelligent agent is required to generate computer code, therefore such an agent is required to generate the information in living cells. However, he fails to acknowledge the significant differences between those two types of information. The significance and meaning of computer code depends on the abstract, or symbolic, significance attributed to physical states of the computer by an intelligent agent. In sharp contrast, the significant functionality of the information of a living cell depends on physical survival and not on abstract significance. Hence, the information in a living cell can be selected for functionality by physical processes without an intelligent agent whereas computer code cannot.

Though we live in an information age, the concept of information is often misunderstood. The word “information” is used in many different ways. It may be helpful to consider three of the categories in which the term is often used.

- a. *Complexity.* Information theorists quantify information as the logarithm of the number of possible states of a system. Four coins, for example, can have 16 different possible combinations of heads and tails. The amount of information is the log of 16, or 4 bits. This category includes so-called Shannon information, named after Claude Shannon who in 1948 published a seminal analysis of the amount of information that can be transmitted in a noisy communication channel (Shannon, 1948). This type of information is related to entropy, which also depends on the number of possible physical states.

Changing some heads to tails can generate an informational pattern without changing the amount of information. Just as there is no conservation principle that limits changes in entropy there is no conservation principle that limits changes in information. In closed systems as well as in open systems with energy flow, information can increase. Rolf Landauer has shown that while energy is not necessarily dissipated in the change or in the increase in information, it is necessarily dissipated in the destruction of information (Landauer, 1961). In other words, there is no fundamental constraint on increases or changes in complex information.

- b. *Compressibility.* Another use of the term information refers to the minimum amount of information required to describe a particular state of the system. It is easier to describe the state of all coins being heads than it is to describe coins in a random sequence. Both states have the same amount of information in terms of complexity, but regarding compressibility, the repetitive sequence has less

information. This category includes Kolmogorov information and information that can be expressed in simpler algorithms. It is extremely useful in the telecommunication industry in transmitting audio and video data.

This type of information can change significantly without any change in complexity whenever the state of the system changes. For example, if some coins are heads instead of tails, the compressibility of the information changes while the total complexity remains the same. Any discussion of the “generation” or “creation” of information is ambiguous without further clarification since it can refer either to *increasing the amount* of information or to *changing the state* of the system.

- c. *Significance*. The popular use of the term information most often refers to the significance attributed to a particular physical state of a system. This significance can either be a physical characteristic or, more commonly, an abstract or symbolic relationship. The physical shape of the letter “A” conveys significance in the English language that is not mandated by the physical characteristics of that letter. It could have had a different meaning. Intelligence is sometimes defined as the ability to carry out symbolic reasoning. Therefore, meaningful information in this category requires intelligence to generate the abstract significance.

Note that physical complexity must exist in order for meaning to be attributed to it. Paul Revere’s famous phrase “...one if by land and two if by sea...” is an example of far-reaching information being conveyed by two bits of information. If the lanterns did not exist, the information would not be conveyed. If an intelligent agent had not assigned that meaning, the lanterns by themselves could not transmit the desired effect. Meyer’s use of the term “specificity” puts it in this category of information.

Meyer adds a second type of specificity, namely functionality. Usually functionality refers to the characteristics or action of a design compared with the design specification set by the designer. If that functionality involves symbolic meaning at any level, then an intelligent agent does need to be involved in some direct or indirect way. What Meyer overlooked, however, is that if no symbolic meaning is involved, then physical processes might be adequate to determine functionality. For instance, computers are constructed from a set of binary systems in which one state in each binary is assigned the symbolic meaning of “0” or “1”. No attribute of the binary system determines which meaning must be assigned to which state. An intelligent agent capable of symbolic reasoning must be involved. However, in living systems the ability to reproduce is a type of complex functionality that has a physical, but not a symbolic, function. If a living cell reproduces, it functions—otherwise it dies. There is no necessity for an intelligent agent to be involved at any level. Significance of information cannot be quantified and is not conserved in any quantitative way.

The information argument sounds appealing at the surface. Most of our daily use of information involves computers, language, and numbers, which are all laden with symbolic value. It makes sense to us that information requires intelligence. The remarkable similarity between DNA code and binary information code makes it tempting to attribute the same requirement of intelligence to the generation of DNA

information. Closer analysis, however, shows that every biomolecule in a living cell can be assessed by its value to survival as opposed to any symbolic relationship set by an intelligent designer. DNA information is complexity with significance endowed by the physical and chemical functions that enable its host organism to sustain existence. This means that natural selection is a viable process for determining DNA information. An intelligent agent is not necessarily required.

The case for an intelligent designer as laid out by the ID community is not compelling for the scientific community. Science has not answered the question of God even in the less stringent form of an indeterminate intelligent agent.

The Two-book Model

The three ideologies described above have failed to provide a persuasive answer from science to the question of God. Other philosophical perspectives such as cosmological fine-tuning and the anthropic principle also claim many adherents but these arguments are not compelling for everyone. Many others have and will attempt such an answer. Perhaps some will succeed but we must also consider the possibility that science cannot answer the question of God. The fundamental reason may be understood from the two-book model itself. Consider the version of this model shown in Fig. 1. God has revealed himself to us through his Word and his works. If we distort that methodology, we encounter all sorts of difficulties.

Consider a theology that interprets the Word of God with no acknowledgment of nature. The incarnation then makes no sense. The very concept of God humbling himself to become part of his creation requires that the creation exists and that it has inherent value. Nature cannot be ignored or devalued.

Think of a theology that studies God through nature rather than through the Word of God. This is natural theology, which has waxed and waned through the ages but fails to bring us to a clear picture of God. Without the guidance of the Word of God, we have no basis for determining what aspect of nature reflects God’s character. Is it the beauty of the sunset or the terror of the tornado? Is it the serene color of a flower garden or the voracious feeding of a carnivore?

Studying nature through the Word of God rather than through science leads to a perspective that is sometimes called “Scriptural Geology.” This is essentially the creationism that was discussed earlier, determining geological and other scientific “facts” from Scripture rather than from observation. It is a result of seeing the Word of God as a revelation of nature in addition to being a revelation of God. Some people believe that in order to be a revelation of God, the Bible must be a revelation of all things, including nature. Many of the public conflicts between science and Christian faith

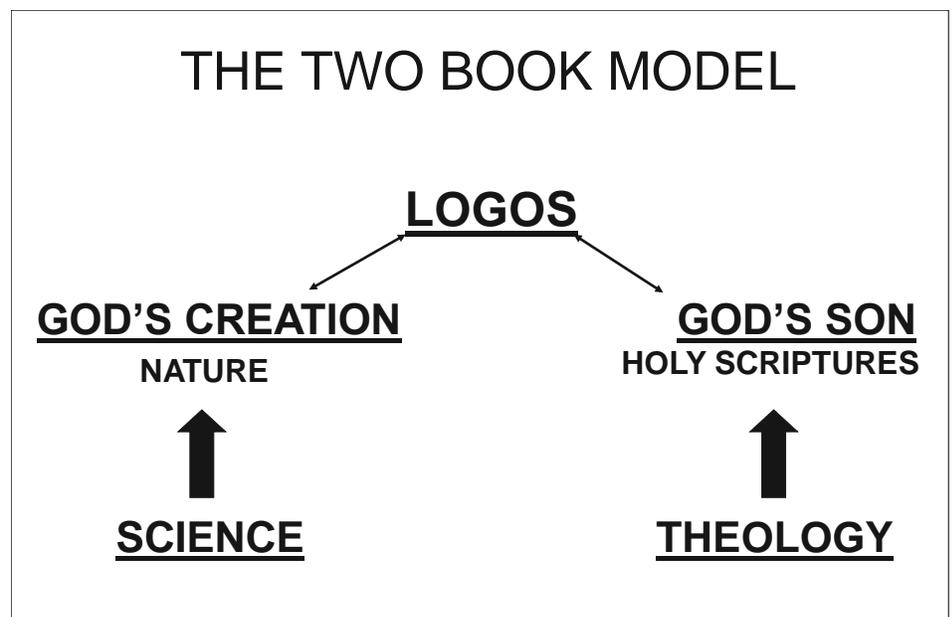


Fig. 1 The Two Book Model

seem to arise from a search for concordance between observations of nature and the interpretations of nature derived from Scripture. The two-book model does not lead to such conflicts since it views Scripture as the revelation of God, his incarnate Son, and the plan of redemption.

Studying the Word of God with scientific methodology leads to higher criticism. This approach can be a useful means of understanding the text and the intended message. Taken by itself, however, without acknowledgment of any divine inspiration, it can lead to a purely human interpretation and a denial of any revelation of God.

Each of these permutations leads to a difficulty in obtaining a rational understanding of God. In this essay, we have been considering the possibility of finding God through science alone in essentially a one-book model rather than a two-book model. It appears that perhaps science by itself cannot answer the question of God. The two-book model provides a balanced approach, incorporating the complementary elements of nature and Scripture as revelations of God. In this way, we can see a clearer path to perceiving God. Only the dual approach of seeing God through his Son, as revealed in his Word, and through nature gives us a more coherent picture of God.

The sequence in which we read these two books can also make a significant difference. George Murphy points out (Murphy, 2006) that it is important to read the book of God's Word first, giving us a Christ centric focus for our study of nature. We then understand the incarnate Christ as the creator of all things. In the light of God's plan of redemption through Christ, we see the importance of the crucifixion and the resurrection. It is Christ's death on the cross that enables the resurrection and the promise of new life for all. From that perspective, the principle of life from death in nature is understood as consistent with God's plan for all of creation. God brings order out of chaos, good out of evil, and life out of death in every part of his creation.

The stereoscopic perspective of the two books of God's revelation brings God into focus in a way that cannot be seen otherwise. Science may not be able to answer the question of God by itself, but God has answered the question of science, bringing meaning and purpose into a world where randomness and chance seem to abound when viewed only through its own lens.

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