



## Carl Sagan as a Theorist of Religion

**Jeffrey R. Halverson**, Professor of Religious Studies, Department of Philosophy and Religious Studies, Coastal Carolina University, Conway, SC, USA, [jhalverso@coastal.edu](mailto:jhalverso@coastal.edu)

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This article proposes the inclusion of the astronomer, cosmologist, astrophysicist, and public intellectual Carl Sagan (d. 1996) as a theorist of religious studies. By gathering material from diverse sources, it constructs a coherent and cohesive account of Sagan's theory of religion, absent any singular treatise by Sagan on the subject. Sagan's debt to earlier theorists is apparent, but with unique insights stemming from his own expertise and era. This article furthermore explores how Sagan's work may remedy certain ongoing issues in the discipline, such as the concept of "religious experience." This study concludes by advocating greater interdisciplinary coordination between the physical sciences and the humanities/social sciences in sharing a collective body of knowledge.

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The discipline of religious studies is defined by its object of study rather than by any uniform theoretical or methodological approach. Thus, scholars designated as “religious studies theorists” come from a variety of disciplines and may never identify with the field. The academy, therefore, judges their relevance to the discipline and utilizes or disregards theories as appropriate. These theorists generally come from the humanities and social sciences. Rarely has the academy looked to scholars from the physical sciences. However, this article proposes the inclusion of the astronomer, cosmologist, astrophysicist, and public intellectual Carl Sagan (d. 1996) as a theorist of religious studies. This study analyzes Sagan’s critical understanding of religion, formulates a substantive definition of religion based on his work, and explores the implications of his approach for the discipline of religious studies. Sagan’s work shows a clear debt to earlier theorists, particularly James G. Frazer (d. 1941), but with unique insights stemming from his own expertise and era. In light of Sagan’s ideas, this study concludes that there must be greater interdisciplinary coordination between the physical sciences and the humanities/social sciences in sharing a collective body of knowledge.

The sources for this study include Sagan’s books, most notably *Pale Blue Dot: A Vision of the Human Future in Space* (1994), *The Demon-Haunted World: Science as a Candle in the Dark* (1996), *Billions and Billions: Thoughts on Life and Death at the Brink of the Millennium* (1997), and *Varieties of Scientific Experience: A Personal View of the Search for God* (2006), a posthumous collection of writings edited by Ann Druyan. The title of the latter is a clear reference to the earlier work of William James.<sup>1</sup> This study also draws from a number of interviews given by Sagan as a public intellectual. He was arguably the most famous scientist in America during the late twentieth century. By gathering material from these diverse sources, this article attempts to construct a coherent and cohesive account of Carl Sagan’s theory of religion, absent any singular treatise on the subject by Sagan himself.

### **A Developmental Scheme of Advancing Human Knowledge**

To understand Carl Sagan’s theory of religion, we must begin with his developmental scheme. In the discipline of religious studies today, developmental schemes are not well regarded. This is understandable given that schemes articulated by earlier scholars, such as the nineteenth-century British anthropologist E. B. Tylor (d. 1917), provided a rationale for imperialism, cultural chauvinism, and racism, advocating the superiority of one people over another. The predictive nature of these schemes has also proven flawed, as religion (whether polytheistic, monotheistic, or something else) persists today in the most scientifically advanced societies on the Earth. The animistic worship of *kami* in contemporary Japan is a prime example. Humans are far more complex than such linear schemes would suggest. But Sagan’s developmental scheme is based on historical achievements in the accumulation of knowledge

(e.g., Darwin's theory of evolution) on a global scale. Sagan charts the evolving intellectual achievements of humanity as a single planetary species instead of competing civilizations, regions, or races. This scheme does not position one people, culture, civilization, or nation over or against another, nor predict the disappearance of earlier or alternative forms of knowledge. It marks new epistemic thresholds. In biological terms, it is not unlike the first mutation that allowed for the appearance of opposable thumbs or for aquatic creatures to breathe oxygen out of water. The advent of these mutations did not immediately eliminate all other types of life, but still marked the start of new possibilities that were never before attainable. Admittedly, change may lead to the eventual extinction of earlier forms of life or ideas ill-suited to meet the challenges of their time. Sagan's theory of religion is intertwined with this historical, developmental scheme.

Some contemporary scholars, such as the biologist David Sloan Wilson and anthropologist Pascal Boyer, have advocated other types of developmental schemes for understanding religion. In his book *Darwin's Cathedral*, Wilson (2002) argues that religion can be understood as an organismic concept. Wilson proposes that religion was advantageous to the survival and reproduction of humans due to its emphasis on altruistic behavior and communal solidarity. Therefore, genetically, humans developed religious inclinations (e.g., psychologically, emotionally) because individuals who were more religious in nature (e.g., altruistic and community oriented) were more likely to survive and pass their genes to a new generation. As Wilson (2002, 6) states: "Religion returns to center stage, not as a theological explanation of purpose and order, but as itself a product of evolution that enables groups to function as adaptive units." As a result, religion has continued to exist among and appeal to humans, even in the scientific age of disenchantment. However, Wilson's evolutionary theory does not explain the substance of religious discourse and practice (unlike Sagan's theory). Furthermore, altruistic behavior and communal solidarity are also traits of secular fraternal orders, different forms of kinship (e.g., tribalism), and nationhood, among other sociocultural phenomena (even sports fandom). One could argue that these advantageous evolutionary traits are what make humans into social creatures broadly and that these traits have no special relationship to religion. Rather, religions—as narrative-based, sensemaking endeavors—reflect the social orientation of humanity (since humans created them). Humans enshrined their socially constructed values as the moral codes or divine laws of religion.

Returning to Sagan's developmental scheme, modern humans, or *Homo sapiens*, have existed on the Earth—which is 4.5 billion years old—for approximately 300,000 years. They are, as Sagan puts it, "Johnny-come-latelys," a colloquialism meaning that humans are only recent arrivals on the scene. For a time, *Homo sapiens* existed on Earth simultaneously with other tool-using,

fire-building humans, such as *Homo neanderthalensis* (and others). The broader *Homo* family tree extends back over two million years to the Lower Paleolithic age—a miniscule fraction of Earth’s history. For the matter at hand, Sagan’s developmental scheme of advancing human knowledge begins in the Neolithic era, when *Homo sapiens* transitioned from being nomadic hunter-gatherers to settlers practicing domesticated agriculture around 10,000 BCE.<sup>2</sup> We can imagine with some certainty the challenges humans faced at the time, as we still face many of those same challenges today, albeit with far greater knowledge and more advanced capabilities at our disposal. Like social anthropologists, such as Tylor, Sagan (2006, 174) sees “animism” as the earliest instantiation of religion. He argues that religions first arose as attempts by humans to understand nature, themselves (including their emotional and psychological experiences), and how the world around them works. The earliest instantiations of religion were sensemaking, explanatory endeavors rooted in prescientific, subjective human observations and experiences.

“To our ancestors there was much in Nature to be afraid of—lightening, storms, earthquakes, volcanoes, plagues, drought, long winters,” Sagan (1994, 52) postulated. Lacking other explanations, humans attributed humanlike sentience and intent to otherwise indifferent natural phenomena and nonhuman forms of life. Following this line of thinking, a successful harvest of crops one year, unlike another year, was due to the assistance of a fertility deity, good conduct, or a ritual performed correctly. Different types of weather were the work of sentient beings too, for example, storm and rain gods (e.g., Baal Hadad, Indra, Thor, Raijin). In the absence of scientific knowledge, humans concluded that a flood, a storm, or a draught was the result of the emotional disposition (e.g., anger) of a deity, a spirit, or another sentient being, or perhaps even a malevolent human (i.e., a witch). Therefore, something could be done to atone, propitiate, or appease the spitefulness and displeasure of the deity, spirit, or being, such as a sacrifice (e.g., an animal), a prayer of repentance, a ritual of praise, or a vow of obedience. Humans repaired social relations between each other in similar ways (e.g., apologies, gifts).

Despite the many complex layers added to it over the centuries, the largest religion on Earth today (Christianity) features a supreme deity, called (principally) Yahweh, who regularly exhibits anger in the Bible (see, e.g., Deuteronomy 9:8, Exodus 32:10, Job 4:9). This deity, according to the Bible, was angered by the first humans for their disobedience and punished them with suffering and death (see Genesis 3). He promised to punish their descendants with fire for all eternity too, if not appeased by an atoning sacrifice (i.e., Jesus’s death on the cross), which Yahweh graciously provided out of love (see e.g., John 3:16). It is hard to ignore the prominent role emotion plays in this explanatory system. Attributing human emotions like anger and love to a deity is a key feature of Christianity.

This is the same deity Christians (and Jews) believe killed the entire human race (and all other life on land) out of anger by unleashing a global flood, save for one man (Noah), his family, and all the creatures he could fit on his large wooden boat. A very close variant of this narrative is recounted in the second largest religion in the world (Islam) and its primary sacred text, the Qur'ān. Meanwhile, there is no evidence a global flood ever occurred, much less one that killed everything except the inhabitants of a very large boat. Clearly, this narrative is not an attempt by the Israelites and their descendants in Palestine to document a historical event. Instead, modern archeological discoveries have revealed that the Judeo-Christian–Islamic flood narrative is Mesopotamian in origin (e.g., *The Epic of Gilgamesh*). The Mesopotamian narratives, like those of the Bible and the Qur'ān, recount angry deities (many, rather than one) intent on killing humanity with a flood. These accounts likely derive from prescientific explanations about the oceans, bad flood seasons along the Tigris and Euphrates rivers, and the perplexing discovery (at the time) of marine fossils in what are now dry, mountainous environments in the Middle East. In all of these cases, human emotions were attributed to natural phenomena to explain why events happened and to suggest it was possible to intervene to prevent future occurrences (e.g., by keeping the deity or deities appeased).

Despite a propensity for storytelling (that persists to the present), humans possess rational faculties too. Thus, some humans went beyond narrative explanations. They turned to logic and produced new explanations alongside (or often intertwining with) narrative-based religious explanations. By the sixth century BCE onwards, there was a flourishing of philosophy in a variety of cultures, including those of Greece, China, and India. These humans went beyond narrative fidelity in search of logical coherence, but with mixed results. For example, while Aristotle (d. 322 BCE) rejected most of the prevailing narrative-based beliefs of his fellow Greeks (e.g., the Olympian deities), he was nevertheless a geocentrist who argued that the stationary Earth was surrounded by celestial spheres in an eternal but finite universe consisting of five elements created by a great deity, the Prime Mover. Though dissenting opinions, including heliocentric cosmologies, appeared among his fellow Greeks, the Indians, and later Arabs and Muslims, the geocentric model of the universe prevailed. As Sagan (1994, 12) puts it: “Aristotle, Plato, St. Augustine, St. Thomas Aquinas, and almost all the great philosophers and scientists of all cultures over the 3,000 years ending in the seventeenth century bought into this delusion.”

While some individuals pursued knowledge independent of religion, many (most, in fact) still traversed religious ideas and explanations. In doing so, many educated elites sought to demonstrate that there was harmony between the disparate fields when understood correctly. The Arab philosopher al-Kindi (d. 873 CE), for example, produced works on philosophy, astrology, medicine, Islamic theology and Qur'ānic exegesis, believing that all of these fields had

something to contribute to our knowledge of the world (other Muslims disagreed). Yet, “philosophy and religion presented mere opinion—opinion that might be overturned by observation and experiment—as certainty” (Sagan 1994, 13). Science, as a way of thinking (and not simply a body of knowledge), depends on evidence. Without substantive or compelling evidence verified by observation, experimentation, and independent review, one must withhold judgment on matters. Sagan (2006, 135) refers to this as “postjudice,” or withholding judgment until after examining the evidence.

Starting in the seventeenth century, the great human intellects of the new scientific age no longer accepted claims based on mere tradition, subjective experience, or faith. The subsequent disestablishment of religion during the Enlightenment (and the freedoms that followed) made the pursuit of knowledge possible for humans like never before. The Scientific Revolution marked a new phase in the production of knowledge, and it resulted in an entirely new understanding of the universe. Longstanding beliefs were shattered. “A multitude of aspects of the natural world that were considered miraculous only a few generations ago [were] now understood in terms of physics and chemistry” (Sagan 1996, 268). Likewise, “microbiology and meteorology [could] now explain what only a few centuries ago was considered sufficient cause to burn women to death [as witches]” (Sagan 1996, 26). Disenchantment spread and religion increasingly retreated to the realm of morals and metaphysics in regions and social circles where the new scientific knowledge was accessible and embraced. Elsewhere, religion persisted, especially at the popular level, and thrived in the public sphere into the contemporary era.

Based on Sagan’s developmental scheme, it is possible to formulate a concise substantive definition of religion that draws from various passages in his writings: religion is a prescientific (and, later, antiscientific or pseudoscientific) extrapolation of human origins, the natural world, and humanity’s place in it—principally expressed through shared narratives—that projects human experiences (e.g., family relationships) and sensibilities (e.g., emotions) outward onto nature. Religion also claims some means to control nature or mitigate the harm nature may bring, including death, via prescribed rites, practices, or codes of conduct (Sagan 1994, 43, 52). There is a clear resemblance between Sagan’s definition and the earlier definition of Frazer (1947) expressed in his study, *The Golden Bough*. Further reflecting on religion, Sagan (1994, 43) notes features of religious discourse that echo universal human experiences over the millennia:

So the Universe was hatched from a cosmic egg, or conceived in the sexual congress of a mother god and a father god, or was a kind of product of the Creator’s workshop—perhaps the latest of many flawed attempts. And the Universe was not much bigger than we see, and not much older than our written or oral records, and nowhere very different from places that we know.

We've tended in our cosmologies to make things familiar. Despite all our best efforts, we've not been very inventive . . . In every culture we imagined something like our own political system running the Universe. Few found the similarity suspicious.

Sagan argues that ancient humans used their own lived experiences as the primary basis for their all-encompassing explanatory systems (i.e., religions) because that was simply the best they could do at the time. Therefore, just as humans have emotional dispositions, so does Nature. "No matter what we're thinking about, animate or inanimate, we tend to invest it with human traits," Sagan (1994, 28) writes of humans. "We can't help ourselves." Regarding the origin of the world, humans likewise postulated that the world and its inhabitants were created much the same way humans themselves create things (e.g., by childbirth or craftsmanship). In addition, the world consisted only of what humans could see, hear, smell, touch, and traverse. Whatever humans could not sense directly (e.g., the afterlife), they imagined as something very similar to the world they knew. "[Therefore,] Heaven is placid and fluffy [like the clouds of the sky above]," Sagan (1994, 43) writes, "and Hell is like the inside of a volcano."

Lacking knowledge of psychiatry, psychology, or neuroscience, humans also concluded that mentally ill members of their communities were afflicted (or possessed) by malevolent spirits (e.g., demons) or the power of a witch (e.g., a curse). Auditory and visual hallucinations could be attributed to either a benevolent spirit (perhaps a deity) or a malevolent one, depending on the experience. Disease in general was often attributed to spiritual forces. For example, plagues were often portrayed as punishments from a deity for bad conduct, including inadequate religious rites. As Sagan (2006, 220) notes:

Look at . . . things like smallpox and other disfiguring and fatal diseases, diseases of children, that were once thought to be an inevitable, God-given part of life. The clergy argued and some still do, that those diseases were sent by God as a scourge for mankind.

Though there were certainly differences among cultures and regions, premodern medicine often involved practices like divination, incantations, prayers, and rites to invoke the intervention of deities, saints, or spirits for healing. Among medieval Catholics, patron saints were believed to be especially effective against certain maladies. For example, Saint Sebastian (d. ca. 288 CE) provided protection against plagues. Thus, the relics of these saints (e.g., a bone fragment) served as important tools for healing. Infertility in particular was a common malady people used prayer and religious rites to remedy. For instance, the Bible recounts Yahweh's intervention to make the childless Abraham into a father of multitudes and give his barren wife Sarah a son, Isaac (Genesis 21).

Today, humans who live in modern, developed countries tend to turn to medical science for the treatment of diseases and infertility rather than clergy or faith healers. However, many still seek supplemental assistance from deities and spirits. Alternatively, they believe divine intervention can occur through medical science itself. Indeed, many hospitals were founded by religious organizations. For example, hospitals (or bimaristans) appeared in the Abbasid caliphate during the ninth and tenth centuries under the patronage of Muslim rulers, funded by religious endowments (Dols 1987; Ragab 2015).

## The Geocentrists

In further support of his view that religions are (at least in origin) sensemaking, explanatory endeavors rooted in prescientific, subjective human observations and experiences, Sagan points to the (historical) global prevalence of geocentrism. Due to advances in astronomy, we now know that there are over 100 billion galaxies in the observable universe. In addition, recent NASA research suggests that there might actually be ten times that amount. In each of these galaxies (including the Milky Way), there are an estimated 100 billion stars and therefore solar systems (potentially with planets). Therefore, there are 200 sextillion stars or “suns” in the observable universe (and potential planets). Some theorists proffer the idea of a multiverse as well. As Sagan (1994, 51) puts it, science has revealed the very humbling reality that humans do not live in the center of the universe but “in the cosmic boondocks.” Humans have no “privileged position in the universe,” and they are not the central characters of the cosmos (Sagan 1994, 7). However, all religions (aside from later pseudoscientific religious movements, like Scientology) initially put forth geocentric models of our universe (or simply our world). As Sagan (1994, 11) writes, “the geocentric conceit” was a “transcultural truth—taught in the schools, built into the language, part and parcel of great literature and sacred scripture.” Regarding the presence of geocentrism in religious scriptures like the Bible and the Qur’ān, Sagan (2006, 30) remarks that “[the Judeo-Christian–Islamic God] is a god of a tiny world and not a god of a galaxy, much less a universe.”

The Bible describes the creation of the world in Genesis (*Bereshit*), and the narrative draws from the cultures, texts, and knowledge of other (i.e., non-Israelite) Middle Eastern peoples from the sixth century BCE (or earlier), such as the Canaanites, Assyrians, and Babylonians. In this creation myth, before anything else exists (even light), there is only liquid water. Then comes the creation of light and the first day. Next, out of the primordial water, comes a dome of air or sky (the firmament) inside the water, and it is surrounded by water (above and below). Then, dry land is created inside the expanse (Genesis 1:9–10), and vegetation appears on it. Next, the Bible describes the creation of the sun, moon, and stars in the sky or firmament above the land (i.e., Earth), stating:

And God said, “Let there be lights in the dome of the sky to separate the day from the night; and let them be for signs and for seasons and for days and years, and let them be lights in the dome of the sky to give light upon the earth.” And it was so. God made the two great lights—the greater light to rule the day and the lesser light to rule the night—and the stars. God set them in the dome of the sky to give light upon the earth, to rule over the day and over the night, and to separate the light from the darkness. (Genesis 1:14–18 NRSV)

In this passage, water and vegetation precede the creation of the sun. The small, finite world of Genesis was the work of the aforementioned deity, Yahweh (or Elohim), who walks, talks, and rests, like a human. The first human, Adam, is created out of clay (like a pot or figurine) in Yahweh’s likeness (Genesis 1:26), suggesting Yahweh looks like a man. As already noted, Yahweh has human emotions like anger and love too.

On the other side of the planet, scribes in ancient Japan recorded their own geocentric creation myth in the *Kojiki* and *Nihongi* (or *Nihon Shoki*) in the eighth century CE. In this narrative, two deities look down at the primordial ocean from a heavenly bridge. One deity is a male (Izanagi), and the other is a female (Izanami). The male deity stirs the water below with a spear, and when droplets fall from the spear to the water below, the first land (an island) is created. The two deities descend to the island, where they marry and procreate like humans. Their union produces the islands of Japan and other parts of the world. However, the female deity dies (as humans do) and descends to the underworld after giving birth to fire. After the male deity attempts unsuccessfully to retrieve her, he purifies himself by washing his face and produces the sun and the moon in the process. The female sun deity (Amaterasu) and the male moon deity (Tsukuyomi) are siblings, but they are antagonistic and do not occupy the sky at the same time. Additionally, the sun deity is regarded as the ancient ancestor of the Japanese imperial family because she sent her grandson (Ninigi) down to the Earth, where he procreated too. Like the Biblical creation myth, the human traits of this geocentric narrative are clear.

In sixteenth century Europe, Copernicus (d. 1543) and other scholars began to challenge geocentrism and advocate a revolutionary heliocentric model instead. These scholars remained in the minority though. Rejecting geocentrism was dangerous because the implications were grave. Galileo (d. 1642) famously went before the Roman Inquisition for advocating heliocentrism. A leading Catholic theologian of the time, Robert Bellarmine (d. 1621), wrote: “To affirm that the Sun is really fixed in the center of the heavens and that the Earth revolves very swiftly around the Sun is a dangerous thing, not only irritating the theologians and philosophers, but injuring our holy faith and making the sacred scripture false” (Quoted in Sagan 1994, 14–15). In other words, despite what the evidence indicated, the narratives of religion were to always take

precedence. Many powerful institutions derived their authority from religion, ranging from popes to the Japanese imperial family. Challenging one religious belief, like geocentrism, could have a domino effect.

In time, as evidence-based scientific knowledge accumulated, earlier explanatory systems (e.g., religions) were broadly challenged, and science achieved increasing victories. In response, proponents of religion either rejected science outright (i.e., the antiscientific approach) or selectively incorporated elements of science into their religions by making new claims and interpretations (i.e., the pseudoscientific approach). For example, the Genesis creation myth came to be understood metaphorically rather than literally. Today, religions that reject science are often described as “fundamentalist,” though the term historically refers to a specific Protestant movement that originated in the United States. This movement garnered widespread attention for its rejection of Charles Darwin’s theory of biological evolution in the twentieth century, especially during the Scopes Trial of 1925.

Meanwhile, revolutionary movements worldwide, inspired by the writings of nineteenth-century German philosopher Karl Marx (d. 1883), denounced religion as the ideology of the ruling classes and the opiate of the masses. New states and parties were established that sought (unsuccessfully) to eliminate religion in the name of dialectical materialism. Rooted in philosophy, Marx posited with great ideological confidence that he had captured the sum of reality. Ironically, the works of many subsequent Marxist thinkers (e.g., Mao Zedong, Pol Pot) were treated with all the zeal and reverence of unerring religious scripture. Science and its proponents were expected to support and conform to the reigning ideology or face the consequences.

The advancement of human knowledge since the onset of the Scientific Revolution, as an aggregate, has produced a series of successive demotions debunking what Sagan calls “human conceits,” such as geocentrism. Among them are a particular set of successive scientific discoveries Sagan describes as the “Great Demotions.” These can be summarized as follows: (1) the Earth is not the center of the universe; (2) the Earth is not the only world; (3) the sun is not the center of the universe but simply a star in a great cluster of stars (i.e., the Milky Way galaxy); (4) the Milky Way galaxy is not the only galaxy but one of billions; (5) the Milky Way galaxy is not the center of the galaxy-filled universe; (6) the Earth and the other planets of our solar system are not the only planets (i.e., there are planets around other stars); (7) the universe predates the Earth by nine billion years (i.e., humans were not here at the start); (8) the Earth does not have some privileged frame of reference; (9) humans (*Homo sapiens*) are not a unique creation apart from other animals (including other members of the genus *Homo*) on the Earth (Sagan 1994, 21–26). As this new knowledge was achieved, humans revised or abandoned earlier ideas or claims that had been proven incorrect. Scientists and like-minded scholars do not accept or teach “old science” when it is incorrect (except as history). In contrast, religious ideas and

texts are presented (by associated institutions and adherents) as perpetually valid and correct. Interpretations may change, but only within limits. For example, scholars cannot edit or rewrite the Bible, the Qur'ān, the Tripitaka, or the Vedas. The content of these texts is unalterable. Only interpretations can change (and not without contention). Likewise, reform or modernization efforts may alter religious communities (e.g., female ordination), but certain religious claims are unalterable (because the religion would cease to exist without them). Scientists might be dogmatic (like “fundamentalists”) at times, but science is always in the process of inquiry, revision, and expansion. Science, as a way of thinking, does not claim to be complete or have all the answers.

The scientific accumulation of knowledge over time has occurred through a slow, deliberative process. This endeavor depends on the ongoing discovery of new evidence and the interrogation of that evidence. Due to the slow (and complex) nature of science, religion continues to thrive today in the gaps science has yet to fill. In some cases, religion thrives on what scientists and scholars have simply failed to explain persuasively to the masses (e.g., biological evolution). Sagan (2006, 64) writes:

What has clearly been happening is that evolving before our eyes has been a God of the Gaps; that is, whatever it is we cannot explain lately is attributed to God. And then after a while, we explain it, and so that's no longer God's realm. The theologians give that one up, and it walks over onto the science side of the duty roster. We've seen this happen repeatedly.

The God of the Gaps (or perhaps the Religion of the Gaps) is malleable and enduring. It settles into every opening and crevice where mystery and unanswered questions remain. In the communities and regions of the world where scientific knowledge is lacking (or willfully rejected), those openings and crevices are much larger and extend into realms where the God of the Gaps has long since retreated in other parts of the world.

### **On the “Spiritual” and the Material**

Spirituality is not synonymous with religion. Rather, spirituality is an individual endeavor to attain or cultivate inner (i.e., emotional, psychological) serenity and meaning, particularly as it pertains to a sense of connectedness between the outer world and the inner world of the individual. Religion, meanwhile, is communal and institutional, with regulated sets of practices and central discourses that carry transcendent status.<sup>3</sup> There is a passage about spirituality in Sagan's book *The Demon-Haunted World: Science as a Candle in the Dark* that is widely taken out of context, especially in the internet age. He writes: “Science is not only compatible with spirituality, it is a profound source of spirituality” (Sagan 1996, 29). Depending on how one understands the word “spirituality,” this quote could be construed—if removed from its context—as a statement

that affirms the harmony of science with religion or beliefs in an immaterial soul or transcendent reality—a hallmark of so-called New Age thought. However, for Sagan (1996, 29), “spiritual” simply meant “that soaring feeling, that sense of elation and humility combined.” It is an emotional state—a product of the brain rather than an immaterial soul, a matter of psychology and physiology rather than theology. Thus, great art, music, and literature, among many other things (e.g., the vastness of the universe) that induce such an emotional state, can be profoundly “spiritual.” He further clarifies: “Despite usage to the contrary, there is no necessary implication in the word ‘spiritual’ that we are talking about anything other than matter (including the matter of which the brain is made), or anything outside the realm of science” (Sagan 1996, 29).

By understanding Sagan’s use of the term “spiritual,” we can see Sagan’s humanist worldview come through. He was a naturalist who acknowledged science and reason as the only reliable, verifiable sources of knowledge. On the existence of God, Sagan gives no credence to claims of divine revelation or mystical union. Rather, Sagan rejects any notion of a personal deity that intervenes in human affairs and judges humans for their conduct. After all, there is no evidence for deities as an ontological category. Citing the earlier claims of Baruch Spinoza (d. 1677) and Albert Einstein (d. 1955), Sagan (2006, 149) only accepts the existence of “God” if the term signifies “something not very different from the sum total of the physical laws of the universe; that is, gravitation plus quantum mechanics plus grand unified theories plus a few other things equaled God.” This “God” is a wholly different ontological entity than the deities (e.g., Yahweh) of the world’s religions, such as Judaism, Christianity, and Islam. The same applies to Sagan’s view of other “spiritual” beings. “Without physical evidence,” he writes, “science does not admit spirits, souls, angels, devils, or dharma bodies of the Buddha” (Sagan 1996, 267). Sagan’s emphasis on physical evidence made him inherently opposed to claims based on inner experiences of the divine or transcendent that eluded critical interrogation. In *Varieties of Scientific Experience*, Sagan discusses his views on “religious experiences.” He argues that they should be understood principally through their cultural contexts and the language of molecular biology and neuronal architecture (Sagan 2006, 180). He argues that most sincerely claimed religious experiences (as interpreted or categorized) are the result of acts of physical deprivation (e.g., fasting), hypnotic trancelike states (e.g., induced via meditation or music), mental illness (e.g., schizophrenia), hypnagogia, or the ingestion of foreign substances (e.g., peyote).

Admittedly, not all religious experiences (assuming they are sincere) can be reduced to these factors. However, scientific advances in biochemistry and neuroscience have shown that human emotions and mental states are fundamentally a product of molecular activity. In other words, religious experiences are the result of chemicals in the human body and brain, not the result of an immaterial soul or a being such as a spirit, saint, or deity (which

are cultural constructs). For example, the fastest growing sect of Christianity today is Pentecostalism, and adherents claim to have religious experiences brought on by the Holy Spirit. In this context, participants attribute certain sensations, moods, and emotions to an encounter with a deity. Muslim mystics, or Sufis, attribute religious experiences to Allah or saints, including the Prophet Muhammad. However, as Sagan notes, these experiences can be induced in a variety of ways, such as through music, rhythmic movement, and breathing techniques. The only difference between the religious and the nonreligious experience is the attribution.

The fact that chemical substances can alter human moods, emotions, and mental states, and induce hallucinations, was particularly interesting to Sagan. These include “natural chemicals in the environment [and] synthetic chemicals made in laboratories” (Sagan 2006, 179). These substances can be found in cultures around the world. He explains:

If you run through our own society and other societies, you find a vast range of substances, many of them chemically very distinct, that powerfully affect mood and emotion and behavior. Not just ethanol but caffeine, mushrooms, amphetamines, tetrahydrocannabinol and other cannabinoids, lysergic acid diethylamide—known as LSD—barbiturates, Thorazine. It's a very long list. (Sagan 2006, 180)

Though not a chemist or biologist, Sagan recounts the effects of many chemicals on humans, including enkephalin, epinephrine, and others. Yet, he notes that none of these substances are solely responsible for religious experiences. They are contributing factors but may or may not be present in an individual case being investigated. Instead, Sagan (2006, 184) posits that science may one day identify a molecule primarily responsible for inducing religious experiences, naming this hypothetical molecule Theophorin. This hypothetical molecule gives humans the sensation they are a part of a dominance hierarchy, producing a feeling of “awe and wonder before a power vastly greater than ourselves” (Sagan 2006, 184). Sagan's description of Theophorin's effect on the human brain is strikingly similar to the religious experiences described by the notable Christian phenomenologists Friedrich Schleiermacher (d. 1834) and Rudolph Otto (d. 1937). Readers will recall that Schleiermacher (1999) describes the essence of religion as a feeling of absolute dependence, while Otto (1958, 10) describes it as “the emotion of a creature, submerged and overwhelmed by its own nothingness in contrast to that which is supreme above all creatures.” In the realm of plausibility, Sagan understandably argues that these religious experiences were far more likely the result of molecular activity in the human brain and body than a response to a deity, spirit, or sacred power that has thus far eluded scientific observation.

Turning from biology to the field of psychiatry, Sagan also discusses the work of Sigmund Freud (d. 1939) in his analysis of religious experiences. Admitting

that many elements of Freud's work are antiquated and Eurocentric, Sagan still finds merit in the "Freudian hypothesis" that the formative relationships between parents and children are a key part of many religions. Specifically, Sagan agrees with Freud that the Judeo-Christian-Islamic God (at its core) is an exalted father. He notes that when humans are small children, they look to their parents for protection, order, guidance, and approval as part of a dominance hierarchy. As humans grow older, they retain some element of these emotional or psychiatric needs from their childhood. Sagan (2006, 178–79) writes:

We start out with the sense that our parents are omnipotent and omniscient, we develop certain relations with them . . . and then we grow up, and as we do, we discover that our parents are not perfect. No one is, of course. There is a part of us that is deeply disappointed. There's a part of us that has been inducted into a dominance hierarchy and doesn't like the uncertainty of having to deal with things for ourselves. You know, one of the many reasons that are given for the advantages of military life and other powerfully hierarchical societies is that it's not required to think for oneself very much. There's something calming about that. And so, according to Freud, we then foist upon the cosmos our emotional predispositions.

The key problem Sagan (among others) identifies with the study of religious experience is that these experiences are entirely subjective. If scholars want observable data that can be independently verified, they must look elsewhere. Subjectivity runs throughout the phenomenology of religion, as well as other areas of religious studies. There are scholars in the field of religious studies who treat the religious experience as the *cause* in the chain of cause and effect (i.e., religions are responses to these experiences). However, Sagan argues that material reality (including complex cultural factors and molecular activity) is the cause, and therefore the experience is the effect (if it is sincere in the first place). This does not mean these experiences are insignificant though. Acknowledging the importance of these religious experiences, Sagan (2006, 162) writes:

People have religious experiences. No question about it. They have them worldwide, and there are some interesting similarities in the religious experiences that are had worldwide. They are powerful, emotionally extremely convincing, and they often lead to people reforming their lives and doing good works, although the opposite also happens.

For those who have these experiences and for certain theorists in religious studies who study them, these experiences are unique. They cannot be attributed to any external physiological or cultural factors. However, there is (at present) no evidence to support such claims. There is only the conviction of the subjective agent who recounts the experience in oral or written form (resulting in texts for

study). And undoubtedly there is emotion, which can be powerfully persuasive. A well-known Harvard psychiatrist, John E. Mack (d. 2004), was so persuaded by the emotional power of personal accounts of alien abduction experiences that he concluded they must be true (see, e.g., Mack 1994). Sagan, once a friend of Mack's, rejected his conclusion, stating: "I think [Mack] is not using the scientific method . . . many people awaken from a nightmare with profound emotional force, that doesn't mean that the nightmare is true" (Rose, 1996). On the related subject of UFOs, Sagan (2006, 162) further argued:

Large numbers of people can have experiences that can be profound and moving and still not correspond to anything like an exact sense of external reality. And the same can be said not just about UFOs but about extrasensory perception and ghosts . . . Every culture has things of this sort. That doesn't mean that they all exist; it doesn't mean that any of them exist.

Aristotle believed the Earth stood still at the center of the universe. The great philosopher argued that humans would experience the motion of the Earth through their senses if it were moving (e.g., rotating continuously on an axis). Aristotle's own subjective experience (i.e., he did not sense the motion) supported his belief, but of course he was wrong. However, when it comes to religion, many scholars (especially phenomenologists) have declared that the abundance of accounts of religious experiences on a global scale are sufficient to make religious experience the focus of the field, or even confirm the existence of a transcendent reality. Of course, early in the discipline of religious studies, scholars like Schleiermacher and Otto came to the defense of religion (more specifically, Protestant Christianity) with this precise argument in the face of detractors like Marx, Weber (d. 1920), Freud, and others who treated the subject of religion irreverently through social scientific analysis. Then and now, the phenomenologists have little to support their position beyond personal testimonies of subjective experiences interpreted within particular cultural contexts. For Sagan, it is the cultural contexts and material factors that inform or influence the subjective agent that should occupy our primary attention. "Science has taught us that," Sagan (1994, 48) wrote, "because we have a talent for deceiving ourselves, subjectivity may not freely reign."

### **On the Persistence of Religion**

Given Sagan's developmental scheme, let us briefly consider his thoughts on the persistence of religion into the present, even in scientifically advanced societies (e.g., the United States). Obviously, a great many humans are still religious in the twenty-first century. Writing at the end of the twentieth century, Sagan argues that religion fulfills important roles that science simply does not, particularly as a source of solace and stability. "There is no question that religions have historically played the role of making people contented with their lot," he writes,

echoing Karl Marx (Sagan 2006, 184). Furthermore, religion has offered (and still does) many benefits for societies around the world. Sagan (2006, 188) writes: “[Religions] can provide in a very significant way, and without any mystical trappings, ethical standards for adults, stories for children, social organization for adolescents, ceremonials and rites of passage, history, literature, music, solace in time of bereavement, continuity with the past, and faith in the future.” Yet, when religion becomes an instrument of oppression, particularly when it suppresses science and free inquiry, it can also be tremendously harmful. This latter point was a major concern for Sagan, even in the age of secularism. He states: “Where religion gets into trouble is in those cases where it pretends to know something about science” (Rose 1996).

As a source of hope, Sagan admits that few other institutions or ideologies on Earth can match religion, especially when it comes to death. Reflecting on his own mortality, Sagan states: “[Death is] a long dreamless sleep. I’d love to believe the opposite, but I don’t have any evidence” (Rose 2016). Anxiety, fear, grief, and despair all grip the human psyche, and those emotions or emotional states often relate to concerns about death. Religious beliefs in the afterlife and eschatology, as well as religious funerary rites, all attest to the power of religion to provide hope, even in the face of death. Yet, Sagan asserts that science has also provided hope in the form of medical advances (e.g., cures for diseases), food production, and countless other achievements. Describing the Scientific Revolution, Sagan (1994, 52) notes: “[S]cience brought hope.” Science, however, still lacks answers (or, at least, comforting answers) when it comes to death.

Religions, as explanatory systems, have also provided meaning, direction, and purpose for human existence. Without religion, humans lack a singular, underlying goal for the species to provide purpose and meaning to their lives, unless one counts hedonism as such a goal (Sagan 1994, 51). “If we crave some cosmic purpose,” Sagan (1994, 55) writes, “then let us find ourselves a worthy goal.” Concerned by this question (which religious leaders and philosophers have probed for centuries), Sagan proposes a nonreligious purpose for humanity—survival, ultimately by expanding outward throughout space. Acknowledging the multitude of problems facing Earth (e.g., climate change), Sagan argues that science (as a body of knowledge and a way of thinking) offers the only substantive solution to those problems. However, Sagan acknowledges that religion can (and has) played a part in facing those challenges too (Sagan 1997, 167–76). But even if those problems are resolved, Earth may still face a cosmic disaster (e.g., an asteroid strike), and the survival of the human race will require it to explore and colonize other worlds in the solar system (e.g., Mars) or even beyond. Science alone can provide such an outcome.

Obviously, the details of such a lofty endeavor are beyond the scope of the present analysis, which is Sagan’s theoretical contributions to the discipline of religious studies. The logistical complexity and financial and material costs of space exploration are astounding. The social and cultural obstacles are also

considerable. Religion is simply far more accessible to people than science. Basic scientific literacy eludes most of the human race, including those who live in otherwise scientifically advanced societies. As Sagan warns in his last television interview, “we live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology” (Rose 1996). Clearly, advances in education are a vital component of any such future effort.

### Objections to and Criticism of Sagan’s Ideas

Religious apologists and critics of Sagan have sometimes characterized him as a proponent of “scientism.” For example, a Christian creationist and biologist, David N. Menton (d. 2021), referred to Sagan as “the prophet of scientism” (Menton 1991). This term is a pejorative, and no one self-identifies with it. “Scientism” is used to signify the dogmatic philosophical or ideological position that science is the sole source of knowledge and arbiter of truth. Many years after Sagan’s death, Ann Druyan responded to this critique in her introduction to *The Varieties of Scientific Experience*, writing:

This charge [of “scientism”] is made by those who hold that religious beliefs should be off-limits to scientific scrutiny—that beliefs (convictions without evidence that can be tested) are a sufficient way of knowing. Carl understood this feeling, but he insisted with Bertrand Russell that “what is wanted is not the will to believe, but the desire to find out, which is the exact opposite.” And in all things, even when it came to facing his own cruel fate . . . Carl didn’t want just to believe: He wanted to know. (Sagan 2006, xi)

Describing Sagan’s advocacy for evidence-based thinking as “scientism” seems dismissive in nature. It ignores the substance of Sagan’s arguments and his interests in qualitative research, the social sciences, and the humanities, including anthropology, history, and philosophy. Many of Sagan’s ideas about religion are rooted in the critical analysis and interpretation of texts and ethnographic studies. For example, Sagan cites sacred texts (e.g., the Bible) and the scholarship of anthropologist James G. Frazer, psychologist Sigmund Freud, and philosopher Bertrand Russell, among others, in his discussions of the subject. “Religion,” he states, “has a long history of brilliant creativity in myth and metaphor” (Sagan 2006, 207). Sagan certainly recognized the role religion has played in human civilization. As he states in his last televised interview: “Religion deals with history, with poetry, with great literature, with ethics, with morals—including the morality of treating compassionately the least fortunate among us—all of these things that I endorse wholeheartedly” (Rose 1996).

This is further evident in Sagan’s moral philosophy, which was expressed vividly in his advocacy for nuclear nonproliferation. By the end of his life,

there were approximately fifty-five thousand nuclear weapons on Earth (Sagan 2006, 200). The potential for unprecedented human-caused destruction—an extinction-level event—was very real. Nuclear war threatened the global ecosystem and all hopes for future generations. For Sagan, life is precious, and death is the end. In his book *Cosmos* (1980, 361), he writes: “Every one of us is, in the cosmic perspective, precious. If a human disagrees with you, let him live. In a hundred billion galaxies, you will not find another.” Regarding the nuclear threat, Sagan (2006, 205) notes the important ethical and moral value of religion, stating: “It seems to me that there are many respects in which religions can play a benign, useful, salutary, practical, functional role in the prevention of nuclear war.” In particular, Sagan (2006, 206–7) points to the “moral courage” and ability to “speak truth to power” that exists in religious communities. However, as always, he asserts that knowledge and truth claims should be based on verifiable evidence, including our understanding of “religion” itself.

Similar to Sagan, the contemporary physicist and cosmologist Paul Davies does not accept the claims of the world’s religions or believe in a deity that intervenes in human affairs. However, reminiscent of a deist, Davies expresses awe at the intelligible order of the universe and attributes it to a mysterious source, which he calls “God.” In his book *The Mind of God*, Davies (1992, 232) states: “I cannot believe that our existence in this universe is a mere quirk of fate, an accident of history, an incidental blip in the great cosmic drama.” Appealing to mystery, specifically about the origins of life and human rationality, he concludes that “we [humans] are truly meant to be here” (Davies 1993, 232). For the discipline of religious studies, Davies’s arguments may be taken as a tacit endorsement of the phenomenology of religion and a rebuke of Sagan’s developmental scheme. Yet, Davies adheres to no religion and endorses no doctrines, except perhaps for an ambiguous form of monotheism or pantheism. The physical sciences, such as physics, remain his source of knowledge rather than revelation, theology, or mysticism. It seems that Davies sees religion as thoroughly human, fallible, and error-prone (but with value in the realm of ethics and morals), as though it were a prescientific (or pseudoscientific) attempt to understand the world and human existence.

### **Sagan and the Future of Religious Studies**

This article explored the work of Carl Sagan as a theorist of religion. In doing so, this study attempted to formulate his definition of religion and address how his ideas might apply to the field of religious studies. Admittedly, this analysis is somewhat novel, as it is rare for the discipline to discuss or utilize theorists from the physical sciences. However, Sagan might be better described as a transdisciplinary scholar. In his writings, he freely traversed the physical sciences, humanities, and social sciences. Yet, throughout all the diverse topics he addressed, Sagan remained consistent in his emphasis on the formulation of knowledge from evidence.

Critics of religious studies, particularly of the phenomenology of religion, argue that it is essentially an ecumenical theological project (see, e.g., Fitzgerald 2000; McCutcheon 2001; Ahmed 2015). While many disagree, there are certainly scholars in religious studies, such as Mircea Eliade (d. 1986), Joseph Campbell (d. 1987), and Huston Smith (d. 2016), who have perpetuated elements of mysticism, pseudoscience, and mythology under the guise of academic discourse and critical scholarship. Whatever their intentions, these scholars lend their credentialed authority and erudite vocabulary to articulate religious beliefs and claims based on “faith” and have no evidence or empirical substance.

With Sagan’s theoretical approach in mind, it seems inherently problematic for scholars to discuss material like religious creation myths (among other things) if an audience or readership is ignorant of the scientific community’s consensus regarding the age of the universe, the age of the Earth, or biological evolution via natural selection (among many other things). Ignorance of basic scientific facts is far more widespread than the educated readers of this article may like to believe. What is the solution then? There must be greater interdisciplinary coordination between the physical sciences and the humanities/social sciences in sharing a collective body of knowledge. Old boundaries must come down. This would undoubtedly require significant changes to how we teach and write. However, as it currently stands, audiences may be inclined to conclude that a religious myth discussed in religious studies scholarship has some reasonable ideas, emotional/psychological resonance, or narrative fidelity and thus *could* be true. They may treat the material as a legitimate option or “theory” about the way things work. Or, “it works for me,” as the popular expression about unapologetic subjectivity goes. In other words, if scholars ignore the science, it amounts to a tacit endorsement of the claims in the material. It perpetuates disinformation. Such behavior and discourse should have no place in institutions committed to the pursuit of knowledge (even if it does provide hope or solace), unless there is some other agenda. Obviously, religiously affiliated institutions have a particular agenda that secular institutions do not.

It is not enough for religious studies scholars to strive for objectivity by teaching and writing from a neutral but sympathetic outsider’s perspective. Rather, Sagan calls on scholars to interrogate claims based on existing verifiable evidence. He also warns them not to do so out of malice but with empathy for their fellow human beings. “If it takes a little myth and ritual to get us through a night that seems endless, who among us cannot sympathize and understand?” Sagan (1994, 51) writes. But empathy is not a license to ignore science. As Sagan (1996, 297) argues: “We cannot have science in bits and pieces, applying it where we feel safe and ignoring it where we feel threatened—again, because we are not wise enough to do so.” In short, scientific facts cannot be suspended or set aside in religious studies. They have as much a place in religious studies courses, classrooms, and scholarship as historical facts. Otherwise, we sacrifice knowledge for the sake of comfort, and we must question the public good of the discipline.

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## Notes

<sup>1</sup> See James (1902).

<sup>2</sup> Henceforth, this article will refer to *Homo sapiens* simply as humans.

<sup>3</sup> See, e.g., Bruce Lincoln (2006, 5–8).

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## References

- Ahmed, Shahab. 2015. *What Is Islam? The Importance of Being Islamic*. Princeton, NJ: Princeton University Press.
- Davies, Paul. 1992. *The Mind of God: The Scientific Basis for a Rational World*. New York: Simon & Schuster.
- Dols, Michael W. 1987. “The Origins of the Islamic Hospital: Myth and Reality.” *Bulletin of the History of Medicine* 61 (3): 367–90.
- Fitzgerald, Timothy. 2000. *The Ideology of Religious Studies*. New York: Oxford University Press.
- Frazer, James G. 1947. *The Golden Bough: A Study of Magic and Religion*. New York: The Macmillan Company.
- James, William. 1902. *The Varieties of Religious Experience: A Study in Human Nature, Being the Gifford Lectures on Natural Religion Delivered at Edinburgh in 1901–1902*. New York: Longmans, Green, and Co.
- Lincoln, Bruce. 2006. *Holy Terrors: Thinking About Religion After September 11*. 2nd ed. Chicago: University of Chicago Press.
- Mack, John E. 1994. *Abduction: Human Encounters with Aliens*. New York: Scribner.
- McCutcheon, Russell T. 2001. *Critics Not Caretakers: Redefining the Public Study of Religion*. Albany, NY: SUNY Press.
- Menton, David N. 1991. “Carl Sagan: Prophet of Scientism.” <https://www.apostolic.edu/carl-sagan-prophet-of-scientism/>.
- Otto, Rudolph. 1958. *The Idea of the Holy*. New York: Oxford University Press.
- Ragab, Ahmed. 2015. *The Medieval Islamic Hospital: Medicine, Religion, and Charity*. New York: Cambridge University Press.
- Rose, Charlie, host. 1996. *The Charlie Rose Show*. Aired May 27, 1996 on PBS.
- Sagan, Carl. 1980. *Cosmos*. New York: Ballantine Books.
- \_\_\_\_\_. 1994. *Pale Blue Dot: A Vision of the Human Future in Space*. New York: Ballantine Books.
- \_\_\_\_\_. 1996. *The Demon-Haunted World: Science as a Candle in the Dark*. New York: Ballantine Books.
- \_\_\_\_\_. 1997. *Billions and Billions: Thoughts on Life and Death at the Brink of the Millennium*. New York: Ballantine Books.
- \_\_\_\_\_. 2006. *The Varieties of Scientific Experience: A Personal View of the Search for God*. New York: Penguin Books.
- Schleiermacher, Friedrich. 1999. *The Christian Faith*. New York: T & T Clark.
- Wilson, David Sloan. 2002. *Darwin’s Cathedral: Evolution, Religion, and the Nature of Society*. Chicago: University of Chicago Press.

