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Statement of Perspective. The word *zygon* means the yoking of two entities or processes that must work together. It is related to *zygote*—meaning the union of genetic heritage from sperm and egg, a union that is vital in higher species for the continuation of advancement of life. The journal *Zygon* provides a forum for exploring ways to unite what in modern times has been disconnected—values from knowledge, goodness from truth, religion from science. Traditional religions, which have transmitted wisdom about what is of essential value and ultimate meaning as a guide for human living, were expressed in terms of the best understandings of their times about human nature, society, and the world. Religious expression in our time, however, has not drawn similarly on modern science, which has superseded the ancient forms of understanding. As a result religions have lost credibility in the modern mind. Nevertheless some recent scientific studies of human evolution and development have indicated how long-standing religions have evolved well-winnowed wisdom, still essential for the best life. *Zygon*'s hypothesis is that when long-evolved religious wisdom is yoked with significant recent scientific discoveries about the world and human nature, there results credible expression of basic meaning, values, and moral convictions that provides valid and effective guidance for enhancing human life. *Zygon* also publishes manuscripts that are critical of this perspective, as long as such papers contribute to a constructive reflection on scientific knowledge, human values, and existential meaning.

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Editorial

Worldviews and IRAS

In this Editorial for the December 2024 issue, you will find a brief overview of the articles included in this issue, both in the general section and in the four thematic sections, including one Book Symposium, as well as an overview of books reviewed in the latest edition of *Reviews in Science, Religion and Theology*.

Article

This issue contains one general article. Mikael Stenmark observes that the increasing number of individuals lacking religious faith or self-identify as nonreligious in certain parts of the world necessitates a shift in science-and-religion to a "science–worldview" dialogue; he subsequently identifies the main ways of relating science and worldviews in a new typology and provides examples for each.

Spiritual Experience

In a thematic section on "Spiritual Experience," Calvin Chatlos, co-chair of the 2025 Summer Conference of the Institute on Religion in an Age of Science, publishes a programmatic article on his "Framework of Spirituality," which is the driving concept behind the upcoming conference. Three commentators have been invited to comment on Chatlos's piece: Michael Winkelman from a scientific perspective, Nick Hedlund from a philosophical perspective, and Fraser Watts from a theological perspective.

IRAS at the Parliament of the World's Religions (by Carolyn J. Love)

In August 2023, in Chicago on the shore of Lake Michigan, the Parliament of the World's Religions offered a "Science and Religion track" for the first time. The event exemplified diverse ideas and beliefs, with 8,000 attendees representing 210 spiritual traditions. The new track highlighted the dialogue between science and religion primarily due to the Institute on Religion in an Age of Science (IRAS) members. The papers addressed the theme, "A Call to Conscience: Defending Freedom & Human Rights," which contained five sub-

themes: Climate Action, Global Ethics, Next Generation, Peace and Justice, and Women's Dignity. The articles in this thematic section represent a few select essays that address Climate Action, Peace and Justice, and Next Generation.

The first two articles address the topic of climate action; the following article focuses on peace and justice, while the final two look at the next generation. The event was a testament to collaboration with physicist and President of the American Teilhard Association, Kathleen Duffy, identifying the interaction between incarnation and evolution as seen in the works of Teilhard de Chardin, which provides a framework for tapping into the sacredness of nature. Duffy explores how this sacredness of matter can motivate us to develop a flourishing humanity and Earth. Similarly, theologian Carolyn J. Love emphasizes the interconnectedness between God, humans, and the environment. Love explores Earth care through a biological-event understanding that examines genetic inheritance (DNA), epigenetic inheritance, and phenomenology to construct an understanding of human experience that encourages ecological protection. Next, JD Stillwater, Science Ambassador, takes a noteworthy approach to peace and justice grounded in the cosmos. Stillwater advocates using creation or natural reality as a standard sacred text for all the world's faith traditions that may ease interreligious and intercultural conflict. Astronomer Grace A. Wolf-Chase, theologian Katharine E. Hinman, and astronomer Laura Trouille examine how collaborative projects build relationships between scientific and religious communities. The Zooniverse initiative effectively integrates scientific research into seminary classes, interfaith programs, and family education programs, thus aiding this and future generations in seeing the rapport between science and religion. Finally, theologian Katharine E. Hinman, ethicist John P. Slattery, theologian Curtis Baxter, and astronomer Jennifer Wiseman explain how teaching science in seminaries prepares future pastors for the challenges of a rapidly changing world. They present a comprehensive evaluation of their Science for Seminaries project that found significant positive impacts on seminaries' engagement with scientific topics, students' perception of science and connection with scientists, faculty engagement and networking, and project sustainability. The Science for Seminaries model is an effective and impactful approach to equip faith leaders with the needed skills and resources for engaging science in their ministry contexts.

Book Symposium (by Mladen Turk)

The Book Symposium in this issue features Neil Van Leeuwen's *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity* (2023). It has four commentators: Alberto Cavallarin and Hans Van Eyghen, Lluis Oviedo, and Konrad Szocik. Van Leeuwen responds to the comments.

Boyle Lecture 2024

This final thematic section contains the 2024 Boyle Lecture, delivered by David Fergusson under the title "Is Religion Natural?," as well as the response by Fiona Ellis and two panel contributions, by Joanna Leidenhag and Russell Re Manning.

Books reviewed in *Reviews in Science, Religion and Theology*

Reviews in Science, Religion and Theology is a quarterly joint publication of the European Society for the Study of Science and Theology (ESSSAT) and the International Society for Science and Religion (ISSR) and is distributed free to all members of ESSSAT and ISSR. In order to give readers of *Zygon: Journal of Religion and Science* an overview of recent publications, we include the list of books reviewed in the latest *Reviews* issue (in this case, September 2024):

- Peter Harrison, *Some New World: Myths of Supernatural Belief in a Secular Age*, Cambridge: Cambridge University Press, 2024
- Justin L. Barrett, ed., *The Oxford Handbook of Cognitive Science of Religion*, Oxford: Oxford University Press, 2022
- Brian Villmoare, *The Evolution of Everything: The Patterns and Causes of Big History*, Cambridge: Cambridge University Press, 2023
- David P. Mindell, *The Network of Life: A New View of Evolution*, Princeton, NJ: Princeton University Press, 2024

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Worldviews and Science

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The increasing number of individuals who lack religious faith or self-identify as nonreligious in certain parts of the world necessitates a shift in the science–religion dialogue and a change of some key categories and notions. This shift, I argue, implies the expansion of the science–religion dialogue into a science–worldview dialogue, so the core question becomes the relevance of science for the formation, revision, and rejection of both religious worldviews (such as Buddhism, Christianity, and Islam) and secular worldviews (such as scientific naturalism, liberal naturalism, and secular humanism). I begin by explaining what worldview studies are and why refocusing from science and religions to science and worldviews is important. I then identify the main ways of relating science and worldviews in a new typology and provide examples for each.

As an active participant in the science–religion dialogue, I have been thinking and writing about how to understand and conceptualize the relationship between science and religion in the contemporary world for many years (Stenmark 1995, 2004, 2010, 2022a). In a different context, I have argued for the importance of developing worldview studies to supplement religious studies (Stenmark 2022b).[1] This is because a significant number of individuals, particularly in regions like northern Europe and northern America, no longer identify as religious. Therefore, it is crucial to establish an academic discipline that investigates these individuals' outlooks on life and juxtaposes them with religious ones.

In this article, I argue that the introduction of worldview studies interestingly changes the focus of the science–religion dialogue. One could even say that the core idea is to expand the science–religion dialogue into a science–worldview dialogue. Today, the relevant question is not how science and religion could and should be related but how, on the one hand, science and, on the other, religious or secular worldviews could and should be related. We need to address not a two-way relationship between science and religion but a three-way relationship between science, religious worldviews, and secular worldviews. What is science's relevance for forming and reforming our outlooks on life—whether we want to live religious or secular lives?

In the first section of this article, I explain what worldview studies are and why refocusing from science and religions to science and worldviews is important. In the second section, I identify the main ways of relating science and worldviews in a new typology and provide examples of each.

Worldview Studies

More people than ever before—especially in the northern parts of Europe and America—self-identify as nonreligious and reject religion. They want to live secular rather than religious lives (Inglehart 2021). The most influential theoretical framework, most of the time a merely unstated assumption to understand this latter development, is what I call the *subtraction theory*. It is the hypothesis that we should assume individuals or groups of people who reject religion or do not self-identify as religious abandon what they see as unnecessary, false, or inadequate add-ons to humanity's shared view and way of life. They simply stop holding religious beliefs and participating in religious practices and organizations. They become atheists (a rejection of theism but not much of a positive statement about anything else), agnostics, religious nones, or nonreligious people. One way of stating this view is to say that religious people believe in the supernatural. In contrast, nonreligious people stop doing that and merely believe in the natural—as religious people also do. Religious believers add on beliefs about the supernatural, whereas nonreligious people make do without that add-on; they are nonbelievers and merely left with the views they share with religious believers. We can also adopt a more practice-oriented

understanding of the subtraction theory and say that religious people engage in certain activities. In contrast, nonreligious people stop doing so. As such, they can be adequately described as "religious nones." Self-described nonreligious people are simply marking an absence or standing in opposition to religion. For this reason, many scholars have been inclined to use analytical terms that are primarily negative and talk about nonreligion, religious nones, nonreligious people, or religion's other (Lee 2015; Smith and Cragun 2019; Bullivant 2020). The core idea is that due to the changes we see in society today, we need to add the study of nonreligion to the study of religion due to the changes we see in society today. To religious studies, we must now add nonreligious studies.

I think we should challenge this theoretical framework or assumption and instead explore to what extent the replacement theory can be philosophically and empirically sustained.[2] Replacement theory is the hypothesis that some individuals and groups reject religion but also consciously or unconsciously replace or strive to replace it with an alternative outlook on life. As Charles Taylor (2007, 9) phrases it, they try to develop "immanent construals of human flourishing." They try to come up with an alternative story of why we are here, what makes something good or evil, what provides meaning in life, and how we should live our lives in light of the key features of this alternative story. Self-identifying as nonreligious in this sense is not assumed to be only a matter of being without religion but also a matter of being with something else. For this reason, scholars need to develop analytical terms that are primarily affirmative (or terms of presence, not absence) and talk about "secular worldviews" and "secular people," "secular rituals," "secular faith," and "secular nones" or develop similar categories. The term "secular" is used here not as a synonym for "nonreligious" but as a term that signals the embrace of an alternative worldview (of one kind or another) to the religious ones. Hence, we need to add secular studies, not the study of nonreligion, to religious studies. Consequently, sometimes at least, we have to distinguish between religious and secular worldviews.

The academic study of both religious and secular worldviews, and everything in between, can be called *worldview studies*. Since there are no clear-cut boundaries between religious and secular outlooks on life, it might also be appropriate to sometimes talk about semi-secular or semireligious worldviews (af Burén 2015; Jonbäck and Palmqvist 2024). The objective of worldview studies is not to understand and theorize about just the world's religions but also the secular or semi-secular alternatives emerging in some parts of contemporary society. The idea is that conceptualizing them in worldview terms provides a better understanding and makes comparison with traditional religions more adequate than conceptualizing them in terms of nonreligion or religious nones.

According to the replacement theory, we should assume that even if not all people are religious, most people have a worldview of one kind or another. Of

course, whether or not that is the case is both a conceptual and an empirical question. First, it depends on what we take a worldview to be and, second, whether we can confirm the existence of emerging secular worldviews.

The choice of the term "worldview" might lead one to think that a worldview must be all-embracing. Michael L. Peterson and Dennis R. Venema (2021, 27) say "a worldview provides a comprehensive framework that serves to fit all truths together in a relationship." Alvin Plantinga (2011, ix) writes that "a worldview [is] a sort of total way of looking at ourselves and our world." So, we expect and countenance only those outlooks on life that contain a whole way of looking at ourselves and our world or express our overall view of the nature of reality as worldviews. It is clear that not all people have such a comprehensive worldview. In this sense, there is evidence supporting the subtraction theory. Many, if not most, nonreligious people have not replaced Buddhism, Christianity, or Islam with some similar overarching set of beliefs, values, and practices. Do such people not have a worldview? I assert that we should resist defining and understanding the notion of worldview in such a way as to imply that they do not. Arguably, many Buddhists, Christians, and Muslims do not have a worldview in this sense either because their outlook on life is not even close to containing a comprehensive framework that serves to fit all truths together in a relationship. Hence, the idea that worldviews must be comprehensive should be rejected.

I suggest that we understand a *worldview* to be a constellation of beliefs, values, and attitudes that people, whether consciously or unconsciously, hold and that constitute their basic understanding of who they are, what the world is like, what their place in it is, what they should do to live a good and meaningful life, and what they can say, know, rationally believe, or assume to be true about these things (Stenmark 2022b, 565). By *belief* I mean what people claim, think, or assume to be true about the world and their place therein. One might believe that God exists, that everything that exists is ultimately made of matter, that people have or do not have free will, that we are basically good or evil, or that there is or is not an afterlife. But worldviews also contain different values about what we should do or avoid to live a good life, both on the individual and collective levels. Humanists think human dignity and the values and duties that flow from a commitment to that dignity should shape our worldview. Transhumanists believe that posthuman lives would be better lives: we ought to enhance ourselves. Furthermore, worldviews also include attitudes or stances directed toward the world, other people, or ourselves. It could be said, roughly, that these attitudes express our emotional dispositions toward things, properties, processes, and states of affairs in the world. For instance, many theists do not merely believe that God exists but put their faith or trust in God.

Thereby, two things a worldview contains, among others, are our ontology—what we take to exist and how these things relate to one another and what properties they have—and our epistemology—what we can know,

rationally believe, or merely assume to be true about these things, properties, and relations. A third requisite is that a worldview encompasses our ethical or moral stance—the value commitments we express in thought and action. Alternatively, and more precisely, a worldview contains those parts of our ontology, epistemology, and ethics that are central to understanding and living our lives (Stenmark 2022b, 565). A worldview is best understood as action-oriented. One can say that a worldview's function is primarily to help people deal with their existential concerns, that is, their questions about who they are, why they exist, what the meaning of their life is, and what attitude or stance they should take towards the experiences of death, suffering, guilt, anxiety, love, friendship, forgiveness, and the like. Consequently, not just any of our beliefs, values, or attitudes will do. A worldview contains those beliefs, values, and attitudes that are of particular importance for our self-identity and the things we fundamentally care about in life.

The central idea in worldview theory is that people—whether or not they are religious—express, through their actions and what they say, a particular understanding of what the world is like, what we ourselves are like, what is most important about the world, what our place in it is, and what we must do to live a good life. While a person's understanding might be limited or partial in several ways, it is a worldview if it is still about these important issues in life. Hence, we should not be misled into thinking that worldviews have to be comprehensive: we must allow that they might merely consist of loosely interconnected attitudes, beliefs, and values central to how individuals understand and live their lives. This is so in the same way that we should not assume that religions must be comprehensive to be religions. Like religions, people's worldviews can be more or less articulated, comprehensive, and coherent. Nor should we be misled into thinking that beliefs, values, or attitudes must come first and practice second. The traffic, so to speak, can go both ways: not merely from what is taken to be true or of value to action, but also from how people live their lives to what they thereby take to be true and of value. At times, a worldview must be inferred from an individual's or group's way of engaging with the world.

One problem with using the notion of worldview as an umbrella term to cover both religious and nonreligious people's outlooks on life is that there is a fundamental ambiguity in how the notion is used in contemporary society. On the one hand, people talk about a "scientific worldview," which means the picture of the universe that emerges if we combine the different theories of physics, astronomy, chemistry, biology, psychology, and sociology into a systematic whole. On the other hand, and in line with how the notion is used here, some people make statements about the embeddedness of science *within* a particular worldview, such as Christianity, Islam, or naturalism (Stenmark 2003, 928–29).

If we understand the concept in the second way, as we must in worldview studies, it follows that science alone cannot provide us a worldview, even though science can significantly contribute to forming or revising a worldview.

This is so because this conception entails that science lacks certain features that characterize a worldview. It is a matter of dispute what these features are exactly, but science seems to lack two elements: values and metaphysics. In this sense (and as I have defined it), a worldview tells us who we really are, what the world is ultimately like, and what we should do to live a satisfying life. It gives our life direction and meaning and thus provides us with values. But science essentially gives us facts or non-normative descriptions of reality, not values. It does not tell us how to live or what we should ultimately value in life. If this is correct, science does not qualify as a worldview.

Moreover, no scientific discipline can tell us whether the physical universe is all there is. If scientists make such an assertion, they make a metaphysical rather than a scientific claim. Instead, a view that says that reality consists of God and all that God has made and that we should live a life according to God's will is a worldview. The same is true for a view that says that, ultimately, reality consists of nothing but matter or physical particles in motion and that nothing possesses any moral value. Some advocates of scientism question this, arguing that the boundaries of science can be expanded in such a way that it can offer us both values and metaphysics (Harris 2010; Rosenberg 2011; Wilson 1990). However, this view is highly controversial and lacks scientific consensus.

The discussion about the proper limits of science goes beyond what can be argued for in this article,[3] but let me at least exemplify. Sam Harris thinks science can determine human values. His basic idea is that "questions about values—about meaning, morality, and life's larger purpose—are really questions about the well-being of conscious creatures. Values, therefore, translate into facts that can be scientifically understood" and justified (Harris 2010, 1–2). Moral truths are simply facts about human wellbeing. Science can tell us what human wellbeing is and what kinds of actions promote it. Harris acknowledges that there might be practical problems in doing this, but in principle, science can determine what is morally right and wrong. It is certainly correct that science can inform our moral choices. Given, for instance, that we do not want to jeopardize present human wellbeing or the wellbeing of future generations, science can offer us guidance on how to limit the severe climate changes that threaten our long-term wellbeing. However, an obvious problem with Harris's proposal is that it is unclear why we should take human wellbeing as our fundamental value. How does science know this is the correct value to embrace? Why human wellbeing rather than, say, the wellbeing of Earth's ecosystems? The answer to this value question could not possibly be a scientific finding. Hence, the core value assumption of Harris's "scientific" ethics does not come from science.

Therefore, in the worldview study discourse, we should call Harris, Alex Rosenberg, and Edward O. Wilson's outlook on life a "scientistic" rather than a "scientific" worldview. This use of the analytical term "worldview" is, of

course, compatible with the observation that some individuals think science qualifies as a worldview. Still, we call such a view "scientistic" because it extends upon the current conceptions of what science is and what it provides.

What we gain by using the notion of worldview—rather than the notions of religion and nonreligion—is an analytical category where both religions and secular outlooks on life can be studied in positive or affirmative terms. We also understand that the reason some thinkers have their view about science and religion depends on their prior acceptance of a secular worldview of one kind or another. This is similar to the views of other thinkers that are colored by their prior religious commitments. If essentially everyone has a worldview, then the discussion about science and religion is not between religious believers and "neutrals"—noncommitted people or nonbelievers—but between people who embrace different, sometimes rival, worldviews.

Therefore, we must pay attention to whether one line of reasoning depends on the prior acceptance of a particular worldview in the science–religion debate. We need to distinguish between worldview-transcending and worldview-immanent arguments. A worldview-transcending argument contains premises or reasons that surpass people's different outlooks on life. Their force does not directly depend on whether we accept a Christian, Buddhist, scientistic, or secular-humanist worldview. Worldview-immanent arguments are arguments containing premises or reasons that depend, directly or indirectly, on the acceptance of one particular worldview or a subset of them.

As I have already indicated, I propose that religious people should not be contrasted to nonreligious people or religious nones but to secular people. The outlooks on life that—consciously or unconsciously—the latter embrace or develop in their lives ought not to be called nonreligion but secular worldviews. We can then distinguish between two types of worldviews, while not denying that there are many borderline cases. Specifying the distinction is difficult, but we could say that *religious worldviews* affirm or assume the existence of a transcendent, divine, or spiritual dimension of reality and uphold its importance for understanding and living our lives. However, religious people can understand this dimension of reality differently. *Secular worldviews* deny or doubt the existence of a transcendent, divine, or spiritual dimension of reality and instead maintain or assume that reality has a different makeup, and it is the basic features of this reality that are important for how we should understand and live our lives. However, secular people can understand this alternative outlook on reality differently (Stenmark 2022b, 573–74).

The worldview many reflective atheists in the Western world embrace today contains, roughly, the view that reality is made up entirely of physical particles in fields of forces brought into existence in the Big Bang and reality's tendency to produce increased complexity over time on Earth (and perhaps elsewhere in the universe) is the result of purely unintended causal processes and natural

laws that happen to exist (Clark 2015). It is against this background that we must understand ourselves and how we should live our lives. In this sense, nature is all there is and ever will be. Within philosophy, this secular worldview is often called *naturalism (*de Caro and Macarthur 2004, 2–3). Graham Oppy and N. N. Trakakis (2009, 301) maintain, "Many atheists have been concerned to develop alternative worldviews to the kind of worldviews that are presented in the world's religions; and, in particular, many atheists have been concerned to develop naturalistic worldviews that leave no room for any kind of supernatural entities." Naturalism could be developed in different ways,[4] but two of the most influential are scientism and secular humanism (LeDrew 2016). Advocates of scientism privilege science in all areas of life and are consequently suspicious of everything else. Science alone should guide us in understanding our world and how we should live our lives. Secular humanists, on the other hand, reject the hegemony of science. Instead, they maintain that secular people should be guided by humanism, a belief in human freedom, autonomy, and dignity.[5]

Today, any worldview that aims to be intellectually credible needs to take into account the theories and discoveries of science. However, most major religious worldviews, and certainly Buddhism, Christianity, Confucianism, Islam, Hinduism, Judaism, and Taoism, did not emerge to prominence in a culture as dominated by science (as we today understand its key features) as ours. Therefore, their core conceptions and ideas were not formulated in a scientifically infused culture, and their compatibility and coherence with contemporary science became a natural question. One important exception is the so-called New Spirituality (or "New Age Spirituality").[6] Not surprisingly, its advocates have consciously chosen a scientifically inspired vocabulary to express their religious views. Hence, the language of the New Spirituality frequently contains terms such as "energy," "frequency," "vibration," "dimension," and "quantum," and they even sometimes talk about the science of yoga, reiki healing as a science, or occult sciences. Moreover, the worldview of the New Spirituality is often expressed in educational terms. Sometimes, the gatherings or meetings are described as workshops, lectures, and classes. As James R. Lewis (2007, 211) writes, "Large New Age gatherings such as the Whole Life Expo resemble academic conferences more than they resemble camp meetings." Lastly, perhaps more than in most other religious worldviews, there seems to be a degree of consensus about the need for science and spirituality to come together in some higher, holistic unity, even if they might have different understandings of how to obtain this unity. These ideas of some higher, holistic unity are, of course, not lacking in the other, more traditional religious worldviews. Still, they were essentially formed in a prescientific age, and these historical roots are essential for Christians, Hinduists, and Muslims' self-understanding, for example. It also means their vocabulary is

more "old-fashioned" and less scientifically influenced. On a surface level, at least, this places them in a disadvantaged position compared to more recently developed religious or secular worldview alternatives.

Nancey Murphy tracks the origin of secular worldviews, or what she (as philosophers typically do) calls naturalism, in the Western world to the writing of David Hume's corpus and Baron d'Holbach's *System of Nature* in the second half of the eighteenth century. Naturalistic traditions during the subsequent centuries included the writings of intellectuals like Karl Marx, Sigmund Freud, and Friedrich Nietzsche, as well as contemporary contributors to this tradition, such as Richard Dawkins and Daniel D. Dennett. In Murphy's (2008) terminology, a tradition is essentially a worldview thought of in terms of its historical development. She refers to James Turner's startling claim that disbelief was not a live option in the United States until roughly between 1865 and 1890. Hence, secular worldviews emerge in a scientifically infused culture, some more motivated by theories in social sciences, others more by those in the natural sciences, but also due to changing social conditions (better life expectancy, less loss of children, and better social safety nets), as many sociologists have pointed out. Perhaps we can talk about four emerging subtraditions: the Humean trajectory leading to skepticism, the Freudian trajectory leading to scientism, the Nietzschean trajectory leading to nihilism, and the Marxist trajectory leading to secular humanism.

Not surprisingly, advocates of secular worldviews try to take advantage of outlooks on life being formulated in a scientific age. For instance, evolutionary psychologist Steven Pinker maintains that the worldview that guides the moral and spiritual values of an educated person today is the worldview given to us by science. He writes, "The findings of science entail that the belief systems of all the world's traditional religions and cultures—their theories of the origins of life, humans, and societies—are factually mistaken" (Pinker 2013). It is just that not all people, including many scientists, have understood this yet.

How to Relate Science and Worldviews

How could and should we then think about the relationship between our different (religious or secular) worldviews and science? I suggest that we essentially have six options to choose from when expressing how we see the relationship between our worldview and science today. The relationship concerns the compatibility, coherence, and relevance of science for the particular beliefs, values, and attitudes that, taken together, constitute our worldview. We could embrace one of the following options:

1) Our worldview is entailed by science; it starts from and stops with science.
2) Our worldview privileges science but nevertheless goes beyond science.

3) Our worldview goes beyond science, but science can support or add to its credibility.
4) Our worldview is compatible with science, but that is all we can ask for since science and worldviews do different and unrelated jobs in our lives.
5) Our worldview is incompatible with contemporary science, but as science progresses, it will become clear that our worldview is compatible with, and perhaps even supported by, science.
6) Our worldview is incompatible with science, but that is what we should expect because these commitments go against reason—including scientific reason.

Notice that the way these six alternatives are expressed here is a shorthand version for a more precise statement, which also contains the denial of a central claim of the previous option. So, alternative (2) should be understood in the following way: our worldview is not entailed by science (as in alternative 1). It merely privileges science or is grounded in science but still goes beyond what science can tell us about reality. According to alternative (3), our worldview is neither entailed nor guided by science because its central motives or grounds are obtained from or provided by other sources. Still, there is contact between our worldview and science, so science can support or add to its credibility. Advocates of alternative (4) do not think that science supports or adds to the credibility of their worldview. However, they see nothing problematic about this because science and worldviews do different and unrelated jobs in our lives; they occupy separate domains at a sound distance from each other. Still, they take their worldview to be compatible with and not in conflict with what science teaches us—and this is all we can ask for.

Before I further explore and exemplify the differences between these options, notice that compatibility or consistency is a binary relation—something is either compatible or incompatible with something else. In contrast, support or coherence is a matter of degree. The evidence we have could increase the likelihood of one of our beliefs *p* to a limited extent, or evidence could increase it so much that we would not merely say we believe *p* but know *p*. We have minimal support, maximal support, and everything in between—besides, of course, the possibility of no support. With this in mind, let us go through each option one at a time.

1) The Scientistic View

If the prestige of science could somehow be transferred to a particular worldview, many think its credibility would increase significantly. Therefore, one stance we can embrace is to try to derive our worldview from science alone. Wilfred Sellars and Rosenberg are two examples of people embracing

the first option. Sellers (1963, 173) maintains that "[s]cience is the measure of all things, of what is that it is, and of what is not that it is not." Rosenberg (2011, 8) describes his worldview (the one he proposes we all should share) when he writes: "Being scientistic just means treating science as our exclusive guide to reality, to nature—both our own nature and everything else's." Hence, we can call the worldview that presupposes this one-dimensional or monistic relationship between it and science a scientistic worldview, scientism, or scientific naturalism.[7]

Although advocates of scientism or scientific naturalists share a skeptical attitude towards what is not a proper part of science, they do not all draw the same conclusions on what to think about the nonscientific. This is because scientific naturalists essentially have two options to consider when assessing something that does not appear to be within the purview of science. They could maintain that the practice or phenomenon must be redescribed, reduced, or transformed into science (the naturalization or scientization strategy). Alternatively, they might maintain that it must be explained away by science and treated as fiction; that is, it must either be taken as a helpful but illusory belief or else be abandoned completely (the elimination strategy). They could try to either "naturalize" or "scientize" a phenomenon, that is, turn it into science or reject it if that is not possible.

However, scientific naturalists have differing views on what should be located in the first category and what should be placed in the second. For this reason, a scientistic worldview could be developed in different ways. (Alternatively, we could say there is more than one scientistic worldview.) Let me give one example. The humanities do not appear to be part of the sciences, so how should one, as an advocate of scientism, think about this set of academic disciplines and their outcomes? Do the humanities have a place in such a naturalistic world? Rosenberg is an example of a scientific naturalist who opts for the elimination alternative. He maintains:

> There is only one way to acquire knowledge, and science's way is it. The research program this 'ideology' imposes has no room for purpose, for meaning, for value, or for stories. It cannot therefore accommodate the humanities as disciplines of inquiry, domains of knowledge . . . the humanities are a scientific dead end . . . When it comes to real understanding, the humanities are nothing we have to take seriously, except as symptoms. (Rosenberg 2011, 306–7)

Values, meaning, purpose, love, and beauty, as studied by the humanities, are illusions: they are not within the purview of science and therefore have to be ruled out.

Wilson, on the other hand, would argue that the humanities could and should be transformed or naturalized. He wants to find ways to incorporate

them into a naturalistic or, more exactly, scientistic worldview. Wilson (1999, 9) maintains that the "only way to establish or to refute consilience [between the natural sciences and the humanities] is by the methods developed in the natural sciences . . . [This idea's] best support is no more than an extrapolation of the consistent past success of the natural sciences. Its surest test will be its effectiveness in the social sciences and humanities." Why would it be a problem if the natural sciences failed in undertaking this project? The answer given by the scientific naturalist is that otherwise there is a great risk that there is no real content to the humanities, since reality is at the bottom what science says it is and nothing more (or, at the least, that there is no knowledge or justified beliefs in the humanities since our beliefs and our theories are justifiable only by the methods of the natural sciences).

Due to the prestige of science, people typically try to maximize their worldview's intellectual standing when opting for this alternative. Often, presumably for rhetorical reasons, they do not want to acknowledge a distinction between science and their scientistic worldview, maintaining that this is, in fact, a scientific worldview, no more, no less.

2) The Extension View

Other naturalists have studied these attempts to naturalize or scientize our world and concluded that science is not enough. They think the world of persons, intentionality, agency, self-consciousness, social institutions, and morality is real and cannot be reduced to the world of the sciences, that we can know things about these phenomena and that they matter for how we should understand and live our lives. Mario De Caro and David Macarthur (2004, 16–17), for instance, maintain that "all attempts to reduce, eliminate, or reconceive these concepts [such as intentionality, agency, freedom, meaning, reference, rationality, and personal identity] in terms of supposedly more scientifically legitimate notions do not just fail—they entirely miss the kind of importance that these notions have in our lives and experiences." These atheists want to develop a more liberal naturalistic worldview, or simply, liberal naturalism. De Caro and Macarthur maintain that liberal naturalists are secular people since they reject theism and supernaturalism (as well as substance dualism). They think science is essential for developing a secular worldview but not quite as crucial as scientific naturalists believe it to be, since there are other forms of knowledge in life besides scientific knowledge and phenomena that cannot be reduced to scientific entities or properties. So, they aim to explore and develop a different secular worldview that still excludes religious outlooks on life.

Liberal naturalists think that people should privilege science in developing a worldview. They believe a secular construal of human life and flourishing should be grounded in but not necessarily derived from science, as scientific naturalists believe. Both scientific and liberal naturalists maintain that science

is paramount for the construal of a secular way of life. They think the defining feature of naturalism is the pride of place it grants science. On this account, naturalism is best understood as the philosophical companion to science, and an interesting question is how far one can deviate from that companionship and still be a naturalist.

However, it is also possible to maintain a religious worldview guided by science in this sense of starting from the deliverances of science, which, nevertheless, goes beyond science to capture religious features of reality. Willem B. Drees (2006, 110) says that naturalism can be "a label for a worldview that follows the natural sciences as its major guide for understanding the world we live in and are a part of." But for him, it is more a matter of methodological advice: recommending a starting point and what to privilege when developing one's worldview, and in cases of conflict or tension, restraining oneself to a particular naturalistic ontology. In Drees's view, this stance toward science is compatible with a religious conviction that there is more than nature. In contrast, naturalism is traditionally perceived in philosophy as the claim that nothing exists but nature. So, Drees (20006, 116) thinks accepting the whole natural world as the creation of a timeless, transcendent God is consistent with naturalism since the "naturalistically minded theist would claim that the sciences are explanatory within the world, but not explanatory of the world as such." Such a form of naturalistic theism (or perhaps deism) is a view Drees says he has sympathy for.

A second example would be religious naturalism, at least when its core idea is taken to be that science has undermined traditional religious views of the world, but something of truly religious significance can be kept even after religion has undergone a naturalization process. Donald A. Crosby (2007, 672) suggests that religious naturalists are characterized by "find[ing] religious meaning, values, and importance solely in nature or in some aspect of the natural order. The antithesis of religious naturalism is any kind of supernaturalism, i.e., belief in supernatural beings, principles, or powers thought to reside in a supernatural realm. Nature and its ongoing changes are metaphysically ultimate for religious naturalists." In this reading, what distinguishes religious naturalists from secular naturalists is that the former, but not the latter, maintains that religious meaning, value, or significance can be attributed to or found in nature or some aspect of the natural order. Loyal Rue (2005, 366) holds that the central core of religious naturalism is that nature is the sacred object of humanity's ultimate concern, and he believes that what characterizes religious naturalists is their reverence and awe before nature and their love of nature. Some religious naturalists also add that traditional religious symbols such as "God" or "karma" can still be used. However, they are through and through figurative or metaphorical and say nothing about what is beyond the limits of the physical world. Still, they provide an indispensable means to overcoming obstacles and obtaining human flourishing and an ecologically sustainable world (Kaufman 1993, 4–8).

I suggest that we call this way of understanding the relationship between science and our worldviews the *extension view*. Another option would be to follow Roosa Haimila (2020) and talk about a "science-oriented worldview," which refers "to meaning-making systems that rely on science." Consequently, this alternative could also be called the *science-oriented view* since there is—as I have shown—more than one science-oriented worldview. Notice, though, that Haimila uses the notion of a science-oriented worldview more inclusively than I do, so in her case, it also covers a scientistic worldview (alternative 1).

3) The Contact View

In contrast to the previous worldviews discussed, the starting point of secular humanism is humanism rather than science. Humanists emphasize the value, dignity, agency, and uniqueness of human beings and human life as well as the essential product of that uniqueness: culture. Human beings are persons born free and equal in dignity and rights. Humanism focuses on the centrality of humanity and human beings' unique status among beings in general. For this reason, and to protect human agency and dignity, humanists are suspicious of all attempts to reduce human beings to physical things or instruments of a divine will.[8] Core humanistic values are thus freedom, liberty, and equality. Secular humanists typically look to the future in hope, believing that human beings, if working together and liberated from religion, can build a better—a more humane—world. There is a progressive element to humanism. In his short introduction to humanism (which he takes to be identical with secular humanism), Stephen Law (2011, 2) maintains that "humanism involves a commitment to the existence and importance of moral value." I think this is true, but it is more substantial than that, since humanists affirm the particular values the ideas of human dignity and freedom imply. Secular humanists do not think science undermines the ideas of human dignity, freedom, and personhood. Still, they typically believe its theories and discoveries (alone or together with historical or philosophical arguments) undermine traditional religions. Thus, secular humanism is an example of a secular worldview that goes beyond science and is not assumed to be entailed by science, but rather is a worldview science can indirectly support or add credibility to by undermining religious worldviews.

What about the new spirituality, or Western esoterism (Lynch 2007; Magee 2016)? I suggest that it is best understood as an example of alternative (3). The idea is not —as in alternative (4)—that the new spirituality is merely compatible with science, such that its advocates would be satisfied if science does not contradict their core commitments. Instead, as I pointed out, there is a consensus among new spiritualists about the need for science and spirituality to come together in some higher, holistic unity. Adherents of the new spirituality would not start with science and then develop a worldview by incorporating

spiritual insights that go beyond science. Instead, they would first go within and discover, through practices such as meditation, channeling, and spiritual guidance, that they have a spark of the divine within themselves and a higher self that is connected to the divine consciousness infused in everything. Therefore, they believe there is a higher or deeper unity and integral wholeness to reality than meets the naked eye. Our consciousness is a part of the cosmic stream of consciousness, and together, these consciousnesses in a profound way, shape the world and how it has emerged and make trans-life progression possible.

Let us look at one classical statement of this kind of worldview and see whether it fits this view of relating one's worldview to science. Fritjof Capra's *The Tao of Physics* ([1975] 2000) is perhaps the most well-known attempt to develop a higher synthesis of science (or, more precisely, quantum physics) and the new spirituality, or what he calls "Eastern mysticism." Capra says he wants to find parallels between quantum physics and the new spirituality. His central claim is that a "view of the world is beginning to emerge from modern physics which is harmonious with ancient Eastern wisdom" (Capra [1975] 2000, 12). He thinks physicists and other readers "will find that Eastern mysticism provides a consistent and beautiful philosophical framework which can accommodate our most advanced theories of the physical world" (Capra [1975] 2000, 12). Capra appears to argue that the spiritual worldview is not only compatible with modern science but that science supports or adds to its credibility because they have both, by following different roads, come to the same conclusion. The findings of science can be interpreted within a larger philosophical framework. Of course, such a framework could also be proposed by advocates of other religious or secular worldviews. Process thinking and panpsychism constitute two such examples (Pfeifer 2016; Griffin 2000). But Carpra believes the new spirituality (or Eastern mysticism) is the best because it is more coherent with science than the others. There is nothing *un*scientific about these interpretations, but they are still *non*scientific, or, more exactly, not parts of quantum physics or science. The idea is that science supports or adds to the credibility of a particular worldview.

The worldviews of many Abrahamic theists engaged in the science–religion dialogue also fit this category. For instance, Robert T. Lehe (2018, 1–2) maintains that "modern science is not only compatible with the existence of God, but that it favors theism over metaphysical naturalism . . . [and theism] is more harmonious with modern scientific cosmology than the nontheistic Buddhist metaphysical framework." For instance, if the Big Bang theory is correct, the universe originated from an incredibly hot and dense state 13.8 billion years ago and has been expanding and cooling ever since. If the Big Bang is the beginning of space-time, matter, and energy, then there would be no prior physical stuff of any kind to cause it. Hence, the universe originated *ex nihilo* in the sense that at the initial cosmological singularity, it is true that there is no earlier space-time,

and it is false that something physical existed before the singularity, but its origin was not *ex nihilo* in the sense that science can establish that God is the cause of the universe's finite existence and therefore the universe is a creation. The Big Bang theory supports that the universe began to exist in the finite past, even if it does not explain what caused it to exist. Science investigates the natural order, but whether its existence depends upon a transcendent ground is beyond the purview of science. Still, the conviction is that science (in this case, the Big Bang theory) supports or adds to theism's credibility. It provides one crucial premise in a philosophical argument for theism or why theism is preferred over rival worldviews such as metaphysical (or scientific) naturalism and Buddhism.

In response to Sean Caroll's remark that when science has finished its work there will no longer be much point in believing in God, Lehe maintains that Caroll is overlooking the main reasons people believe in God, which are primarily religious rather than theoretical. Most theists see little point in looking to science for evidence of God's existence or insight into how to attain salvation. Instead, Lehe (2018, 9) writes, "their worldview is largely based on their religious beliefs, which may be thought of as beliefs concerning a dimension of reality that is transcendent, regarded as sacred (of supreme value and the source or ground of all value and perfection), and that pertains to the ultimate *telos* of all human endeavor." Hence, the grounds for being a theist in the first place—just as in the case of secular humanists—are not provided by science. Therefore, a theistic worldview is neither taken to be guided by science in its formation (as required in alternative (2)) nor entailed by science (as in alternative (1)).

One thing to pay attention to is that the support in the discussed alternative is assumed to go from science to a particular worldview and not both ways. However, in his debate with Michael Ruse, Michael Peterson maintains that theism explains better than naturalism (and perhaps any other religious or secular worldview) why science is successful. The very fact of science makes the best sense in a theistic universe. Peterson reminds us that he is not speaking about a scientific explanation here because science cannot explain itself. It is a philosophical explanation (Peterson and Ruse 2017, 49). To say that theism explains a particular phenomenon, such as science, better than a rival worldview is to say that the likelihood of that phenomenon occurring is higher or much higher on the assumption that theism is true than on the assumption that the rival worldview is true. It is not blind cosmic luck (one option open to advocates of secular worldviews to embrace) that our reasoning abilities happen to yield results that conform more or less to the truth about the world; it is only to be expected if we live in a theistic universe. It is because God created the world with certain regularities and structures that creatures like us can understand it. Not only is the universe orderly in itself, but it is also intelligible to us. According to Peterson, there is a deep concord between theism and science because a theistic

worldview provides a rationale for the conditions required for the development and success of science.

Hence, this way of reasoning suggests a stronger version of alternative (3) might sometimes need to be formulated to capture the feedback loop some religious thinkers (and presumably also some nonreligious thinkers such as secular humanists) believe exists between their worldview and the scientific enterprise. One suggestion of such reformulation would be:

3*) Our worldview goes beyond science, but science can support or add to its credibility, and vice versa.

We can call (3) the weak and (3*) the strong contact view.

4) The Independence View

Yet another way to understand the relationship between our worldview and science is to maintain that it is merely compatible with science. We cannot ask for more than compatibility or consistency because science and worldviews do different and unrelated jobs in our lives. These practices have different aims, different means to reach those aims, and, consequently, different contents. To ask for more than compatibility is to misunderstand the nature of either one's worldview or science. This stance is typically called the *independence view* within the science–religion literature (Barbour 2000; Stenmark 2010). An example could be that religion provides salvation and meaning in life, whereas science gives us theories and facts about the empirical world. Ian Barbour (2000, 17–19) identifies Karl Barth and Langdon Gilkey as Christian theologians who would embrace alternative (4) or something along its lines. Stephen Jay Gould's (1999, 209) well-known principle of non-overlapping magisteria says that science and religion do not overlap, nor do they compass all inquiry. However, in this context, the independence view merely applies to how one thinks about the relationship between people's religions and science. So, it is unclear how Gould understands the relationship between his presumably secular worldview (which includes agnosticism about God) and science.

Maybe there is a reason for not thinking alternative (4) comes naturally for advocates of secular worldviews in contemporary society. If so, it would be an option that primarily attracts some religious people. Something Wilson says might support this line of reasoning. He argues that when religious stories are abandoned and considered obsolete, the theory of evolution can replace them and play this role in people's lives. He claims that "the evolutionary epic is probably the best myth we will ever have" (Wilson 1978, 201). Wilson thinks secular people today can and should understand themselves and live their lives in the light of an evolutionary and not a creation story. If we assume that people need to embrace some origin narrative (where

does the world, humanity, and all other living things come from?), then the evolutionary story science provides would be a natural part of most secular individuals' worldviews. Consequently, the independence view is rejected because the evolutionary narrative is then taken to be an essential part of most contemporary secular worldviews. In contrast, theists could embrace a religious worldview in which the world is seen as God's creation. Whether God created living things directly using natural selection or any other process can be viewed as consistent with their worldview but essentially irrelevant to what they take Judaism, Christianity, or Islam to be all about. They could (but need not) embrace the independence view.

One could object to the line of reasoning that in at least some secular people's lives the evolutionary narrative plays no role; it is of no relevance to their self-identity, their understanding of the world around them, and the things they fundamentally care about in life. Evolutionary theory nor any other scientific theory does not give any shape or meaning to the beliefs, values, or attitudes that make up their worldview. I think this is a possibility. So, it could presumably be said that this subgroup of secular people embraces—consciously or unconsciously— the independence view.

5) The Tension View

Some people maintain, or what they say entails, that their worldview is incompatible with contemporary science. Due to the significant influence of Barbour's writings, this stance has been called the *conflict view* within the science-religion dialogue. Barbour (2000, 2) argues that since biblical literalists reject the theory of evolution because it conflicts with their faith, they think "science and religion are enemies." However, this is misleading. A more charitable and reasonable interpretation of those Barbour (2000, 15–17) classifies as biblical literalists, like Phillip Johnson and Michael Behe, is that they actually think it is possible to reconcile their Christian worldview with science, not today but in the future. They do not think the conflict between the two will last. Hence, this stance can be rationally reconstructed in two different ways (as alternatives (5) or (6)), and only in the second way could it be said that its advocates perceive science and their religion—or, more generally speaking, their worldview—as "enemies" or genuinely incompatible.

Instead, people who embrace alternative (5), like Johnson and Behe—if I understand them correctly—accept that their worldview is incompatible with contemporary science but add that this is as things stand right now. As science progresses, it will become clear that their worldview is compatible with, and perhaps even supported by, science. God is, after all, the author of both the book of nature and the Bible, and God cannot contradict himself. Barbour's mistake is treating science as a monolith, failing to see that criticism leveled against science often targets specific assertions, theories, or attitudes and not necessarily the scientific enterprise as such.

Therefore, one way of interpreting the criticism of science that can be found in society is to assume the critics see the relationship between their—religious or secular—worldview and science in terms of alternative (5). Certain religious conservatives do not accept central parts of evolutionary theory, other people reject determinist and mechanistic scientific accounts of human behavior, and yet others reject evolutionary accounts of human nature (they might even question the idea that there is a human nature) or society. They could embrace a feminist worldview and charge science with being objectionable because it is inherently male-biased. They may be radical environmentalists who are deeply suspicious of science because they maintain it is the prime example of a mechanistic-instrumentalist mindset directed towards nature, which they perceive as a major cause of the ecological crisis we face today. Or, to take one last example, their worldview may include climate change skepticism and thus conflict with the scientific consensus that global warming is taking place and will have harmful consequences for human civilization and the Earth's ecosystems in the near future. *Science criticism* is an integral part of these people's worldviews (Jewett 2020). Whether we think it is justified or not is beside the point. If they think the conflict is temporary, their understanding of the relationship between their worldview and science is best captured in terms of alternative (5), what we can call the *tension view*.

6) The Irreconcilability View

The last option is to think that one's worldview is incompatible with science, and this will not go away but is something we should expect because faith or worldview commitments go against reason—including scientific reason. There are not many who actually say they embrace alternative (6). Maybe some Christians inspired by the writings of Søren Kierkegaard would embrace it, although I think that would be more reasonably explicated in terms of the independence view. I am thinking of those passages in his writing that emphasize the offensive character of the Christian faith to natural reason (including presumably scientific reason). For instance, under the pseudonym Johannes de Silentio, he developed the idea that religious faith requires believing something irrational, absurd, or contrary to reason, and yet it is the highest possible thing we can aspire to (Kierkegaard [1843] 1983). Some hardcore environmentalists might embrace it if they think the scientific attitude clashes essentially with the attitude they maintain we should have toward nature.

However, we need to include alternative (6) in our typology primarily because some claim that *other* people's worldview is incompatible with science. John Worrall (2004, 60) maintains that "[s]cience and religion are in irreconcilable conflict . . . There is no way in which you could be *both* properly scientific minded *and* a true religious believer." Susan Blackmore (2024, 63) claims that evolutionary psychology, cognitive science, and memetics show that God is a

meme and thus undermine completely theistic worldviews, so that "[t]here is no God who created the universe, no God who made us in His own Image, no God who answer (some people's) prayers. . . . There is no creator who has a plan for His Wonderful World and who will rescue us from the mess we are making of it." If we want to use the notion of conflict to capture elements in both alternatives (5) and (6), we might call this last option the *irreconcilability view* instead of the *conflict view*.

Concluding Remarks

The starting point of my discussion was an observation, namely, that a significant number of individuals, particularly in regions like northern Europe and northern America, no longer identify as religious. This change, I argue, should make us see the relationship between science and religion in a new way, explicitly taking into account that today, there is a three-way relationship that should be explored between science, religions, and secular outlooks on life. We can only fully understand some of the standpoints in the science–religion debate if we consider that a third party is involved, implicitly or explicitly, in the discussion—namely, secular worldviews. The notion of worldviews was introduced to cover both religious and nonreligious people's views of life. I also pointed out that it is crucial to establish an academic discipline that investigates secular people's outlooks on life and juxtaposes them with religious ones. This is the task of the emerging field of worldview studies.

What we gain by using the notion of worldviews is an analytical category wherein secular outlooks on life, and not merely religious ones, can be studied in terms of what they positively affirm about reality. It then becomes evident that the reason some thinkers have the views they do about science and religion depends on their prior acceptance of a secular worldview of one kind or another. This is similar to the views of other thinkers, colored by their religious commitments. If essentially everyone has a worldview, then the discussion about science and religion is not between religious believers and "neutrals"—noncommitted people—or nonbelievers but between people who embrace different, sometimes rival, worldviews.

Therefore, we must pay attention to when one line of reasoning depends on the prior acceptance of a particular worldview in the science–religion debate. We need to distinguish between worldview-transcending and worldview-immanent arguments. A worldview-transcending argument contains premises or reasons that surpass people's different outlooks on life. Its force does not directly depend on whether we accept a Christian, Buddhist, scientistic, or secular-humanist worldview. Worldview-immanent arguments are rather arguments containing premises or reasons that depend, directly or indirectly, on the acceptance of one particular worldview or a subset of them.

We have also seen that the significance of science for worldview formation and revision depends on how relevant we think science is for the particular worldview we embrace. I suggested that six options are available today to religious and secular people alike. One's stance could be that their worldview is entailed by science; it starts from and stops with science (the scientistic view). A second possibility would be to deny that one's worldview is entailed by science and instead maintain that it merely privileges science while still acknowledging that it goes beyond what science can tell us about reality (the extension view). A third option is to maintain that the central motives or grounds of one's worldview are obtained from or provided by other sources than science but still stress that science can support or add to its credibility (the contact view). A fourth alternative would be to say that one's worldview is merely compatible with science but assert that that is all we can ask for since science and worldviews do different and unrelated jobs in our lives (the independence view). For those who embrace the extension, contact, or independence view, it becomes essential to distinguish between things that are "nonscientific" and those that are "unscientific," whereas, for those who endorse the scientistic view, these categories essentially coincide.

Science criticism plays an essential role in forming some people's worldviews. The last two options try to capture this stance. One option is to grant that one's worldview is incompatible with contemporary science but maintain that as science progresses, it will become clear that it is compatible with, perhaps even supported by, science (the tension view). The last option is more radical: the stance that one's worldview is indeed incompatible with science, and that that is what should be expected because one's core worldview commitments go against reason—including scientific reason (the irreconcilability view). Presumably, few people embrace this alternative, but it is essential to include because some claim that *other* people's worldviews are of this kind. These critics then assume irreconcilability to be a vice and not a virtue.

If my analysis is correct, then an essential question to explore is the relevance of science for forming and revising our different worldviews, both religious and secular. Worldview theory also makes it easier to understand and conceptualize that the main reason certain nonreligious individuals have a specific view of the relationship between science and religion is not always due to how they conceive science or religion but rather because of the secular worldview they embrace. This could be the case whether or not they are aware of this fact. The recognition that most, if not all, people have a worldview of one kind or another makes it possible and desirable to develop a more symmetrical explanation of some religious and secular individuals' views of science and religion.

Notes

[1] I am not the only nor the first researcher who has argued for the development of worldview studies; see also Anders Jeffner (1992), Ninian Smart (1995), M. Elisabeth Lewis Hall and Peter Hill (2019), and Ann Taves (2020). My first attempt to do so dates back to (Stenmark 1995, 239–52), although then I used the technical term "views of life."

[2] The theory is my proposal, but a reviewer pointed out that a similar theoretical framework can be found in Miguel Farias (2013).

[3] See, for instance, Hugh Lacey (1999) and Nicholas Rescher (2014).

[4] There are also forms of naturalism that arguably could be classified as religious or semireligious worldviews. I have in mind different forms of religious naturalism (see next section).

[5] I have analyzed their core commitments in Stenmark (2022c). John Gray (2018) differentiates between seven forms of atheism.

[6] Experts in the field sometimes call this view "Western esotericism" (Hanegraaff 2013, 1–3).

[7] It has also been named "philosophical naturalism" or "metaphysical naturalism." For a discussion of different forms of scientism, see Stenmark (1997).

[8] I am not saying that the affirmation of human dignity and freedom entails that humanists must affirm that humans have libertarian freedom. Some certainly embrace that view, but others are compatibilists. However, most of them have presumably not thought much about the issue at all. The idea is merely that there is something special about humans, and this makes them unique, so that we, for instance, can genuinely talk about human actions and not merely human behavior.

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Spiritual Experience: Scientific, Philosophical and Theological Implications

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A review of spiritual experience centered on a framework of spirituality developed by the author identifies implications for the disciplines of science, philosophy, and theology, presenting specific questions to be considered. A general introduction clarifies the terms and limits of the discussion and the focus of the requested commentary prepared for the Institute on Religion in an Age of Science Conference in June 2025. Scientific focus includes the dual process of cognition and its implications for medicine, psychology, psychiatry, neuroscience, anthropology and evolution, and the inclusion of "soul studies." Philosophical discussion highlights the values, Ground of Being, and universal moral values challenging the naturalistic fallacy of "is-ought." Theological implications focus on the Veil of Illusion, mystical experience, transcendence versus immanence, the causal joint problem, a specific Faith Process and a proposed field of applied spirituality, and the nature of soul. A common discussion for all disciplines is the role of ontology and a worldview that demands disciplinary agreement.

Introduction

Recent research with psychedelic-assisted psychotherapy, empirical research within the psychological sciences, and research within psychiatric clinical interventions has dramatically expanded our knowledge of spiritual experience. Debates about the reality versus unreality of spiritual experience have now been settled on the side of reality. Debates about the source of spiritual experience being transcendent versus immanent—outside of versus within material experience—overwhelmingly fall on the side of immanence. (It must be noted that this is limited by competing interpretations of "transcendent.") Debates about the value and practical usefulness of spiritual experience versus its "airy-fairy," bordering on imaginary, and delusional nature resoundingly demonstrate it being practically valuable and even a key element in emotional healing and wellbeing. In fact, psychological constructs of the Five-Factor Model explanations of personality (extraversion, agreeableness, conscientiousness, neuroticism, openness to experience) now show that spiritual or numinous experience is proposed as a sixth, independent factor of personality determination and function (Piedmont 2001). Our subjective spiritual experience can no longer be treated as ephemeral, delusional, or unimportant to our worldview and must be as seriously explored as our objective outerspace. One could humorously propose creating a National Administration of Spiritual Applications.

This knowledge challenges our current worldviews in scientific, philosophical, and theological studies and requires dialogue and reconsiderations. The Institute on Religion in an Age of Science (IRAS) was the first organization to explore a specific "Framework of Spirituality" (FOS) that has impact on each of these areas, subsequently published in *Zygon: Journal of Religion and Science* (Chatlos 2021) with a follow-up of its potential impact on adolescent development (Chatlos 2022). To continue its progressive efforts, IRAS is planning a conference entitled "Spiritual Experience: A Scientific, Philosophical and Theological Retreat" for June 22–29, 2025 on Star Island, New Hampshire. Leaders in the disciplines of science and neuroscience, philosophy, and theology will be brought together to academically and informally explore these reconsiderations. This article aims to identify some of the areas for reconsideration at the boundaries of these disciplines. As such, it presents a specific perspective often without including objections or alternative perspectives. In this issue, experts have been asked to review this framework and begin a critical exploration to identify supporting and alternative perspectives. It is hoped that these commentaries and the upcoming conference will set the stage for continued exploration and multidisciplinary development by leaders in these areas of study and applications of spiritual experience.

Multidisciplinary discussions of spirituality require some definitions for clarity. The focus is on spiritual experience that may or may not be connected with religious experience. This discussion begins with descriptions used in

studies mostly related to the role of religion/spirituality in health, mental health, and addictions, derived from Harold Koenig (2015):

- Religion—the institutional aspect of beliefs and practices related to the sacred or divine as held by a community or social group.
- Spirituality—a personal dimension of human experience related to the transcendent, the sacred, or ultimate reality. Spirituality is closely related to values, meaning, and purpose in life. Spirituality may develop individually or in communities and traditions.
- Religiousness—systems of beliefs and practices related to the sacred or divine that may or may not be related to a specific religious tradition or social group.

For most purposes, this article makes an important distinction between spirituality, with expansion of these definitions, and specific personal spiritual experience. A good beginning for this distinction is a quote by William James ([1902] 1970):

> Were one asked to characterize the life of religion in the broadest and most general terms possible, one might say that it consists of the belief that there is an *unseen order*, and that our supreme good lies in harmoniously adjusting ourselves thereto. This belief and this adjustment are the religious *attitude* in the soul.

James uses the word *religion* in the way this article uses the word *spiritual* and sets the stage by identifying the general idea of spirituality as an *attitude* (see following definition). This attitude is a harmonious adjustment to this unseen order for our supreme good. Historically, this includes:

- the nature of this unseen order (transcendent, divine, God, sacred, ultimate reality, something greater than ourselves, a higher power, etc.)
- a disposition to self, others, and the world (values, ethics, and morals)
- our role in the world (meaning and purpose)
- our expression (beliefs, practices) of this disposition

Specific spiritual experience is presented as a fundamental experience available to all persons and has become associated with religious traditions in various ways. Other terms in this dialogue relating to spiritual experience include *mystical*, *numinous*, and *intuition*, with their specific relationships and overlap to be part of the discussion.

- mystical—(ME. *mistik* < L. *mysticus* < Gr. *mystikos*, belonging to secret rites < *mystes*, one initiated) 1. any doctrine that asserts the possibility

of attaining knowledge of spiritual truths through intuition acquired by fixed meditation.
- numinous—(L. *numen*=nod, *ie* to the divine) 1. arousing spiritual or religious emotion; mysterious or awe-inspiring.
- intuition—the direct knowing or learning of something without the conscious use of reasoning. (Collins English Dictionary)

Discussions of spiritual experience can extend in many directions and include many phenomena. In this article, FOS refers to a non-ordinary experience that occurs with a sense of awakening or unveiling of a wider truth or reality with a noetic or revelatory quality, associated with mystical-type experiences, including a sense of direct connection, communion or merging with some non-ordinary source. It is often associated with states of peace, equanimity, aliveness, awe, sacredness, gratitude, reverence, unconditional love, bliss, and ecstasy. There may be strong physical sensations and enhanced senses that include hearing voices, having visions, and having unusual body and mental experiences. These may be triggered by stress, specific events such as near-death experiences, and practices such as meditation, prayer, dance, or other physical or mental activities (Corneille and Luka 2021). Finally, opening to this awareness can be mild or gradual (i.e., an insight) or dramatic (i.e., a conversion experience) (James [1902] 1970). At this time, this discussion and current evidence of the framework of spirituality does not include psychic or paranormal phenomena, telepathy, telekinesis, teleportation, time travel, alien abduction, ghosts, demons, or quantum entanglement phenomena. An open-mindedness must be maintained that future exploration may identify associations of the FOS with some of these phenomena.

The introduction and subsequent development of thought regarding the FOS has been incorporated in publications with open-access available to all readers. These articles are summarized here with a brief description of their focus for quick reference.

- **A framework of spirituality for the future of naturalism** (referred to as *naturalism* in text) (Chatlos 2021). Relates to naturalism and other religious and theological perspectives, cognitive behavioral theory (CBT), morality and ethics, and neuroscience, with speculation of an evolutionary foundation.
- **Adolescent identity formation versus spiritual transformation** (referred to as *adolescent identity*) (Chatlos 2022). Relates to adolescent development and spirituality.
- **Did Freud miss the discovery of our spiritual core?** (referred to as *Freud*) (Chatlos 2023a). Elaborates on the framework's relationship to psychoanalysis and psychotherapies.

- **Bullying, spirituality, anxiety, and depression** (referred to as *bullying*) (Chatlos 2023b). The relationships between spirituality and bullying, depression, and anxiety.
- **Is spirituality a master controller for human wellbeing?** (referred to as *master controller*) (Chatlos 2024). Spirituality is proposed as a master-controller for human well-being.
- **Pilot study of a CBT-based intervention for promoting spiritual experience among men in residential addiction treatment** (referred to as *pilot study*) (Chatlos et al. 2025). A pilot study to demonstrate the feasibility and preliminary efficacy of the theoretical foundation of the FOS.

Highlights are summarized in this article with references to guide discussion. This article outlines some possible implications of current knowledge about spiritual experience relevant to science, philosophy, and religion/theology. The commenters were asked to review the original article and subsequent expansion of the theory and provide commentary on these suggested aspects:

- the validity/non-validity of these claims within their area of expertise
- the importance/relevance of these claims in their area of expertise
- the usefulness of the vision presented and/or elements to be added to the vision as presented within their area of expertise
- the challenges of this perspective to their area of expertise
- their critique of this perspective, alternative explanations, ot related information from other sources of knowledge.

Framework of Spirituality Summary

FRAMEWORK OF SPIRITUALITY			
Domain of Being	**Experience of Self-Worth**	**Expression of Dignity**	**Creative Forces/ Creative Openings**
Think	Self-confidence	choice / **Reason**/wisdom	**TRUTH**
Feel	Self-esteem	empathy/**Compassion**/ caring (Justice)	**LOVE**
Do	Self-competence/ Self-efficacy	honesty/**Courage**/giving (Generosity)	**FAITH**

Figure 1: This illustrates the full FOS, beginning with the CBT elements of thoughts, feelings, and behaviors, including the distinction of self-worth and the expression of dignity that expands socially as wisdom, justice, and generosity. The expansion to the creative forces/creative openings occurs as the spiritual core (***Σ***) is opened, associated with mystical-like experiences. The shaded areas indicate the functional "soul" experience.

The framework of spirituality (Figure 1) describes the manner in which spiritual experience is psychologically organized in human experience, beginning with a

CBT foundation of the perceptions of thoughts, feelings, and behaviors (details in *naturalism)*. The integration of thoughts, feelings, and behaviors occurring simultaneously is what is meant by an *attitude*:

- attitude—a manner of acting, feeling, or thinking that shows one's disposition (*Collins English Dictionary*).

The keys to open awareness of spiritual experience are the integrated experiences of self-worth (self-confidence, self-esteem, self-competence/self-efficacy) and dignity (choices with reason, empathy, and compassion; courage beginning with honesty) operationalized as noted. Self-worth, including self-confidence, self-esteem, and self-competence/self-efficacy are each defined and measurable in psychological research. Research shows that there is a developmental progression from self-competence/efficacy (age 1−2 years), progressing to self-esteem (age 3−4 years) and self-confidence (age 5−8 years), and becoming integrated as self-worth (age 8−10 years) (Harter 1990). Operationalizing dignity results from its definition as "the quality of being worthy of esteem or honor," identifying what it is we honor most about being human in the areas of thinking, feeling, and doing. Attitudes develop from the effect of life events on self-worth and dignity. Components of self-worth and dignity can either be empowered or injured by life events. With the processing of injury and the resultant empowering of a core self-worth and dignity, a proposed spiritual core (***Σ***) spontaneously opens with mystical-type experiences to a new level of mind function now available for conscious use. The creative forces/creative openings happen with its moral-truth core, love that is open-hearted and compassionate, and faith with a powerful courage is the functional "soul" experience. This soul experience is a real experiential entity that when injured is personally experienced as loss of faith. Just as damage to the experience of self-worth is experienced as shame and damage to the expression of dignity is experienced as guilt, damage to "soul-worth" is experienced as loss of faith (injury to faith) and associated with moral injury (injury to truth-force) (Bernstein 2015) and compassion fatigue (injury to love-force) (Meadors et al. 2010). Injury to the "soul" experience can be associated with resulting depression, anxiety, and hopelessness, with attempts to compensate leading to addiction and/or antisocial and self-defeating behaviors (*bullying)*.

The proposed spiritual core is designated with the Greek symbol ***Σ***. This is chosen to designate the "addition" of a new awareness that is unknown, yet to be defined, and has no historical or personal connotations with the words spiritual, mystical, or numinous.

The theoretical foundation of the Framework of Spirituality has been used in the development of a clinical application as CBT-STE (Cognitive Behavioral Therapy-Self-Transcendent Experience). This application has now been

demonstrated with replicability, feasibility, and preliminary efficacy in a pilot study (Chatlos et al. 2025).

In the following discussion of implications, it is recognized that science, philosophy, and theology have many overlapping areas of interest since the goal of each is to understand and explain reality from different perspectives. Inclusion of discussion in one discipline may have relevance to the others and should be considered as integratively and comprehensively as possible.

Scientific Implications

Note: The following discussions of the implications of the current knowledge about spiritual experience include specific questions with no responses provided. These are suggested questions that may be addressed by the commentaries on this article in preparation for further discussion at the 2025 IRAS conference.

Science and Medicine

The FOS has implications for extensive areas of science, as it impacts fundamental understanding of human nature with applications at many levels, both individual personal and social. As this framework for understanding spiritual experience has been developed outside of any specific predecessors except CBT, Jean Piaget's (Piaget and Inhelder 1969) work on cognitive development, and Susan Harter's (1990) work on self-worth, there are wide-open opportunities for research. A major opportunity for science in general is to research, understand, and integrate this framework and process with current scientific knowledge in the multiple areas of science in which it has impact—biology, chemistry, psychology, neuroscience, medicine, sociology, etc. The author's works noted at the beginning of this article have begun to connect the FOS with other sources. Some yet to be explored connections may include Lawrence Kohlberg (1981) with stages of moral development; James Fowler (1995) with stages of faith development; Ken Wilber (2017) with quadrants and stages of consciousness; Roy Bhaskar (Gorski 2013) connecting social science with spirituality; many transpersonal and positive psychology authors and researchers such as Abraham Maslow (1954) with stages towards self-actualization; and recently, a metamodern perspective (Dempsey 2023). A main difference between the FOS and several of these sources is that the FOS is not a stage theory, except for that of Piagetian cognitive development. As aspects of self-worth and dignity are inherent in early child development, further exploration can identify progression of these experiences as cognitive development proceeds. This author claims that stage theories other than that of cognitive development may be artifactual and describe stages of humanity's modern (twentieth century) uncovering of knowledge related to moral, faith, and consciousness awareness. As self-

worth, dignity, and the creative forces are culturally and developmentally empowered as fundamental human values, it is predicted that Piagetian cognitive development will be the dominating influence. It is anticipated that the socially related stages of moral, faith, self-actualization, and even consciousness development will need to be reassessed to determine if they are inherent stages in development or actually historical paradigms.

Also important are the many areas for application in mental health and general and psychosomatic medicine. This would include adapting or developing methods to evaluate this process, comparing this process to other interventions such as medications including psychedelics, technological interventions, and other psychological, social, and physical (embodiment) interventions.

This discussion highlights only some of the immediate implications from current knowledge and use of this process and is not intended to be exhaustive. It is intended to provide clarification for greater understanding of the process and opportunity for multi-disciplinary discussion to consider its extensive implications.

Fundamental Theoretical Foundation

A major premise of the FOS and its applications is the knowledge that humans have two main brain processors, a theory known as the "dual process of cognition" (Evans 2008). This was popularized in the book *Thinking Fast and Slow* by the Nobel Prize-winning economist Daniel Kahnemann (2011). He describes two modes of thought related to two brain functioning systems —a fast, automatic, emotional, not logical, and unconscious system and a slower, logical, conscious system—operating simultaneously though not always connected. The faster system may make decisions that are out of the awareness of the slower system, though the slower system has the capacity to become aware of and modulate the faster system. This has some yet-undetermined similarities to the Freudian conscious vs unconscious, the right-brain left-brain disconnection from the split brain experiments (Gazzaniga 2018), and a triune brain theory (MacLean 1982) related to human cortical vs mammalian-related limbic system and automatic reptilian-related survival functions.

Without being side-tracked into technical details and theoretical deliberations, the FOS uses this knowledge in its understanding and exploration of the spiritual core. It appears the unconscious, decision-making limbic system or the differential brain hemisphere functions are in some manner related to the spiritual core. This leads to an illustration of the human condition (Figure 2).

The FOS describes how specific use of the conscious part of experience is instrumental in exploring the unconscious part of experience to understand and utilize the nature of spiritual experience.

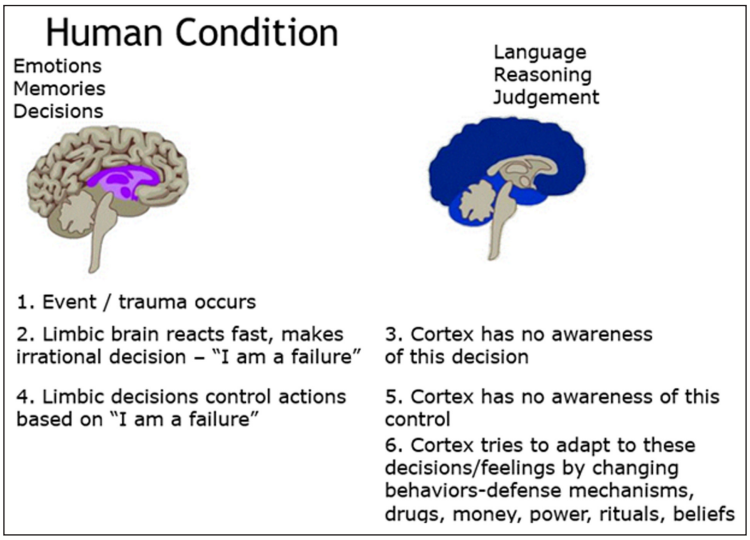

Figure 2: A trauma/event occurs with an irrational, possibly limbic brain decision, out of awareness of the cortex but directing behaviors that the cortex attempts to rationalize and adjust its behaviors to compensate.

It is acknowledged that many of the details and theoretical understandings of this foundation and process have yet to be developed. The purpose of this article is to provide a broad perspective to expose the disciplines of science, philosophy, and theology to the current knowledge of spiritual experience to begin planning further activities and priorities.

Psychology

The word psychology is derived from the Greek word *psyche* for spirit or soul. The field of psychology, even before the word's first English use by Steven Blankaart in 1694 stating that psychology "treats of the soul," has struggled to define its subject matter and discipline. It has been described variously as the study of behaviors as in behaviorism, cognitions as in cognitive science, emotions, the conscious and unconscious as in Freudian psychoanalysis, individual mental processes or social processes, motivation, morality, values, and even true to its derivation, the soul or spirituality. There have been various "waves" extending from these studies, including humanistic and existential, transpersonal, and recent attempts at a unified protocol. These latest attempts exemplify what has been considered for many years a "crisis of disunity" (Yanchar and Hill 2003) within the field of psychology, referring to it having no unified domain for focus.

In an attempt to address this disunity, one of the main unifying perspectives that has been noted historically but skirted around in the field of psychology is that of "ontology," the study of "Being" (capitalized to refer to the ontological experience of life). Within psychology, ontology is limited to the study of

human and animal existence. Ontology is generally considered a specific formal branch of philosophy described broadly as the study of "the nature of existence." This broader perspective in philosophy goes beyond the nature of Being that includes human and animal life and is closely related to metaphysics. Metaphysics is another branch of philosophy having to do with the nature of all reality and may include concepts such as God, creation, and the nature of all matter itself, which impinges on another discipline that will be discussed later, theology.

A major implication within the field of psychology is how the scientifically grounded FOS provides an approach that can unite all three of these disciplines. This occurs as the foundation of the framework begins with the perceptions within psychology that are part of CBT—thoughts, feelings, and actions/behaviors. As presented in greater detail in *Freud,* the perceptions of thoughts, feelings, and behaviors—and the next level of psychological organization of "conceptions," including beliefs, values, and habits/practices—determine much of the usual realm of human psychology. Most psychotherapies address these levels of experience, such as when CBT deals with irrational thoughts and beliefs, dysfunctional feelings and values, and self-defeating behaviors and habits. Religious and theological thought remains in this area of beliefs, values, and practices as part of a "religious identity" but does not bring a person into spiritual experience.

The next level of organization within the FOS carries understanding into the domain of "Being" with the integration of thoughts, feelings, and behaviors as an "attitude" (see Figure 3).

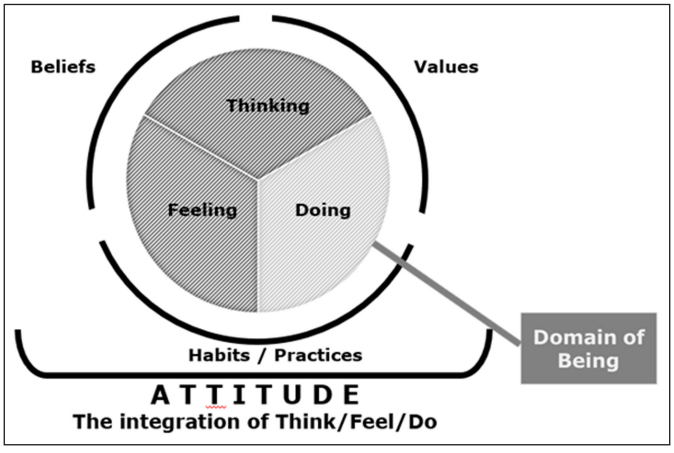

Figure 3: The integration of thinking, feeling, and doing (the domain of Being) opens awareness of the experience of Being, which is captured by the focus on "attitude." See "Did Freud Miss the Discovery of Our Spiritual Core?" (Chatlos 2023a) for a description of the limitations of beliefs, values, and habits in discussions.

Integration of these perceptions as an attitude begins the exploration of the domain of Being, as Being includes all three simultaneously—sometimes also identified as mind, heart, and body with a full embodiment of the experience of Being. As noted in *Freud* and here, an attitude determines the total direction or disposition of a person—disposition to self, others, the world, past, future, etc. For example, a pessimistic attitude may include a thought of "life never works out," a feeling of discouragement or hopelessness, and an act of withdrawal or avoidance.

Furthermore, attitudes develop as a result of injury or empowerment of the specific distinctions of Being identified as self-worth and dignity. Again, note that self-worth is a total Being integration of self-confidence, self-esteem, and self-competence—each of these defined and measured within the usual realm of psychology. Similarly, the distinction of dignity is the integration of making choices with reason, expressing compassion, and acting with courage. Working with distinctions of Being requires working within an ontological perspective beyond the usual limited psychological perspective of thoughts, feelings, and behaviors, or even beyond the theological and religious level of beliefs, values, and practices/habits. The FOS demonstrates how the philosophical branch of ontology should also be formally brought into the scientific field of psychology (see Figure 4). This framework demonstrates how to understand these experiences ontologically and how to apply these ontological experiences functionally and clinically with specific useful interventions for praxis and research and entrance to spiritual experience.

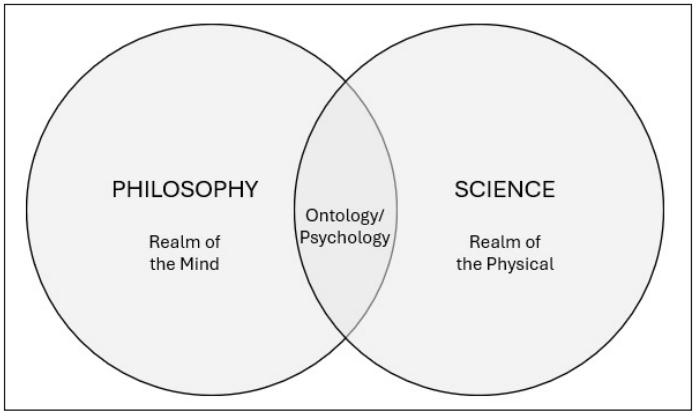

Figure 4: Overlap of science and philosophy in a common ontological area of interest.

The next step with the FOS demonstrates how ontology can further be extended to become part of the discipline of theology, including metaphysics (Figure 5) and the overlap of theology with philosophy, including an ontologically common interest in spirituality.

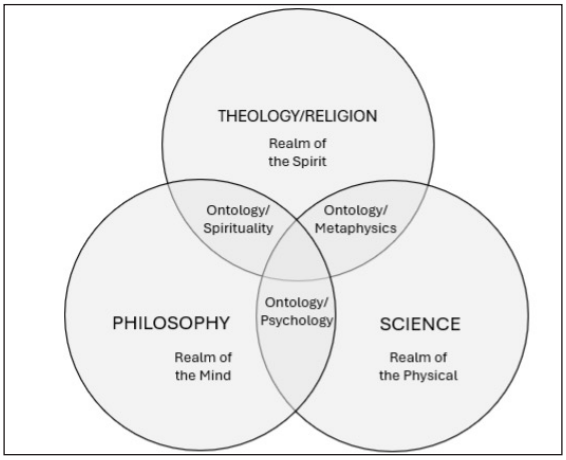

Figure 5: Overlap of philosophy and theology highlighting a common ontological interest in spirituality, and the overlap of science and theology with common ontological interests, including metaphysics.

The strengthening of a core self-worth and dignity by the processing of, and opening beyond, attitudes that developed from injury leads to spontaneous opening to the level of the creative forces/creative openings (**Figure 1**). As described in *Freud*, this opening occurs with mystical/numinous characteristics that may include a sense of connectedness, vitality, wholeness, noetics, peace/serenity, and meaning and purpose. These characteristics are a sign that our spiritual core that is usually out of conscious awareness has become opened as part of this spiritual experience or awakening. This core opens to the spiritual creative experiences of agape love, a moral truth-force core, and an indomitable faith, which are the functional characteristics of our "soul" experience. In this manner, the ontological understanding developed through the science of psychology (thoughts, feelings, behaviors, etc.) now connects indelibly with religion and spirituality. This is part of the larger ontological overlap with science and theology that may also include an overlap with philosophy. There will be more about this later, with exploration of the implications of this connection with theology. The central overlap of all three disciplines will also be discussed later.

The inclusion of this understanding of ontology within the field of psychology praises William James and his attempts to bring spiritual/religious experience into the realm of psychology. Hopefully, future efforts will address a remarkable lack, or dismissal, of spiritual/religious experience within much of psychology and mental health, including the medical discipline of psychiatry. This applies not only to the modern field of psychoanalysis (see *Freud*) but also to the modern therapeutic fields of CBT and almost all other therapies, as elaborated in *master controller*.

Medicine and Psychiatry

As a brief follow up to the last section, it is important to specifically note the implications of the FOS for the scientific discipline of medicine, especially the field of psychiatry and mental health. Since 1977, the dominant model of medicine and psychiatry has been the biopsychosocial model of medicine, as espoused by George Engel (1977) (Figure 6).

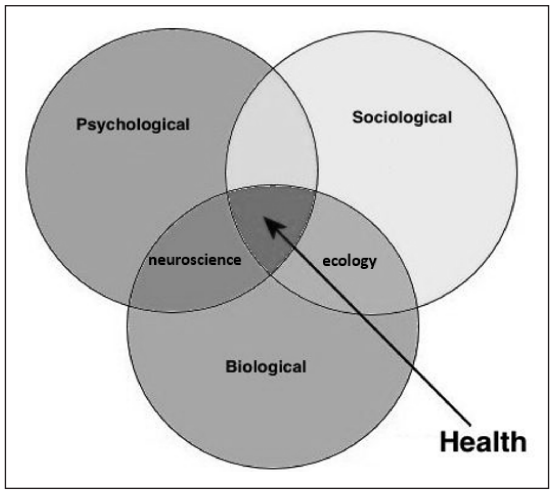

Figure 6: Biopsychosocial model of medicine, with biological, psychological, and sociological determinants being balanced to result in health.

The biopsychosocial model illustrates the idea that we have biological, psychological, and sociological aspects of experience that, when balanced in some manner, are the source of health and wellbeing. For years, there has been a noted lack of spirituality within this model. The central role of spirituality and spiritual experience in the healing process requires a revision to highlight the recent knowledge presented in this article. The biopsychosocial model can metaphorically be seen as a two-dimensional view of human beings and a mostly cognitive fact-driven and action-focused discipline. The FOS demonstrates how, with the ontological opening to the distinctions of self-worth and dignity, a depth of experience is identified and extended into the deepest levels of spiritual or soul experience. This includes not only emotions but also values of reason, compassion, and courage and existential aspects of morality, love, faith, and meaning and purpose. The inclusion of this depth appears to be a major source of healing—both emotional and physical—that is yet to be explored. It is proposed that comprehensive inclusion of these various levels of experience requires an expansion to a biopsychosocial-spiritual model (Figure 7) where spirituality is central, as it has very broad aspects of biological, psychological, and sociological determinants.

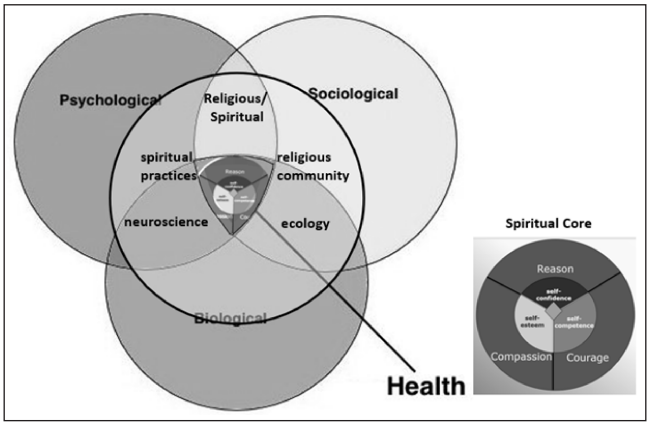

Figure 7: Proposed biopsychosocial-spiritual model with large central religious/spiritual determinants, including religious practices, in sociological overlap and spiritual practices in biological and psychological overlap. The central core is the empowering of self-worth and dignity that fosters opening to a spiritual core and its creativity and healing characteristics.

Religious community can include more of the sociological realm, while spiritual practices may include more of the psychological realm, and even the biological realm when including body practices such as yoga, tai chi or qi gong. These relationships are further illustrated as a three-dimensional model with experiential depth (Figure 8) in which our spiritual core, with the processing and healing of injury to self-worth and dignity, is a critical central component of healing, especially if it is a master controller of wellbeing as described (*master controller*).

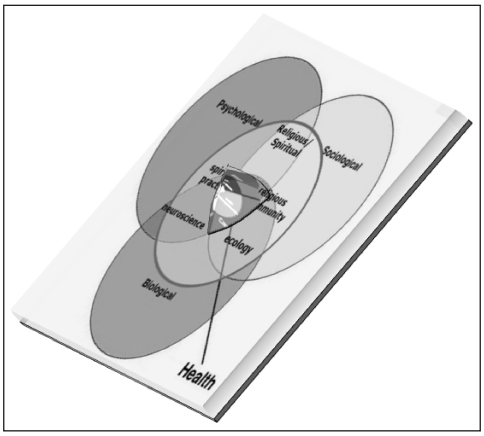

Figure 8: Biopsychosocial-spiritual model, including spiritual core, with self-worth and dignity opening a depth and central source of health and healing.

Adoption of this biopsychosocial-spiritual model can have profound effects on the future practice of medicine, psychiatry, and mental health.

Neuroscience

Some details of the neuroscience implications are elaborated in *master controller*. Research of spiritual experience did not advance significantly until recent use

of neuroimaging and specialized EEG measures. Earlier studies in this area primarily explored religion—religious affiliation, attendance, practices, and measures of religiousness and religiosity—providing early suggestions of specific brain regions involved with religious/spiritual experience. This research often studied brain differences between religious practitioners who had years of experience such as nuns and monks and those with no or less experience. Studies more related to spiritual experience studied specific practices such as meditation and mindfulness using experienced practitioners such as monks and nuns engaged in specific activities of prayer, meditating on God or divinity, recalling particular spiritual experiences, doing religious recitations, and viewing religious versus nonreligious images. Studies were limited by theoretical issues such as a lack of clarity on what defines spiritual experience, practical issues such as neuroimaging being unable to capture true spiritual experience while someone is in the scanning machine, and having limited research models to actually induce or promote personal spiritual experience.

Despite these limitations, research identified some specific brain regions related to spiritual experience. Regions suggested by neuroimaging include:

- medial prefrontal cortex, associated with mystical states (Van Elk and Aleman 2017)
- superior parietal lobes and temporoparietal junction, associated with peak experience and feelings of unity (Van Elk and Aleman 2017)
- inferior parietal lobe, associated with attention, reasoning, connection, and sense of self and self-awareness (Miller et al. 2019).

Of most interest has been a network of connected brain regions called the default mode network, which includes the medial prefrontal cortex, the posterior cingulate cortex, the parahippocampal cortex, the amygdala and the inferior parietal lobe. It is described as a "functional and structural hub in the brain, assimilating and transmitting representations of salient external and internal events through global brain activity patterns" (Raichle 2019). It has some unique characteristics, including being active when other brain activity is at rest. Default mode network activity is also calming when other brain areas are active, suggesting a modulating homeostatic control. It also has special abilities of creativity (Raichle 2019).

The advent of psychedelic research created an experimental research model, as the psychedelics actually induced and promoted spiritual/mystical experience rapidly that could be measured with psychological and spiritual assessments and a brain scan the following day. These induced spiritual/mystical experiences have been associated with dramatic results in healing multiple mental disorders, including depression, anxiety, PTSD, OCD, and substance use disorders, along with a sense of wholeness, well-being, and quality of life. (Carhart-Harris et al. 2012; Chi and Gold 2020). This has led to

increased interest in and understanding of the possible default mode network role in spiritual experience (Carhart-Harris and Friston 2019).

Further implications for neuroscience to pursue will mostly focus on technical aspects—definitions, instruments of measurement, methods of research—that will not be discussed in this article.

Even if specific regions of the brain are identified as definitively associated with spiritual experience, a major problem remains. While we may know the amygdala region of the brain is associated with emotions, we only have physical methods to use this knowledge functionally. The only methods in this area would be chemical interventions (as with medications like antidepressants) or physical interventions such as transcranial magnetic stimulation, electroencephalographic neurofeedback, electroconvulsive therapy, EMDR (eye movement desensitization and reprocessing, a physical therapy regarding eye movements and the resolution of traumatic memories), and even direct intracranial brain stimulation. The FOS now provides a language for psychological, cognitive, emotional, and verbal interventions to be effective. Using the language and direct experiences of the distinctions of self-worth and dignity allows a person to directly engage and change or transform the brain function in these various areas. Verbal psychotherapies can be used to strengthen use of reason, compassion, and courage while our future research investigates the brain transformations that are likely to be occurring. It is anticipated that future research will identify the mechanisms for the universal mystical/numinous experience that occurs when the spiritual core opens. Some of this work is already in progress, as Michael Winkelman (2010) describes a biopsychosocial perspective of this awakening and Robin L. Carhart-Harris and Carl J. Friston (2019) attempt explanation within psychedelic and neuroscience research. Now that the FOS provides a human research model to intentionally promote spiritual awakening/experience, it is theorized that these non-drug-induced direct experiences of spiritual awakening will be correlated with neuroimaging, physiological measures, and possibly even electroencephalographic recordings.

A major part of the therapeutic process using the FOS, known as CBT-STE (cognitive behavioral therapy for self-transcendent experience), assists self-acceptance with a release of emotions of suffering, similar to the Buddhist approach to happiness and wellbeing of "non-attachment." It is well known that MDMA (ecstasy, a psychedelic) is being pursued for approval by the U.S. Food and Drug Administration for psychotherapeutic use. MDMA has the unique characteristic of removing the fear reaction when recalling traumatic memories. This impact allows psychedelic-assisted therapy to rapidly transcend the suffering from past traumatic memories with sometimes ecstatic results that appear to have long-term transformation when assisted with personal integration. A vision of the not-too-distant future would be that we can

identify the brain mechanisms that consolidate and promote the continuation of suffering from trauma with the hopes of developing new interventions.

In view of later discussion, questions are raised regarding the theological and philosophical implications of this power of undoing the emotional effects of past experiences. It is an emotional "do-over" of life, part of what is experienced in a "born again" conversion experience.

Anthropology and Evolution

The reality of spiritual experience as a universal reality available to all human beings requires some explanations within anthropology, especially as it relates to evolution. In *Naturalism,* an evolutionary explanation for our capacity for spiritual experience was suggested. In summary, the theory proposes that at a bottleneck in time, the characteristics of spiritual experience were socioculturally developed for the survival of the pre-human, possibly hominid, tribe. This included an increased sense of connection and empathy with compassion for protecting and caring for each other, a vitality necessary for success in their short, survival-threatened twenty-year lives, and a sense of wholeness and integrity with peace and serenity. Each person had their own role as in a beehive, with constrained flexibility for conflict due to the vagaries of life and the need for survival. Finally, this created an extreme cooperative and communal sense of meaning and purpose. Experientially, a capacity for self-worth was developed neurologically with survival value, as a hominid with poor self-confidence would have little initiative, one with low self-esteem with depression would likely be left by the wayside by the tribe, and poor self-competence would make for fatal mistakes. As a group, choices with reason needed to prevail and compassion and protection for each other were crucial; very little needs to be said about the survival value of courage among leaders. Thus, self-worth and dignity became personally integrated with the identified social characteristics of spiritual experience—connection, vitality, wholeness, peace, and meaning and purpose. Spiritual experience was a by-product of what was needed for survival, it was not what made survival possible.

- Is this supported with current knowledge in anthropology and evolutionary theory? If not, what is needed to either affirm this explanation or offer another explanation for the capacity for spiritual experience within humans?
- An explanation must account for how it is that *all* humans possess this capacity. When did this development occur in evolution and why?
- What was the survival value of spiritual experience?

Currently, most theories of spirituality and religion focus on the cognitive aspects (Rappaport and Corbally 2018), which occurred significantly later in evolution than the capacity for empathy and the presence of courage.

What is unique about this theory is its explanation for why spiritual experience is out of awareness. The idea proposed is that once survival from the bottleneck occurred, the human cortex expanded dramatically with rapid dualistic judgment for social survival—yes or no, good or bad, right or wrong, friend or foe, approach or avoid—as there was likely greater tribal conflict and a new drive for expediency in decisions. Another impact was the development of language with cortical expansion, as the ability to label with words immediately produced a dualism of "is-is not," which then created a necessity for judgment—what is-isn't, good-bad, safe-not safe, etc. As hominids and pre-homo sapiens were migrating out of Africa, the cortex eventually dominated and overruled the hominid spiritual core/limbic brain, relegating it to the unconscious but not eliminating its functioning, despite the major problems with dualistic thought setting the stage for future/current problems of humanity. The role of eruptions of these spiritual drives into awareness with associated mystical experiences in the development of religious traditions could account for the presence of a universal mystical core (Teasdale 1999) in the majority of religious traditions.

Creative Forces and the Soul Function

As noted previously and elaborated in *master controller*, the FOS identifies the experience of the creative forces/creative openings with experiences that are similar to what would normally be included with the word soul: a moral truth-force core; agape love of self, others, life, and the "divine"; and faith as an action related to courage rather than as a belief. Science, including psychology, has avoided, if not denied, the reality of the soul and currently has no place for its study or understanding. The FOS suggests that this would include at least aspects of moral injury, compassion fatigue, and experiences of loss of faith. If soul is recognized as a functional reality associated with a specific set of experiences, then there must be a location in scientific discipline for soul studies.

- What must psychology do to incorporate this study? Would it be under a new field of ontology?
- How would soul studies be included in neuroscience? In sociology? In biology? Chemistry? Physics? Information theory? Integral studies?
- As the spiritual core is suggested as a master controller for human behaviors, what about impact within economics? Engineering? Political science? Ecology and climate change?

Soul must also be considered in other fields such as ethics and morality and human development, as it was described earlier how self-worth and dignity are related to development (Harter 1990).

- What about within cosmology, as humans are recognized as anthropocosmic beings?

In a previous Institute on Religion in an Age of Science conference on "Varieties of Spiritual Transformation," Ashok Gangadean (2006) stated that "[t]he future evolution of the sciences . . . must come to terms with . . . the global deep ontology of our enchanted cosmos."

Finally, what about the role of this knowledge in consciousness studies? As was noted at the beginning of this article, the FOS does not include experiences of psychic phenomena.

- How do spiritual and mystical experiences intertwine with psychic phenomena and consciousness studies?

At the very least, it would be expected that any explanations of experiential phenomena outside the usual realm of science must first take into consideration the knowledge of the FOS and its related experiential phenomena as explanatory. How often have we heard of mystical-type experiences as have been described herein being explained by psychic or supernatural explanations, or ideas such as quantum entanglement?

Philosophical Implications

A previous Institute on Religion in an Age of Science conference suggested there be a move from an anthropomorphic worldview of being human within a cosmos to an anthropocosmic worldview of being human as an expression of cosmos. The power of this image itself is transformational, as it immediately dispels the isolation, alienation, and disconnection of our human experience and addresses a prevalent longing for belonging and connection that may prejudice our philosophical pursuits and definitely impacts our human happiness. The FOS supports this as an awakening awareness of our spiritual core that recognizes our connectedness with all of nature and co-creation with the universe in the here-and-now moment. Often, philosophy promotes experiential disconnection with its emphasis on logic and cognitive processes, and this perspective reintegrates it.

Values and Ground of Being

A major part of philosophy and spirituality deals with values. The question of the survival value of spiritual experience has already been raised. To refer back to Figure 3, discussion of values occurs within psychology as a conceptual level of cognitive organization beyond perceptions of thoughts, feelings, and actions. This raises a philosophical question: Are there universal cosmic values or are values humanly determined and grounded?

The presence of capacities for self-worth and dignity already suggest their "evolutionary" value.

- Are life and humanity just inevitable progressions of the universe's developmental expression, such as a value similar to a cosmic constant like *pi*, or are they something else?
- Are life and intelligent, conscious creatures cosmically destined to occur in this universe?
- Are values dependent on human interpretation and valuing since they only relate to humans?
- If humans were gone, would this "value" still be present in the universe?
- What does this really say philosophically about the place of values in the universe?

A significant source of values noted in philosophy is the possibility and value of a "ground of Being" as elaborated by Paul Tillich (2014) in a reference to the experience of God. This invokes the idea that God is an answer to the ontological threat of "non-Being," often with the promise of heaven or reincarnation, as well as God being related to the meaning and purpose of Being. The FOS addresses this question:

- If our spiritual core is holotropic (moving toward wholeness) as described, with wholeness being a fulfillment of our self-worth and dignity and opening to the soul experience of the creative forces, can this spiritual core be considered a physical, real embodiment of the ground of Being?
- Is a major value and meaning of life the fulfillment of our self-worth and dignity and connection with our soul experience?
- Is this spiritual core then the source of God?
- Is it the source of God as an embodied entity, or only God as an experience of self-worth and dignity fulfilled with the opening to agape love, a moral-truth core of experience, and a faith in the guidance of our spiritual core and the life process itself?

The other way spiritual experience may be related to the ground of Being is that one of the major measures of spiritual experience with the Numinous Motivation Inventory relates to spiritual experience as addressing the existential question of Being itself. Is there life after death? How do we live as Beings who know that death is an end point of Being?

> Courage . . . transcending the non-being of the anxiety of fate and death . . . the anxiety of emptiness and meaninglessness (and). . . the anxiety of guilt and condemnation . . . has the character of faith. (Tillich 2014, 155)

Both of these inquiries suggest that our spiritual core and its drivenness to connect to our soul experience may actually be the ground of Being to which Tillich refers.

Related to this philosophically and theologically is the Omega Point of Teilhard de Chardin (1959). The Omega Point refers to the source and final end point of unification of humanity. Teilhard incorporates this within the Christian idea of "logos" as the source and purpose of all Being, which he associates with our salvation through Jesus Christ.

- Could our spiritual core actually be the embodiment of the Omega Point and the source and container of "logos"?
- Is our spiritual core the source of our purpose, as its awakening is the desired end point of our existence and fulfills the unity with all other human Beings as humanity becomes aware of and connected with our universal spiritual core soul experience?

This can even be carried further beyond Christianity, raising the question of whether this spiritual core is also the source of the Tao—the way of life, or the source of Buddhism's Four Noble Truths—as we detach from the suffering of injury to our self-worth and dignity and achieve happiness.

- Is the surrender to God's will within Judaism and Islam, of which the foundation of its name is "submission," similar to the spiritual experience seen with the FOS that requires an ego surrender to the higher power and guidance of our spiritual core?

This leads us into the full realm of the philosophical idea of panentheism and its theological correlate within process theology.

- Does the presence and function of our spiritual core relate to the concept of panentheism—the idea that God and the world are fully interrelated, with the world being in God and God being in the world?

If panentheism literally includes the whole "world" including all of natural creation, probably not. But if it is interpreted as the whole world of human experience, then the answer would be a resounding "yes." If the master control by our spiritual core influences all our experiences, especially our source of and drive to human wellbeing, happiness, and even bliss, then this spiritual core is interrelated with the whole world of our experience and our whole world of experience is related to our spiritual core. Thus, the FOS and its uncovering of our spiritual core experientially supports an idea of panentheism if God is an inseparable part of experience.

Philosophically, and in conjunction with our later discussion of theological implications:

- How does philosophy deal with this conclusion?
- Is our spiritual core even in the same realm as the "divine" or is it just plain physical and materialistic?
- With the recognition that this spiritual core is a neuroscientific reality, does it make further discussion of the "divine" irrelevant, or even unreal?
- What does the presence of this spiritual core do to the foundation of process theology?
- Why not just move process theology to the field of science and a materialist explanation devoid of any religious or theological attachment?
- Would this relegate theology to a historical and irrelevant vestigial attempt at understanding reality similar to phlogiston or the ether theory?

As the FOS and spiritual core only relate to human experience, these observations can make no claims about notions of God outside of human experience (such as God as creator or having influence on nonhuman events). Challenges to the concept of an all-loving, all-present, all-powerful entity are an existential injury to our worldview and our foundation of security, importance, meaning, and purpose.

- Is our continued attempt to redefine God only an unresolved "religious" injury to our self-worth and dignity that when processed and grieved would allow one to fully move beyond a God concept attachment as in Buddhism?

Universal Moral Direction and Values

The FOS addresses various areas related to values, specifically moral values. *Master controller* tackles this directly, challenging the "naturalistic fallacy" or the "is-ought" question. The philosopher David Hume (1978) states that just because something "is" does not necessarily mean that it "ought" to be. Since Hume, the conclusion of this has been that moral values cannot be derived from natural properties; therefore, moral foundations on this basis or any basis of material reality are false. If this is true, there is no possibility of universal ethics or morals related to the reality of science and the material world.

The FOS challenges this conclusion and provides an alternative approach to ethics and morality. In contrast to Hume, the *Encyclopedia Britannica* states that "moral terms, concepts, or properties are ultimately definable in terms of facts about the natural world, including facts about human beings, human nature, and human societies." Following this perspective, a major premise described by John Stuart Mill's (1987) version of utilitarian ethics is that an action is morally right to the extent that it tends to produce happiness (or pleasure, broadly construed) and morally wrong to the extent that it fails to produce happiness

or tends to produce unhappiness (or pain, broadly construed). This of course is problematic as there are a multitude of ways to define human happiness—including, among many others, the often disastrously contradictory goals of short- and long-term happiness, as seen with addictive behaviors.

The FOS provides a related and more directly applicable approach to ethics and morals. In this framework, self-worth and dignity have been specifically operationalized, making their fulfillment much more defined than "happiness." A person can be reasonably clear about the subjective experience of achieving increased self-worth and dignity, and this can be visibly seen and empathically felt when it occurs in a clinical setting. The extension from Mills's utilitarian ethics would be that "an action is morally right to the extent that it tends to empower self-worth and dignity, and morally wrong to the extent that it fails to empower, or even harms, self-worth and dignity." Assuming this is more useful, it raises the question: Why place self-worth and dignity above all others on the pedestal of human values?

A potential answer becomes: because they are what inherently drive human beings to fulfillment as identified by this framework; the fulfillment of our capacity for self-worth and dignity leads to a specific internal experience of wellbeing and happiness; it is available for all people regardless of life circumstances. Traditionally, this is discounted by the naturalistic fallacy that just because we have an order to our psychological organization described by the FOS ("is") does not make it the way it "ought" to be.

- Is there any way to move ethics/morality beyond being discounted by the naturalistic fallacy argument?

Exploration of the framework provides a new understanding of this dilemma that is directly related to the spiritual core and the thought processes associated with it. The is-ought argument is based on our dualistic thinking and judgment of things as right/wrong or good/bad, which has dominated our formal thinking about moral and ethical judgment as noted earlier. This itself *is* the fallacy. An example of the limits of this may assist, for instance: if evolution leads to the development of a characteristic fact that humans have two arms ("is"), then humans "ought" to have two arms. This is a typical, and non-arguable, is-ought conclusion acceptable by all people. This is *not* a dualistic moral or "ethical judgment" of right or wrong but a "natural judgment" of how certain material things ought to be. A non-dualistic thought process would use this natural judgment as evaluative or instrumental (i.e., utilitarian), such as good/better, or even best, rather than the dualistic judgment of good/bad or right/wrong, and the is-ought conclusion is no longer a fallacy.

- Does the FOS as described dismiss the naturalistic fallacy? And does the presence of this psychological organization with emphasis on self-worth and dignity make it a primary part of how humanity "ought" to be?

- Does this address the "price" of dualistic thought that has been paid by human history for language development?
- Is this similar to the both/and perspective of Jainism rather than a Western world dualistic thought of either/or?

Opening of the spiritual core moves persons into a new awareness of non-dualistic thinking processes about experience. Experience within this spiritual core is not about judgment, good or bad, right or wrong, but rather accepting that "all is the way it has to be" as a reality principle; therefore, "all is good" because it is reality—and it can be better! In fact, an argument can be made that our human cortical dualistic judgment is not the best guide for human wellbeing due to its dichotomous limitations, a conclusion espoused by Eastern religions for thousands of years.

The FOS is much clearer about human nature, with our optimal function being designed for empowered self-worth and dignity and the opening to the creative forces—truth, love, and faith. This moral truth-force is the Satyagraha (truth-force) of Mahatma Gandhi, the built-in embodied "gut" reaction of injury to self-worth and dignity. If, similar to the two arms example, we have this universal moral truth ("is"), then humans "ought" to have this moral truth through empowered self-worth and dignity. This use of is-ought is not a fallacy! The "is-ought fallacy" is an artifact of our fundamental dualistic thinking in making decisions about ethics and morality. A great example to bring this home is that when we look at values, their fundamental nature is that they are not black or white, right or wrong, which unveils the falsehood of basing ethics and morals on a dualistic foundation. With this conclusion, the elements of the framework ought to be intentionally pursued or valued, providing a specific universal ethical and moral framework. This should highlight the core values of self-worth as self-confidence, self-esteem, self-competence/ efficacy, and dignity, with all of its parts of choice/reason/wisdom, empathy/compassion/caring-justice, and honesty/courage/giving-generosity. These are universal core values that ought to be empowered in our culture. The is-ought dilemma *is* a fallacy and *ought* to be discarded. A world moral order can be agreed on that is grounded in the unique nature of being human with the "two arms" of self-worth and dignity.

Theological Implications

Since the issue of ontology has been repeatedly mentioned, this discussion of theological implications will begin with this topic. Figure 9 illustrates the role of ontology within each of these disciplines—science, philosophy, and theology. The overlap of ontological interests with science and theology includes the nature of matter, creation, and life, including metaphysics; the overlap of philosophy with theology for this discussion will focus on spirituality; the overlap of science and philosophy includes the study of the mind; while the overlap of all three is the main focus of this section.

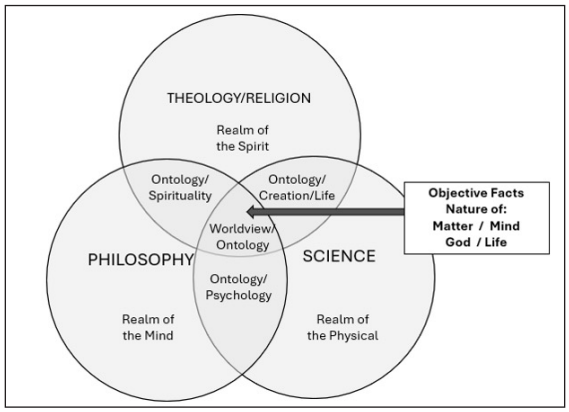

Figure 9: The inclusion of ontology as part of each major discipline, with the overlap of theology and philosophy focusing on spirituality, the overlap of theology and science including metaphysics and creation, and the overlap of science and philosophy including the study of the mind. The central overlap highlights a common ontological worldview.

The central overlap of all three disciplines is a common ontology—the nature of existence. This centrally includes the nature of matter, mind, life, and God. Since this is a part of science, this central overlap must be consistent with objective reality (as much as this can be determined). As such, its content must be agreed on by all three disciplines in what is best described as a common "worldview," a neutral term with no bias for any one of these disciplines. This area will be a major focus of the June 2025 conference on spiritual experience.

As several areas of theology have already been discussed in previous sections, this section focuses specifically on some central theological concepts not previously discussed or elaborated.

Veil of Illusion and Mystical Experience

The Veil of Illusion, or Maya, is included in Hindu and Buddhist writings and refers to a metaphorical veil that separates our human perceptions and awareness from an ultimate reality.

> The self cannot be realized through the external world; it is known when the mind is stilled and Maya is transcended. (Katha Upanishad 1.3.10)

> When the ignorance (Maya) is destroyed, the self, which is the substratum of all, shines forth by its own light. (Brihadaranyaka Upanishad 4.5.15)

This may be described as the manner in which the material world obscures awareness of the true self (Atman) and ultimate reality (Brahman). A journey of inner exploration is necessary to overcome the veil of illusion and achieve spiritual liberation (Moksha). Similar ideas may be found in Plato's allegory of the cave from *The Republic* and in the Gnostic gospels.

The FOS sheds some light on this from a Western perspective with the understanding of the nature of attitudes. Attitudes that develop from injury to self-worth and dignity, that are primarily fear based, block a person's connection to and awareness of their spiritual core with its experiences of moral truth, agape love, and a powerful faith in life. An attitude such as "I am a failure" blocks a person from loving self and also from loving or accepting love from others. A person with this attitude develops self-loathing, becomes fearful of intimacy and love with other persons, feels undeserving, and dismisses love from others. This leads to doubt and lacking faith in self and in relational life. Awareness of the presence of this attitude, associated with the processing of memories and feelings related to the adoption of this attitude, allows acceptance and, with self-compassion and forgiveness, opens awareness to restore lost faith, self-worth, and dignity. The connection is restored when the injury to self-worth and dignity is processed, often with forgiveness, self-compassion, and self-acceptance, opening the awareness to this deeper self associated with happiness and wellbeing. The Veil of Illusion has been pierced and the unconditional love, moral truth, and faith now open to genuine happiness, peace related to authentic self-acceptance, and freedom from the judgmental and fearful attitude.

- If this is so, how does theology interpret this experience? How does this relate to God, or the divine, beyond just being psychological insights related to various brain functions?
- Can attitudes coming from injury to self-worth and dignity explain the source and nature of the Veil of Illusion?

Clinical application suggests that the CBT-STE process describes in detail a Western world scientific-language guide to piercing the veil.

Though it is not yet understood, the opening of our spiritual core is associated with mystical-type experiences of connection with a powerful source, a wholeness, and union with a sense of belonging, love, and acceptance, a serenity or peace, and finally, a meaning and purpose to life. Historically, these non-ordinary mystical experiences have been interpreted as indicative of an external power or source such as God. One of the mystical characteristics of this spiritual core opening is the certitude of a new "truth" of this experience, that it is revelatory and reveals new knowledge of reality. It "feels" like an ultimate truth experience.

- Again, if this is known to be related to certain psychological operations and brain functions, how does this relate to God?
- Does it reveal anything more about the nature of God than a rational scientific explanation of chemicals and brain function?

This opening to real experiences that "feel like" characteristics of God—such as omnipotent power, all-knowing truth of omniscience, feelings of timelessness as of eternity and even immortality, an all-accepting and encompassing love, joy, and even bliss—undermines any attribution to some external source imbued with these powers and god-like characteristics.

- How does theology interpret these phenomena in relation to God or the divine?

Transcendence vs Immanence

To continue this last discussion further, the opening of this spiritual core is associated with a dissolution of the experience and awareness of spatial boundaries, so there is an inability to determine whether these feelings, or even some thoughts, are coming from inside (immanent) or from outside and transcendent. Repeated experiences of opening this spiritual core eventually provide a person with an ability to make this determination and distinguish that they are coming from within.

- Does this imply that we are gods or god-like?
- Does it provide evidence that God is within us?
- Is this understandable part of our mind/brain experience evidence that God as an entity may be a delusion, a fabrication, or a misinterpretation?

Causal Joint Problem

Sarah-Lane Ritchie (2019) provides an extensive discussion about what is called the "causal joint problem." To summarize the question, "If God does play a role in human endeavors, how is this carried out? What and where is the 'joint' or connection with humans in which this non-material God carries out these actions in the material world?" One possible solution being proposed is the "receiver-transmitter" hypothesis: that our spiritual core is just a receiver for God's transmission or broadcast, and through this receiving, God's will is done. "Christ Jesus is the transmitter of divine grace towards man," and "[i]t is through Christ that our prayers are spiritually transmitted—sent, carried and conveyed—to God" (Calvary Independent Baptist Church 2015).

- How would we determine if our spiritual core is operating as a receiver/transmitter?
- If it is, what is the character of the God transmitter? How can a nonmaterial entity "transmit?"
- Does the God transmitter just communicate and broadcast to humans or actually impact physical and/or psychological and social events in the world?
- How can a God transmitter heal a leper, raise a man from the dead, or walk on water?

The Faith Process and Applied Spirituality

The Faith Process (Figure 10) is a yet-to-be-explored process of the FOS. The Faith Process is the practical application of the FOS and the foundation of what is proposed as a new field of "applied spirituality." Applied spirituality can be a new multidisciplinary field that investigates the worldview within the common ontological focus of all three disciplines of science, philosophy, and theology. This is the in-depth study of the nature of Being as humans.

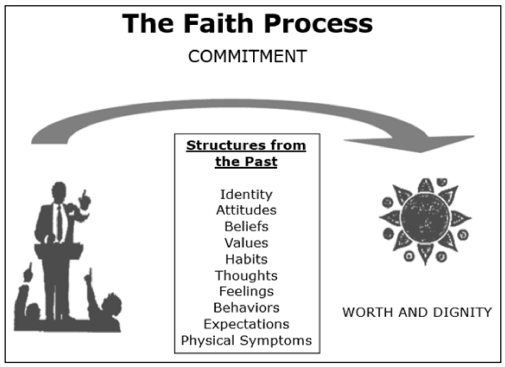

Figure 10: Making a commitment to the worth and dignity of every person invokes a spiritual attitude and creates increased awareness of blocks (aspects of past personal experiences) that prevent individuals from keeping this commitment. Processing these blocks increases a person's self-worth and dignity as it opens the spiritual core.

The Faith Process begins with making a meaningful commitment to the worth and dignity of all people, including oneself. Making this meaningful commitment increases the awareness of the structures from the past that interfere with keeping this commitment. These are organized in order of complexity, with identity usually being the most prominent block as it comes from the consolidation of habitual attitudes. Processing of our "structures from the past," including our ego identity, attitudes, and all else that interferes with keeping this commitment, connects us with our spiritual core. This process engages a person with the adoption of a spiritual attitude toward life as an acceptance of reality; that all is as it has to be without dualistic judgment of good or bad, or right or wrong; that all is part of our individual and connected human anthropocosmic purpose; that we are DNA/evolutionarily designed to learn from experience and not to have experience lead to shame, guilt, or loss of faith; that agape love can be empowered; that faith has yet unknown power with yet unknown courage. The engagement of the Faith Process as a part of an applied spirituality praxis (which occurs in a clinical application in treating injury to self-worth, dignity, and the creative forces in psychotherapies and addiction and trauma recovery) opens persons to the power of their spiritual core as part of "spiritual awakening," as described. Acting with this "faith" leads to currently unexplainable results as the creativity and generation of new possibilities appear as "aha" moments believed to be generated from the opening of the spiritual core and its creative source and powers (Raichle 2019).

Participants engaging with the Faith Process may take on a project having no idea of the solution (i.e., acting with faith) and can have metaphorically miraculous (i.e., unimagined) results as the spiritual core creativity provides new possibilities. This process can be seen as an explanation for such popular approaches to wellness and happiness or "eudaimonia" as *The Secret*, with its "Law of Attraction" (Byrne 2006), *A Course in Mira*cles (Foundation for Inner Peace 1992), *The Calling* (Mossbridge 2019), and the transforming of the past to be "mind present" and focus on the "now" as emphasized by Eckhart Tolle (2004). Despite some promoted uses of these approaches that may be excessively self-centered, hedonistic, and materialistic, the powerful underlying psychological process is what is alluring followers. It appears that aligning with and allowing this "higher power" process to guide a person may enhance the function of being human. It is noteworthy that maintaining the integrity of dignity of the FOS will not allow these distorted goals to occur, as making choices with reason and having true compassion will limit imbalance toward only self-focused ends. Moving toward wholeness and the fulfillment of self-worth and dignity fosters discovery and acceptance of our immanent meaning and purpose, which is a powerful attraction of these approaches.

A main focus of the field of applied spirituality would be the realistic exploration and application of the "soul" function—the results of aligning with our moral truth-force core, the power of the full acceptance, the appreciation and celebration of reality that is the nature of agape love, and the untapped power of indomitable faith empowered by a fearless courage.

- What is the validity or non-validity of these claims within science, philosophy, and theology?
- What is the importance and relevance of these claims in each of these disciplines?
- What is the usefulness of this vision when realized?
- Should a formal "ontology" be developed including all three disciplines, maybe with an applied spirituality praxis?
- What elements can each discipline add from their expertise and methods of inquiry?
- Could this worldview ontology involve three common but different perspectives such as a scientific existential ontology (including medicine), a philosophical Being ontology (including law, ethics, and morals), and a theological sacred ontology (including religious beliefs and practices)?

This definitive bridge of science with spirituality of the FOS demands that science, theology, and philosophy agree on a common worldview in this overlapping area. This is potentially a revolution of this process. This is the challenge we hope to explore with the commentaries of this article and the discussion at the upcoming Institute on Religion in an Age of Science conference in June 2025.

The Nature of Soul

Previous sections have referred to and described the functional "soul" experience. This soul is not a specific entity separate from the body and appears to be a specific emergent quality of experience to be further explored. The following description is being presented for review and discussion by scientists, philosophers, and theologians as it is a central focus of the common ontology and worldview on which all three disciplines should be able to agree.

There appears to be a common soul of humanity (call it Soul with a capital S) that is part of human development as our spiritual core. It includes the human capacities for self-worth and dignity that are inherent in all people (this is not to say that dignity is inherent, but that the *capacity* for expression of dignity is inherent—big difference). These capacities get developed through life experiences and empowered by "relationship" with the world. Some people have these capacities more fulfilled than others depending on life events. This spiritual core is operating out of awareness, unconsciously, and includes many characteristics of Jung's collective unconscious. It is "driven" by a holotropic (toward wholeness) character (Grof 2016) to have our conscious human cortex "wake up and fix" us from all of life's injuries to restore self-worth and dignity to its full potential wholeness. This waking up is the spiritual awakening of transformation with a new awareness of and connection with this Soul within our specific personal Being. With awakening, we experientially get in touch with our Soul and then let it (higher power) guide our conscious soul (lowercase s—conscious awareness) to an integrated wholeness. When this occurs, we are being responsible as an individual human to contribute to the process of further "incarnation" of the greater Soul through our spirit and spiritual attitude connecting in our love for self and others and assisting in empowering others' awakening and transformation. Therefore, our Soul is present before this awakening but is not yet incarnate and connected with a person's awareness and full agency. The Soul of humanity (spiritual core) is within our human body, with an opportunity for our personal soul to become consciously aware and co-create and co-evolve our common Soul of humanity. The Soul works through spirit (relationship) and may get injured, injure, be empowered, or empower. In psychology, a therapeutic relationship is spirit/relationship working. This process is beyond the treatment of mental disorders and does not have to be done with a therapist. It can be any healer, friend, or loved one connecting this process with the multitude of non-mental health related healing practices. It is the embodiment of the "I-thou" relationship identified by Martin Buber (1958).

The Faith Process is a method to assist persons in opening/awaking to Soul and strengthening the continued connection once awakened. In some manner, this healing toward wholeness, due to its mystical nature, experientially appears to be related to what we might label holy or sacred. In some manner, holy or sacred may be related to the experience of "honor" that is the nature of human dignity as defined in the framework. Think about how a personal experience of honor or honoring is very different in quality than usual ordinary life experience, making

it a non-ordinary and experientially transcendent (beyond ordinary) experience deserving the label of holy. In this manner, transcendence is a powerful quality of human experience but is not outside the natural/material world.

- Is "holy" actually a recognition of the honor we give certain experience?
- Is this what underlies our attribution of what is "sacred?"

This part of human experience can be considered the gift or "grace" of the universe; as with grace, a person does nothing to deserve it. Gratitude, giving, and generosity being powered by faith and the courage "to Be" is the anthropocosmic expression from the experience of Soul in this human body. This awareness and connection to our spiritual core develops our personal soul to contribute to the evolution of the human Soul as part of community and unity toward a wholeness of humanity. The continuing incarnation of Soul (universal) with soul (individual) occurs as injury to self-worth and dignity is healed.

- Can we recommend that the ontology studies within each discipline in this discussion legitimately and realistically explore the nature of the "soul" experience?
- What might "soul studies" look like or include?

Conclusion

This article presents a broad overview of aspects of the current knowledge about spiritual experience. A specific approach describing a CBT-based framework connects science, including neuroscience and psychology, directly with spiritual/mystical experience. Specific implications to the disciplines of science, philosophy, and theology/religion have been identified as part of the dedication of the Institute on Religion in an Age of Science to promote multidisciplinary efforts to explore and apply this knowledge. Experts in these disciplines will be engaged at a week-long conference themed "Spiritual Experience: A Scientific, Philosophical and Theological Retreat" scheduled for June 2025 to explore some of these implications and promote action steps for coordinated future efforts. Our vision is to bring leaders of these disciplines together to personally explore this knowledge and identify coordinated efforts to further the flourishing and wellbeing of our future.

In ending, I include a personal experience and look forward to the results of commentary and further discussions with scientists, philosophers, and theologians in an attempt to agree on a worldview for our future.

A powerful example of spiritual experience was described as a Canadian Anishanaabe elder spoke at the 2018 Parliament of the World's Religions saying, "I thank the Great Spirit for using me in your work. I am supremely grateful for and will miss the opportunity to taste a fresh strawberry, feel the life-giving sun on my face, and experience the chest bursting feeling of being in love. We are truly spiritual beings in a human body." Namaste.

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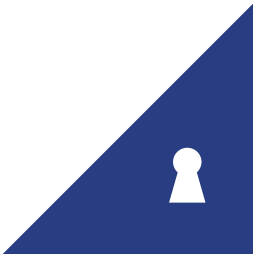

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Consilience in Developing a Multidisciplinary Framework of Spirituality: Scientific Commentary on Chatlos

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Calvin Chatlos provides a novel consideration of spiritual experiences and attempts to find ontological grounds to span these concerns within science, philosophy, and theology. Conceptualization of spiritual experiences in terms of self-worth presents interesting avenues for future considerations of the role of self in explaining spirituality but also faces several validity challenges. Resolving ontological issues requires first addressing epistemological issues regarding the nature of knowledge, which permits an interdisciplinary investigation of spirituality and the soul. The cross-cultural validity of such constructs requires their basis in neurophenomenology, neurognostic perspectives, and neurological processes that engage naturalist perspectives on the foundations of religion.

What Is Spirituality and the Soul?

Chatlos addresses a general concept of spirituality rather than specific personal spiritual experiences, but in doing so abandons the concrete experiential and phenomenal realities of most experiences at the core of spirituality. His reference to Harold Koenig's (2015) concept of spirituality as "a personal dimension of human experience related to the transcendent, the sacred, or to ultimate reality . . . to values, meaning, and purpose in life" appears much broader than the concept of a spiritual experience. Furthermore, since Koenig's studies mostly examine religious beliefs and behavior, a more refined assessment of the relationship of spirituality to health awaits. The framework of spirituality (FOS) proposes spiritual experience be understood in terms of a psychological organization of experience of perceptions of behaviors, feelings, and thoughts that, when integrated, form attitudes—"a manner of acting, feeling, or thinking that shows one's disposition" (*Collins English Dictionary*). Chatlos recognizes this ambiguous denotation in stating spiritual experiences also include the mystical, numinous, and intuitive.

Chatlos (paraphrase) takes William James's ([1902] 1970) definition of religion as a basis for defining spirituality. This involves beliefs regarding an *unseen order* that we must adapt ourselves to for harmony through adjustment of the *attitude* in our soul. This approach identifies the general idea of spirituality as an attitude that combines behavior, feeling, and thoughts. Chatlos's characterizations of adjustment to this unseen order are through a core feature of spirituality—the self. Spirituality is about an unseen order "greater than ourselves . . . a disposition to self [and] others, our role in the world" (with role being the primary attributes of self; Chatlos 2025). The keys to awareness of spiritual experience are the integrated experiences of self-worth involving self-confidence, self-esteem, and self-competence/self-efficacy. Chatlos proposes that empowering the core of self-worth and dignity opens up a new field of awareness that accesses the spiritual core.

Why should "self" aspects be so central to spirituality?

Spirituality as "Self-Worth"

To paraphrase Chatlos (2025), the keys to open awareness of spiritual experience are the integrated experiences of self-worth (self-confidence, self-esteem, self-competence/self-efficacy). The strengthening of a core self-worth and dignity leads to spontaneous opening to the level of the creative forces/creative openings that may include a sense of connectedness, vitality, wholeness, noetics, peace/serenity, and meaning and purpose. A depth of experience is identified and extended into the deepest levels of spiritual or soul experience.

The operationalization of spirituality in terms of "self-worth" merits consideration. But this proposal faces a challenge in that it lacks face validity because it diverges from commonly recognized concepts of spiritual experience

and phenomenal experience of personalized entities core to widespread notions about spirituality across cultures and time. Justifying this perspective of spirituality as self-worth in relation to traditional concepts of spirituality and the soul appears problematic.

Chatlos's conceptualization of spirituality in terms of self-related concepts (confidence, esteem, and competence/efficacy) that can be measured with psychometric instruments is a step in the right direction. This conceptual framework also appears to lack ecological validity in that this is not what *spirituality* conventionally means. Even if it is valid in a specific WEIRD ("Western educated industrialized rich democratic"; Joseph Henrich 2020) reference group, establishing cross-cultural validity is challenging given divergent cultural concepts of spirituality (and probably in meanings of self-worth elements). This problem is not unique to Chatlos's theory, as any general theory of the soul and spirituality and their determinants must address how to operationalize them in a cross-culturally valid way.

Chatlos's (2025) has a "potential answer" for placing the concepts of self-worth and dignity at the core of spirituality—"they are what inherently drive human beings to fulfillment [through] a specific internal experience of wellbeing and happiness." But empirical evidence for the claim is lacking, and even the (theological?) tradition informing his approach is not presented.

To clarify spirituality, Chatlos proposes several relevant aspects of the self as measurable attitudes—self-confidence, self-esteem, self-competence/self-efficacy. The face validity of aspects of the self as reflecting spirituality and soul concepts is promising and likely to be a very fruitful area of investigation. But the construct validity, whether assessments of elements of self-esteem measure spirituality, and the content validity of specific elements of self-esteem measures remain to be established. Chatlos proposes an explanation for these attitudes as an evolutionary adaptation that provided confidence. While this may be true, it does not establish their equivalence with spirituality. While these raise questions about the validity of the specific proposal, the conception of spirituality as related to the self may be key to interdisciplinary study of spirituality and the soul.

The Self as a Core to Consilience

Commonalities between spirituality and psychology are bridged with the concept of the self, which provides a framework shared by the social and psychological sciences and religious and theological concerns. Concepts of the self are highly varied but represent core aspects of identity formed in the confluence of biological, social, cultural, and personal influences that provide personal references essential for consciousness. Self experiences are core to spiritual and mystical experiences in one's relations with spiritual others.

The self is not a singular entity or process but involves a multidimensional stratum of auto-reference and identity that spans neural, social, and cultural

levels and exhibits well-recognized psychological, neuropsychiatric, and psychosocial profiles. Nonetheless, these diverse models presumably all have some neurological basis. Reviews of fMRI studies on task-based elicitation of self-relevant networks identify neural mechanisms involved in distinctive biologically based forms of the self (i.e., interoceptive, exteroceptive, and mental; Qin, Wang, and Northoff 2020; Wu, Huang, Qin and Wu 2024). This provides a neurological framework for organizing multidisciplinary inquiry into the self. Neurological evidence derived from EEG studies of self forms that are spontaneously manifested in meditation sessions exhibit experiential features corresponding to classic notions: the self, a witnessing observer; me, a representation of emotional agency; and the I, a capacity for reflective agency (Fingelkurts, Fingelkurts, and Kallio-Tamminen 2021). Such neurological evidence provides bridges to classic mystical notions of the self and foundational concepts for an interdisciplinary science of spirituality.

Chatlos's proposal to identify the progression of these experiences of self-worth and dignity as occurring as a consequence of cognitive development might be fruitful, and ought to begin with stages proposed by psychologist Jean Piaget. Using Piaget's framework of cognitive development to assess the nature of self changes in spiritual development provides a broad scientific framework for an integrative science of mysticism that establishes firm epistemological bases and interdisciplinary bridges. It is through epistemology that we can come to appreciate the relation of the self to the nature of mystical knowing and the relationship of both self and knowing to biological structures and processes (Winkelman 2024).

What Is the Soul?

The FOS identifies the soul with reference to experiences of creative forces/creative openings of moral-truth, open-hearted love, and indomitable faith that indicate the functional soul experience. Just what is the evidential basis or theological rationale for making such attributions regarding the nature of the soul is not presented, nor are they consistent with the experience of the soul reported across cultures. Traditional concepts of the soul emphasize a person's immaterial essence that can experientially separate from the body and even survive physical death. The divergence between the FOS and traditional concepts illustrates that there is still a phenomenon to delimit and validity concerns. What is a soul and how do we define it, or even further, operationalize such experiences? What is being denoted and how can it be reliably assessed across cultures?

Ede Frecska, Levente Moro, and Hank Wesselman (2011) propose conceptions of the soul found cross-culturally that reveal a tripartite model of physical, mental, and spiritual dimensions, suggesting they are derived from psychobiological structures. While the tripartite model seems to imply

strictly metaphysical aspects to some soul components, it may be that all three of these aspects have a grounding in physiological systems (e.g., the immune system or specific nervous systems). A biological basis for soul concepts is clearly reflected in universally distributed out-of-body experiences like astral projection and the shamanic soul flight. Thomas Metzinger (2009) proposes that the out-of-body experience manifests separated elements of the protoself in the disintegration of the normal unity of the visual field and self-identity from the physical body. This persistence of cognitive functions with suspension of the corporeal functions produces an experience of a soul-like entity (see also Winkelman 2019). These body-self dissociation experiences reveal the tripartite structure in the underlying functional brain architecture—a mental self-identity, a disembodied mimetic self, and a dissociated physical body. Studies of people who can induce these experiences voluntarily (Blanke and Metzinger 2009) illustrate how soul experiences can result from interference with brain systems (temporo-parietal junction; see Winkelman 2010 for review) and provide a model for the interdisciplinary study of spirituality.

Brain Structures and Spiritual Experience

The role of the deactivation of brain structures or systems in spiritual experiences is illustrated in the body's production of spiritual experiences in response to sustained high stress, resulting in a collapse of the balance in the autonomic nervous system. The association found across cultures of mystical and spiritual experiences that engage a broad range of positive emotional states (e.g., peace, equanimity, aliveness, awe, sacredness, gratitude, reverence, unconditional love, bliss, and ecstasy) suggests these persistent features are the result of specific aspects of brain functions or neural structures. The role of brain dysregulation in spiritual experience is illustrated by the central role of deactivation of the default-mode network (DMN) in mediating psychedelic-induced spiritual experience. The role of the DMN is not in producing the experiences but rather in permitting the spontaneous emergence of these experiences from lower brain systems when the repressive functions of the DMN are taken "offline."

Spirituality is often experienced as an awakening to a wider reality. Such transcendence perspectives of spirituality as something external should not blind us to evidence that phenomenal qualities of such experiences exhibit structures that are homologous with specific functions of our brains and minds. For instance, experiences of psychedelic-induced oceanic boundlessness are associated with the downregulation of the DMN, suggesting that the suspension of the DMN's self-integration functions and control of egoic consciousness are what enable access to such experiences.

Knowledge from clinical and psychological sciences about the role of the brain in religious experiences and beliefs provides evidence for immanence, a

perspective that considers spiritual experiences to arise from within us, from the nature of our body and brain functions. Recognition that specific forms of spiritual experience are available to persons across religious traditions challenges the notion that spiritual experiences are induced only by the expectations of religious traditions ("constructivism"), instead indicating they have a natural source. Similar spiritual experiences can be triggered by diverse means and circumstances—accidents, drugs, meditation, prayer, dance, music, extreme stressors, and spontaneous occurrences—suggesting their source in our biological nature is activated by diverse conditions that disrupt normal consciousness.

Consilience in Ontology, Epistemology, and Metaphysics: A Naturalizing Approach

Chatlos proposes that a definitive bridge between science and spirituality requires that science, theology, and philosophy agree on a common ontology and worldview. This agreement across all disciplines on ontology (the nature of existence) may be less attainable than a meta-perspective in which the phenomenological contributions of different disciplines can be integrated into a common framework for assessing their knowledge about spirituality. Chatlos's hope for a common framework to integrate disciplines has a better chance of success if framed more practically in terms of what consilience can be achieved despite the diverse disciplines' incommensurable paradigmatic approaches to ontology.

Chatlos's proposes to bridge the ontological approaches of science and theology in metaphysics, but a common ontological framework regarding the nature of matter, mind, life, and God is unlikely given the different metaphysical assumptions of science and theology. A unifying perspective through a common ontology for science, philosophy, and theology faces insurmountable barriers given their incommensurability that seem to preclude a common framework regarding the nature of existence.

So Is Consilience Possible?

What might be aspired to is a common framework regarding the nature of the human capacities for knowing, leading us instead to questions regarding epistemology. Philosophy may contribute to scientific understanding of supernatural experiences through epistemological issues regarding valid evidence, the significance of experience, and the nature of human knowledge of reality.

Philosophy's contributions to frameworks to integrate knowledge regarding spirituality may be fruitful through a framework of neutral monism, the perspective that reality involves something underlying both matter and mind. A scientific justification for neutral monism is based in recognition of what

the neurosciences tell us about human perception and knowledge: what we perceive of physical reality is not reality itself but an acquired model shaped by habituation, learning, and socialization and, most significantly, limited by the human sensory and cognitive systems that are oblivious to most information of the universe. Consequently, a scientifically defensible epistemological framework is an idealist orientation that recognizes the symbolic mental representation of all experience, independent of its source, combined with a provisory materialist metaphysics that recognizes the obviously incomplete data of our senses.

Naturalizing Mystical and Spiritual Experiences

Chris Letheby (2017) proposes naturalizing mystical and spiritual experiences within the physical sciences with a "naturalized spirituality" for experiences involving changes to the core of the self that enlarge self-concept beyond the constraints of the ego. Experiences of spiritual entities can similarly be naturalized as inevitable by-products of our innate intelligences (Gardner 2011), particularly the highly developed social intelligences that evolved to perceive humanlike entities, infer their desires and mental states, and accommodate our behaviors to what we perceive of their intentions (Winkelman 2018). Innate intelligences include the narrative capacities of spiritual and mythological intelligences that unfold out of our unconscious to produce personalized cosmological accounts of the universe. Extending our concepts of innate intelligences to include imagination provides a broader framework to explain spiritual experiences as products of a generative intelligence that parallels generative processing capacities underlying language.

This notion of spiritual beliefs emerging from interactions among innate components is central to the cognitive science of religion that characterizes spiritual beings as by-products of our social adaptations. These involve intuitive, innate cognitive operators for detecting agency, perceiving humanlike agents, theory of mind, internalizing others' qualities, and other psychological dispositions supporting ultrasociality that evolved to adapt to the most important environmental feature—social others. Together, innate cognitive operators provide inferences about unseen others with humanlike minds and their desires and beliefs that inevitably produce imagined, humanlike entities.

Naturalizing spirituality within science requires neurophenomenological and neuroepistemological approaches that accept the phenomenology without endorsing the supernatural interpretations they often evoke. Scientific evidence about how mind and brain processes are altered by psychedelics provide a useful framework for materialist explanations of the phenomenology of psychedelic experiences (Winkelman 2017). The fundamental role of mental beliefs about the physical world as foundational to human reality is reinforced by psychedelic science, as the most consistent predictor of positive psychedelic-induced therapeutic outcomes is mystical experiences and not some dose-dependent

measure of the drug. The enduring therapeutic benefits of psychedelics are from spiritual experiences, suggesting an idealist rather than a materialist cause.

Evolution and Spirituality

Evolutionary perspectives are key to naturalizing spirituality, as the universality of spiritual beliefs reflects direct or indirect (by-products or exaptations) evolutionary adaptations. Chatlos proposes the survival value of spiritual beliefs is expressed through the resultant effects on self-worth in bolstering self-confidence, enhancing initiative and increasing self-esteem and self-competence, enhancing capacities for more competent action and decisions, as well as stimulating compassion for and protection of others. But Chatlos also proposes spiritual experience is a by-product of what was needed for survival, not what made survival possible. Where by-products are subsequently used for new applications that enhance survival, these exaptations are also adaptations. The question of the survival value of spiritual experience must be contextualized not only in the framework of belief, but more importantly, in terms of how spiritual values affect behavior, social groups, and emotional wellbeing. While most evolutionary theories consider spiritual experiences to be by-products, a growing body of empirical research on how supernatural beliefs manage various social problems, (free-riding, moral systems, constant vigilance, and supervision of norm violations) suggests that they subsequently constituted at least cultural, if not biological, adaptations. The potential survival value of spiritual experiences engages a broad range of processes because of the multifactorial nature of their effects.

Most current theories of spirituality and religion exemplify the cognitive science approaches, which neglect the evolved capacities for community and empathy that existed much earlier in our evolutionary history. If spirituality is equated with community, then the effects of community on human survival are without parallel, with sociality being our most important survival strategy. Spiritual beliefs enhance social groups and moderate numerous psychological conditions and physiological responses by giving meaning, assurance, and calming influences that can shift the dynamics of stress and immunological systems, with direct implications for wellbeing, reproduction, and survival.

A Phenomenological Psychology of Spirituality

What must psychology do to engage this scientific inquiry into spirituality and soul studies? Many spiritual phenomena are already addressed within the methodological and conceptual frameworks for the study of anomalous phenomena (Cardeña, Lynn, and Krippner 2014) and phenomenological psychology. The emphasis of phenomenological psychology on verbal or written descriptions of experience through first-person introspection is a necessary step in creating an empirical science of spiritual and soul experiences.

Such studies need to take seriously the admonitions of the phenomenological approach to provide descriptions of experiences and avoid speculation about their causes or ontology. Only with analysis of such data to extract their core features and patterns will we have a phenomenon to study, a set of experiences that can be further examined through the tools of the neurosciences.

I call for a study of psychedelic entities through an "entitiology," a multidisciplinary research program to determine the range of phenomenal qualities of spirit engagements and the patterns of features and relationships they manifest (Winkelman 2018). A clearly delimited phenomenology of spiritual entities and experiences has yet to be instantiated, or differentiated, and a recognition is needed of distinct types of spirit experiences with different origins and functions.

Just what phenomena constitute the principal forms of spiritual experience remains to be determined at a phenomenological level, and even more so at a biological level. Out-of-body experiences, unity experiences with a sense of merger with something larger, and possession experiences of evil dominating entities are distinct spiritual experiences. The experiential and self-dynamics are so contrastive as to demand consideration as distinct types of spirituality. A developed science of spirituality must be a multidisciplinary endeavor informed by existing methods and theories of diverse human sciences with the help of philosophy. For a scientific study of spirituality and the soul, we first need to delimit a phenomenon of study, beginning with a rigorous study of the phenomenology of an agreed upon class of experiences. This is a challenge even if we do not go beyond the WEIRD cultures. Only if we have a clearly delimited and reliably produced or accessed phenomenon (or phenomena) can we examine how its appearance relates to measurable neurological functions, other personal experiences, aspects of personality, or even external forces such as electromagnetic and quantum fields.

The study of spirituality, spiritual experiences, soul awakenings, and similar anomalous religious experiences should be situated within the psychology of consciousness, altered states of consciousness, and transpersonal psychology and anthropology. These scientific disciplines have already begun the study of these phenomena and the organization of data to produce valid scales, empirical analyses of the patterns and relationships to diverse demographics, and even studies of the relationships of specific forms of experience to personality and brain function.

Applied Spirituality

Decades of research have established the empirical effects of spiritual experiences on diverse aspects of health (Koenig 2015), but ontological questions remain regarding the bases and nature of some of the mechanisms. The significance of spirituality for health, as indicated by epidemiological and clinical sciences,

provides evidence for an objective reality of the effects of spiritual experiences and beliefs, but their ontological claims may never be able to be satisfied from the perspectives of science.

But diverse branches of science do sustain evidence for the reality of the effects of spiritual beliefs on health, providing significant evidence that indicates science and its worldview need substantial, if not paradigm-changing, corrections. The challenges that evidence about the empirical effects of spirituality present for the currently dominant materialist worldviews require a multidisciplinary science to develop the conceptual frameworks needed to understand and apply an alternative foundation.

A Biopsychosocial-Spiritual Model?

Chatlos proposes that incorporating spirituality within medical science requires an expansion of the biopsychosocial model to incorporate spirituality. The biopsychosocial model has significant contributions as a bridging model for studying spirituality. Its significance is not just causal interactions across the three domains but the novel paradigmatic framework of supervenience, the top-down effects of our intentions upon physiological processes. This is a core element of an alternative to the materialist paradigm in which the material is subjected to the influences of more subtle forms of human capabilities, where social conditions affect physiological responses (i.e., group behavior activating the individual's endogenous opioid system) or where psychological states (e.g., mediation) can affect a wide range of physiological parameters. Chatlos's notion that the specific regions of the brain associated with spiritual experience can only be affected through physical methods or physical interventions (e.g., EEG neurofeedback, electroconvulsive therapy) misses the point that many meditators use conscious intentions to control physical brain functions without external feedback.

These top-down functions enable spiritual beliefs, attitudes, and relations to impose or elicit physiological responses in ways that can have significant effects on physiological processes that promote health and wellbeing. Perhaps, as Chatlos proposes, we accommodate spirituality within the biopsychosocial model, not as a new fundamental aspect but as an additional dimension that emerges from interaction between aspects. Is spirituality how the social or psychological realms engage the physical body? Is spirituality how meaning or self-significance engages physiological responses?

The proposal to include spiritual or numinous experience as an independent personality factor shows that subjective spiritual experiences are not ephemeral delusions but applications of spiritual beliefs in medicine require a shift in paradigm to recognize the power of symbols and their capacities to elicit physiological responses. Supernatural beliefs in souls independent of the body reflect the human proclivity to find hidden symbolic meanings

and understand them in personal terms as caused by unseen actors (Deacon and Cashman 2009). Spiritual beliefs also reflect our meta-representational capacities, with the integration of innate cognitive operators exemplified in the humanlike personification of spirits, producing emergent possibilities from unconscious cognition. Symbolic information represented in communication from spirit others permits possibilities that exceed innate capacities. Spiritual experiences, such as awe and self-transcendence, are uniquely human emotions produced through symbolic processes that expand possibilities by integrating incompatible or even contradictory emotional properties outside of normal biological experience.

The Roles of Psychedelics in Applied Spirituality

How can we engage this endeavor of applied spirituality with what are ephemeral and generally infrequent, often idiosyncratic, experiences? If we are to have a scientific study of spiritual experiences and the soul, we need to have people who can produce these experiences more or less on demand, and under observable conditions. An example are meditative experiences studied in laboratories with persons adept at inducing such transformations of consciousness to determine the unique profiles of the brain dynamics under specific conditions of meditative intent, even finding contrastive brain systems engaged by distinctive forms of meditation (e.g., loving kindness versus focused attention). The brain activity during such experiences is informative (even enlightening?), and studying people or processes that can reliably produce spiritual experiences should be a central approach to studying spiritual phenomena with neurophenomenological methodologies. The study of mystical experiences in the context of psychology, in particular their use as outcome measures in the current waves of psychedelic clinical research, illustrates that what at first might appear as ephemeral concepts can be operationalized in ways that have construct validity, and even cross-cultural applicability, as illustrated in the Mystical Experiences Questionnaire (Barrett, Johnson, and Griffiths 2015).

The clinically established evidence for the ability of psychedelics to objectively, and relatively reliably, produce mystical experiences (in the context of specific clinical set and settings) may suggest an avenue for the transdisciplinary study of spirituality, specifically mystical experiences. This is due to the ability of these substances to produce such experiences of interest that have been notoriously difficult to achieve for most, even the most adept. If we accept the legitimacy of the psychedelic-induced entheogenic experience as a valid spiritual (mystical) experience, the physiological dynamics of the psychedelic-induced state then become relevant to answering questions about the origins and nature of spiritual experiences. Since altered states of consciousness are typically, almost universally, associated with spiritual experiences, their psychobiological dynamics are also relevant to explaining how our biological

structures are related to our spirituality. The answers from psychedelic brain dynamics and studies of altered states of consciousness point to a common shift in the overall brain dynamic in which the normal top-down brain control (repression) of lower-level systems is disabled or suspended, allowing the lower brain system to project into and express in the frontal brain systems (Winkelman 2017). From a brain systems perspective, spiritual experiences are manifestations of our ancient brain systems, exemplified in the activation of innate cognitive operational systems that were adaptations of the ancient hominin brain for enhanced sociality.

This is illustrated in Chatlos's suggestion that the FOS be contextualized in reference to the brain's two main brain processing systems. He situates spirituality in reference to the theory of the "dual process of cognition," which proposes that the major differences in modes of thought are based in two distinct functional systems—"a fast, automatic, emotional, not logical, and unconscious system and a slower, logical, conscious system" (Chatlos 2025). Chatlos notes the similarity of these two systems to Freud's concept of conscious versus unconscious processing and the widely recognized hemispheric differences. An application of this right-brain versus left-brain paradigm is significantly expanded in Iain McGilchrist's (2019) book and requires further attention in the context of the FOS.

Conclusions

Chatlos shows that self is important for a multidisciplinary study of spirituality, but it remains to be seen if a cross-cultural examination will establish the validity of his claims regarding the central role of self-worth in spirituality. Nonetheless, the concept of the self should provide a bridge across science, philosophy, and theology. A common framework for their approaches requires greater attention to a common epistemology, addressing how the symbolic mediates all knowledge and imposes on the physiological as well as psychological dimensions. The empirical approach to the spiritual will find much use in engaging the most powerful spiritual tools available, the psychedelics, renowned for their ability to reliably produce entheogenic experiences, and make them more amenable to detailed investigation.

The naturalization of the entheogenic experience means taking both neurology and phenomenology as givens and attempting to use the former to explain the structural features of the later. This begins with an acceptance of the experience as real, but without ontological assumptions about the source of the experience except that the brain plays an essential role in revealing the experience to the percipient. This neurological framework provides a basis for understanding the typical phenomenology of psychedelic experiences as neurophenomenological, with their phenomenal qualities reflecting the pharmacological effects of psychedelics on the visual processing systems, the

innate intelligences, and neural networks supporting the theory of mind, social inference, and global brain connectivity (Winkelman 2017).

The diverse multidisciplinary sciences of spirituality have yet to be incorporated within a single scientific paradigm, a condition reflecting their early phase of development. A bridging methodology can be found in neurophenomenology as a research approach to theoretical formation grounded in both the natural sciences and personal spiritual experiences. Such a methodology offers hope of an initial consilience in finding plausible mechanisms for the structure of perceptions.

Although brain research has repeatedly implicated statistical associations between diverse forms of spiritual experience and specific brain lesions or regions of activity, such associations are often weak and do nothing to establish a "god spot" in the brain. Even when we find spiritual experiences associated with a specific brain structure or function, this does not establish that our spirituality derives from that neurological basis. The associated neurological structures may be like the intricately interconnected components of a TV, something necessary to receive the signal and display it for consciousness, but not the source of the programming, which is the really significant information. A multidisciplinary explanation of the human capacity for spirituality must nonetheless address how general and specific effects on the brain enable modifications in the structure–function operations that permit the emergence of these experiences. We need to know how it is that we tune the human biocomputer's receptors to optimize spiritual experiences so that they can become an object of observation and the multidisciplinary study of one of humans' most important resources.

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Toward a Unified Science of Spiritual Experience—Visionary Realism and the Ontology of Interiority: Philosophical Commentary on Chatlos's Framework of Spirituality

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This article proposes visionary realism as a philosophical framework to underlabor for the development of a unified science of spiritual experience. By integrating elements of Roy Bhaskar's critical realism, Ken Wilber's integral theory, William James's radical empiricism, Johann Wolfgang von Goethe's participatory epistemology, and Rudolf Steiner's subtle empiricism, visionary realism outlines key ontological and epistemological challenges to studying interior realities such as consciousness, culture, and spirituality. Visionary realism critiques the reductionist tendencies of physicalism (scientific materialism) and the neo-Kantian conflation of subjectivity and interiority, reclaiming interiority as an emergent, ontologically real dimension of the natural world that, while epistemically relative and fallible, can, in principle, be understood objectively—namely, in an ontologically realist and transfactual manner. This article advances an expanded or integrative empiricism—radical, deep, and subtle—that integrates subjective, intersubjective, and objective methodologies to legitimize spiritual experience as a domain of rigorous scientific inquiry. It further explores the nested relationship between a science of interiority, a science of spiritual experience, and the emerging academic field of soul studies. This integrative framework seeks to bridge science, philosophy, and theology, offering transformative responses to the meaning crisis and the larger global metacrisis by fostering a secular spirituality capable of re-enchanting the disenchanted world.

Introduction

We live in an age of great scientific prowess and profound spiritual disorientation. In this disenchanted world, where deep meaning wanes and the incessant pull of nihilism and its myriad inflections of spiritual malice seem to be approaching an apogee, how can we reclaim the reality and depth of our interior life in an era that seeks collapse it? The study of spiritual experience presents a unique challenge at the intersection of science, philosophy, and theology. To investigate such phenomena scientifically within a naturalistic, secular, and realist framework, we must first clear away the unjustified metaphysical presuppositions that obstruct the possibility of a rigorous and integrative inquiry into the nature of spiritual experience and spiritual reality—or the "unseen order," as William James (1912) called it. As John Locke ([1690] 1996) aptly put it, we need "philosophical underlaboring" to clear the "metaphysical rubbish" from the path of knowledge.

In this commentary, I argue for the development of a visionary realist philosophy of science that underlabors for a new *science of interiority* capable of systematically exploring subjective spiritual experience and the objective ontological realties that underpin it (Hedlund 2021). This approach provides philosophical buttressing for John Calvin Chatlos's proposed Framework of Spirituality (FOS)—a naturalistically compatible model that seeks to integrate science, philosophy, and theology within a unified ontology. This is not to say I agree with all the details or the claims Chatlos makes, but rather that I seek to support the general direction of his FOS in the sense of developing a naturalistic ontology and scientifically grounded approach to the study of spiritual experience and realities. My aim is to contribute to the dialogue in field of science and religion about what a naturalistic common foundation for the scientific study of spiritual experience and spiritual realities might look like.

Chatlos's (2025, 2) FOS forms the basis for a scientifically grounded study of what he calls the "spiritual core"—a kind of rationally intelligible "soul studies." Central to this framework is the "unseen order" of subjective experience, which includes not only the spiritual core but also creative forces such as love, truth, and faith (Chatlos 2025, 2). While the FOS emphasizes phenomenology and subjective spiritual experience, it clearly presupposes an intransitive ontology of universal and real spiritual structures, including a tripartite model of thinking, feeling, and doing; a stratified self with depth; and an intrinsically lawful spiritual development.

This ontology implies interiority is structured and follows rationally intelligible principles. Spiritual development unfolds through stages, reflecting a universal process of transformation, even as individual expressions vary due to historical, cultural, and psychological mediations. In this way, the deep structure of interiority is implicitly universal, with the spiritual core both innate and emergent—innate in that it is a fundamental aspect of human being,

emergent in that its realization depends on participatory engagement. Hence, spiritual experience in the FOS is not merely subjective but ontologically real and causally efficacious, unfolding according to lawful, though experientially variable, patterns of transformation.

Further, Chatlos's framework suggests the spiritual core and its development transcendently depend on spiritual realities such as love, truth, and faith, which function as creative forces shaping both individual transformation and collective meaning-making. Thus, while the FOS operates within a naturalistic paradigm, it does not reduce spiritual experience to mere subjectivity or neurological epiphenomena; rather, it affirms the ontological depth of spirituality, advocating for a scientific approach to studying these realities within a unified, interdisciplinary framework.

To shift from the prevailing empiricist–physicalist paradigm—where only what can be seen or measured through the five senses is deemed real—to a transcendental realist, post-physicalist paradigm that recognizes the unseen order of interior causes and structures as real, we must indeed "clear out the rubbish." Visionary realism contends that a crucial part of the rubbish has to do with the Kantian insistence that we cannot touch noumenal reality or the thing-in-itself (*ding an sich*), leaving us confined in the Kantian straight jacket of subjective phenomena. The visionary realist proposal for a new science of interiority (Hedlund 2021) critiques the neo-Kantian coupling of subjectivity and interiority, arguing that interiority constitutes an ontological domain distinct from subjectivity, which it construes as epistemic. Subjectivity is the primordial foundation of all knowledge, encompassing our epistemic access to both interior and exterior domains, but that does not mean interior phenomena are merely subjective. By decoupling interiority and subjectivity, we can recover the ontological reality of interior phenomena (consciousness, culture, ethics, spirituality) and move toward a framework that supports "objective" knowledge claims in these domains, understood not as a view from nowhere, nor a panoptic view, but as a systematic, rigorous, procedurally rational intersubjective agreement (Habermas 1984) that lays claim to reliable and valid description and expression of alethic truth (Bhaskar [1979] 2015) despite being inexorably situated, fallible, relative, provisional, and subject to revision and falsification.

Grounded in critical realism (Bhaskar 2016; Bhaskar et al. 2016), visionary realism holds that science can, in principle, yield transfactual, objective knowledge about the real but unseen causes of events—interior as well as exterior—even though such knowledge remains fallible and theory-laden. In rejecting the Kantian doctrine of unknowable reality, visionary realism affirms that the interior domains of mind and spirit, no less than the exterior natural world, can be known in theory (albeit always provisionally). This stance seeks to resolve the stalemate between modernity's naïve empiricist realism and postmodernity's social constructivist anti-realism, pointing toward a post-postmodern participatory

realism in which knowledge can be more or less resonant with reality (namely, alethic resonance) and thus asymptotically described and expressed through disciplined inquiry. In this vision, interiority (consciousness and culture) is not an ineffable mystery forever beyond knowledge but an emergent aspect of nature that can be explored through appropriate epistemic participation. We can begin to imagine a transfactual or objective science of interiority that is as methodologically rigorous as the natural sciences yet adequate to the depth of its subject matter. With this philosophical foundation in place, we can now examine how visionary realism reclaims interiority and sets the stage for a unified science of spiritual experience.

The Neo-Kantian Coupling of Subjectivity and Interiority

Modern Western thought has largely inherited Immanuel Kant's strict separation of the knowing subject from the ontological reality of what is known. Kant confined interiority to the realm of mere subjective experience, accessible only via the mind's transcendental structures, thereby banishing phenomena of mind and spirit from the domain of objective reality. This neo-Kantian legacy treats subjectivity as the epistemic domain of the knower and relegates interiority to it, implicitly denying that consciousness, culture, or spiritual insight could correspond to anything real. Visionary realism directly challenges this assumption, decoupling interiority from subjectivity. Drawing on Bhaskar's ([1979] 2015) critical realism, visionary realism maintains that interior phenomena possess ontological intransitivity—they exist relatively independently of our awareness of them. Instead of being absolutely unknowable or strictly subjective and non-generalizable, interiority is both an intransitive ontological domain of reality and a transitive epistemic mode of participatory access to it, as knowledge (e.g., science and philosophy) is constellationally contained by being (e.g., social reality). This recursivity in the social domain does not amount to a kind of self-referential paradox in which ontology is reduced to epistemology (what Bhaskar calls "the epistemic fallacy") but adds a degree of relativity to the notion of ontological intransitivity that necessarily is justified in a process-relational ontology. Once an object or structure has come into being (at t_1), whether in the social or natural world, it is both determined and determinate as well as inalterable (at t_2)—that is, it is existentially intransitive (Bhaskar 2016, 46–47). Such an entity or structure may be partly causally constituted in a causally interdependent, recursive manner (as in social and human science), and therefore only relatively intransitive in a causal sense, but not an existential one. In short, scientific knowledge (in the transitive dimension) of a social reality is partially constitutive of the social reality it describes such that the transitive and intransitive dimensions remain categorically distinct but not discrete.

In this view, experiences of mind, soul, and spirit are not "nothing but" private constructions; rather, they are real, emergent dimensions of the natural world with their own causal structures that can be studied objectively. This shift opens the possibility of a naturalistic yet non-reductive science of interiority, recognizing that interior phenomena cannot be fully explained away as neural activity or social convention.

Philosophical Underlaboring and Clearing Metaphysical Rubbish

As a philosophical underlaborer, visionary realism works to clear these epistemic obstacles. Locke's metaphor of the philosopher removing "metaphysical rubbish" from the path of progress is apt here. Visionary realism directly addresses the ontological and epistemological barriers that have marginalized interiority in science. It integrates insights from critical realism and integral theory to develop an expanded, integrative empiricism into a coherent framework capable of bridging the epistemic divides between science, philosophy, and theology. In practice, this underlaboring means proposing new terms of inquiry wherein interior dimensions are taken as real and investigable.

For instance, Ken Wilber's (1995, 1998, 2000) integral theory provides a valuable corrective to aspects of the neo-Kantian legacy by positing an "all-quadrant" model that situates sentient beings within an ontological matrix encompassing interior and exterior dimensions of the individual and collect (consciousness, culture, behavior, and systems). This model affirms the co-arising of interior and exterior realities, challenging the reductionist "flatland" worldview that confines scientific inquiry to the exterior domain. Similarly, James's (1912) radical empiricism insists that relations between experiences are as real as the experiences themselves, providing a philosophical basis for the systematic study of spiritual phenomena. By drawing on such perspectives, visionary realism helps clear space for a legitimate science of interiority.

Beyond Physicalism: A Naturalistic but Non-Physicalist Framework

Visionary realism's critique of physicalism is central to its project of reclaiming interiority. Physicalism, which equates reality with material processes observable through the five senses, systematically excludes interior phenomena from the realm of legitimate scientific inquiry. This exclusion is evident in the dominance of reductionist paradigms such as the "neuroscience meets mindfulness" framework, which seeks to explain spirituality exclusively through neural correlates and adaptive functions (Murphy 1992; Wilber 2000). By contrast, visionary realism affirms a post-physicalist ontology that situates interior phenomena as real emergent features of the natural world. It draws on Johann Wolfgang von Goethe's (1988) participatory epistemology, which emphasizes

the active role of the observer in the process of knowing, and Rudolf Steiner's ([1910] 2009, [1923] 2009a, [1923] 2009b) expanded empiricism, which includes subtle faculties of perception capable of apprehending spiritual realities. This expanded framework allows for the study of spirituality not as a reducible by-product of material processes but as a lawful domain of existence in its own right.

Addressing the Meaning Crisis and the Metacrisis

The exclusion of interiority from scientific inquiry has far-reaching consequences for contemporary society, contributing to what John Vervaeke (2019; Vervaeke et al. 2017) terms the "meaning crisis." This crisis is characterized by existential alienation, nihilism, and the fragmentation of ethical and cultural norms (anomie). The meaning crisis is arguably symptomatically related to the intense contemporary mental health crisis in the West and the mass shootings and opioid crises in the United States. Visionary realism addresses the challenges of the meaning crisis by re-enchanting the world through a new philosophy of science and a new science of interiority. By restoring a sense of deep meaning, purpose, intrinsic value, and interconnectedness to our understanding of reality, it offers a response to nihilism.

As I have argued (Hedlund 2021), the global metacrisis—the convergence of eco-social, ethical, existential, and epistemic crises and their interconnected network of root causes (Hedlund et al. 2016; Hedlund and Esbjörn-Hargens 2022; Hedlund and Esbjörn-Hargens forthcoming)—demands an integrative framework capable of addressing its multiple dimensions. The ontological affirmation of spiritual realties helps heal the divides—between subject and object, science and spirituality, being and knowing—that lie at the root of the meaning crisis. By reclaiming interiority and affirming the ontological reality of spiritual phenomena, visionary realism provides the philosophical infrastructure for a eudaimonistic planetary society oriented toward both human and planetary flourishing.

Visionary Realism and the Foundations of a Science of Interiority

Visionary realism offers a transformative philosophical foundation for the systematic study of interior phenomena. By decoupling interiority from subjectivity, critiquing the reductionism of physicalism, and integrating expanded empiricism, it creates the conditions for a science of interiority that is both rigorous and comprehensive. This framework lays the groundwork for subsequent inquiries into the nested fields of spiritual experience and soul studies, providing the intellectual tools necessary for addressing the meaning crisis and fostering planetary flourishing.

This philosophical underlaboring is not merely an academic exercise but an urgent imperative for navigating the perilous complexities of our time. By bridging the epistemic and ontological divides that fragment our understanding, visionary realism holds the potential to re-enchant the world and contribute to the emergence of a transformative, integrative science of interiority.

Rethinking Objectivity

A central innovation of visionary realism is its reconceptualization of objectivity. The dominant positivist and empiricist paradigms define objectivity as the elimination of subjectivity, relying exclusively on quantifiable, empirical data, and the neutral observer ideal to ensure unbiased scientific knowledge. This narrow conception of objectivity dismisses interior phenomena as subjective and non-quantifiable, and thus not truly objective. Visionary realism, by contrast, advocates for a pluralistic, integrative, and participatory notion of objectivity, encompassing three dimensions: (1) epistemic reliability, (2) epistemic validity, and (3) ontological intransitivity (Hedlund 2021). These respectively ensure our methods are consistent and our constructs and theories are accurate, as well as that the phenomena studied have real existence independent of our observation.

Objectivity as Epistemic Reliability

Epistemic reliability pertains to the consistency and reproducibility of methods and results. While natural sciences achieve reliability through quantitative methods, qualitative approaches in the human sciences can also achieve systematic reliability. Techniques such as intercoder agreement and psychometric inter-rater reliability demonstrate that subjective phenomena can be studied with rigor and consistency (Miles and Huberman 1994; Dawson 2004). For example, the neo-Piagetian tradition in developmental psychology has shown that the structures of human interiority can be systematically mapped through reliable, cross-culturally valid methods (Commons et al. 1984).

Objectivity as Epistemic Validity

Epistemic validity concerns the extent to which methods accurately represent the phenomena they aim to study. In the context of interiority, validity involves aligning research methodologies with the complexity and depth of interior phenomena. Construct validity, for instance, ensures that scientific methods genuinely capture the structures and dynamics of consciousness, culture, and spirituality (Creswell and Plano Clark 2011). Visionary realism emphasizes the integration of reliability and validity, recognizing that robust science requires both consistent methods and accurate representations of its objects of inquiry.

Objectivity as Ontological Intransitivity

Critical realism's distinction between epistemic and ontological objectivity is essential for reclaiming interiority as a legitimate domain of scientific inquiry. Ontological intransitivity refers to the independent reality of objects, structures, and mechanisms, irrespective of whether they are known or observed. Visionary realism affirms that interior phenomena like consciousness, values, and spiritual intuitions have intransitive being: they are not merely mental projections but real features of the world with causal powers that can systematically influence behavior and experience.

Embracing these expanded notions of objectivity lays a firm groundwork for a science of spirituality that moves beyond the limitations of physicalist paradigms. It affirms that spiritual experiences, while lived subjectively, are genuine interactions with real dimensions of existence that can be studied with scientific rigor. For instance, practices of meditation and contemplation, often dismissed as subjective exercises, can be understood as methods for systematically engaging with and exploring the structures of interiority. In this way, reframing objectivity legitimizes the subjective and intersubjective realms as parts of nature open to scholarly study.

Toward a New Science of Spiritual Experience

Contemporary discussions of spirituality within the sciences are often constrained by a reductive physicalism. Spiritual experiences tend to be treated as epiphenomena—by-products of neural activity to be mapped or evolutionary behaviors to be catalogued—rather than phenomena with ontological depth. While valuable insights have been generated within such approaches (e.g., the neuroscience of religion), prevailing frameworks tend to truncate spirituality, effectively explaining it away in terms of neurological processes and adaptive behaviors that fail to address its ontological and existential depth. Visionary realism offers a way forward, advocating for a science of spiritual experience grounded in a naturalistic yet non-physicalist ontology.

In visionary realism, spiritual experiences are emergent properties of interiority that intersect with broader cultural, ethical, and ecological realities. As James (1912) argued, spirituality must be studied within the full spectrum of human experience, integrating subjective, intersubjective, and objective dimensions. Visionary realism extends this approach, framing spiritual experience as a legitimate object of scientific inquiry grounded in an expanded empiricism and an ontologically rich framework. Rather than dismissing mystical or contemplative phenomenological insights as merely subjective, it treats them as data—phenomena that can be investigated systematically, interpreted, and even intersubjectively corroborated (just like physical phenomena). The task then is to develop scientific approaches that honor the subtle depth of spiritual life without sacrificing rigor.

Expanded Empiricism: Radical, Deep, and Subtle

To build such an approach, visionary realism advocates for a reimagined empiricism that transcends the narrow confines of the five physical senses. James's (1912) notion of radical empiricism is a starting point: all aspects of experience, including relations and qualitative nuances, are admissible as data for science. James maintains that the continuity and connections between experiences are as real as the sensations themselves, which pushes us to include the felt sense of meaning—the context and relations of spiritual experiences—in our investigations rather than stripping it away.

Building on James, Wilber (1998) proposes a broad or "deep empiricism" that asserts empiricism must encompass not only the exterior dimensions of reality—accessible through the physical senses—but also interior dimensions, accessible through introspection and systematic contemplative practices. Wilber's framework is grounded in his epistemological model of the multiple "eyes of knowing" beyond the physical senses, including the sensory-physical (eye of flesh), the conceptual-logical (eye of mind), and the contemplative-mystical (eye of spirit). These epistemic modalities, Wilber argues, must be integrated to fully understand phenomena, particularly those involving spiritual experience. Visionary realism integrates Wilber's insight by insisting that empirical science need not be limited to what can be seen or touched; it can extend to what can be experienced inwardly under disciplined conditions.

Other thinkers affirm this widened empiricism. Michael Murphy's (1992) "synoptic empiricism" complements this perspective by integrating insights from diverse disciplines—including psychology, anthropology, medicine, and mystical literature—to uncover deep patterns in extraordinary human capacities. Similarly, Stephen Phillips's (2008) characterizes certain Vedantic approaches as "mystic empiricism," treating mystical experience itself as a valid source of knowledge (provided it is approached with rigor and critical discernment). Both perspectives reinforce the notion that empirical inquiry can embrace data from prayer, meditation, or peak experiences in a methodical way.

Goethe's participatory epistemology and Rudolf Steiner's development of subtle empiricism further enrich visionary realism's expanded empiricism. Goethe's scientific method (Bortoft 1996) emphasizes an intuitive and imaginative engagement with phenomena, allowing the observer to resonate with archetypal realities beyond the physical senses. This participatory empiricism broadens the scope of inquiry, recognizing that well-cultivated faculties of intuition and imagination can access dimensions of experience typically excluded from conventional empiricism (Goethe 1988). Steiner, as a key interpreter and developer of Goethe's scientific work, advanced a resonant vision by identifying additional "organs of perception" or subtle senses that extend beyond the five physical senses. These include imaginative cognition, inspirational cognition, and intuitive cognition, which, once cultivated, enable

the perception of spiritual realities through vivid imagery, direct insight, and unmediated understanding (Steiner [1910] 2009, [1923] 2009a, [1923] 2009b). In Steiner's view, humans have up to fifteen senses, including these finer capacities. Such claims challenge conventional science, but visionary realism takes up the spirit of Steiner's proposal pragmatically and hypothetically: it suggests that human consciousness may access layers of reality (through symbols, meditative insight, etc.) that standard empiricism overlooks, which is to be more definitively verified or falsified in further philosophical and scientific research. By incorporating disciplined inner observation and intersubjective comparison of those observations, the ambit of empiricism is potentially stretched to include the subtle, the transpersonal, and the sacred.

In sum, visionary realism argues for an integrative empiricism that is radical (accepting all experience as data), deep (probing inner as well as outer realities with mental and spiritual perspectives), synoptic (synthesizing multiple sources of evidence), mystical (open to insights from altered states of consciousness), participatory (engaging the observer's creative intuition), and subtle (utilizing refined faculties of perception). This transfigured empiricism lays the methodological foundation for a visionary realist science of spiritual experience, affirming the ontological reality of spiritual phenomena and their accessibility through diverse modes of human perception.

This integrative empiricism includes:

- First-person (phenomenological) methods: Phenomenological approaches explore the lived experience of spirituality, capturing the subjective depth and richness of spiritual phenomena. Methods such as mediation, introspection, and autoethnography serve as tools for systematically observing one's own consciousness. Such methods yield rich qualitative data on spiritual growth, inner conflict, and transformative insight. Rather than being dismissed, disciplined subjective reports become crucial data for understanding spiritual phenomena from the inside.
- Second-person (relational) methods: These dialogical approaches investigate spirituality as it emerges between people. Examples include qualitative interviews and group dialogues and hermeneutic practices about spiritual experiences, studies of communal rituals and collective prayer, and examinations of mentor–mentee relationships on the spiritual path. In these cases, intersubjective verification—finding commonalities and shared meanings across individuals' experiences—adds rigor. The focus is on how spiritual realities are co-created and validated in relationship.
- Third-person (systematic) methods: These apply often quantitative or formally qualitative techniques to spiritual phenomena. They include neuroscientific studies of meditation (e.g., EEG or FMRI), psychological surveys of mystical experience, cross-cultural comparisons of

> developmental stages, and other objective analyses. Such methods situate individual spiritual experiences within larger patterns and mechanisms—linking subjective reports to measurable correlates or societal factors. Third-person approaches provide an external, observable anchor to claims about spirituality.

By triangulating and integrating first-, second-, and third-person methodologies, visionary realism provides a pluralistic framework for studying spirituality that honors the complexity and depth of its subject. It resists reductionism, affirming that spiritual experiences are not merely private whims, or psychosocial constructions, but mediated interactions with real (albeit subtle) dimensions of existence. Only through such an integrative methodological pluralism can the study of spirituality remain both scientifically rigorous and true to the phenomena's depth and nuance.

The Ontological Reality of Spiritual Phenomena

By embracing this expanded empiricism and methodological pluralism, visionary realism allows for a deeper ontology of spiritual reality. No longer reduced to epiphenomena or illusions, spiritual events are seen as emergent properties of nature. In contrast to physicalist paradigms that dismiss spirituality as purely subjective or illusory, visionary realism affirms that spiritual phenomena have ontological reality—they exert real causal influence in individual and collective life. Rooted in the understanding of a methodological circle wherein philosophy and science are syncategorematic and inter-informed, visionary realism contributes an a priori philosophical ontology, laying the intellectual foundations for a new science of interiority, which, when put into an expanded empirical practice, can inform an a posteriori scientific ontology. Together, these produce a consilience in which an integrative ontology of spiritual realities can be progressively developed. This consilience includes both transcendental philosophical methods and empirical scientific ones. Bhaskar's (2002, [2002] 2012a, [2002] 2012b) meta-reality, for example, develops a secular spiritual ontology rooted in transcendental arguments that conclude to demonstrate a deeper ontological unity or nonduality underlying both natural and social worlds. Meta-reality emphasizes the interconnectedness and co-presence of all dimensions of reality, offering a philosophical foundation for a secular spirituality that avoids the pitfalls of dogmatism while preserving transformative potential. Bhaskar's ([2002] 2012b) "esoteric sociology of everyday life" illustrates how mutual understanding and ethical action presuppose a non-dual spiritual substrate—a meta-real ontology that undergirds all human interaction. This framework demonstrates that transcendental methods grounded in procedural rationality and methodological transparency can systematically explore the deeper structures of interiority and spirituality. Such methods, when combined

with visionary realism's expanded empiricism, can help bridge the gap between empirical science and philosophical inquiry.

In integrating expanded empiricism with Bhaskar's meta-reality, visionary realism provides the philosophical infrastructure for a transformative science of spiritual experience. This science holds the potential to re-enchant the disenchanted world, addressing the existential and epistemic crises of modernity by restoring meaning, purpose, and interconnectedness to human existence. By situating spiritual experience within an ontologically robust and epistemologically pluralistic framework, visionary realism opens new horizons for understanding and engaging with the profound dimensions of human interiority.

Visionary Realism and Chatlos's Framework of Spirituality

Chatlos's FOS provides a practical model toward which these abstract principles can be applied. The FOS is an integrative schema that spans personal, interpersonal, and transcendent dimensions of spirituality. It is essentially a proposal for a unified field theory of spiritual development, aiming to ground soul-related concepts in a naturalistic yet meaning-rich context (Chatlos 2025). Visionary realism both complements and strengthens this framework by supplying it with deeper ontological and epistemological underpinnings. It ensures that Chatlos's empirically grounded approach to spirituality rests on a robust philosophy of reality, where interior constructs like the "spiritual core" could potentially, through research, be validated as real aspects of nature (not merely useful fictions).

Soul Studies

The emergence of "soul studies" as a formal academic field, as proposed by Chatlos (2025), represents a bold and transformative initiative to explore the depths of human interiority. Chatlos's FOS articulates a secular view of the soul as the spiritual core of the human being, situated at the intersection of personal (self-worth), interpersonal (dignity), and transcendent (creative forces) dimensions. This multidimensional approach integrates empirical science, philosophical inquiry, and theological reflection. As Chatlos (2025, 18) states:

> the FOS identifies the experience of the creative forces/creative openings with experiences that are similar to what would normally be included with the word soul: a moral truth-force core; agape love of self, others, life, and the "divine"; and faith as an action related to courage rather than as a belief. Science, including psychology, has avoided, if not denied, the reality of the soul and currently has no place for its study or understanding . . . If soul is recognized as a functional reality associated with a specific set of experiences, then there must be a location in scientific discipline for soul studies.

While physicalism and proponents of New Atheism (e.g., Richard Dawkins, Sam Harris, Christopher Hitchens, and Dan Dennett) argue that the notion of the soul represents pre-modern, pre-rational dogma incompatible with secular rationality (Harris 2014), visionary realism challenges this claim. Visionary realism provides the philosophical foundation necessary to legitimize this emerging field, addressing its ontological, epistemological, and methodological bases. Once the limitations of neo-Kantian empirical realism and the flat ontology of Humean actualism are exposed, the necessity of a depth-stratified ontology becomes clear (Bhaskar [1975] 2008). From this expanded epistemological perspective, an inquiry into the soul as a transfactual, causally efficacious structure becomes fully coherent with modern scientific rationality and procedural rationality criteria (Habermas 1984).

Through Chatlos's FOS and clinical research, rich first-person empirical data has been gathered, demonstrating significant phenomenological consistency in experiences linked to the soul. Positive psychospiritual transformations observed in patients undergoing Chatlos's cognitive behavioral therapy-based spiritual interventions—often sparked by mystical "oceanic feelings" of oneness—illustrate the soul's functional reality and crucial role in human wellbeing.

Soul studies, as envisioned within visionary realism, occupies a nested position within a broader science of spiritual experience, itself nested within the overarching science of interiority. While the science of interiority broadly investigates phenomena like consciousness, ethics, and culture, soul studies specifically explores deeper transcendent dimensions of human existence. It focuses on the ontology of the soul, dynamics of spiritual growth, and the ethical, relational, and contemplative practices that nurture it. Consistent with Popperian science, soul studies remains open to falsification, viewing any scientific conceptualization of the soul as provisional and fallible.

A central task of soul studies is to clearly articulate the ontology of the soul by synthesizing diverse intellectual and spiritual traditions within a naturalistic yet non-physicalist framework. Visionary realism affirms that the soul is neither merely subjective nor a mythic metaphorical, but rather an emergent and causally efficacious reality. Drawing on critical realism's depth ontology, the soul can be understood as a structural mediator between the empirical, actual, and real (and meta-real) dimensions of existence—the supervenient causal force of order that governs the morphological trajectory of an embodied human personality. In this way, we could say, resonant with Chatlos, that the soul is the mediator of the transpersonal unseen order (the real) and the personal order of (actual) seen (empirical) events. Steiner's ([1923] 2009a) spiritual science enriches this ontology by emphasizing subtle faculties—imagination, intuition, and inspiration—that enable the soul to mediate between sensory and spiritual worlds. Wilber's (1995, 2000) integral theory further positions the

soul within a developmental cosmology, identifying its evolution through pre-personal, personal, and transpersonal stages. Bhaskar's meta-reality deepens this understanding by characterizing the soul as the authentic core of individual being, inherently linked to the ground state and facilitating transformative unity with transpersonal reality.

Together, these perspectives allow visionary realism to articulate the soul as a multidimensional entity that actively shapes human thought, emotion, behavior, and community through its alignment with transcendent realities like love, truth, and faith (Chatlos 2025). This multidimensional ontology provides soul studies with a robust foundation for scientific inquiry into the deeper structures of human experience.

Methodologically, soul studies would mirror the multi-modal empiricism outlined earlier, but with special attention to soul-specific data. First-person approaches might involve intensive journaling of inner experiences or training in contemplative techniques to observe soul dynamics (e.g., "dark night of the soul" experiences or moments of epiphany). Second-person approaches could compare insights across spiritual direction sessions or group dialogues about purpose and calling, highlighting how the soul's expression is mediated through relationships and culture. Third-person approaches could include longitudinal studies on how profound spiritual experiences alter a person's values, health, or community engagement. In all cases, visionary realism's influence ensures soul studies remains scientifically legitimate without stripping away the profundity of its subject. The field would maintain academic rigor (clear concepts, evidence standards) while still engaging with phenomena of love, virtue, and transcendence that are often left to theology alone.

Re-Enchanting the World through Spiritual Science

At the heart of the metacrisis lies a profound crisis of meaning—a deep fragmentation and disconnection from a coherent and adequate worldview that confers a sense of deep existential meaning. The metacrisis is fundamentally linked to an interior crisis of sensemaking, where the external turmoil of society mirrors the internal void of shared purpose and existential orientation. To address this core challenge, visionary realism proposes the development of a new science of interiority and spiritual experience as an essential pathway forward.

Visionary realism counters the disenchantment identified by Max Weber ([1917] 1946), characterized by the reduction of existence to physicalist, mechanistic processes that have stripped life of intrinsic meaning and value. It reaffirms the ontological reality of interior phenomena—such as consciousness, values, and spiritual experiences—and promotes rigorous scientific investigation into these profound human dimensions. By bridging science, philosophy, and spirituality, visionary realism seeks to re-infuse the cosmos with meaning, purpose, and interconnectedness.

This integrative framework asserts that interior experiences, traditionally seen as subjective or anomalous, are central to human wellbeing and societal transformation. For example, empirical studies on transformative events like near-death experiences have demonstrated their power to profoundly reshape individual lives, realigning personal values towards compassion, interconnectedness, and meaning. By validating and systematically investigating such interior experiences, visionary realism cultivates wisdom and meaning, addressing existential alienation and nihilism at their roots.

Ultimately, visionary realism offers an ambitious yet necessary vision—a reunion of empirical rigor and spiritual imagination. By renewing objectivity, expanding empiricism, and affirming the "great unseen order" of interior life (Chatlos 2025), it creates a unified field of knowledge honoring all dimensions of human experience. Such integration carries significant implications for education, health care, technology, and culture, guiding humanity toward deeper ethical clarity and integral flourishing. In doing so, visionary realism provides a decisive step toward resolving the meaning crisis at the core of the metacrisis, nurturing a more integrated, resilient, and re-enchanted civilization.

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Healing the Rift between Theology and Spirituality: Theological Commentary on Chatlos's Framework of Spirituality

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There is often an unnecessary relationship of mistrust between theology and advocates of spirituality. Theological misgivings about a spirituality that is independent of religion focus largely on concerns about what the word *spiritual* means; questions about how spirituality relates to religion; concerns about an overemphasis on subjective experience in the framework of spirituality (FOS); the question of whether there are external influences on religious and spiritual experience; and the prospects for interdisciplinary work on spirituality between theology, science, and philosophy. I suggest that the FOS is less nonreligious, as often assumed, but rather stands in a distinct quasi-religious tradition, and that internal and external influences on spiritual experience should not be regarded as alternatives. My hope is that there will be more fruitful dialogue between theology and the FOS, though that depends on a better understanding of the nature of the various disciplines involved and respect for their various core assumptions.

I have been asked to provide a theological commentary on the theme of the forthcoming Institute on Religion in an Age of Science conference, "Spiritual Experience," and in particular on the programmatic article by J. Calvin Chatlos, published here in *Zygon: Journal of Religion and Science*. The issues raised are interesting, important, and potentially controversial. The focus on spirituality, and spiritual experience, evident in this article is in tune with the wider shift in society from religion to spirituality, on which many social scientists have commented. However, it is a shift about which many theologians have reservations and concerns, which is what I will focus on here.

I will first try to locate where I am coming from. I partly share the enthusiasm for spirituality that is evident in Chatlos's article. However, I am also aware of, and have some sympathy with, the critique many theologians would want to offer. I am myself not quite in either camp, but a fellow traveller with both, wanting to improve communication between these two very different approaches. I would like theologians to take the shift to spirituality in society more seriously than they often do, and to be more sympathetic to it. I would also like those, who are advocating such a shift, such as Chatlos, to do so in a way that is more self-critical and shows more awareness of why many theologians might have reservations about their approach.

My primary discipline is psychology rather than theology, and I would say that I am a psychologist turned theologian. I received my formal theological education within the Faculty of Divinity at the University of Cambridge and taught in that faculty for almost twenty years. As I approach this commentary, I am very mindful of the kind of critique my former colleague Nicholas Lash (1996) would have offered of it, particularly drawing on his book *The Beginning and End of 'Religion'*, which included an extended and incisive critique of the kind of approach to religious and spiritual experience developed by William James. I detect the influence of Lash in how another of his former colleagues, Rowan Williams, might critique some approaches to "spirituality" (e.g., Williams 2024).

I am also familiar with current social science research on those who are spiritual but not religious, and I particularly admire the work of the brilliant young Canadian social scientist Galen Watts (2022), currently at the University of Waterloo, especially in his book *The Spiritual Turn*. I have also been a lifelong admirer of the bold Christian ministry of Coventry Cathedral. Relevant to this article, I was influenced by two former Canons of Coventry: Stephen Verney (1976), particularly for his pathbreaking book *Into the New Age*, and Peter Spink, who, after Coventry, founded and led a spirituality movement called the Omega Order. Like Spink, I have been much influenced by the Austrian spiritual polymath Rudolf Steiner, a guru for some in the current spirituality movement, and the psychologist, Carl Jung. For many years, I combined my university role in Cambridge with leadership of a church in Cambridge that attracted a

congregation of whom many would say were more spiritual than traditionally religious. I would like to see mainline churches engage with such people more effectively than they often do.

I will organise my comments on Chatlos's article under five headings: the question of what the word *spiritual* means; the relationship of spirituality to religion; the framework of spirituality (FOS) on subjective experience; the question of whether there are external influences on religious and spiritual experience; and the prospects for interdisciplinary work on spirituality between theology, science, and philosophy.

What Does *Spiritual* Mean?

One of the complaints many theologians would make of the focus on spiritual experience is that the word *spiritual* is hopelessly vague and confused. That complaint is understandable, but I think it is exaggerated. In a series of publications on different aspects of spirituality (e.g., Watts 2017, ch. 8; 2024a; Dorobantu and Watts 2024), I have taken the view that, though the meaning of *spiritual* is complex, it is not impossible to say what it means.

Being spiritual has various aspects, and none of them on their own capture all of what it is to be spiritual (Watts 2017). However, there is nothing unusual about that. In a similar way, religion has various aspects, such as beliefs, experiences, and practices. Those who are spiritual but not religious often (i) have a set of assumptions about the fundamental nature of reality and about there being something more than the everyday world; (ii) have had personal spiritual experiences that have had a significant influence on them; and (iii) engage in spiritual practices, such as mindfulness or some other kind of meditation. To speak of their "spirituality" is to summarise those different facets under a single heading.

It is easier to clarify what is meant by the adjective *spiritual* when it is applied to a particular noun, such as spiritual healing (Coakley 2020; Watts 2011) or spiritual intelligence (Dorobantu and Watts 2024). When *spiritual* is applied to experience, it might refer to the experiences of people who are judged to be spiritually mature; to the phenomenology of certain experiences; to the presumed source of those experiences; or to the consequences of the experiences. Often, all of these are intended when the word spiritual is used, but sometimes the focus is just on one or more of these, not all. I maintain that it is possible to clarify what is meant by spiritual in any particular context, though the word is often used vaguely without such clarity.

The core meaning of spiritual often involves a reference to what Robert A. Emmons (1999) calls "ultimate concerns." Similarly, Marius Dorobantu and Watts (2024) suggest *spiritual* indicates a level of depth and is concerned with the meaning, purpose, and significance of whatever is under discussion. There

is generally no clear demarcation between what is spiritual and what is not. It is rather that *spiritual* refers to particular aspects of facets of what is under discussion or considers things from a particular point of view.

The Relationship between Religion and Spirituality

There are interesting and complex issues about the relationship between religion and spirituality. The implicit assumption of many people is that there is a combined package of religion and spirituality, and that spirituality is what you are left with if religion is subtracted from the package. The debate is then about whether spirituality is best integrated with religion or treated as a stand-alone phenomenon.

Galen Watts (2022) advances a different view, which is that those who are spiritual but not religious stand in a different historical tradition from traditional religion, and that there is more to being spiritual but not religious than the subtraction theory suggests. Those who are spiritual but not religious are not just nonreligious, he argues. Rather, they stand in a different quasi-religious tradition from traditional religion and espouse a "religion of the heart" (to use a phrase popularised by Robert Bellah) with historical roots in romantic liberalism.

The debate between traditional religious people and spiritual but not religious people is then more a debate between two different religious traditions rather than a debate about whether or not spirituality should be annexed to religion. Grasping that helps to make sense of the skepticism many theologians, who are often nested within traditional Christianity, feel towards the developing spirituality tradition. They are often uneasy about it because it stands in a different religious tradition from their own.

In a fascinating analysis of cultural shifts about morality, religion, and other things, Gordon Rattray Taylor (1973) makes use of a distinction between matriarchal and patriarchal cultures, in which patriarchal cultures are more controlling and have more thick-walled ego boundaries. It seems to me that the "religion of the heart," of which Chatlos's FOS is one manifestation, belongs to a more matriarchal culture, whereas traditional religion is more patriarchal (see Watts 2013).

The interpretation of cultural movements offered by Iain McGilchrist (2009) in part two of *The Master and His Emissary* tracks similar shifts. The romantic tradition, of which the contemporary spirituality movement is one flowering, shows, in his terms, a better balance between left-brain and right-brain cognition, whereas fundamentalist religion is an extreme manifestation of the relentless trend towards overdominance of left-brain cognition in religion as in everything else (McGilchrist 2009). I suggest that traditional Christianity, with which many theologians are associated, also tends to emphasise left-brain cognition, though in a less extreme way than fundamentalism.

It is worth noting that Chatlos's article is fervent and quasi-religious, even evangelical, in tone. The religion it offers is not that of any of the main faith traditions of the world, though it draws on them. Rather, it is offering a quasi-religion of its own, and doing so with evangelical fervour. Chatlos is advocating a focus on spirituality rather than traditional religion, but he does not seem to be fully aware of the quasi-religious zeal that he is displaying in advocating that approach, nor of the historical roots of the position he is advocating.

Chatlos draws on a wide range of scientific and other literature, but it is notable that his article proceeds by a method of synthesis rather than analysis. He avoids the normal academic methodology of engaging with potential criticisms and instead chooses to build and state a particular position with confidence and conviction. He seems to be proclaiming a kind of spirituality gospel, and doing so with messianic conviction and enthusiasm. In this brief commentary, I will try to proceed with more caution.

The Focus on Experience

An important point of theological concern about the shift from traditional religion to spirituality focuses on the over-prioritisation, as theologians see it, of subjective experience. The "rationality" of religion is something on which there is a sharp divergence between religious insiders and outsiders. Religious insiders are inclined to pride themselves on the rationality of their religious tradition, whereas many outsiders regard religion as the epitome of irrationality. A key theological concern about the move from traditional religion to spirituality is that it seems to represent an abandonment of the high ground of objectivity traditional religion has tried to defend and a descent into the quagmires of subjectivity.

There is a particular theological worry about the unusual character of spiritual experience. That unease focuses partly on the emphasis on individual rather than collective experience. The assumption is that nothing much can be built on purely individual experience, whereas collective experience provides a more secure foundation (as in natural science, with its emphasis on replicability). There is a further concern that spiritual experiences are in some way aberrant or "anomalous," to use a term sometimes found in psychology (e.g., Reed 1988). Lash uses the emotive term "spook," and emphatically does not want religion to depend on spook.

The concern is thus that the shift from traditional religion to the new approach to spiritual experience represented by the FOS involves an overemphasis, from a theological point of view, on (i) purely individual subjective experiences and (ii) experiences that are spooky and anomalous and that provide a rickety foundation on which to build any secure theological conclusions. There is a track record of theologians being particularly nervous about any association between religion and parapsychology. They often seem

unable to take a dispassionate view of the evidence for parapsychology which, in my view, at least with some phenomena, is better than many people are willing to recognise (e.g., Eysenck and Sargent 1982).

Culturally, we are in a very anomalous situation. On the one hand, as Charles Taylor (1989) has brilliantly documented, there is an increasingly strong sense of self and a growing requirement in popular culture that religion and spirituality should be warm and experiential, not dry and propositional. Alongside that, as McGilchrist (2009) has documented with equal brilliance, there is a growing in contemporary reliance on objective, analytical cognition, which distrusts feelings. The mutual distrust between traditional religion and spirituality needs to be set in the context of these culture wars. Traditional religion is trying, even if not entirely convincingly, to align itself with objectivity, whereas spirituality is embracing the popular shift towards subjective experience.

There seems to have been a significant shift from late modernity onwards towards an emphasis on the experiential aspects of religion and spirituality. Accounts of the evolution of religion (e.g., Dunbar 2023) often distinguish between an earlier experiential or imagistic phase in which trance dancing played a significant role and a later doctrinal phase that developed when human beings established fixed settlements. Watts and Dorobantu (2023) note that the power and appeal of doctrinal religion is currently fading, and that there is a return to something more akin to the earlier phase of experiential religion.

I think theologians are unnecessarily nervous about a descent into subjectivity. The very distinction between objectivity and subjectivity, as currently understood, is a fairly recent one. It seems to only have been in the late nineteenth century that people started to make a sharp distinction between referential, propositional uses of language and evocative, expressive uses (Bowker 1998). That has been reflected in debates within theology about whether religious doctrine should be interpreted in propositional or in expressivist terms (Lindbeck 1984). Traditional religion has often taken a propositional approach to language, whereas the FOS is more expressivist. However, there are also those within theology, including Lash, who have refused both of those options and argued instead that doctrine is really establishing a set of grammatical protocols for how to speak, or not speak, about God.

My advice to theologians would be to abandon the attempt to defend the objectivity of theology and avoid what they see as a descent into subjectivity, and instead work to heal the split that has occurred in late modernity between objectivity and subjectivity. Objectivity and subjectivity need each other. As Owen Barfield (1977) puts it rather vividly, "non-objectifying subjectivity" and "subjectless objectivity" are like two adjoining cells in a prison, and "the first step towards escape for the two prisoners of language is to establish communication with one another."

Internal and External Influences

One of the issues that concerns Chatlos is whether spiritual experience arises from inside or outside, whether it is immanent or transcendent. He claims that this debate has been settled in favour of immanence. In his introduction, he says, "Debates about the source of spiritual experience being transcendent versus immanent—outside of versus within material experience—overwhelmingly fall on the side of immanence" (Chatlos 2025). I think it is a mistake to present internal and external factors as alternatives. There is surely no doubt about the fact that internal factors are at work in giving rise to spiritual experiences, whether those are assessed by neurological measures or self-reported measures of subjective experiences. However, it is possible for both internal and external factors to be at work, interacting with each other. The disputed question is surely whether external factors are at work in spiritual experience *in addition to* internal factors. No amount of research on internal factors can settle that question.

Some might invoke a rule of parsimony and argue that because spiritual experiences can be explained in terms of internal factors it is unnecessary to invoke external ones as well—and that parsimony requires us not to do so. Parsimony has often been a helpful rule of thumb in scientific investigation, but it is no more than a rule of thumb. It does not provide evidence, or valid argument, to show conclusively that external factors are not involved in religious experience.

It might also be argued that external factors should not even be considered because, in principle, there cannot be scientific evidence for them. It is probably correct that transcendent influences on spiritual experience can never be demonstrated scientifically. However, it is possible that the claim that external transcendent factors are involved in religious experience might be true, even if that cannot ever be proved. There can be meaningful propositions, even if they are outside the scope of scientific proof.

My own view is that, all things considered, it is a reasonable conjecture that transcendent factors are involved in spiritual experience. There are general background assumptions that make this conjecture reasonable, and the arguments involved are of the cumulative case kind (e.g., Mitchell 1973). If you take a wide range of factors into account, assumptions about the impact of the transcendent on spiritual experience are not unreasonable, even if they are beyond definite proof.

In a short but interesting section headed "Transcendence vs Immanence," Chatlos (2025) suggests that "the spiritual core is associated with a dissolution of the experience and awareness of spatial boundaries," making it difficult to discern whether spiritual experiences have an internal or external origin. There are indeed various lines of evidence that suggest that an openness to anomalous

experience and permeable ego boundaries make spiritual experience more likely (Watts 2017). What I find puzzling is that Chatlos (2025) goes on to claim that "repeated experiences of opening the spiritual core eventually provide a person with an ability to make this determination and distinguish that they are coming from within." I am not sure what evidence he has for this, and it seems to me that what he says is unlikely to be correct.

However, it may be well be that, over time, people on a spiritual journey come to recognise that spiritual experience is both transcendent and immanent and straddles the dichotomy between what is within and what is without. Claims of spiritual experience are sometimes associated with a dualistic division between the material and spiritual worlds, but, as I have argued elsewhere, they equally can be associated with monistic assumptions (Watts 2024b). Interpreted in this way, spiritual is neither entirely internal nor external. It is also not a separate domain of reality but a facet of, or perspective on, a single, all-encompassing reality. It is an aspect of reality that we can only experience by participating in it, not by trying to study it as external observers.

Interdisciplinary Work between Theology, Philosophy, and Science

It is a repeated theme of Chatlos's article that he wants to see theology, philosophy, and science working together. However, I have questions and concerns about how he defines these three disciplines and about the kind of working relationship between them he hopes to see. There are no very carefully considered definitions of the three disciplines. However, in figures five and nine, theology/religion is said to be the realm of the spirit; philosophy is said to be the realm of the mind; and science is said to be the realm of the physical (Chatlos 2025). I find these to be strange and unconvincing formulations.

To start with science, there are certainly physical sciences, but there are also sciences, such as experimental psychology, that are not obviously physical. I suggest that science is distinguished more by its methodology than its subject matter. Philosophy would now normally be seen, especially in Britain, as a set of tools for analysis and argument rather than as the study of the mind, which I would see as being part of science. Philosophy includes the philosophy of mind, but philosophy does not necessarily focus on mind. There can be a philosophy of anything. I see theology as the rational reflection of faith traditions rather than necessarily concerned with the realm of the spirit. There is a theological perspective on everything, including the material, mental, and spiritual. Theology does not confine itself to the spiritual, though it considers things from a transcendent or God's-eye perspective.

I suggest that all three disciplines are better defined in terms of their methods and approaches rather than their subject matter. Chatlos's unconvincing definitions of the three disciplines undermine confidence in what he has to say

about their interrelationships. I suggest it is a central requirement of any fruitful interdisciplinary work that each discipline is accepted on its own terms. Chatlos's strong commitment to the view that spiritual experience arises internally, and not from anything transcendent, goes against one of the core assumptions of theology. So, within the FOS, theology is not being allowed to be itself; it is required to abandon one of its axiomatic assumptions in order to play the role required of it in the FOS.

Chatlos (2025) is explicitly unwilling to allow the three disciplines to make different assumptions, saying that the "definitive bridge of science with spirituality demands that science, theology, and philosophy agree on a common worldview in this overlapping area." I cannot see that the FOS is in a position to require such agreement. Starting with this requirement is unlikely to lead to fruitful cross-talk between the disciplines. I strongly recommend that the dictatorial approach of the FOS to cross-disciplinary work be abandoned. Theology can contribute to the FOS project, but it is unlikely to make its potential contribution if the FOS insists on theology abandoning core assumptions.

Conclusion

As I reflect on the current relationship between those who are enthusiastic about a focus on spirituality and those who locate themselves within the more traditional religious framework, what I hope to see is a healing of this division. In traditional religions, such as Christianity, I hope to see a stronger emphasis on the experiential component, greater emphasis given to the rich spiritual tradition within traditional religions, and a more sympathetic engagement with the prioritisation of spirituality within contemporary society. In those who are developing a focus on spirituality, I hope to see a deeper and more sympathetic engagement with the religious traditions from which the focus on spirituality emerges, a greater willingness to learn from them, and a greater recognition of the extent to which the FOS is in itself a new kind of religion rather than something that stands outside religion.

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Teilhard's Synthesis as Impetus for Greater Care for Our Earth

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Early in life, Pierre Teilhard de Chardin knew he must love both God and Earth with equal passion. Yet, it took him many years to formulate his famous phrase "communion with God through Earth," (Teilhard de Chardin 1968a, 57) and many more years to articulate in a profound way how the interaction of incarnation with evolution provides a framework for this formula. Today, it is recognized that a deeper sense of matter/spirit, of incarnation/evolution, allows the tapping into the sacredness of matter in a way that will motivate us to develop a flourishing humanity as well as a flourishing Earth. This article explores these concepts.

Introduction

There is no need to reiterate the long list of threats that beleaguer our planet, the difficulties that beset us on every side—racial discrimination, global poverty, the ravages of war—nor the growing number of events that indicate the severity of the climate crisis: diminishing natural resources, unhealthy air quality, polluted waterways, denuded forests, wildfires, violent storm. In new and dramatic ways, we are damaging our environment—either without realizing it or without caring enough about the consequences. Given the magnitude of the problem, we can easily become disillusioned, confused, and immobile, not knowing what to do next. Yet, rather than approach these challenges together, we often find ourselves and those around us polarized and ineffective. Unless we change the paradigm by which we operate as a human community, things will only get worse. In this article, I explore the components of a vision that could make a difference, a worldview that evokes a tremendous amount of hope and creativity, one that focuses us beyond the present moment and into the future, a worldview proposed and lived by Pierre Teilhard de Chardin.

Pierre Teilhard de Chardin, SJ

Teilhard was a Jesuit priest and paleontologist who lived during the first half of the twentieth century. Throughout his life, Teilhard faced numerous ordeals: he served as a stretcher bearer on the front lines during World War I; he struggled to integrate the science of evolution with his Christian beliefs and was forbidden by his religious superiors to speak about or publish his ideas; and perhaps most difficult of all, he experienced rejection of his most precious work by his Jesuit order and the church that he loved. He was very aware of the sufferings of humanity as well as of the difficulty involved in attempting to transform a worldview so deeply embedded in the psyche of a group.

Once, after contemplating the disasters of his world, Teilhard (1959, 136–37) shared his anguish: "On certain days the world seems a terrifying thing: huge, blind, and brutal. It buffets us about, drags us along, and kills us with complete indifference. At any moment the vast and horrible thing may break in through the cracks—the thing which we try hard to forget is always there, separated from us by a flimsy partition: fire, pestilence, storms, earthquakes, or the unleashing of dark moral forces—these callously sweep away in one moment what we had laboriously built up and beautified with all our intelligence and all our love." This description sounds all too familiar: natural disasters, dark moral forces, the destruction of a lifetime of effort. Yet despite the desperate tone of his prayer, Teilhard (1959, 137) is able to continue: "Since my dignity as a Human forbids me to close my eyes to this, that I may not succumb to the temptation to curse the universe and the one who made it, teach me to adore it by seeing you concealed within it. In truth, the huge and dark thing, if we want it to be so, is

you! You have told me: 'It is I, do not be afraid.' The immense hazard and the immense blindness of the world are only an illusion to the one who believes."

How was Teilhard able to see Christ in the midst of a world in chaos? Do his words seem overly optimistic? Are they unfounded? Or are they the fruit of mystical insight? Teilhard's faith in the future depended on several things: his contemplation of nature, his understanding of the dynamic cosmic processes that operate in our world, his ability to imagine and feel Christ's presence and action in the world, and his belief that the incarnate Christ is empowering the forward movement of evolution both at the heart of matter and from the future. His faith in the evolutionary process pointed the way, stirred his creativity, and helped him imagine approaches to the problems and crises he faced, many of which we still experience today.

As a child, Teilhard wondered why living things die while rocks seem to be more permanent. He spent the rest of his life pondering a profound question: "What holds everything together?" At first, he began collecting anything that seemed hard and dense—scraps of iron that he stored in the barn near his home and visited regularly for worship. Once he realized that iron rusts, he switched to the hardest and most beautiful specimens of rock he could find. He eventually decided to pursue a career in geology and paleontology, a choice that afforded him much time in the field, where he could contemplate the beauties of nature and the structures of our planet.

As he searched for fossils and chipped stone, Teilhard (1978, 198) touched Earth at its most intimate level. In an early essay, he writes: "I have always loved and sought to read the face of Nature; [however,] my approach has not been that of the 'scientist' but that of a lover." Nature nourished him. It was a catalyst for his mysticism. He sometimes could even feel the divine presence animating and directing everything.

Evolution

During his years in the Jesuit seminary, Teilhard discovered the theory of evolution and immediately realized its potential for enhancing the theology he was learning at the time, a theology that seemed static in comparison. The connections between the theory of evolution and the Christian doctrine of the incarnation provided him with possibilities for developing a synthesis of science and religion as well as a more cosmic theology. In the first chapter of his Gospel, John tells us that, at the beginning of time, the Word Incarnate plunged into matter, descended into its deepest depths, penetrated to its very heart to be present to all things at all times for a single purpose: to hold all things together (John 1:1–5). Ideas such as these are also found in the epistles of Paul, who clearly refers to a cosmic Christ (Ephesians 1:9–10; Colossians 1:15–17). These connections led Teilhard to understand that Christ, who is embedded in matter, is ever encouraging creation to overcome its inherent

resistance to transformation and guiding creation from within as it ascends toward ever greater integration and consciousness. Furthermore, by the power of the Resurrection, the cosmic Christ has gone ahead of us into the future and reappears at the focal point of the evolutionary project, alluring all things into a profound unity. Seeing Christ at work in the world in such a powerful way allowed Teilhard to hope in the future.

During World War II, Teilhard began to apply his synthesis to world problems. He realized that unless humans know and internalize the dynamics of the universe of which we are part, we can easily cause more difficulty when we try to change things. Without a more holistic and dynamic understanding of our evolutionary cosmos, of the process by which we have arrived at this time and place, we walk blindly into the future. The perils that face us will continue to haunt us. For instance, even today as we connect globally, we continue to identify too narrowly with family, political party, nation, religious group, etc. Instead, Teilhard would advise us to grow to a world scale and think of ourselves as terrestrians.

So how does our universe work? Where did it come from and where is it going? Teilhard's scientific research helped him discover answers. In his major work, *The Human Phenomenon* (1999), he weaves a detailed story of the cosmic becoming with facts about the evolution of matter, but he also looks for meaning and direction, for the physical and psychological dynamics by which the universe forms and the importance of relationship throughout.

It is now understood that in the beginning, shortly after the Big Bang, all that existed were simple elementary particles in a very hot, dense, and expanding environment. Protons darted about repelling each other since positively charged particles do not want to be close. But, in an atmosphere of extremely high pressure, some of the protons ended up so close to each other that the strong nuclear force took over, and they fused into more complex particles such as heavy hydrogen and helium. The electromagnetic force complexified matter further by encouraging nuclei to unite with electrons to form atoms, which later combined into molecules, leaving the early cosmos full of gas and dust particles. Even though the universe has been expanding since the beginning of time, the force of gravity has been attracting the gas and dust scattered throughout space and drawing it together to form the galaxies, each of which contains billions of stars.

In the cores of the stars, the strong nuclear force once again encouraged relationship between particles. At first, heavy hydrogen fused into helium, then later carbon and nitrogen formed, and eventually, so did many of the other elements needed for life. This process can happen only in the extreme heat and pressure found in the stellar cores. Once life appeared on Earth, complex molecules formed cells that then joined to form living organisms; eggs and sperm produced living individuals. And the process of emergence continues. It

is intriguing to notice that elementary particles become interesting only when they interact, when they are in relationship with other particles.

Creative Union

A unification process has been at work throughout the universe's long history. Teilhard called this process creative union: whenever entities come together and bond without losing their identity or integrity, they create something of greater complexity. More complex and novel structures gradually emerge from the union of simpler structures. Union is happening everywhere. In fact, Teilhard found that a thrust towards union seems to be coded into the very fabric of the cosmos: particles of heavy hydrogen fuse into helium; nuclei unite with electrons to form atoms; atoms combine into molecules; cells join to form organisms; egg and sperm produce a new living individual. What is significant about the process of creative union is that when individual elements interact, they find themselves capable of more than had they been acting alone.

Teilhard further proposed that once a new entity is formed by creative union, it becomes capable of greater consciousness. Teilhard calls this the law of complexity-consciousness. He also noted that spiritual bonds, like their physical counterparts, grow ever stronger as matter becomes more and more conscious. These laws of creative union and complexity-consciousness govern the forward movement of spirit as surely as the laws of physics, chemistry, and biology. They also eventually become a mandate for humanity's path to accomplishing what Teilhard calls the great work of union. They encourage us to implement union, the most important and fundamental process in the cosmos (Teilhard 1968b, 44–49).

Particle physicists who probe the hidden depths of matter notice that elementary particles are interactive, always on the move, ever ready to relate by way of the fundamental laws of physics. It is relationship that causes spurts of complexity and diversity. This means that relationship is at the heart of the universe, and interdependence, rather than independence, is its hallmark. For Teilhard (1968b, 45), "to be" is to be in relationship. This might be obvious at the human level where love is clearly the unifying element, but it is just as true at the elementary particle level.

But the processes of creative union and complexity-consciousness are not without struggle. Although some forces do foster union, others can be destructive. They can increase the entropy of a system, deplete and waste the potential scope of physical and spiritual creative energy. Processes of transformation in nature are often initiated in an atmosphere of violence. For instance, nuclei fuse only in an atmosphere of extreme heat and pressure. Chemical reactions can be explosive. However, rather than impeding progress, conflict between these

forces often drives the system to something new, something more complex, and provides the impetus for ever-greater organization.

Creativity

The emergence of life on planet Earth some four billion years ago represents a turning point that initiates ever-greater complexity and consciousness. Plants and animals acquire new characteristics, new ways of relating and communicating, new ways of practicing creative union. Many species of fish, insects, and birds engage in collective behavior to carry out a common task. Swarm behavior, a particularly interesting example of this, is practiced by starlings. A flock of starlings flies as a single bird, contracting and expanding, soaring up, and then diving down into the trees. This flock has no single leader. Instead, it is a decentralized system in which the flock's cohesive movement is created by interaction among the birds in the flock as a whole. Researchers have spent years photographing and analyzing the movements of large flocks of starlings. Using sophisticated software, they determine the three-dimensional position of each individual bird, and with a computer model, simulate their movement in order to study how the movement of a given bird is affected by its neighbors. The researchers found two very interesting results: first, each bird stays equally distant from its seven nearest neighbors so that as one bird moves, the rest of the flock needs to adjust. This ensures flexibility of the flock shape while allowing expansion and contraction of the flock. Second, birds at the edge of the flock tend to bunch closer together. This behavior actually constricts the flock so that it tends to fly as a whole in the same general direction (Miller 2010, 163–79).

Swarm behavior is a creative and effective unification strategy that enhances starling survival. A pressing need—escape from a predator—drives the starlings to respond, to interact coherently. Because each individual bird accepts a goal larger than itself, the flock can cooperate in a highly organized way. Clearly, the flock is more than the sum of thousands of starlings; instead, it is a self-organized dynamical system. Intelligent behavior emerges from the flock as a whole.

The Human

With the coming of the human, almost fourteen billion years after the Big Bang, consciousness reached another milestone, a new phase of development. The human is gifted not only with the power of co-reflection but also with the potential to share both knowledge and feeling with others, share information through time and space, see back in time, have a sense of history, and thus see beyond what other lifeforms are able to see. The convergence of one human's thought with that of others allows for an ever-growing compendium of both

physical and psychic knowledge. Humanity is becoming capable of experiencing a sense of the whole, of seeing into the future and predicting the direction of the cosmos, of making choices that will ensure flourishing for all.

Union has been the hallmark of the evolutionary process, and it is ours to encourage in ever more important ways. Co-reflectors can establish effective moral codes, set up plans of action that will lead to a flourishing future, and initiate integrated and practical approaches to what is the greatest global crisis of all times. As human freedom and heightened consciousness intensify, greater responsibility becomes essential. And in a world that is evolving both physically and spiritually, humanity is obliged to act. The cosmos depends on humanity as a whole, not simply on the individual.

Teilhard imaged the structure of human consciousness as an intricate fabric that silently, almost imperceptibly, envelops our Earth—as an intricate web of thought that makes up humanity's collective heart-brain in which threads of spirit weave matter's psychic component, producing a tangle of fibers of ever greater novelty, held together by the ultimate bonding force in the universe, which is love. Its threads of spirit weave matter's psychic component with matter's physical component and produce a tangle of fibers of ever greater novelty, held together by the ultimate bonding force in the universe, which is love. He called this web of consciousness the Noosphere. The internet, which today facilitates almost instant communication among peoples throughout the world, provides a visual image of this collective heart-brain, of humanity's nervous system, of this "halo of thinking energy" (Teilhard 1999, 125).

Teilhard (1959, 168–80) has compared the evolutionary front, on which the human phenomenon is playing out, to the battlefront of World War I, where he and his fellow soldiers experienced feelings of freedom, unanimity, and exhilaration as they confronted its dangers together. With a goal greater than his own wellbeing and with the support of his fellow human beings, Teilhard felt himself part of humanity, part of a process that was leading somewhere. The front became for him a symbol for "the boundary between what Humanity has already achieved and what is striving to emerge, between what we are already aware of and what is still in process of formation" (Teilhard 1965, 203–4). It is a place of creativity where novelty can emerge, where we are moved to become ever more conscious of our role in the world and to act in accordance with this responsibility. To stand together at the evolutionary front of human consciousness is to dare to give all to its forward movement. Teilhard hoped that humanity would come to realize the power of a group united around a single purpose for the good of the planet. Today, as we experience so much lack of care for our environment, we have an issue that deserves our total attention, one that needs our primary focus.

Chaos

Although many of us long for a life of peace and equilibrium, scientists have noted that, in the physical world, transitions to novel forms never happen when systems are in equilibrium. In fact, change happens only in an atmosphere of instability and high energy, in that particularly creative region that scientists call the *edge of chaos*. At the edge of chaos, a complex system responds to the invitation to change, interacts with the environment, searches for new ways to stabilize, and produces something new. There is a fine boundary, then, between equilibrium and turbulence called the edge of chaos where new forms are generated. But the system must be driven far from equilibrium in order to reach the edge of chaos (Gleick 1987, 119–53).

One of the reasons chaotic systems are so creative is that they experience positive feedback. Negative feedback is useful for stabilizing a system, maintaining it in equilibrium. For instance, a thermostat keeps the temperature of a room fairly constant. When the thermostat senses that the temperature of the room is too cold, it turns the heater on; when it senses the room is too hot, it turns the heater off, maintaining a sort of equilibrium. But unlike negative feedback that works to stabilize, positive feedback amplifies small changes, driving a system away from equilibrium into a state that is unpredictable, which is usually seen as negative. This is the case with global warming, where each poor decision causes further degradation of the environment. However, when the system reaches the edge of chaos but before it becomes turbulent, positive feedback can be a mechanism for transformation—usually to a state that is not only unpredictable but also totally unexpected.

Computer scientists who track the development of chaotic processes have come up with galleries full of graceful patterns that they call strange attractors, patterns that plot the development of chaotic systems. They notice that, even though systems at the edge of chaos are unpredictable and free to roam about, they are not turbulent. Instead, they are attracted to an invisible center and held within a boundary.

Although Teilhard would not have known the theory behind complex systems, he was very aware of the phenomenon. Instead of thinking of evolution as a gentle drift toward equilibrium, he saw it as an irresistible vortex spinning humanity into ever-greater consciousness. He realized that the instabilities that confront us provide opportunities for the change that can lead us forward along the evolutionary path. For Teilhard, instability is a signal that change is needed.

Teilhard sensed what contemporary scientists are finding in almost every branch of science—that driving a system far enough from equilibrium can facilitate union. When things go smoothly, there is no incentive to change and thus no drive to create something new. Change results only when a system is driven far from equilibrium by blocks to progress, by new experiences and

information, by feedback from a variety of sources that encourage us to be more creative.

Today's overwhelmingly apathetic response to environmental issues is due to negative feedback. Fear of change and desire for comfort are creating a state of equilibrium rather than creativity, preventing a movement toward corporate solutions. But positive feedback is at work also: progress, no matter how small, at recent climate conferences and rallies; action groups mobilizing throughout the world; religious leaders and young people who are beginning to find their voice. This kind of feedback drives humanity into new ways of thinking, new ways of being, new ways of loving our Earth, and finally, new ways of experiencing the divine within matter. Today's global disasters seem to be driving humanity toward the edge of chaos, toward that point where creativity is enhanced and where motivation for radical action is acquired. The future depends on whether we have the courage to respond, whether we are willing to risk all without knowing exactly what will happen.

The Great Work

So many of us yearn to make at least a small individual contribution to the flourishing of our world, to contribute to a healthy environment, to care for the needs of the other, to put ourselves at the service of a greater consciousness. But today, the great work of creative union has become ever more challenging and requires the participation not only of each individual but also of the global village as a whole. As the peoples of our world interact with those from other parts of the globe and become more conscious of a larger reality, new blocks to unity need to be addressed. Becoming one is not easy; transformation is often painful. There is a price to pay. Union this deep requires a willingness to surrender all that we have and all that we are.

The pitch pine provides a striking example of the pain involved in transformation. This coniferous tree, which can readily survive forest fires, often grows in ecosystems where fires are prevalent. It is extremely sturdy, with a thick bark that protects the underlying cambium. However, its pine cones ordinarily remain closed long after the seeds have matured. The cones typically open to disperse the seeds only after exposure to very high temperatures, such as occur during a forest fire. The heat of a forest fire softens the resins that hold together the scales of the cone and scatters the seeds.

Sometimes, while immersed in fieldwork, chipping away at Earth's rocky layers, Teilhard experienced sudden fits of awareness of the laborious unification happening on planet Earth over the past 4.5 billion years. At those moments, he would become overwhelmed by a sense of the evolutionary processes still at work around him. He could intuit Earth acting and could sense the divine presence at its heart, drawing him forward. He identified this presence as the God

of evolution, the Cosmic Christ up ahead in the future, encouraging all creation to become more coherent, more intelligible, more united. The divine attractor who is ever seeking to hold all things within the divine grasp encouraged him to hope in the future, to expect novelty, and to believe that the world is becoming one. He vowed to work together with the God of evolution who is leading the way toward greater consciousness.

The Human Response

Given what we know about the dynamics of our evolving, chaotic, and unfinished world, will these insights motivate us to be truly creative and generative as Teilhard would suggest? Will they engender hope regarding our emerging future? Will knowledge of the increasing degradation of our environment encourage us to accept our responsibility to engage in the long-term and difficult work ahead? Will awareness of the damage done by our thoughtless actions as well as the effectiveness of our creative approaches to environmental problems lead us to more sustainable pathways?

The environmental crisis is a global one. Proposed solutions will involve and impact all peoples of the world. Therefore, conversations regarding future approaches must include all sectors of society. In 1995, the United Nations Earth Charter outlined fundamental values and principles needed by those who wish to build a just, sustainable, and peaceful global society. Since 1992, international climate change conferences called COP (Conference of the Parties) have been encouraging nations to limit greenhouse gases. Yet, many of the richer nations are reluctant to make significant changes.

Economic, political, and social organizations could play a key role in fostering the transformation to sustainability. Yet, they will not likely take up the challenge unless they are prodded by voters and consumers, spurred on by the people who use their services and are affected by their decisions. Global environmental organizations such as Eco Civ (Clayton and Schwartz 2019, 45–69) have been significantly impacting the policies of a few corporate and political organizations, helping them transition to what their proponents want. John B. Cobb Jr. defines an ecological civilization as a civilization whose "policies learn from nature and from nature's success in creating ecosystems that over time increase in complexity and richness" (Clayton and Schwartz 2019, 2). This kind of activity is sorely needed, since in the long run, progress will be made only when the larger culture changes.

The religions of the world could make a significant impact by uniting their members throughout the world around environmental issues. Some have taken helpful steps. Shortly before the recent climate conference, Pope Francis, Orthodox Patriarch Bartholomew, and Anglican Archbishop Justin Welby issued a joint statement urging broad commitment to the fight against the destruction

of our planet (McDaniel 2021). And the Jesuits have initiated a seven-year action platform (Jesuits n.d.) to implement the seven ecological goals found in Pope Francis's 2015 encyclical *Laudato Si'*. Their program, which involves not only Jesuit institutions but also many religious congregations throughout the world as well as all people of good will who wish to participate, aims to provide leverage for church members who are attempting to impact their congregations regarding environmental issues.

But, the local churches could do so much more with their congregations, especially by developing a deep empathy for polluted air and water, for denuded forests, and for endangered species, an empathy deep enough to counteract our compulsion to treat Earth's resources as consumer products. Without a deep connection to Earth, we tend to minimize its sacred nature and more easily abuse it. Celebrating rituals and liturgies that honor the beauty, immensity, and sacredness of Earth could more effectively touch hearts, heighten awareness and empathy, and, in the process, stimulate radical action that is both peaceful and loving. Imagining hopeful futures together would stimulate creativity, point us to new solutions, keep hope alive, and supply the energy needed to reverse the problem. On the other hand, frantic action without reflection about the complexities of the problem tends to encourage strategies that are ineffective and sometimes even drive people apart.

Many individuals continue to adopt practices that begin to turn the tide: cultivating awareness of their ecological footprint, recycling, reducing the use of natural resources such as fossil fuels. But individuals must also join with others who feel the problem deeply, with groups willing to exert pressure on government officers, corporate managers, and religious leaders to adopt policies and practices that have a positive impact on our environment, with organizations that can impact the prevailing culture. The goal here is not merely personal transformation, although that is a first step. What the world needs most is a communal transformation of consciousness.

Although it will take political, corporate, and technological effort and expertise as well as religious motivation to stem the tide of this climate crisis, significant change will happen only with the support of ordinary folks who, though perhaps already aware and concerned, are still addicted to consumerism and resistant to change of any kind, especially change that might affect comfort and convenience, lifestyle and economic status. In the face of the problems of our day, the individual can feel powerless, but in communion with others, people become more highly conscious and creative. Deepening our connection with the rest of the natural world and allowing that to affect our interaction with the environment will help us establish ever more effective networks with those who are willing to join the struggle. Teilhard (1959, 144) dreamed of the day when the whole of humanity would form "a single body and a single soul in love" and

would "choose to open its arms to call down and welcome the fire." Aware that we are part of the cosmos's amazing unfolding, each of us must become ever more conscious of our responsibility to engage its ongoing evolution.

As our world becomes gradually more complex, more coherent, and more intelligible, finding ways to put Teilhard's theory of creative union into practice is greatly needed. Like the protons that engage in fusion, like the molecules that form cells, like the starlings that swarm, we are each called to creative union: to treasure and care for the Earth of which we are a part, to forming ever-larger groups that could impact world governance, to engaging in ever more effective actions, to encourage union of person with person, of nation with nation, of humanity with Earth. Working together will enhance our innate creativity and reverse our feelings of powerlessness, allowing us to find new ways to move forward together. This puts relationships front and center—our relationship with God; with others, particularly those we might consider the outsider or the stranger; and, in our day more than ever, with our beloved Earth. The more we enhance our ability to establish loving connections with one another and with our Earth, the more we will be able to carry out the great work of creative union. Being conscious of Earth dynamics can inform choices.

Above all, we must keep hope alive—not a naïve optimism that refuses to look at stark realities but a hope based on our experience of Earth, of humanity, and of God. Despite Teilhard's experience on the front lines during all of World War I and his many struggles with church leaders, he continued to believe in the future and urge us to hope. His vision of promise can encourage us. As he says, "We have only to believe. And the more threatening and irreducible reality appears, the more firmly and desperately must we believe. Then, little by little, we shall see the universal horror unbend, and then smile upon us, and then take us in its more than Human arms" (Teilhard 1959, 137). Implementing this vision will require a commitment of all that we have and all that we are. But we can do it if we work together in love. My hope rests in our potential as conscious human beings to make a difference in our world. Our Earth is fruitful, humanity is good, and God is with us, ever urging us on.

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Temporal Creatures Tending the Planet: Theology and Biology in Earth Care

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God, humans, and environments intertwine, informing humans' unconscious assumptions about temporality and interconnectedness. This deeply embedded framework often ignores contemporary biological insights about our being-in-the-world and its influences on our experiences of self and creation. This article examines the concept of Earth care through a biological-event understanding that examines genetic inheritance (DNA), epigenetic inheritance, and phenomenology to construct a more robust understanding of human experience and interconnectedness to the environment. The interdisciplinary dialogue between religion, biology, and philosophy aspires to spark the protection of our environment by understanding ourselves as temporal. This article provides an original approach to thinking about the care and keeping of the Earth in a culture that seeks scientific explanations and answers from religion.

When the predictions are grim, how do we tend our planet as creatures living on a temporal rock whose climate is rapidly changing? Earth care, protecting and nurturing our planet, encompasses climate change and how we understand ourselves among creation. In the Judeo-Christian Bible, Genesis (1:28 JPS Hebrew-English TANAKH) opens with God telling humans to "fill the earth and master it; and rule the fish of the sea, the birds of the sky, and all the living things that creep on the earth. In Genesis 2:14, God commands man to "till and tend" the garden of Eden. Yet today, we look around at our planet and see humanity pillaging Earth's resources, polluting its air, and contaminating its water. What can we do? Where do we begin?

The spiritual/religious understandings of Thomas Berry, Pope Francis, and Patriarch Bartholomew help define the problem. Thomas Berry (2009, 89), a Catholic Priest, cultural historian, and self-described "geologian," states that the Earth-human relationship is the most crucial issue of our time. He recognizes that creating this relationship requires a mutually supportive liaison between science and religious traditions (Berry 2009, 3). Scholars must "incorporate existing data into more meaningful contexts" (Berry 2009, 25). Berry states, "We must find a way of interpreting the evolutionary process itself. If interpreted properly, the scientific venture could even be one of the most significant spiritual disciplines of these times. This task is particularly urgent since our new mode of understanding is so powerful in its consequences for the very structure of planet Earth. We must respond to its deepest spiritual context or else submit to the devastation that is before us" (Berry 2009, 120). Berry recognizes that it will take a multifaceted, interdisciplinary approach to solve the challenge of Earth care, which will foster human flourishing.

Similarly, Pope Francis, in his encyclical *Laudato Si'*, sees tending our home, Earth, as a central concern for all humanity. He links caring for our environment to caring for the marginalized and those experiencing poverty, who suffer disproportionately as ecosystems are destroyed. He asserts, "These situations have caused sister Earth, along with all the abandoned of the world, to cry out, pleading that we take another course. Never have we so hurt and mistreated our common home as we have in the last two hundred years" (*Laudato Si'*, 53). Francis calls us to a shared responsibility for one another, the world, and decency. For him, solutions must emerge from multiple ways of seeing and interpreting reality (*Laudato Si'*, 63).

Finally, Patriarch Bartholomew of Constantinople suggests that when looking at the planet's degradation, we need a "radical reversal of our perspectives and practices" (Bartholomew 2017). This reversal must foster a change in human relationships with each other and nature. Patriarch Bartholomew sees living simply, restraining our consumption, and praying for assistance as necessary to address the devastation the Earth caused by humans. These three religious

men outline the need for interdisciplinary, multifaceted perceptions that inspire people to heal our battered world.

I suggest we rethink being-in-time or temporality as a springboard to change how we treat each other and the environment. Why? Because our existence in a temporal reality frames our day-to-day interactions with each other, events, history, our environment, and God. Berry (2009, 98) suggests, "We . . . need the story of our past and our dream of the future Ecozoic Era, for this coming era must first be dreamed. Through the dream comes guidance, the energy, and the endurance we will need." Although I do not have a complete vision of this Ecozoic Era, I argue that a new understanding of our being-in-the-world will play an essential role in building this aspiration. To envision an Ecozoic Era, I look at temporality, or how we experience the world, including a biological-event model (Love 2014), and propose how this calls us to action.

Temporality: Being-in-the-World

Temporality, or our being-in-time, fosters modernity's inclination to see the present through self-presence and the person as an autonomous, self-grounded self outside of history. According to astrobiologist David Grinspoon (2016, 122, 124), we must step away from the immediate present in order to become global change agents, "seeing ourselves as a geological process." Grinspoon (2016, 176) points out that Earth evolved without us, and "we have always seen ourselves as autonomous actors on a passive planetary backdrop." He acknowledges that for human civilization to endure, we must completely change our understanding of the planet and ourselves (Grinspoon 2016, 176). We need to reframe how we think about the relationship between natural time (part of the geological process) and our current consciousness of temporality.

Our Western perception of temporality bears the imprint of Enlightenment thinking, which narrows our understanding of it. Embracing the notion of linear progress, Enlightenment philosophers instilled the belief that human reason and scientific inquiry could continually advance society and individuals. This belief manifests in our modern view of time as a forward-moving force toward enlightenment and development. Furthermore, Enlightenment thought emphasized human agency, fostering a perception of time as a domain to be mastered and controlled. This ethos is evident in our preoccupation with productivity, efficiency, and the rationalization of timekeeping practices. Additionally, the Enlightenment's secularization of time is reflected in our modern calendar systems and the separation of religious observances from public life. Ultimately, the recent history of time reflects the Enlightenment, narrowing the spectrum of temporal modes and creating a universal linear time (West-Pavlov 2013, 6).

According to Michael Northcott (2015, 1273), an Anglican priest and Christian ethicist, the Enlightenment fostered a dualism between humanity and nature. This dualistic view permits us to ravish the Earth for our own means. Nature becomes separate from the human person and thus subject to human desires. This Enlightenment thinking traces its roots to the classical Christian understanding of time, as explained in St Augustine's book, *The Confessions.* (I am not suggesting that Augustine caused or promoted the Enlightenment dualistic understanding, but Enlightenment thinkers were influenced by Augustine.) Augustine (1998, XI, xx, 26) sees time or temporality as contained in the mind or soul instead of the cosmos, separating humanity from nature. For Agustine, only "now" happens as attention. Neither past nor future time exists except in the mind as memory, making this dualistic view easier to develop. This represents the separation between nature and humans and how many contemporary people understand their being-in-the-world as an autonomous superior entity with the world at their disposal.

Enlightenment thinking also influenced the seeking scientific solutions to the world's problems. Today, we use science to conquer diseases or issues or better understand something around us, believing science can solve all crises. Sometimes, it can step in and competently address a challenge, as seen with the COVID-19 vaccine, which has allowed society to return to "normal." Yet Grinspoon (2016, 213), while discussing climate change, asserts, "[w]e wouldn't be having this conversation if science were solving all our problems. In tossing out other worldviews . . . did we throw out any babies with the bathwater?" What helpful prescientific worldviews did science discard? Grinspoon (2016, 213) suggests that some indigenous cultures that identify closely with nature and do not perceive themselves as separate from nature were jettisoned.

Nonetheless, our scientific culture often focuses on verifiable facts as the only truth, the only valid worldview, which can lead to an understanding (or misunderstanding) that everything exists as reducible compartmentalized objects. Yet, according to biological-event temporality, we are interconnected to our environment and each other (Love 2014, 2023). Biological-event temporality originates in how science and philosophy understand the human person as an inter-relationality. This understanding expands the Enlightenment worldview to include how we live in and with the world around us.

Biological-Event Temporality

Examining our temporal existence (how we as biological organisms utilize and internalize time) creates a new non-dualistic narrative where no gap exists between nature and humans. This article explores three aspects of the biological-event model, including genetic inheritance, epigenetic inheritance, and event phenomenology, presenting only a small array of the available information.

Genetics (DNA)

The first aspect, genetic inheritance, explores our DNA as a physical record of our past. Enlightenment understanding represents temporality only as "now," but genetic inheritance suggests a "then/now" temporal understanding. Enlightenment's "now" temporality focuses on our mind, containing our memory, as the location of our past, which fosters an anthropocentric notion of being in time. A "then/now" approach recognizes the importance of our DNA as a historical record containing knowledge of both our individual past and our species' past. It also recognizes the role of the mind as memory. Biological-event temporality's "now/then" insight expands our perspective on temporality beyond humans to include all creation, living and nonliving. Our DNA links us historically to all other living creatures, and the molecules that form our DNA tie us to all nonliving creations.

Every strand of DNA not only differentiates species but also reveals the deep history of speciation that reaches back to the beginning of life on Earth. DNA allows us to look beyond our own existence and learn about what occurred in the past before our species existed. Geneticist Steve Jones (1993, 107) sees modern creatures as living fossils whose DNA offers a window into the past. A geneticist can "read" the past in an organism's DNA, permitting a glimpse into its evolutionary past and seeing when it diverged from its ancestors. "[Y]our DNA molecules are billions of years old and will be quasi-immortal . . . at least as long as Earth life lasts" (Grinspoon 2016, 69). Thus, we carry our evolutionary history within ourselves even though we have no conscious memory of our deep past or potential future.

This DNA record of our deep past makes our present possible. A relationship exists between the past and present where the past shapes the present. Every existing organism has experienced changes to its DNA through mutation and recombination. An example of a significant change in DNA and its impact on primates can be seen in the research of Katherine Pollard, who studied the evolutionary history of the human gene sequence HAR1. This sequence contributes to brain formation , allowing assessment of how and why chimpanzees and human brains diverged through DNA base pair substitutions over six million years ago (Pollard 2009, 44–49). If that alteration in our ancestors' brains had not occurred, we would not be capable of advanced symbolic reasoning and language or searching for meaning and purpose, which we do today. The present is not independent from the past but contingent upon it. For our "now" (or any creature's "now") to exist, a "then/now" has to exist in our DNA as a link between our ancestors' "then" and our "now." The past cannot be dismissed or discarded in biology. Biological-event temporality sees the inter-relationality between all creations' history and their present. The past is indeed inseparable from the present.

This is not like a history where past discoveries develop into current technology but instead comprises a record of a distinct "then/now" because the past is necessary and part of the present. The genome of the past would be distinct from the current genome in tangible and detectable ways, lacking evidence of future events. New technology instead replaces the old technology; we trade an abacus for a slide rule and a slide rule for a calculator that does not contain either an abacus or a slide rule. This is an informational association that can embody many diverse materials. Unlike technology, our DNA is a physical record, a non-intellectual memory of the past that becomes part of the present. Our DNA, which contains our ancestors' DNA, is incorporated into our current function and reproduction. The present could not exist without the past.

Yet DNA does not act alone. For DNA to function, it takes the entire organism interacting with the cellular apparatus, which interacts with the body's biochemistry, other cells, and the outside environment, comprising a web of inter-relationality. This web allows us to effectively survive in our physical environment and, yes, change it both positively and negatively.

A "then/now" view sees the interconnectedness of DNA to our environment, facilitating a greater appreciation for other creatures and our environment. We share a deep history with all creatures. A past that transcends intellectual memory and needs to be brought into our consciousness. Could reorienting our thinking this way be a first step in addressing Berry's (2009, 25) suggestion of finding "a way of interpreting the evolutionary process itself "? Or assist Patriarch Bartholomew (2017) in addressing "a radical reversal"? Similarly, could comprehending our interconnectedness to the environment help us not harm and mistreat "our common home" (*Laudato Si'*, 53)?

Epigenetics

However, a "then/now" temporality within the inter-relationality between humanity and our planet may not be enough to evoke change. Therefore, biological event temporality investigates epigenetic inheritance, where non-DNA molecular and structural changes cause phenotypic changes in the organism. Epigenetic change occurs through DNA methylation, histone modification, and non-coding RNA that cause the mRNA to translate the DNA differently, resulting in phenotypic changes. These changes are not usually passed on to progeny. However, intergenerational changes lasting one to two generations and transgenerational changes lasting three or more generations have been noted. "[T]hey sometimes, but not always, occur in response to environmental stimuli" (Burton and Greer 2022, 2–3). Epigenetic inheritance does not change the DNA in an organism. Because no alteration of the DNA occurs, these epigenetic changes are reversible.

When looking at Earth care, epigenetics reveals that the environment can cause changes in organisms, including humans, that can be passed down to future generations. The environment, food, pollutants, and social interactions can all cause epigenetic changes that affect phenotype, bodily processes, metabolism, and health (Francis 2011; Gregg 2018). These changes affect the individual and their progeny and echo the need for "a softening up in our relations toward each other and toward nature" (Bartholomew 2017).

The Netherlands and Sweden illustrate two examples of food's impact on human epigenetics and health. The Dutch Hunger Winter of 1944 demonstrates how maternal nutrition and timing are essential to a child's long-term health. Children of women who experienced famine during the first trimester of pregnancy exhibited an increased risk of obesity and cardiovascular disease later in life. Children whose mothers experienced the famine during the second or third trimester exhibited insulin resistance and hypertension due to epigenetic change (Burton and Greer 2022, 11; Burton and Lillycrop 2019, 306, 308; Guthman and Mansfield 2012, 492). Experiments on maternal diets of rats and mice also demonstrate epigenetic changes in the offspring (Burton and Lillycrop 2019, 307). However, it is not only maternal diets that affect offspring; paternal diets can also induce long-term effects on the health of the progeny via epigenetic alteration. Burton and Lillycrop (2019, 309) outline a study done in Sweden "that food availability during the pre-pubertal period of grandfathers was associated with the risk of diabetes and CVD [cardiovascular disease] in grandsons, although not granddaughters." Like the maternal diet, paternal diet variation also induces phenotypic changes in rodent offspring (Burton and Lillycrop (2019, 309).

These two examples demonstrate how environmental changes in one generation can affect generations via epigenetic change. Both intergenerational and transgenerational effects can be adaptive and deleterious (Burton and Greer 2022, 5). Thus, they may benefit and/or harm the recipient and/or offspring. This is seen in the response to nutrient stress caused by the Dutch Hunger Winter, where maternal adaption to famine contributed to metabolic pathologies (Burton and Greer 2022, 5).

Food is not the only cause of epigenetic alterations. Social interaction and environmental stress can also induce epigenetic alterations, such as affectionless control seen in rodents. If the mother does not nurture (lick) the pups enough, it increases timidity and anxiety in her offspring. These characteristics can be passed down to future generations (Francis 2011). "[T]his new science presents a completely new dynamic, interactive, and open-ended model of relations between environments, genes, bodies, and health status" (Guthman and Mansfield 2012, 487). Epigenetic changes impact the being-in-the-world of those in which they occur and potentially their progeny.

Food scarcity and social stress will increase as our planet's temperature rises. According to the United Nations Intergovernmental Panel on Climate Change, the Earth's surface temperature will reach 1.5°C (the increase that spells a climate

disaster) during the 2030s (Dickie 2023). When this threshold is breached, we will see "environmental degradation, natural disasters, weather extremes, food and water insecurity, economic disruption, conflict, and terrorism" (United Nations 2023). Climate change "impacts tend to fall primarily on the poor and vulnerable" (United Nations 2023). Therefore, an increase in epigenetic alteration should be anticipated in already marginalized populations across the globe.

Our epigenome responds more quickly and flexibly to environmental change than DNA adaptations. Human epigenetics' reaction to environmental stress can have negative and positive outcomes for our species, changing how we understand ourselves and our being-in-the-world. Our epigenome is the "molecular archive of past environmental conditions" (Gregg 2018, 265). Our DNA and epigenome, with their unique record of our ancestors' past and our own genetic combinations, recombination, and epigenetic alterations, form our biological foundation and our biological "now."

Our biological "now" reflects an interaction between our history and Earth, whose planetary backdrop our biological evolution responds to, establishing the species we have become. Our genetic structure generates a rational, self-reflective being that has developed our limited view of temporality and the current ecological crisis. We need to stop removing ourselves from natural time, or as Grinspoon (2016, 118) states, "from geological time," and see "ourselves within the spatial and temporal landscape of the planet we inhabit." Our "now" needs to enter a new understanding of self beyond cognition to include a holistic understanding of temporality and interconnectedness.

Berry (2009, 25) suggests we need to "incorporate existing data into more meaningful contexts." Genetic and epigenetic data demonstrate the interconnectedness between humans and Earth. Anthropologist Agustin Fuentes (2015, 176) states:

> Our systems of evolution, development, and inheritance are not purely physical, and the boundaries between genes, epigenetic systems, bodies, ecologies, psychologies, societies, and histories are fluid and dynamic. Perception, meaning, and experiences are central in our evolutionary processes as nutrients, hormones, and bone density—and all of these elements can interact. How we see the world—or better put, how we imagine the world to be—matters in our evolutionary histories and futures.

We participate in an intricate genetic dance between the Earth and ourselves. Incorporating this information requires humanity to understand how degrading the Earth translates into the degradation of ourselves.

Claud Romano's Phenomenology

The final aspect of biological-event temporality utilizes the event phenomenology described by Claud Romano in his book *Event and World* to examine how human

beings understand and interpret their being-in-the-world through the categories of "event" and "encounter." Romano approaches phenomenology from the perspective of birth as the opening to human possibility. For Romano (2009, 19), birth is the source of possibility that opens the person to the events that characterize their being-in-the-world; birth occurs before a person's being-in-the-world and opens the possibility for their life world. Romano's phenomenology shares a common entry point with genetics and epigenetics, a biological study based on creative regeneration seen in evolution, in which birth also opens up the possibility for being-in-the-world.

Romano (2009, 27) classifies events as "innerworldly facts" and events in the "*evential* sense". Innerworldly facts occur without being ascribed to a person, while events in their evential sense can be ascribed to a person because the event happens to them (Romano 2009, 27). An event as an innerworldly fact occurs to no one in particular and ranges from events perceived by the senses (a bird singing) to events perceived by the mind (the formation of a thought) or actions taken (executing a task). An example is lightning; lightning during a storm would be an innerworldly fact. However, if lightning struck an individual, it would cease to be an innerworldly fact and become an event in the evential sense. Upon the person's reflection on being struck by lightning, the innerworldly fact would take on meaning within its evential context. In other words, what does getting struck by lightning mean to the person who was struck? The lighting becomes more than a fact. It takes on meaning for the person.

Events in their evential sense or significant events, as I will refer to them, share four characteristics: 1) they happen to someone, 2) they illuminate their own context, 3) they contain their own possibilities, and 4) they open time (Romano 2009, 45–46). First, as seen in the example of lightning, the event no longer occurs to anyone in particular but now can be assigned to someone, "me," who, upon reflection, can ascribe meaning to the event.

Second, the person's world is reconfigured by the significant event; the horizon of meaning opens itself to the person's adventure or life (Romano 2009, 45). The significant event of being struck by lightning changes how the person understands their being, either positively or negatively, opening a new horizon of meaning.

Third, significant events are unconnected to any prior condition. They create their own origin and cannot be reduced to just another fact in the world (Romano 2009, 42). They upend their "own context by its an-archic bursting forth" by the possibility of making it possible (Romano 2009, 43). The lightning strike becomes the possibility to reconfigure the being-in-the-world for the person, thus constructing new meaning.

Fourth, significant events are not dateable; instead, they open time or temporalize it because they overflow the present of its actualization and touch

the person's past, present, and future (Romano 2009, 46). The lightning strike marks the temporal fabric of the person's lived experience, making a defining mark that may or may not occur linearly within the person's other life events. Linear time ceases to determine the being-in-the-world of the person who understands their life as significant events that alter and inform their day-to-day existence. A person understands their life as a series of interruptive significant events rather than a linear birth to present continuous temporal path. These interruptive life-altering events cause a "fissure" between the past and future. They disrupt linear time and, thus, open time to a nonlinear understanding that brings new self-meaning and new possibilities. Our being-in-the-world, how humanity understands itself in the world, is not measured by a clock but understood through significant events, which occur temporally, that provide meaning and context to human life (Romano 2009, 55).

For Romano, significant events form the backbone of humanity's being-in-the-world. Through these events, the lived life understands itself and the world around it. Significant events open up meaning for the person by radically altering their current mode of being and providing meaning beyond the mundane. These events also present how a person understands their life in time as a series of events instead of a linear calendar.

Comprehending these significant events does not rely on meaning in conformity with a prior context but forms the foundation where the person experiences the event. The event's meaning is incomprehensible within the worldly context that explains it and is "only comprehensible in the conformity with meaning that well up with it" (Romano 2009, 62). Through the significant event, meaning and understanding occur, which exceeds the explanation of fact (Romano 2009, 65).

The person "understands" the significant event as it opens new meaning for them and continues reinterpreting the event as life unfolds. This significant event collapses the previously understood world context for the person and recreates it (Romano 2009, 65–66). After a significant event, such as being struck by lightning, life takes on a different meaning. One might be so grateful for being alive that they undergo a complete transformation. However, if the strike left one physically challenged, the event would radically change that person's world. This collapse of the previous context redefines the being-in-the-world for that person, positively and/or negatively.

Understanding takes on a greater or more robust description than just an explanation of fact, going beyond it to redefine the person's world. It is through understanding that a person grasps that their world has been upended by a significant event and will never be the same as before the event. Understanding allows the person to recognize, redefine, and reinvent their being-in-the-world to adapt to their new reality.

However, a significant event also contains possibility or "eventuality." Eventuality reconfigures the intrinsic possibilities of the person and opens the

person to future possibilities. It is future-loaded, where the possibilities delivered from the future exceed the present and change one's past understanding of the world (Romano 2009, 85–86). Returning to the lightning, the lightning strike irreversibly changes the present of the one struck. Through the significant event, the person becomes confronted with possibilities, not only in the present but also in the future.

For Romano, the event brings consciousness and phenomenology together to measure being-in-the-world, punctuated by nonlinear meaning. The measure of time becomes the defining significant events that shape a person's comprehension of themselves, not linear physical time. These events disrupt linear temporality to form a new temporal meaning found in the person's life world. These events do not flow from moment to moment but radically disrupt and reorder time, causing one to measure life by defining events that open up potential. Romano transfers temporality from the narrow linear time of the Enlightenment to what lived time or natural time creates: events.

Romano also looks at how "encounter" does not rely on memory and how encounters intertwine a person's life with another's, thus reconfiguring possibility. Encounter occurs from a distance and will open a new meaning for those involved.

First, an encounter, as a significant event that, when reflected upon, creates change for that person, is not the object of memory. The encounter cannot be reduced to the moment of introduction since it transcends the introduction by reconfiguring the person's being-in-the-world, whether they recognize it or not. It may even occur against the person's will (Romano 2009, 123). It is not the introduction that changes a person but what Ramano (2009, 125) calls a "continuing encounter" that establishes a beginning that never ends. This beginning continuously opens the person to new possibilities, becoming genuine encounters that exceed the moment of introduction and memory. Upon reflection, the person perceives the changes within themself because of this encounter with the other, and this change surpasses their chance meeting and includes endless possibilities.

Second, an encounter entwines lives and changes how a person understands their world. For Romano (2009, 128), "an encounter signifies the irruption of another world in an *advent's* [person's] own world." The person finds their world changed because of the inbreaking of the other's world. This encounter opens the world of another by permitting the person to appropriate the other's possibilities and redeploy them as their own. Thus, an encounter opens the possibility of reconfiguring the person's world and its possibilities in another way by accessing another's world (Romano 2009, 129). Encounter helps us build meaning beyond our current being-in-the world. This becomes important in understanding how we influence others, seen in the later section Where Do We Begin?.

Bringing Together Biology and Phenomenology

By bringing together the objectivity of science and the immediacy of lived experience, a richer conception of our temporal experience emerges. A new worldview of temporality is created that attends to science and philosophy. Biological-event temporality moves from the mind or consciousness into life, as biological and phenomenological, considering the complexity of our life world. The temporal measure becomes our DNA, epigenetics and biology, combined with our life events, the biological-event "clock," which measures the mentally comprehensive and incomprehensible aspects of our being-in-the-world. The human temporal foundation takes on a profound meaning that encompasses our physical selves, our cognitive selves, and our life world (see Love 2014, chapter 4 for construction of biological-event temporality).

Call to Action

Where Do We Begin?

How we encounter the other, including information, becomes our mechanism for change. "Living things do not evolve to fit into pre-existing environments, but co-construct and coevolve with their environments, in the process changing the structures of ecosystems" (Laland 2014, 162). This co-construction includes the biological, behavioral, and perception outlined by biological-event temporality. But how does this call us to the "broader vision of reality" (*Laudato Si'*, 138) Pope Francis summons us to embrace?

I suggest that the interdependence of the biological-temporal model awakens our consciousness to the importance of the other and our environment. This awakening calls us to a new realization that we are not entirely autonomous but part of a community: social, environmental, biotic, and abiotic. Biological-event temporality finds purchase not on humanity's cognitive desire to produce, consume, and reproduce material goods but on humanity herself. It is not about replacing or disregarding the other but about how, as temporal creatures, we consciously and unconsciously live out time as a relational web between DNA, epigenetics, cells, body, environment, and life world. In biological-event temporality, we see the interdependence of lived life and time, not empty production. Thus, the notion of encounter expands beyond the person to include all creation.

Science speaks to both the believer and the unbeliever. Berry (2009, 100) notes that we need "to recognize our emergence out of the long evolution of the universe and the Earth." This new realization petitions the believer, particularly the Christian believer, to imitate Christ, who also experienced a temporal body. "And the Word (*Logos*) became flesh and lived among us" (John 1:14 NRSV). Liberation theologian Jon Sobrino (1992, 106) states, "Jesus is not simply 'God,' but God in concrete relation to history." Liberation theology calls for a critical reflection on praxis "based on a true analysis of the signs of the times and the

demands with which they challenge the Christian community" (Gutiérrez 1971, 6). Theologian Elizabeth Johnson (2011, 198) states, "In an ecological ethic, Jesus' great commandment to love your neighbor as yourself extends to include all members of the life community . . . also the whale, the dolphin and the rain forest." The Christian community that imitates Jesus must extend love to all creation. Jesus intimately experienced an evolved body and thus biological-event temporality. Therefore, imitating Christ requires apprehending the genetically evolved body, valuing the environment, and embracing diverse societies and cultures.

Jesus the Christ, who Christians accept as the second person of the Trinity, calls us to love one another (John 13:34). "God is love" (1 John 4:16). Johnson (2011, 209) explains understanding God as triune "points to an unfathomable divine plenitude who has a history with the world, one that includes knowledge of suffering and death." Jesus, who had a temporal body, suffered and died. Johnson (2011, 209) continues, "[A] divine life structured in love . . . is 'ecstatic,' directed outward toward the world to redeem and heal . . . people of faith are called to the praxis of justice and peace so that all people and all creation may share in the communion." Johnson (2011, 224) sees "God is love" through the communion of the Trinity as energizing, a loving way to counter our self-destruction and nourish compassion toward the world. "Borne by 'the grace of our Lord Jesus Christ, the love of God, and the fellowship of the Holy Spirit,' we become committed to a fruitful future inclusive of all people, tribes, and nations, all creatures of the earth" (Johnson 2011, 224). God as love extends beyond humans to include all living and nonliving creation. It calls us to change the structures that destroy ourselves and our communal home: Earth.

Pope Francis states, "The urgent challenge to protect our common home includes a concern to bring the whole human family together to seek sustainable and integral development, for we know that things can change" (*Laudato Si'*, 13). By changing our way of thinking about temporality, we can respond to Pope Francis, Patriarch Bartholomew, and Thomas Berry's call for us, temporal humanity, to take Earth care seriously. Eco-theologian Sallie McFague (1992, 271) states, "[Theology of nature] will acknowledge and press the interconnectedness of peace, justice, and ecological issues, aware that there can be no peace or justice unless the fabric of our ecosystem is intact." If people change their understanding of their being-in-the-world to see that the environment and others are not separate from us but interconnected to our wellbeing, it could create a domino effect and move us toward an Ecozoic Era. But how?.

What Can We Do?

How can an understanding of ourselves as interconnected help with the climate crisis? According to Grinspoon (2016, 259), "[T]he first step is seeing clearly who we are." He asserts:

> By developing "situational awareness," by becoming cognizant of how we are behaving on a planetary scale, in space and time, and integrating that knowledge into our actions. This will not require altruism or idealism or self-sacrifice, only acute self-perception and "enlightened self-interest." Responsible global behavior is ultimately simply an act of self-preservation of, and for the global beast that modern technological humanity has become (Grinspoon 2016, 225).

Grinspoon (2016, 262) suggests we understand ourselves as a "planetary-scale entity" and "start behaving like one. Biological-event temporality highlights the interconnectedness between us and the world that created us through the co-evolution of Earth and humanity. Biological-event temporality provides a species view that considers deep-time and an evolutionary process, which Grinspoon (2016, 421) sees as necessary.

Pope Francis recognizes that we need a change in our culture to confront the ecological crisis (*Laudato Si'*, 53). "Nature cannot be regarded as something separate from ourselves or as a mere setting in which we live" (*Laudato Si'*, 139). He sees a need for decency and goodness between one another and the world (*Laudato Si'*, 229). He asks us to change our self-understanding by enacting a cultural shift from the Enlightenment's notion of the autonomous self to thinking as a global community where nature and humans have value.

Yet, how can an idea or self-understanding attend to Earth care or change our culture? Foremost, we need to realize the Earth does not require us. Other species will survive climate change, even if ours does not. Changing our notion of temporality opens us up to viewing ourselves as creatures on a temporal rock that measures time in millions of years. We must clean up our mess and visualize a way forward (Grinspoon 2016, 260). How? Will it work?

How?

In addressing the "how," climate activist and ecologist Sara Via (2024) suggests we need an attitude adjustment, viewing ourselves as "connected in an interdependent biosphere." In her YouTube video, "We Need an Epidemic of Climate Action: The Surprising Power of the Tipping Point," Via (2022) explains that our perception of change appears on a linear, consistent pace, when, in reality, many multiplicative processes occur exponentially or nonlinearly on an s-curve. As seen in epidemics, a multiplicative process spreads faster than expected depending on how many people one infects. Social change follows this same s-curve and can result in a tipping point, the possibility of sudden change (Via 2022). Therefore, adjusting our view to an interconnected understanding, as seen in biological-event temporality, can make an exponential difference in how we act and influence others.

In the article "Social Tipping Dynamics for Stabilizing Earth's Climate by 2050," Ilona M. Otto et al. investigate social tipping dynamics of behavior,

opinions, knowledge, technologies, and social norms to elicit structural change and reorganization. "These spreading processes resemble contagious dynamics observed in epidemiology that spread through social networks" (Otto et al. 2020, 2355). The study describes how financial systems, norms and values, education systems, and information can influence tipping points. It points to the importance of "social and public opinion leaders [asserting] the ethical implications of fossil fuels and generat[ing] pressure in their peer groups" (Otto et al. 2020, 2360). The study describes how norms and values (recognition of the moral implications of fossil fuel) create a cascading effect; values influence policies, and policies impact governance, changing resource allocation and market exchange. The estimated time needed to trigger a social tipping point ranges from very fast at a year to very slow at 30 plus years (Otto et al. 2020, 2362). "The social tipping dynamics are likely to spread through adaptive networks of interactions rather than via straightforward cause-effect systems" (Otto et al. 2020, 2361). They note that trends in human behavior need simultaneous institutional stimulus to create stable change from the old to a new social order (Otto et al. 2020, 2361–62).

Yet, the impetus for change occurs at the level of education (accurate information) and advocacy for that position (Otto et al. 2020, 2362). If we understand ourselves as interconnected, thus responsible for Earth care, and advocate for this position, we could become social influencers for change. According to Grinspoon (2016, 263), "every book, lecture, discussion, online argument, flame war, and bar fight about climate change, the global economy, and the Anthropocene itself is a part of this beginning." Our opinions and values and how we see ourselves within the world can boost feedback loops that lead to social tipping points. In biological-event temporality, encounter opens a person's being-in-the-world by permitting them to appropriate the other's understandings and redeploy them as their own. This is how our opinions and values affect others, by creating feedback loops of possibility.

Feedback loops within the aforementioned categories feed the change process until a tipping point is reached where change becomes the norm (Via 2024). Environmental scientist Frances C. Moore et al. (2022, 103–4) analyze the feedback process within the climate-social system to understand individual, communal, national, and global human behavior dynamics to assess potential tipping points. Their findings suggest that behavior can significantly lower global CO_2 emissions (Moore et al. 2022, 109). Behavior includes opinion (social conformity) and morals but requires credibility. "Changing behaviour to better align one's consumption or practices with how one believes society ought to function can strengthen this moral identity and send a normative signal to other community members about desired collective outcomes" (Moore et al. 2022, 104). Credibility affects how the solar panel advocates' and climate scientists' message is received. If they have solar panels or drive an EV car, their message

carries more weight and is more impactful (Moore et al. 2022, 104–6). Opinion and action need to come together to spark change. Therefore, a biological-event temporality understanding must come together with action.

In the webinar "Worried about Climate Change? Take Action!" Via proposes five ways to proceed, stop disinformation, increase discussion, be a spokesperson, decarbonize your life, and celebrate progress. Regarding decarbonizing one's life, Via proposes to stop burning fossil fuels, control methane leaks, consume less goods, revamp agriculture, protect and restore natural lands, eat a plant-based diet, reduce food waste, and cooperate with others (Via 2024). She suggests picking two action items one finds easy and enjoyable. The two actions with the most significant impact on climate change for the individual include eating a plant-based diet and reducing food waste. Both of these actions lower the amount of methane gas released into the environment, contributing to global warming. Not only does she suggest acting, but she also suggests talking to friends, neighbors, and colleagues about what you are doing. She challenges us to see ourselves as citizens, not consumers, and to "make noise for political change" (Via 2024). As individuals who see themselves as interconnected with the Earth and Earth's creatures, what we do and say can influence our social networks, organizations, the public, and culture, creating a tipping point in caring for Earth.

Will It Work?

Scientists like Via, Grinspoon, Otto et al., and Moore et al. see hope for our species' future. Still, it will take people like us (voters, intellectual leaders, the middle class, spiritual leaders, the younger generation, media, governments, teachers, politicians, influencers, etc.) to actively engage with climate change. Otto et al. and Moore et al. demonstrate how behavior can lead to a tipping point and rapid social change, thus mitigating climate change. They offer strategic ways of changing social norms. Via and Grinspoon espouse that we can still change our future: "Don't fear it. Learn to shape it. It is the awareness of ourselves as geological change agents that, once propagated and integrated, will provide us with the capacity to avoid doom and take our future into our own hands" (Grinspoon 2016, 477). We need to see ourselves both individually and globally as change agents.

Berry (2009, 94) offers spiritual hope for our future. He believes we will see our human story as inseparable from the universe's story. We will understand ourselves as interconnected with the world around us, causing a recognition that "every particular mode of being has the universe as its context . . . we are a subsystem of the universe system. More immediately, we are a subsystem of the Earth system" (Berry (2009, 94). He sees our challenge as moving from a human-oriented focus to one that embraces the universe. "This will require an immense shift in orientation, one that recognizes our emergence out of the

long evolution of the universe and the Earth" (Berry 2009, 100). The hope lies in our ability to physically and spiritually envision and enact an Ecozoic Era.

Conclusion

I propose a biological-event temporal understanding that integrates science and philosophy beyond linear time (event) and provides an evolutionary, interconnected view of (biological) self as a starting point to looking at Earth care. This view of temporality moves us away from a purely reductionist, anthropocentric, Enlightenment view of linear time. It allows us to see ourselves as interconnected and interdependent with each other, events, history, creation, and God. Our evolved bodies, minds, and spirits experience our being-in-the-world as a then/now that acknowledges our deep history, connecting us to Earth's history. Our present no longer represents only self-presence but goes beyond cognition to incorporate a conscious and unconscious recognition of biological time that we experience through events. This model espouses having encounters where our opinions and values can be appropriated by others. Encounter with the other can initiate change, as seen in social tipping points.

Will this model alone prevent climate change or save our species? No. Yet, it can offer a starting point for rethinking ourselves and the place we call home—Earth. As interconnected to creation, biological-event temporality calls us to praxis by envisioning ourselves as part of creation. "We both depend on the web of life for our own continued existence and in a special way we are responsible for it, for we *alone know* that life is interrelated and we *alone know* how to destroy it" (McFague 1992, 270). Thus, we must create an attitude of care and concern for each other and the Earth and take action by becoming ambassadors for change. If each of us tells three people and they tell three people, reaching the world's population would take less than twenty-one cycles (Kelly 2022, 89–91). Now, imagine if those people took the message of Earth care seriously by performing two of the action items Via presents: stop burning fossil fuels, control methane leaks, consume less, revamp agriculture, restore natural land, eat a plant-based diet, reduce food waste, and cooperate with each other. Our world would be better, and it would have started with rethinking ourselves and putting this rethinking into action.

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Nature's Scripture: The Interfaith Promise of Science

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Underlying the human world of strife and separation is an oft-neglected landscape of commonality among faiths: the natural world. At precisely the time when our religious and political divisions threaten the existence of life on Earth, science offers a sweeping interfaith vista filled with revelations and insights as spiritually meaningful as ancient scriptures. Understood and interpreted as "scripture," creation (natural reality) offers a common text for all the world's faiths. Studied as sacred scripture, natural reality could ease interreligious and intercultural conflict.

One touch of nature makes the whole world kin.
—William Shakespeare, *Troilus and Cressida*

Background

The extractive nature of humanity's current global civilization is unsustainable, burning through resources and spewing out wastes at rates far beyond the planet's carrying capacity (Rockström et al. 2009). Centuries-old conflict between the findings of science and traditional theological models encourages a disconnect between "what is" as described by science and "what matters" as delineated by theologians and other clergy. Since global crises play out in natural reality, addressing them requires strong knowledge and understanding of "what is" as described by science, but the dis-integration of science and theology over the last few centuries hinders such understanding for people of faith. Facing a historic juncture that includes a possibility of civilizational collapse (Greer 2016; Catton 1982), approaches that increase the integration of science and religion, as well as open dialogue between diverse faith communities, could transcend barriers to global cooperation.

As described in Ian Barbour's now classic work *When Science Meets Religion* (2000), there are four basic approaches to the relationship between science and religion: conflict, independence, dialogue, and integration. This article bridges those last two, proposing that theologians and lay people perform exegesis on what science reveals about natural reality as though it were a form of holy scripture. Such an approach promises to integrate not only science and religion but diverse religious faiths, at least to the extent that they share a common sacred scripture.

What makes a text sacred? Jesuit priest and scholar Michael A. Madigan (2013; emphasis added) writes: "Texts become sacred, not because of any inherent literary property, but because communities of faith have come to consider them so . . . That is to say, they have recognized that a certain particular text or group of texts **somehow express truth** and so make a particular claim on them."

Rather than evaluating a text by its provenance, consider the implications of evaluating a text by its potential to provide spiritual and personal insight, to "somehow express truth." The phenomenological hermeneutics of Paul Ricœur suggest that the purpose of interpretation is to "conquer a remoteness, a distance between the [setting] to which the text belongs and the interpreter himself. By overcoming this distance . . . the exegete can appropriate its meaning to himself: foreign, he makes it familiar, that is, he makes it his own. It is thus the growth of his own understanding of himself that he pursues through his understanding of others. Every hermeneutics is thus, explicitly or implicitly, self-understanding by means of understanding others" (Ricœur, Reagan, and Stewart 1978, 101).

Could any text become sacred by the study and application of the wisdom it offers? In the spirit of Madigan and Ricœur taken together, I assert that any text

or series of texts that "somehow express truth" for a community of interpreters who "can appropriate its meaning to [themselves]" can become sacred.

In 2015, Harvard Divinity School student Vanessa Zoltan experimented with applying exegetic principles to Jane Eyre, in what, to this author, appears to be an application of Ricœur's hermeneutics! Zoltan studied the text the way people often approach scriptural study, earnestly searching for spiritual and moral guidance within the language of the text itself. She and her professor were surprised at how fruitful this approach proved to be. Then, Zoltan offered it as a class, titled "Jane Eyre as a Sacred Text" (Paulsell 2016; Zoltan 2016). Fellow student Casper ter Kuile said, "'This is a great idea. We should do it with a book people actually like, like *Harry Potter*'" (Harry Potter and the Sacred Text. n.d.a).

They tried it, and the class was wildly popular. It spawned a podcast, and within a few years, their podcast, "Harry Potter and the Sacred Text" (HPST), had 16 million subscribers—16 million people benefitting, spiritually, from studying Harry Potter books as though they were scripture. It should be noted that the podcast team acknowledges and rejects J. K. Rowling's exclusionary perspectives on transgender rights (Harry Potter and the Sacred Text. n.d.b).

Their point is not that Harry Potter books are inherently sacred. They chose the Harry Potter series because it is well known, and the plot is rich in metaphor, character development, and archetypal human dramas. Zoltan and her team say, "We believe that in treating texts as sacred, we can learn to treat one another as sacred" (Harry Potter and the Sacred Text. n.d.b). In other words, the HPST team believes that, when we give them the time and attention required for deep understanding, rich texts and fellow humans become sacred to us as a result of our deep investment in them.

The HPST team emphasizes that exegesis performed on popular fiction novels yields benefits because of three elements: **trust**, **rigor**, and **community**. Regarding trust, they say, "'Trusting the text doesn't mean we understand the text to be perfect—either in construction or moral teaching—but that it is worthy of our attention and contemplation. A guiding principle is that the more time we give to the text the more blessings it has to give us" (Harry Potter and the Sacred Text. n.d.c). Imperfect texts require some passages to be interpreted literally while others can be understood metaphorically, or even rejected outright.

Rigor, in this case, involves engaging with the text earnestly, slowly, and repeatedly, bringing full attention to what it might offer in the way of insight. The podcasters say, "'The text in and of itself is not sacred, but *is made so through our rigorous engagement with it*'" (Harry Potter and the Sacred Text. n.d.c; emphasis added). As with traditional religious scriptures, a *community* of people engaged in devoted study is an important part of the exegetical process. The synergism of the interaction among participants is substantive, generative, and extensive.

If there were a text common to all faith traditions, might interfaith study of it lead to a convergence among and between faith traditions? If millions of people can extract spiritual enrichment from studying the fictional Harry Potter novels,

then applying a similar process of study to a globally constructed interfaith work of nonfiction promises far greater religious and spiritual benefits. If there is such a text, and if it were studied with trust and rigor in a spirit of interfaith community, the world might be very different.

Even if humanity recognized a common global scripture, different people undoubtedly would make different meanings from it. The many denominations of Christianity read different meanings from Christian scriptures, as do various sects that hold the Qur'an as sacred. The billions of people who study the Hebrew book of Genesis extract many different understandings of what it means in regard to the role of women, for example. A common scripture would not necessarily prevent discordant interpretations, or blatant misuse, of it, nor would it guarantee religious reconciliation. But as diverse as Christians are theologically, they nevertheless have a shared scriptural language, some shared symbols and metaphors. That commonality helps bridge their interpretational differences. A similar commonality connects Sunni and Shia communities, however at odds they may be in other ways. At the very least, a global common scripture for humanity would offer some shared holidays, and we would have a common language for addressing challenges, from personal conundrums to global crises.

Thesis

Humanity does have a common global scripture, and we have been living and worshiping in its "pages" our entire lives, perhaps never considering its spiritual potential, its sacred depths. It is tremendously rich in theological content. We might disagree about the divine provenance of one another's traditional scriptures, and often do, but by definition, our common scripture was "written" into existence by the forces that birthed it (by the Creator, if you will), however differently we might describe or name those forces.

Our common scripture is nature—creation—natural, physical reality—a vast cosmos we now know to be at least 47 billion light years across, a universe that includes all of us on Earth, along with uncountable other worlds. In any faith tradition in which a divine entity is believed to have created natural reality, it is reasonable to look to that creator's handiwork for clues about the creator.

By analogy, even if we knew nothing about Leonardo da Vinci's life history, we might still obtain glimpses of the inner workings of his mind through thoughtful study of his artworks. For example, we might examine his many portraits and conclude that his attention to the proportions of human faces reveals an abiding concern with geometric forms and proportionality. Such a conclusion would be directly supported by his drawing "Vitruvian Man," which lays out the geometric proportions of male human bodies in both figures and text. Other da Vinci works, with their consistent patterns of geometricity and proportion built into the imagery itself, provide further evidence that the artist cared greatly about these elements of representation.

Such study—done with trust and rigor and in community—would be akin to exegesis, but of artworks instead of scriptural texts. What an artwork is nature! Centuries of rigorous scientific study have already revealed far more than a glimpse, and what we can now see reveals yet more mysteries awaiting further exploration. Natural reality is so vast and intricate that, taken as sacred scripture, it may be the only such scripture that will never be finished, whose revelations are ongoing, infinitely.

This is not a new idea; Thomas Berry (1999, 15) described natural reality as the "book of the universe," and the "Great Book of Nature." Berry urged that, at a minimum, natural reality should supplement written scriptures or, at the maximum, replace them. This article argues that Berry's idea of embracing nature as holy scripture should happen in interfaith contexts, as a common scripture among and between all faith traditions. Such interfaith scripture study could also naturally include and invite those of no faith: atheists, agnostics, nontheists, and empiricists.

Taken as scripture, natural reality is completely different from all other sacred scriptures in that it is not new (it predates all others), and its provenance is unquestioned; humans are diverse in the ways we name and describe the creative forces that birthed the universe, but we agree that reality exists and that the universe must have been created somehow. Study of physical reality is therefore a self-evident option for seeking insight into ultimate reality.

Understood as a source of information and inspiration about the mind of the creator, natural reality is, by definition, a common scripture for all the world's religious faiths as well as those with no religious faith. Natural reality is the only source of inspiration about ultimate reality that is common to all humanity.

What is new is our ability to read it. Before the advent of scientific inquiry, humanity had only myths, metaphors, and guesses about the nature of nature. Like our varying faiths, those myths and metaphors differed from culture to culture. With empirical approaches, we generate evidence that is cross-cultural, replacing myths with evidence-based models. Explanatory models are still metaphors, but constructed from empirical evidence anyone can examine. In the best case, such models are refined or scrapped as new evidence challenges them. Scientific knowledge evolves, nudged along by the natural selection pressure of having to align with physical reality. This winnowing process, which Gregory Bateson (1972) called the "ecology of ideas," would also apply to interpretations (exegesis) of the findings of science. Interpretations that match with human sociocultural worldviews would persist in the short term, while those well aligned with realities of the natural world would prevail in the long term. Exegetical understandings would therefore also evolve over time.

Science is limited to the study of natural reality, so science is necessarily agnostic about the existence of anything supernatural. But scient*ists* are Muslims, Christians, Buddhists, Taoists, Shintoists, Jews, Jains, Sikhs, Zoroastrians,

Confucians, Animists, Pagans… name any religious tradition and there are almost certainly research scientists who practice that faith, along with others of no religious faith. Elaine Howard Ecklund and her team have worked to quantify this assertion, summarized in their book *Secularity and Science: What Scientists around the World Really Think about Religion* (Ecklund et al. 2019, 199). They write:

> Scientists, globally, are more religious than many people are led to believe . . . A substantial portion of scientists across the regions we studied pray frequently and attend religious services regularly. Two-thirds of scientists in Turkey, one-quarter of scientists in India, and 10 percent of scientists in the United States and the United Kingdom say they have "no doubt" about God's existence. Among the atheist scientists we surveyed and interviewed, we found much less vitriol toward religion than we see among New Atheists . . . A number of atheist scientists, especially in Western countries, described having a science-consistent spirituality, finding feelings like awe, wonder, purpose, and meaning in their scientific work. Atheist scientists do not necessarily see science and religion as inherently in conflict.

Often working in collaborative teams from many faiths, scientists take reality apart to reveal hidden splinters of truth, then reconstruct them into a grand framework of how nature works. At every step, they challenge one another, ensuring that anything counted as "knowledge" is verifiably aligned with reality through openly available empirical evidence.

After a few centuries of the scientific endeavor, humanity has assembled a vast library of knowledge about natural reality, an extensive "text," if you will, that describes natural reality as well as it can with the evidence generated thus far. As much as possible for a human endeavor, scientific knowledge attempts to be value and culture neutral. It offers insight into what is, but not what it means, or what matters, or how it should be. Science can help guide us in those areas, but it does not address them directly; that requires human interpretation. If meaning or insights are to be taken from natural reality that are relevant to what matters or how things should be, we must interpret it; that is, we must perform exegesis with it. Let us begin.

Examples

The following four examples were chosen from among dozens if not thousands of others. Thirty-five revelations and fifteen insights are listed at jdstillwater.earth/revelations-insights (2024), but the exegetical potential of natural reality as described by science is almost completely unexplored. Based on initial work, the theological fecundity of the approach is probably infinite (e.g., Berry 1999; Fowler 2021). Each example here begins with the mundane observations (measurements) offered by the scientific endeavor, followed by a "revelation" (metaphor) that is

implicit within them (but far less mundane). I then volunteer one meaningful "insight" (meaning) that arises from these observations and revelations, as interpreted by this author. Finally, a few thoughts are given on what the insight offers in the way of clues about ultimate reality (metaphysics), abbreviated as "Source" (following theistic conventions for capitalizing the names of Creators).

In each step of the exegetical process, I progressively move from measurements to metaphors, then to meaning, and on to metaphysics. In doing so, I gradually shift from the realm of science to the realm of the humanities, basing our metaphors, meanings, and metaphysics on scientific measurements, but subject to differing interpretations at each step. Other students and scholars of nature's scripture may interpret the science differently. We are performing exegesis on natural reality as revealed by scientific methods. As much as Baptist and Quaker interpretations of Christian scripture differ, so might our interpretations of natural reality differ.

Gravity

Observation: Objects with mass attract one another across unlimited distances. That attraction keeps massive bodies in orbital relationships. Calculations tell us that our every movement, even as small as commuting to work, measurably influences the orbits of other planets over time (Irion 2013).

Revelation: The mass in your body helps hold the Milky Way Galaxy together and affects large-scale behaviors of stars and star clusters, as do all bodies of all kinds within the galaxy.

Insight: Gravity binds every object in the universe with every other object into a single interconnected system. Human beings are not objects acting independently of other objects; we are integral parts of a single universal being. Our actions matter—and our presence is meaningful—even on galactic scales.

Theology: This revelation exemplifies a consistent pattern bolstered by many other examples: the interdependence and interconnectedness of living species within ecosystems (Günther and Folke 1993); the unity of time and space (Einstein 1916); the complementarity of particles and waves (Bohr 1928); the constant flow of matter through living bodies (see the following discussion of water). Along with many other such examples, this pattern of universal unity suggests that the Source of the universe had a penchant for interbeing, for deeply inherent interrelatedness, with no isolated systems and nothing irrelevant to the whole. Patterns of interbeing are both personal and universal.

Evolution

Observations: Under environmental pressures that advantage relevant traits, living populations experience genetic changes commensurate with those environmental pressures (Darwin 1859). Over time, such changes can lead to speciation (new species). Genetic similarities allow for tracking the relatedness of extant species back through time (Patwardhan, Ray, and Roy 2014).

Revelations: Since every known species is related to other species through intersecting lines of relation, there is only one single family tree of relatedness among living creatures on Earth. All living beings descended from a common ancestor.

Insights: All living systems are genetically interrelated. All humans are cousins. Therefore, all conflicts are family conflicts—all wars are civil wars. All living species are cousins, too. Human nature inherits much from primate nature, which inherits much from mammalian nature. The moral and ethical implications are endless:

- What happens to our definition of "family" as we consider cousins further and further distant from us on the family tree of life?
- Addictions, violence, and greed (all the "deadly sins") were likely selected for in our ancestry. Would we even be here without those traits? Are they "sinful" or advantageous or both?
- How should we interact and relate to distant relatives, especially those contributing to our sustenance?

And so on.

Theology: Physical laws are constructed such that order and chaos, life and death function in tandem to allow for creativity, on Earth and throughout the universe. The astounding variety of "endless forms most beautiful" (Darwin 1859, 490) testifies to the capacious creativity possible within the orderly bounds of natural laws. Many other lines of physical evidence suggest that endless diversity is expressed throughout the cosmos, hinting that the Source favors creativity, diversity, and variation. This generativity is both constrained and promoted by the orderly limits of physical laws. Dynamism and constraint—built into the fabric of reality—give rise to consistent patterns of creative diversity.

Water

Observations: Macroscopic matter such as water is made of nanoscopic atoms that associate into molecules through attractive electrostatic forces. Water molecules are extremely small but can be counted using their molecular mass and Avogadro's number. The water cycle on Earth assures near-total mixing of surface waters over time. Human bodies are ~50–60% water, of which ~3% is excreted and replaced each day (Rieble and Davy 2013).

Revelation: Each liter of water I drink contains hundreds of millions of water molecules that have been inside the bodies of Abraham, Buddha, Confucius, Gandhi, Jesus, Moses, Muhammad, and every other human who lived more than a few decades ago. Each liter of water includes varying numbers of molecules from all the plants and animals that lived more than a few decades ago too.

Insights: All water is holy, including the water in my body. Human bodies participate in Earth's water cycle (along with other cycles) and are integral

elements within those cycles. This is true of all living bodies. Such insights are therefore personal to us as humans and in common with all life on Earth.

Theology: Here again it appears that interrelatedness is a matter of universal principle—a quality of the Source. The cyclical nature of water on Earth hints at cyclical economies (echoed in other natural cycles, e.g., carbon, nitrogen, rock), not only of matter but also of time in the form of days, months, seasons, and years. There is an additional pattern related to scales of existence, built up from the quantum scale to the macro and cosmic scales, interrelated systems built of interrelated systems, like matryoshka dolls, or, as Arthur Koestler described, holons within holons (Koestler 1967).

Complementarity

Observation: When passing through narrow slits in various arrangements, subatomic particles exhibit properties associated with both waves and objects. Further experimental observations establish that, when not observed, such particles exist as a superposition of both mutually exclusive models. They cannot be both, yet they are. This paradox was termed "complementarity" by Niels Bohr (1928).

Revelation: A single entity can simultaneously exist in two mutually exclusive states. Every object in the universe is made of such paradoxical materials. Like other macro-scale objects, human bodies are made of pico-scale entities that exhibit paradoxical behavior.

Insight: Explored using the either/or logic of empirical science, the universe reveals itself to be fundamentally both/and, with implications for social identities (gender, sex, race, etc.), conflicts of all kinds, certainty and dogma, inclusion, and politics.

Theology: Complementarity suggests that the Source transcends all our certainties, convictions, and dogmas based on either/or reasoning. Complementarity urges us towards humility in our conclusions and suggests that the Source values both content (being) and process (becoming). To emphasize one to the exclusion of the other is theological malpractice.

Relevance for This Time in History

We live in a world on the brink of catastrophe, for humans at least. As has been thoroughly described by other contributors to this journal, humanity is experiencing the natural consequences of living out a worldview marked by separation, domination, conflict, and exploitation. At this precarious time, the meta-crisis we face (Rowson 2023) requires global cooperation and good will, but conflict among human cultures and religious groups continues largely unabated. Such conflict is often marked by self-righteous certainty, dogmatic ideologies, and proselytizing. Arguably, intercultural conflicts of all kinds are exacerbated by environmental crises as resources become scarce.

Culture wars urge us to think of science as an enemy of religion and spirituality, claiming that science reduces all magic and mystery to the mundane muck of materialism—to the profane (Derry 2014). In truth, the last 150 years in science have done just the opposite. From particle physics to the standard model of cosmology, every discovery, every revelation, every dark frontier illuminated, reveals ever-greater mysteries beyond the shores of our knowledge, like quantum entanglement at the nano scale (Einstein, Podolsky, and Rosen 1935) and dark energy and matter at cosmic scales (NASA 2024). With each new revelation, nature's glory and intricacy grow, often by leaps and bounds. Studied with a scriptural mindset, revelations from science inspire an ever-expanding awe of the creative forces that gave birth to everything.

If the world's religions want to work together to address global crises, especially environmental crises, we might consider starting on common ground. Natural reality is the only literal common ground we have. And here we are, living in it, as it. What if our sources of inspiration and spirituality included one based on what we *know* alongside what we *believe*?

What we believe does not always sit comfortably alongside what we know. There is no point in denying that new evidence sometimes upsets cherished beliefs. Incendiary debates over evolution and creationism continue today, a century and a half after Charles Darwin. Over time, some of those flames have softened into debates about "intelligent design." Intelligent design, whatever one's perspective on it, allows evidence and belief to coexist somewhat more companionably than creationism. This softening and eventual integration is rarely a comfortable process; new revelations force us to reconsider our beliefs in a new and more expansive light. Mystics, ascetics, monks, and other religious practitioners know that the point of a religious life is not perpetual comfort. Embracing discomfort is a spiritual practice (Woolley and Fishbach 2022)! Indeed, it may be a requirement, if humanity is to survive the coming environmental changes.

Integrating what we know with what we believe (rather than rejecting one or the other to remain comfortable) stretches our perspective. In the centuries-long dialogue between astronomy and theology, the long trend is clear: astronomy vastly expands our perceptions of ultimate reality and the Source of it all. In just the last 200 years, humanity went from knowing only of the stars we could see to realizing that our sun is one star in a large spiral galaxy of hundreds of billions of stars and that there exist many other "island universes," other galaxies (Hubble 1926). Just in the last few decades, we came to know there are about two trillion galaxies, each with 400 billion stars on average, most of those with planets, based on exoplanet discoveries orbiting nearby stars (Cassan et al. 2012). There are more solar systems in the visible universe than there are grains of sand in all the deserts and beaches of Earth (Stillwater 2020). The universe as we know it now is a hundred quadrillion times larger than the one perceived by Galileo (Benz 2017). Our perception of the Source has had to expand accordingly (see Swimme and Berry 1994). Astronomy has been good for theology, though it took centuries of resistance from some theologians before this could be noticed.

When religious communities reject what humanity knows, they risk the stagnation of what humanity believes. Approached as holy scripture undergoing continuous revelation, the study of physical reality offers to enrich our beliefs immensely. Acknowledged and explored in interfaith contexts, that same process of revelation and integration could open up expansive new terrain for human flourishing.

For example, how does the genetic kinship of all living things resonate—similarly or differently—for Hindus and Muslims? For Jews and Daoists? For Jains and Christians? For Mormons and pagans and atheists? What could these groups learn from one another if they were to go deeper than polite appreciation for each other's distinct beliefs and rituals? The fact of this kinship is something we all share because we are it; we are twigs on a tree of kinship. As one observation among thousands revealed by scientific inquiry, kinship provides a sturdy trunk for supporting deep and authentic interfaith dialogue, even in the buffeting winds of global crises. Remember, our genetic kinship is just one chapter of humanity's shared global scripture. The full text is nearly endless, and it is overflowing with richly fertile, inspirational soil waiting to be plowed.

As suggested by Harry Potter and the Sacred Text, interfaith dialogue should begin with **trust** that studying natural reality can yield generous rewards. **Rigorous engagement** with nature will then elevate nature's text from mundane observations to holy scripture. Performing exegesis in interfaith **community** will bring the entire range of human experience to the task of making meaning from the handiwork of the Source.

When the text is natural reality, interfaith study of it has a welcome side effect: because we are embedded in and spring from natural reality, sacralizing nature sacralizes us too. This brings us back to the foundational tenet of Harry Potter and the Sacred Text quoted previously: "We believe that in treating texts as sacred, we can learn to treat one another as sacred." Natural reality already includes all humanity within the community of life among the stars. In treating natural reality as sacred—by giving it the time and attention required for deep understanding—we can learn to treat one another (and ourselves) as sacred because we are part of nature. When reality is made sacred, nothing mundane remains.

Conclusion

The world's faith traditions have one important "scriptural" text in common: natural reality. Studied as a sacred text, natural reality invites a convergence, a consilience that not only promises to put disparate faiths "on the same page," but also to enrich their respective traditions with new insights about the Source of all. The "text" of natural reality is an ongoing revelation that arises from the global multifaith community of scientists. Interpreting the text of reality as revealed by science is most promising when performed in interfaith spaces, with each tradition bringing different pieces of the puzzle of human meaning to the table.

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Empowering Diverse Faith Communities through Engagement in Participatory Science

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Developing successful strategies that promote meaningful dialogue between scientific and religious communities is arguably one of the most urgent issues of our time. Perceptions of science as hostile to religion have led governments to adopt educational policies that are not in the best interest of communities and adversely affect participation in science by people of faith, disproportionately excluding minorities and women (e.g., Bolger and Ecklund 2022; Barnes and Brownell 2018; Ecklund et al. 2019). Diversifying science requires respectfully and constructively engaging with diverse worldviews and cultures. One way this can be accomplished is through collaborative projects that facilitate building relationships across communities that might not otherwise interact.

Participatory Learning

In recent decades, it has become increasingly possible for people of all ages and from all walks of life to participate in real research projects alongside professionals in many fields of study. Citizen science and community science are examples of participatory science that engage members of the general public in advancing knowledge and/or problem-solving with scientists and other specialists. Although there is no clear distinction between community science and citizen science, community science often refers to a global movement through which scientists and nonscientists alike make observations and collect data to help answer some of our planet's most critical questions. Research tends to be driven and controlled by the needs of local communities, is often carried out in partnerships with academic or other organizations, and is characterized by local knowledge, social learning, collective action, and empowerment (e.g., National Academy of Medicine, n.d.; Community Science, n.d.).

On the other hand, citizen-science projects are typically developed by research teams that require human help to extract information from large quantities of data. The label *citizen* is unfortunate, as it may have negative implications, and participation does not require an individual to be a citizen of any particular place. Because of this, the label *participatory sciences* has been suggested to describe a variety of research efforts that depend on knowledge, insights, or observations from members of the public (Association for Advancing the Participatory Sciences 2024). Online platforms for participatory science enable people to contribute to research projects that appeal to them from anywhere and at any time (e.g., Zooniverse, n.d.a; NASA, n.d.). Furthermore, many of these research projects include the humanities as well as the sciences. In this article, we will use the descriptor *participatory* except when it is necessary to use *citizen science* to refer to specific initiatives, organizations, or products that have used this terminology.

Along with enabling projects that would be impossible without the help of many individuals, participatory science benefits volunteers in critically important ways. Most science is learned in informal environments outside of school (Falk and Dierking 2010); however, the internet is rife with misinformation about science. Through participation in real scientific research, volunteers learn about the process of science while contributing to the pool of human knowledge. This can be an empowering experience for participants and an effective way to build trust and positive relationships among diverse individuals and communities by putting a human face on both the research and researchers. In the words of Johann Wolfgang von Goethe, "Who wants to understand the poem must go to the land of poetry; who wishes to understand the poet must go to the poet's land" (Libquotes, n.d.). We learn about others best when we enter their communities and participate in their activities.

An increasing number of educators are also providing students at all levels with opportunities to participate in real research, a practice that can benefit students and teachers alike. Course-based undergraduate research experiences (CUREs) offer students hands-on experience doing original research and offer faculty the opportunity to generate new information within their disciplines (Auchincloss et al. 2017). Research shows that CUREs, particularly at the introductory-course level, increase student cognitive gains and interest in science and may be a way to improve the diversity of the scientific community (e.g., Bangera and Brownell 2014; Dolan 2014; Auchincloss et al. 2017).

Public Participation in Research through Zooniverse

Zooniverse is the largest and most popular online platform for participatory science. It began with the 2007 launch of Galaxy Zoo, a project that invited volunteers to help classify different types of galaxies (Lintott et al. 2008). Thus far, Galaxy Zoo has produced over 70 academic publications on subjects such as the sharing of datasets, discoveries of new types of galaxies, deepening our understanding of how galaxies evolve over time, and much more (Zooniverse, n.d.f). Over the years, Zooniverse has expanded to include many areas of research in disciplines such as biology, medicine, physics, the social sciences, and more and has produced hundreds of academic publications in top journals, including "Meta Studies" that explore the use of Zooniverse in formal and informal education settings, participant pathways from dabblers to deep engagers, participant motivations, etc. Meta Studies also report advances in machine-learning techniques that have been made possible by human classifications (Zooniverse, n.d.f). Over 2.6 million people are registered participants on Zooniverse, working alongside the hundreds of researchers who have led over 400 Zooniverse projects to date.

At any given time, volunteers can choose from around 90 active projects in diverse fields of study across the sciences and humanities, including a wide selection for virtually all ages. Project participants classify or annotate different subjects, which might be images, photos, texts, graphs, or videos, depending upon the requirements of the research project. Zooniverse can be used by individuals or groups in both formal and informal learning environments. The website provides many resources for further learning, including materials for teachers at all educational levels, and a tool that can be used by anyone interested in building their own research project (Zooniverse, n.d.e). Projects that are launched on the main Zooniverse website undergo several reviews by the Zooniverse leadership team; however, the project-builder tool can also be used to build smaller projects of interest to specific communities.

Each project on Zooniverse combines contributions from many individual volunteers, relying on a version of the "wisdom of crowds" to produce reliable and accurate data. Projects have their own tutorials and discussion boards

that provide opportunities for volunteers to interact with each other as well as the research teams. Interactions with scientists in particular can help build confidence in individuals who doubt their own abilities to contribute to science in meaningful ways. Many of the most interesting discoveries from Zooniverse projects have come from discussions between volunteers and researchers; some participants have even achieved coauthorship on resulting research publications. Examples from the project Galaxy Zoo include the identification of previously unknown types of extragalactic objects known as Hanny's Voorwerp and Green Peas (e.g., Cardamone et al. 2009; Lintott et al. 2009).

Engaging Faith-Based Communities in Citizen Science through Zooniverse

The features described in the previous section make Zooniverse an ideal platform for helping diverse audiences engage with science in nonthreatening ways and in their own environments, enabling wonderful opportunities to increase public understanding of science among faith communities and foster a more diverse STEM population. Most communities of faith have adult, youth, and/or intergenerational classes or other programs to help relate religious learning to societal issues. Furthermore, an increasing number of seminaries have received support to integrate scientific topics into their courses and programs through the American Association for the Advancement of Science's Dialogue on Science, Ethics, and Religion (DoSER) Science for Seminaries program (American Association for the Advancement of Science's Dialogue on Science, Ethics, and Religion 2020). All of these programs provide superb occasions to address apprehensions about science through active participation in the scientific process and to help individuals relate science and religion in positive and meaningful ways.

Engaging Faith-based Communities in Citizen Science through Zooniverse (for simplicity, Engaging) was a funded eighteen-month initiative to create intentional and sustainable pathways for faith-based communities to engage with science through the Zooniverse platform (Wolf-Chase 2022). We use the word *initiative* rather than *project* to avoid confusion with individual research projects on Zooniverse. The principal intentions of the initiative were to cultivate new relationships and build trust with diverse religious communities by inviting them to become collaborators in scientific discovery and to demonstrate that participating in science can be fun, engaging, and empowering.

At the outset of Engaging, a six-person multidisciplinary advisory board that included representatives from the Abrahamic faith traditions, scientists, and people experienced in science and religion or interfaith dialogue was established to help guide the initiative. Together with Engaging's leader, advisory board members helped advertise Engaging through their respective venues and among their communities, including but not limited to the Institute on Religion in an

Age of Science (IRAS 2020); the Zygon Center for Religion and Science at the Lutheran School of Theology at Chicago; the Vatican Observatory; the Illinois Holocaust Museum and Education Center; The Clergy Letter Project (n.d.a.), an endeavor to demonstrate that religion and science can be compatible; the American Academy of Religion; the Interfaith Youth Core; and various media of organizations dedicated to science and religion dialogue (e.g., Lutheran Alliance for Faith, Science, and Technology, n.d.; Presbyterian Association on Science, Technology and the Christian Faith, n.d.).

Throughout the duration of the initiative, Engaging's leader organized and led online workshops to showcase the capabilities of Zooniverse; generated awareness of the initiative through articles, blogs, newsletters, and website contributions; and facilitated new relationships and ideas for broadening engagement. In total, these combined efforts reached at least 100,000 individuals who may not have been attentive to other venues promoting participatory science.

The most serious limitation was that Engaging took place during the COVID-19 pandemic, such that the vast majority of presentations, tutorials, and events had to be conducted remotely. In some respects, this made participation in Zooniverse a natural fit to the online modes of operation communities had to learn to navigate. However, since faith communities struggled just to maintain themselves and their ongoing activities during the pandemic, introducing entirely new programmatic elements was not possible for many. Unfortunately, this resulted in many one-time events and fewer sustained efforts. Communities recruited to participate already had some interest in science, as well as programs in place that could accommodate scientific learning opportunities. Even so, the participatory aspect that enabled individuals to engage with the process and collaborative nature of science was, by and large, new.

Models for Engagement in Participatory Science

The Engaging initiative produced models for integrating learning about science through participation in Zooniverse across assorted venues (Wolf-Chase 2022). A few of the successful ways Zooniverse projects were integrated into seminary, interfaith, and youth and family programs are detailed in this section.

Seminary Education

The capabilities of Zooniverse were showcased to seminaries who applied for, or received, DoSER Science for Seminaries grants (Science for Seminaries 2024). Cosmology, anthropology, evolution, climate, and ecology are all scientific topics represented on the Zooniverse platform that are relevant to theological themes. A particularly successful outcome of this outreach was the decision by a professor at Hood Theological Seminary, a historically black graduate and professional school sponsored by the African Methodist

Episcopal Zion Church, to integrate several research projects into her course on the history of Christianity in the United States, a course taken by all seminary students at Hood.

During the spring semester of 2020, students were assembled into small teams and asked to choose a project from a given list. They were then asked to participate in their chosen project over the course of the semester while reflecting along with other team members on what they were learning and its relevance to course themes. Students initially were asked to produce podcasts on their experiences; however, pandemic constraints necessitated that the students write papers instead. For example, students working on Hubble Asteroid Hunter (Garvin et al. 2022; Kruk et al. 2022) reflected on the potential threat of asteroids to life on Earth; students working on Notes from Nature (Matsunaga, Mast, and Fortes 2016) reflected on the relationship between plant and animal habitat loss and human health; and students working on Parasite Safari reflected on the church's ecological responsibility. Students who worked on Snapshot Elephants for Africa related social behaviors of male elephants to structures in the Black church (S. Grant, personal communication, October 25, 2021).

Features that made this model successful include providing students with the opportunity to choose projects of interest; sustained engagement in projects over the course of the semester; and collaboration with other students, which reflects the collaborative nature of science. What could have benefited the experience further was more direct and sustained interactions with the project scientists beyond the discussion boards.

Interfaith Programs

Many interfaith organizations are devoted to mobilizing diverse religious communities toward action on scientific issues that intersect with issues of social justice. For example, Interfaith Power and Light (n.d.) coordinates affiliated interfaith organizations across the United States that are dedicated to environmental justice. These organizations provide resources to empower communities to take climate action through local projects. Although most of these actions involve in-person efforts, for some people, including but not limited to the elderly and infirm, online participation might be more appropriate. This was especially true during the pandemic, when Zooniverse leadership received expressions of gratitude from individuals around the world seeking to engage in meaningful activities from the safety of their homes.

In April 2021, the Engaging leader cohosted a webinar with Chicago-based environmental organizations Faith in Place and the Chicago Muslims Green Team to demonstrate how individuals could take climate action during the pandemic and beyond by participating in one or more of the many environmental research projects available on Zooniverse, including the local Chicago Wildlife Watch (faithinplace 2021). On many occasions, Zooniverse research teams have

coordinated large events involving challenges to participants to achieve a certain number of classifications on specific projects. Future efforts could specifically target interfaith organizations dedicated to proactive climate action. Such an event, if advertised through prominent media outlets, would be a powerful demonstration of cooperation across diverse faith traditions and would stand in stark contrast to the pervasive culture wars and messages of polarization.

Youth and Family Programs

Engaging has produced several models for integrating Zooniverse projects into youth and family programs of faith communities. A Lutheran pastor in Texas with a strong science background had his confirmation class vote on a Zooniverse project on which they would all work. The class collectively chose Penguin Watch, a popular environmental science project (Arteta, Lempitsky, and Zisserman 2016; Jones et al. 2018, 2019; Jones et al. 2020). Since not all students would have chosen this project, the degree of engagement varied considerably, and the pastor decided that in the future, students would have individual choices among projects and be encouraged to make greater use of the discussion boards to interact with team scientists.

In general, pastors and youth leaders will not have scientific training, nor should this be an expectation. Most will need to work closely with a scientist to implement Zooniverse effectively. In some cases, scientists might be pulled from local congregations, similar to the models produced by the Scientists in Congregations initiative (Scientists in Congregations, n.d.). Scientists could also be recruited remotely from Zooniverse project teams to work directly with religious leaders. A good, albeit one-time, example took place in February 2021, when Engaging's leader worked remotely with a youth leader to colead a session themed around "God and Physics" with middle- and high-school youth groups at a Presbyterian church in California. The scientist introduced students to Zooniverse and led them through a tutorial on classifying galaxies in Galaxy Zoo, highlighting the potential for students to discover new objects or new types of galaxies, while the youth leader encouraged students to reflect on how the vastness of the universe in time and space might expand and deepen the way they thought about God.

Zooniverse also provides an excellent platform for families to learn together. Hood Theological Seminary and the organization Families and Communities Together have co-organized minority-serving intergenerational summer science camps (Hood Theological Seminary, n.d.). In 2020 and 2021, Engaging's leader conducted online sessions with Zooniverse on Zoom, highlighting projects that were related to camp themes. The 2020 science theme was space, which facilitated discussion of nascent star clusters that were discovered by volunteers working on the Milky Way Project (Kerton et al. 2015; Wolf-Chase and Kerton

2015; Wolf-Chase et al. 2021). In keeping with the 2021 focus on ecology and the climate, the Zooniverse project Fossil Atmospheres was used to demonstrate how people around the world are helping to track how Earth's atmosphere has changed over time (Soul et al. 2018).

Evaluation of Engaging

The summative evaluation report for the Engaging initiative can be accessed and downloaded online at informalscience.org (Wolf-Chase, Hinman, and Trouille 2021). This website is maintained by the Reimagining Equity and Values in Informal STEM Education Center funded by the U.S. National Science Foundation Advancing Informal STEM Learning program. The evaluation report contains a thorough description of the methods, limitations, findings, and recommendations of the initiative, as well as appendices listing all the organizations to which the initiative was communicated, online surveys used for evaluation, and sample responses to open-ended survey questions. Highlights of the results are presented here. The reader is referred to the full report for further details.

Engaging was evaluated using online surveys designed to be completed by individuals before and after participating in Zooniverse, focus groups conducted by Engaging's leader during the summer of 2021, and feedback gathered via informal conversations throughout the funded period. Information was obtained in order to assess views on science and scientists; gauge interest among faith leaders and communities in participating in citizen science; gather information on the types of projects and messaging that would appeal to different audiences and motivate continuing engagement; and obtain feedback regarding what worked and what did not in integrating Zooniverse into programs of religious organizations.

Online Surveys

Because the faith communities that participated in this initiative were so diverse (seminaries, youth groups, interfaith audiences), surveys were distributed using convenience sampling to different audiences participating in four specific events: attendees of a virtual DoSER Science for Seminaries retreat during the summer of 2020; middle- and high-school youth groups at a Presbyterian church in February 2021; attendees of a virtual international multicultural workshop in March 2021; and attendees of a virtual interfaith environmental webinar in April 2021. As a consequence, most of the feedback provided by the surveys came from one-time events rather than long-term programs. To gather more data from individuals who might not actually participate in a citizen-science project after completing a survey, the surveys were also distributed through the e-newsletter of the Clergy Letter Project (n.d.b.). The Clergy Letter Project

e-newsletter is distributed to between 8,000 and 10,000 religious leaders on a monthly basis. Beginning in February 2021, it was also possible to access the surveys through the initiative's website (American Association for the Advancement of Science Dialogue on Science, Ethics, and Religion 2021).

The rate of survey return was unfortunately low. While 185 people returned the pre-participation survey, only twenty-seven returned the post-participation survey, with an overlap of eighteen people who completed both surveys. The returnee demographic was dominated by white (86%), male (67%), highly educated (87% masters or doctorate), older adults (74% over 50 years of age), who self-identified across diverse faith traditions. The most interesting results came from the open-ended responses, which revealed several common themes. Open-ended questions addressed the inclination of respondents to participate in either online or in-person citizen science; confidence in science and scientists; and whether respondents viewed science to be in conflict with their religious beliefs. For the last, it should be noted that most of the Christian respondents came from mainline Protestant and Catholic traditions and their responses do not necessarily reflect the views of individuals who identify as evangelical Christians.

On the whole, respondents showed no strong preference between participating in online versus in-person citizen science. For each of these types of project, roughly 33% of people who submitted pre-participation surveys were "in between" as to whether they would be inclined to participate, with roughly 33% "likely" or "very likely" to participate and 33% "unlikely" or "very unlikely" to participate. In contrast, 74% of respondents who participated in Zooniverse and returned a post-participation survey were "likely" or "very likely" to participate again. Post-participation respondents were also somewhat more favorably inclined to try an in-person citizen-science project than pre-participation respondents. The most common reason given for not being inclined to participate was time—given the large number of responses from clergy, this may be motivated by reluctance to take on an activity completely outside of one's vocational training.

While most respondents viewed science itself favorably, confidence in actual scientists was tempered by the fallibility and motivations of humans in general. Respondents who knew scientists personally were inclined to view scientists favorably in general, underscoring the importance of having interactive experiences with actual scientists. Some responses indicated a higher level of trust in scientists employed in independent or academic research, as opposed to those employed by corporations or industries that were seen as potentially motivated by economic rather than humanitarian interests.

The vast majority of respondents (90%) did not see conflict between science and their personal religious views, although many of the extended responses

came from religious leaders whose theological views may not reflect the views of their typical congregants. While some viewed science and religion as complementary, others felt that science can inform, challenge, deepen, or modify religious understandings. Still others felt that science and religion could inform each other. Most of the conflict responses were not about science per se but reflected ethical concerns about some applications of science.

Decades ago, Templeton Prize winner Ian Barbour used four terms—Conflict, Independence, Dialogue, and Integration—to describe ways in which science and religion are observed to interact (e.g., Barbour 2000, 2–4). More recently, Lutheran theologian Ted Peters (2019, 26) reported that Berkeley's Center for Theology and the Natural Sciences adopted the phrase creative mutual interaction (CMI) when formulating the editorial policy of the journal *Theology and Science* in order to promote two-way conversations between science and theology. Peters applies CMI particularly in the context of speculations about the religious and ethical stances of hypothetical extraterrestrial intelligent life, where he suggests that theology can help point out hidden ideologies in extra-scientific claims (e.g., Peters 2019, 25–43). The "complementary" views of survey respondents roughly align with Barbour's "independence" or "dialogue" categories and the "inform" and "modify" responses with Barbour's "integration" category (Barbour 2000, 2–4); CMI provides a good description of the views of respondents who felt science and religion could inform each other.

Focus Groups and Informal Conversations

Throughout the duration of Engaging, the initiative's leader had informal conversations with prospective citizen-science participants. Additionally, the leader conducted two focus groups during the summer of 2021 to gain additional information from people who had participated in at least one Zooniverse project. The focus groups consisted of a retired Lutheran pastor who used Zooniverse as an individual and helped market the platform among science and religion organizations; a professor at a minority-serving seminary who integrated several Zooniverse projects into her seminary classes and intergenerational summer camps in North Carolina; a lay member of a Muslim community in Chicago who is actively involved in marketing citizen science among Muslims; and the pastor of a 600-member Lutheran congregation in a small Texas city who used Zooniverse with his confirmation class.

One of the primary points to emerge from the focus groups and informal conversations was the importance of the continued involvement of scientists in implementing citizen-science projects. While discussion boards are helpful, there is no substitute for personal, real-time interactions between scientists and participants. This is especially important to help new participants build

confidence in their abilities to contribute meaningfully and to help them learn and stay engaged. Some participants also may need more assistance navigating online tools for annotations and classifications.

One focus group participant suggested the formation of "affinity groups" across different churches and community organizations, wherein people from diverse backgrounds would participate in projects of common interest. Another focus group member felt that organizing a challenge with some sort of reward for reaching a specified level of participation could motivate engagement. For example, such rewards might come from community partners donating gift cards or providing other incentives for volunteers.

There is no one-size-fits-all approach when it comes to marketing participatory research to religious communities or the kinds of projects that may be of interest. Although the Muslim focus group participant indicated that connecting science to religious values expressed in the Qur'ān, and highlighting doing science as a way of connecting with God, was important to Muslims, focus group members felt that on the whole, local conditions, age, and other factors not directly related to religious concerns play large roles in motivating people to participate in citizen science. Scientists need to work closely with local leaders to identify the best fits for a given community. Two-way communication is extremely important, and diversity is critical. Participants need to see scientists that remind them of themselves.

Recommendations

Science-Apprehensive and Underrepresented Audiences

The level of trust in science and scientists is affected by the representation of one's own culture within a given scientific community (Odekunle 2020; Thorp 2020). This is true when it comes to gender, culture, ethnicity, and other factors such as religion. Although Engaging facilitated many new connections with diverse faith communities and provided models for integrating online participatory research into assorted programs, further efforts are required to make significant inroads into populations underrepresented in science. This includes ethnic minorities as well as religious communities that may be more apprehensive about science in general. Many religious communities are happy to work with scientists who may not share their own religious views; however, informal conversations with members of organizations of evangelical Christians in science, including the American Scientific Affiliation (ASA) and BioLogos, indicate this is often not the case when it comes to interacting with more conservative evangelical Christians. These organizations could play important roles in encouraging evangelical Christians to participate in science.

Although Engaging's leader had several conversations with representatives of the ASA, BioLogos, the Emerging Scholars Network (a network within

InterVarsity's Graduate and Faculty Ministry), and homeschool networks, the relatively short duration of the funding period, and the fact that all communications were necessarily remote during the pandemic, made relationship building and creating new programs with the help of these organizations unfeasible. However, ASA representatives expressed interest in future possibilities, including a Zooniverse training workshop for ASA chapter members who could subsequently connect with local leaders of evangelical congregations to discuss projects of interest and programming possibilities.

Just as evangelical Christians in science can facilitate building relationships with many Christian communities, minority scientists who belong to religious communities have a critical role to play in building bridges of trust to enhance ethnic and religious diversity in science. Research indicates that scientists need to incorporate discussions about religion to help address race and gender disparities in science, as perceptions of science as anti-faith disproportionately exclude minorities and women (e.g., Bolger and Ecklund 2022; Barnes and Brownell 2018; Ecklund et al. 2019). Religious leaders who serve minority populations might help identify scientists within their communities who could serve as role models for churched youth, and a proactive outreach effort by scientists, such as leaders of Zooniverse project teams, to historically Black colleges and universities, educational institutions that serve Indigenous populations, community colleges, etc., would help to build trust and engage audiences that remain severely underrepresented in science.

Creating Long-Term Partnerships

Building relationships and trust between scientists and faith communities takes time, effort, and resources. Although participatory science offers a natural way to build relationships while at the same time furthering research in many areas, sustainable partnerships require ongoing financial support, and many potential community partners do not have access to the grant-managing institutions that are typically eligible for funding from federal agencies and foundations. One recent effort to engage people from faith communities in participatory science is a partnership between SciStarter and the North Carolina Council of Churches (North Carolina Council of Churches 2024). However, it is likely that engaging many underrepresented audiences will require a more proactive effort, and it is not clear how smaller or poorer communities that do not have access to many resources can "prime the pump." Funding agencies should consider ways to broaden the categories of organizations that can apply for grants, particularly seed funding that could help small communities establish new programs.

One intent of the Engaging initiative that was never realized was the co-creation of new research projects with faith communities using Zooniverse's project-builder tool. In principle, any digitized dataset can be turned into a crowd-sourced research project, the scale of which would depend upon the

size of the dataset and the requirements of the project. The dataset might be drawn from a library, museum, historic records of a faith community, etc., to create a project that would address specific research questions of interest to the community or communities involved. Such an effort could directly involve the faith community in the creation of a research project and provide tangible benefits to the community along with the opportunity to broaden their understanding of, and engagement with, science. A few examples of excellent projects that demonstrate some of these possibilities include Print Dynamic Networks (Zooniverse, n.d.c), Scribes of the Cairo Geniza (Zooniverse, n.d.d), and Maria Edgeworth Letters (Zooniverse, n.d.b).

A key factor in efforts such as these is increasing the involvement of scientists. There are many possible venues for recruiting scientists to work with religious communities in an ongoing fashion. In addition to encouraging scientists leading projects on Zooniverse to connect with these communities, scientists could be recruited from within religious communities themselves as well as through networks such as the scientific consultants to the Clergy Letter Project (n.d.c.), professional scientific societies such as the American Association for the Advancement of Science, or organizations devoted to societal wellbeing and respectful dialogue at the intersections of religion and science, such as the Institute on Religion in an Age of Science.

While there are certainly many organizations that could help create partnerships between scientists and religious leaders/communities, and an overwhelming number of potentially useful resources, the sheer wealth of information poses a particularly large challenge for identifying appropriate potential partners. What is desperately needed is the creation and maintenance of a searchable database that could be used by faith leaders and scientists alike to connect through commonalities, needs, interests, location, etc. Such a database could facilitate the building of relationships, the development of new research projects, and the creation of partnerships that could transform how communities and individuals understand the relationship between science and religion.

Conclusions

Participatory science offers a natural way to build relationships across diverse communities, while at the same time furthering research in many areas and increasing public understanding of the research process. Engaging Faith-based Communities in Citizen Science through Zooniverse was an initiative to broaden awareness of, and participation in, scientific research among faith communities and interfaith organizations. Despite constraints imposed by the pandemic, a short timeline, and a small number of scientists involved, the initiative produced models for how online Zooniverse research projects could be creatively and

effectively integrated into seminary classes, interfaith programs, and youth and family education, as well as suggestions for future expansion of this effort to engage more underrepresented or science-apprehensive audiences.

One-time events made possible through this initiative have continued to receive views on YouTube (American Association for the Advancement of Science Dialogue on Science, Ethics, and Religion 2021); however, a one-time interaction with a scientist is not likely to result in a sustainable program. The most important points that emerged during evaluation of Engaging were the need for continuing personal involvement by scientists, the need to overcome the limitations of time and resources, and the need for the effective pairing of scientists and community leaders. Going forward, this will be particularly important for one aspect of the initiative that was never realized—co-creating new research projects with faith communities.

There is no one-size-fits-all approach when it comes to marketing or the kinds of research projects that may be of interest to faith communities. Local conditions, age, and other factors not directly related to religious concerns play large roles in motivating interest and participation. Scientists need to work closely with local leaders to identify the best fits for a given community. Ongoing two-way communication is extremely important in helping people who doubt their ability to contribute to a research project develop confidence, and diversity is critical. For science to flourish, it must embrace diversity in gender, culture, ethnicity, and religion, bearing in mind that for many people, having scientific role models who share their faith is important to envisioning themselves as scientists. Finally, there is no quick and easy way to build trust across diverse communities in the polarized climate we find ourselves in today. However, creating partnerships between scientists and religious leaders/communities to work together on projects may be the best approach to bridging societal divisions. Just as participating in activities from within a faith community is the best way to better understand the community and its constituents, participating in science alongside scientists is the best way to better understand science and its practitioners.

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Science for Seminaries: Measuring the Impact of Equipping Future Religious Leaders to Engage with Science

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Faith leaders are important community guides in issues of science and society, but few have formal scientific backgrounds. The Science for Seminaries project of the American Association for the Advancement of Science's Dialogue on Science, Ethics, and Religion program provides grants to seminaries to incorporate science engagement into the core theological education of future faith leaders. From 2014 to 2022, the project provided grants to fifty-four seminaries, which modified over 280 courses to include science topics from a variety of disciplines. A comprehensive evaluation of the project found significant positive impacts on seminaries' engagement with scientific topics, students' perception of science and connection with scientists, faculty engagement and networking, and project sustainability. The Science for Seminaries model has been shown to be an effective and impactful approach to equip faith leaders with needed skills and resources for engaging science in their ministry contexts.

Introduction and Project Background

Although the level of religious participation and identification has been declining in the US, a strong majority of US adults (69%) still identify as religiously affiliated, and even more (74%) say religion is somewhat or very important in their lives (Pew Research Center 2021). Among other things, people's religious faith can influence their views on scientific topics (Pew Research Center 2015). While there is a widespread perception that science and religion are at odds with one another, this does not seem to be reflective of people's personal experiences. For instance, the Pew Research Center found that while 59% of US adults said science and religion are often in conflict, only 30% reported that science even sometimes conflicts with their own religious beliefs (Pew Research Center 2015).

Congregation members often look to their religious leaders for guidance on navigating issues in their lives, and many of these issues involve the interpretation and application of science. During the COVID-19 pandemic, religious leaders found themselves in the position of making public-health decisions for their own faith communities, such as whether and how to gather for worship (Conger, Healy, and Thompkins 2020). Their decisions also influenced the personal public-health decisions of their community members, such as whether to get vaccinated (Muller 2021). Beyond public health, faith leaders are often seen as guides for a wide range of emerging topics in science and society, including how to understand and interact with artificial intelligence and the existential questions these technologies raise, how to navigate personal choices around healthcare and end of life decisions, and what stewardship responsibilities individuals and communities have in addressing climate change, among many others. Other areas of concern for faith communities also frequently have important connections to science. Issues of social and economic justice intersect with conversations about disproportionate impacts of and access to scientific discoveries and technological advancements, while concerns for food security involve considerations of environmental impacts, the genetic modification of food crops, and access to clean water.

Despite having a central role in science-engaged conversations and decisions, few current or future faith leaders have a background in science. The Entering Student Questionnaire carried out by the Association of Theological Schools (ATS) for the 2021/22 school year found that less than 28% of entering seminary students had an undergraduate degree in the sciences, with only one-third of those being in the natural or physical sciences (Association of Theological Schools Commission on Accrediting 2023). Without an academic background in the sciences, religious leaders may not be well equipped to guide their congregations in addressing scientific issues. They may not know where to go for reliable scientific information or how to interpret and evaluate it, much less how it relates to their ministry and communities. A 2016 survey of

faculty at ATS Protestant seminaries found that only 21% of faculty agreed that their students were "well prepared" to address scientific topics in their future ministries (Hill and Gin 2017, 117).

By contrast, the vast majority of Christian pastors have at least some seminary training. A 2008 survey of more than 1,000 Protestant pastors found that two-thirds had at least a master's degree and 85% had taken seminary classes (Lifeway Research 2010). Incorporating science engagement into seminary education could therefore be an important avenue for familiarizing future pastors with scientific topics and preparing them to address these issues in their ministry. Discussing science topics in seminary is not a wholly novel approach. For example, a 2016 ATS faculty survey found that only 7% of respondents said they never taught or discussed science or science-related information in the classroom, while 14% said they addressed them frequently (Hill and Gin 2017, 104–5). Of scientific topics discussed, social science and psychology were most likely to be addressed (reported by 73% and 56% of faculty, respectively), while subjects such as physics and earth science were addressed much less frequently (28% and 27%, respectively) (Hill and Gin 2017, 109). Perhaps not surprisingly, faculty who had some graduate training in the sciences were most likely to include science engagement in the classroom, and the topics discussed were those the faculty felt most prepared to teach (Hill and Gin 2017, 106–7). Of the 27% of faculty who reported that they would like to spend more time on scientific issues, around half indicated that the factors impeding them included a lack of time to prepare and not feeling knowledgeable enough (Hill and Gin 2017, 110–11). However, while faculty felt there was some institutional support for addressing scientific issues, more than half indicated that their seminary could be doing more, with class or curriculum changes being the most frequently suggested avenue for engagement (Hill and Gin 2017, 120–21).

In response to this need, the Science for Seminaries project was originally developed to provide future religious leaders exposure to science engagement as part of their core theological education. From the beginning, this project was a collaboration between the Dialogue on Science, Ethics, and Religion (DoSER) Program of the American Association for the Advancement of Science (AAAS) and the ATS, the largest umbrella organization for North American seminaries, representing more than 270 theological schools and supporting and accrediting graduate schools of theology in the United States and Canada (Association of Theological Schools, n.d.). The AAAS is the world's largest multidisciplinary scientific society and the publisher of the *Science* family of journals (American Association for the Advancement of Science, n.d.b). In 1995, the AAAS established the DoSER program to foster dialogue between scientific and religious communities on issues of science, technology, and society (American Association for the Advancement of Science, n.d.a).

The partnership between the AAAS and the ATS grew out of recognition of both the importance of faith leaders in guiding communities to understand and address scientific topics and the reality that faith leaders may need further training to prepare them for this role.

Formal preparation for the Science for Seminaries project began in 2010 with meetings, symposia, workshops, and surveys to gather information on the needs and interests of seminary faculty, students, and administrators and to conceive of an approach that could help increase the inclusion of scientific content within theological education. This article reports on the first two phases of the project: the Pilot Phase (2014–17) and Phase II (2018–22). As of publication, the Science for Seminaries project continues in various forms in North America and worldwide, but the analysis here is limited to the two phases between 2014 and 2022.

This article seeks to provide a description, analysis, and evaluation of these two phases of the Science for Seminaries project, drawing upon internal evaluation tools, grantee reports, the personal experiences of people involved, and a systematic external evaluation of both phases completed in 2022. First, we provide a description of the project itself, including its major activities, expectations, outputs, and the numbers and types of schools involved. Second, we offer several detailed accounts of project recipients given through reports and internal evaluations. Third, we examine the resource development aspect of the grants, seen through the production of a film series. Fourth and finally, we utilize a comprehensive external evaluation of the project completed in 2022 to offer a wholistic analysis of the Science for Seminaries project, highlighting its biggest strengths and detailing needs that remain unmet in the seminary community.

Project Description

The Science for Seminaries project provided grants to seminaries accredited by the ATS for the purpose of incorporating science engagement into the core curriculum of various ministerial degrees. A key element of the Science for Seminaries project was its emphasis on the incorporation of science engagement into the core coursework of Master of Divinity (MDiv) students. The project particularly focused on MDiv students as this is the primary degree sought by those preparing for religious leadership or other service in congregations. To qualify for the grant, schools must incorporate science content into core courses in at least one of the four main areas of study for MDiv students, which are (as articulated by the ATS) religious heritage, cultural context, personal and spiritual formation, and religious and public leadership (Association of Theological Schools Commission on Accrediting 2020).

Although many seminaries offer elective classes on aspects of science and religion, students who take those courses are self-selected and presumably already have an interest in these areas. Their incorporation into core coursework was intended to ensure all students have the opportunity for exposure to science engagement as part of their theological education. Additionally, incorporating science content into existing courses provides a much lower barrier to entry for faculty compared to designing and teaching an entire course. Modification of core coursework also increases the likelihood of science engagement being sustained beyond the grant period. Seminaries receiving grants were required to incorporate up-to-date scientific engagement into at least two core courses and host at least one public or campus-wide event.

The pilot phase provided three-year grants of between $90,000 and $200,000 to ten seminaries. Phase II provided one-and-a-half-year grants of $75,000 to thirty-two seminaries, broken into four cohorts averaging eight schools each. Toward the end of Phase II, $15,000 seed grants were also provided to twelve additional seminaries to build capacity for science engagement. Although seed grant recipients were not required to include science engagement in coursework, many did. In sum, fifty-four seminaries received over $3.2 million in grant funding from Science for Seminaries between 2014 and 2022.

Seminaries received support from the DoSER program throughout the application process and granting period, including FAQ sessions for applicants, personalized advice, and reviews of letters of interest and grant applications. DoSER also provided guidance during the grant in securing science advisors and resources for the projects, ensuring schools received help from respected scientists in their desired fields. These "science advisors" were typically recruited from geographically near institutions to increase the potential for in-person participation and relationship building. In addition, seminaries also received the support of mentors with experience in theological engagement with science. Together, the mentors and science advisors formed a personalized advisory committee for each participating seminary.

Beyond advisors, there were many required and optional meetings throughout the grant. First, DoSER hosted curriculum development meetings for each cohort as well as summer retreats for project leaders and prospective new applicants. These gatherings provided opportunities for grant recipients to form peer-to-peer relationships with other project faculty as well as scientists and other scholars. For all of the Pilot Phase and half of Phase II, these meetings were held in person. After March 2020, the meetings moved to virtual in the face of COVID-related closures. Several in-person meetings were held at the end of Phase II in late 2022. Second, project leaders were also expected to attend the AAAS annual meeting, giving grantees the chance to broaden

their own exposure to and understanding of new and emerging scientific discoveries. At the AAAS annual meeting, DoSER hosted multiple events for grantees to help them process the conference and build community. Third, each grantee seminary was required to hold a curriculum planning meeting at their seminary with all involved parties. DoSER staff attended and helped plan these curriculum and planning meetings.

Project Goals

The many activities of the Science for Seminaries project attempted to fulfill four specific goals, laid out before the beginning of the Pilot Phase in 2014. First, the project aimed to cultivate positive attitudes toward science and enhance science literacy among seminarians, seminary faculty, and the wider seminary community through courses and events. Second, the project aimed to facilitate the development and dissemination of successful models and strategies for dialogue and engagement between science and theology within and across seminary campuses. Third, the project aimed to encourage institutional investment within participating seminaries to sustain and expand initiatives developed with DoSER support. Fourth, the project aimed to establish peer and institutional networks to share knowledge, best practices, and lessons learned.

Recruitment and Application

The application opportunity was advertised through ATS channels, and all ATS-accredited seminaries were invited to apply. Over the course of the project, the AAAS received 175 letters of inquiry from 115 unique seminaries, representing 42% of ATS-accredited seminaries. Eighty-three seminaries were invited to submit full applications, representing 31% of ATS schools. Projects were proposed by seminary faculty who served as project leaders. In total, fifty-four grants were awarded.

Applications were reviewed by an advisory team consisting of subject matter experts, including scientists, theological educators, and others with particular expertise in science-religion engagement. Applications were evaluated on their potential impact, with a particular focus on bringing science engagement to seminaries that had few science components in their curriculum. Applications were also evaluated on the experience and ability of project personnel, the commitment of the seminary as an institution to the goals of the project, and the impact and sustainability of the project beyond the grant period. The final selection of grantees was made by the AAAS and the ATS with input from a dedicated content consultant.

Seminaries applying and selected to receive grants spanned the theological and geographical diversity of the ATS (Tables 1 and 2). Awarded seminaries ranged in enrollment from twenty-eight to 2,498 students (Table 3).

ATS ecclesial family	No. of applications received	No. of grants awarded
Anabaptist	2	1
Evangelical	28	21
Mainline Protestant	30	18
Catholic/Orthodox	20	13
Jewish	1	1

Table 1: Science for Seminaries applications received (n=81) and grants awarded (n=54) by ATS ecclesial family.

Geographic region	No. of applications received	No. of grants awarded
US West	12	9
US Midwest	25	18
US Northeast	15	8
US South	22	13
Canada	7	6

Table 2: Science for Seminaries applications received (n=81) and grants awarded (n=54) by US Census geographic region.

Enrolled student body size	Number of awarded seminaries
<100 students	9 (16.7%)
100–199 students	18 (33.3%)
200–299 students	13 (24.1%)
300–499 students	7 (13.0%)
500–1500 students	5 (9.3%)
>1500 students	2 (3.7%)

Table 3: Number of students enrolled at Science for Seminaries-awarded seminaries (n=54)

Grantee Activities and Individual Accounts

Granted seminaries often exceeded expectations for activities carried out under the Science for Seminaries grants. Most grantee schools were required to modify two core courses and hold one public or campus-wide event. However, over the course of the project, the fifty-four seminaries modified more than 280 courses and held over 135 campus-wide or public events. Over half of the courses modified were taught by faculty who were not project leaders, indicating a wider interest in science engagement among faculty at granted institutions. In post-grant surveys, 96% of award project leaders said their enhanced courses were still being taught, and 82% said the courses were being taught by the same

faculty (Damond, Sharon, and Slattery 2022, 74). Most schools also exceeded the requirement of one campus event. Even in the face of COVID-related closings and interruptions, seminaries hosted events including lectures, workshops, symposia, and book discussions. These achievements reflect the enthusiasm of seminaries for science engagement as well as the success of this approach for incorporating engagement directly into the curriculum.

Science topics addressed by the seminaries spanned multiple disciplines, with the more common topics including neuroscience, psychology, cosmology/astronomy, biology, and evolution. While guidelines from the funder precluded the inclusion of environmental or biomedical sciences in the core project activities, several schools that modified additional courses addressed these issues in those classes. Some seminaries elected to incorporate a single scientific discipline into multiple classes, while others chose a variety of science topics to engage in. Likewise, the types of courses modified spanned the gamut of the theological curriculum. Theology courses were the most commonly modified (forty-six courses in Phase II), with Bible and scripture courses (25 courses) and counseling, pastoral care, and health courses (20 courses) following (Table 4).

Course area	**Number of courses**
Theology	46
Bible/scriptures	25
Counseling, pastoral care, and health	20
History	17
Leadership, mission, and ministry	16
Spirituality and spiritual formation	10
Ethics	7
Philosophy	6
Cross-disciplinary courses	15
Other	5

Table 4: Number of courses modified by seminaries to incorporate science engagement in Phase II, categorized by course area (n=167).

Seminaries were strongly encouraged to bring the voices of scientists directly into classrooms and events. Scientists served as guest lecturers, participated in symposia and public events, participated in faculty workshops and events, and even invited seminary students into their laboratories.

Many schools pursued further means of science engagement, including establishing centers or institutes to sustain engagement; creating seminars and reading groups on science topics; offering student prizes for writing or preaching about science and faith; giving faculty subgrants to develop latent

science interests and explore new engagement initiatives (such as science activities with local congregations); funding field trips to local science museums and laboratories; and giving financial support to faculty or students to attend science conferences.

A Showcase of Selected Grantees

While there is not room here for a full description of the activities of all fifty-four seminaries, the following detailed accounts from a selected group showcase grantees' experiences of the grant and illustrate the contextualization of projects to the unique seminaries. In this section, we detail the work of Mundelein Seminary, Hood Theological Seminary, Southeastern Baptist Theological Seminary, and seed grant recipient Garrett-Evangelical Theological Seminary.

Mundelein Seminary of the University of St. Mary of the Lake is a Roman Catholic seminary in Mundelein, Illinois with a total student enrollment of approximately 217. They received a grant from 2018 to 2019, in the first cohort of Phase II of the grant. As a seminary engaged in the training of Roman Catholic priests, Mundelein faced the particular challenge of having a fairly set curriculum. The Science for Seminaries grant allowed them to incorporate science engagement into their existing curriculum as part of a comprehensive initiative in faith–science integration. They chose to incorporate neuroscience and cognitive science into the Fundamental Theology course required for every first-year theology student to help students better understand how the mind receives and processes information and how this relates to religious thought and experience. They also modified their Anthropology, Creation, Grace, and Eschatology course to include engagement with evolutionary science and cosmology. In addition, they brought concepts of science engagement into practice with a seven-week mini course on Discovery: Faith and Science and the modification of their existing Teaching Parish program to provide students the opportunity to lead discussions on science in their local parishes. This last initiative in particular proved to be one of their most effective and allowed seminarians to witness the interest and enthusiasm of many of their parishioners for discussions of science and faith.

Hood Theological Seminary is a historically Black seminary associated with the African Methodist Episcopal Zion Church. They received a grant from 2019 to 2020. Located in Salisbury, North Carolina, Hood has a total student enrollment of approximately 140. The project team at Hood modified their core courses of History of Christianity in the United States and Teaching and Learning in Educational Ministry to incorporate the histories and philosophies of science and neuroscience. Hood also offered two elective courses: Transhumanism and the Imago Dei: The History of the Church and Technology and Science, Faith, and Healing in the History of Christianity and

African Diasporic Religion. Significantly, Hood also used their engagement with the Science for Seminaries program as a launchpad for the International Center of Faith, Science, and History, which holds yearly conferences and other events on the intersection of science and religion (Hood Theological Seminary, n.d.). The center also aired a number of podcast episodes that brought in guest speakers and provided students a platform to discuss science topics important to them and their community. Hood also brought science engagement into their community by sponsoring summer science camps that integrated scientific content and Christian education for underserved children, youth, and adults in Salisbury, North Carolina.

Southeastern Baptist Theological Seminary is a Southern Baptist seminary located in Wake Forest, North Carolina. The largest full grant recipient seminary, it has an enrollment of over 2,100 students. Through their 2019–20 grant project, Faith Seeking Understanding: Integrating Faith and Science in the 21st Century, they brought science engagement into multiple facets of their theological education curriculum, revising seven courses. Southeastern faculty in theology, counseling, and the Old Testament brought leading-edge science topics in neuroscience and the history and philosophy of science into courses taken by undergraduates and graduate students. Additionally, Southeastern project leadership brought more intentional and intimate science and faith conversations to the broader faculty and PhD students in a monthly colloquium. There, current and future teaching faculty received pedagogical skill training and the opportunity for more open discussions on topics important to that community. Internal activities included mentoring for PhD students as well as book discussion groups. In addition, they hosted four campus-wide evening lectures by scientists and took field trips to the JC Raulston Arboretum, Moorehead planetarium, and a physics lab at North Carolina State University.

Seed grant recipient Garrett-Evangelical Theological Seminary is a United Methodist Seminary of approximately 280 students in Evanston, Illinois. Their 2021–22 project, Race, Technology, and Healing: Science and Religion in Dialogue, focused on questions of human identity, trauma, and livelihood, exploring scientific, sociocultural, psychological, and theological ways to understand humanity. They revised their existing required course Person in Community to include discussion of human origins and evolution. They also convened a student–faculty book discussion group that explored Ruha Benjamin's *Race After Technology: Abolitionist Tools for the New Jim Code* and explored the role of technology in exacerbating racial divides. A spring conference entitled Science Is Not to Save Us: Recentering Our Knowledge Systems in a Relational Cosmos brought together scientists, faculty, and PhD students to engage a wider audience on impactful topics at the intersection of race, science, and technology.

These few examples illustrate the variety of models and formats for science engagement in theological education institutions. The schools discussed show the diversity and breadth of topics addressed and course contexts these topics were integrated into. They also demonstrate the expansion of the audience beyond faculty and current students in MDiv programs. Projects opened programming and opportunities for enrichment to PhD students, other graduate students, and undergraduates, as well as the wider public.

These seminaries and the other grant recipients provide helpful examples of pedagogical insights and skill building for science engagement and can help faculty and pastors generate ideas for topics and approaches to incorporate science into their own seminaries and communities. The Science for Seminaries website includes profiles of all granted schools along with descriptions of their projects (Science for Seminaries, n.d.). Syllabi from all the participating schools are also available on both the Science for Seminaries website and the DoSER resource website (Dialogue on Science, Ethics, and Religion, n.d.), providing a resource for other faculty and institutions who wish to incorporate science engagement into theological education. Course syllabi are tagged with labels including course area, seminary ecclesial background, and science topic to make them easily searchable.

Resource Development

Hill and Gin (2017, 114–15) identified that video resources, such as short video clips, were the most frequently desired resource by seminary faculty interested in incorporating more science content into their classrooms. Funding for the Science for Seminaries project enabled DoSER to produce several series of short videos for use in seminary classrooms and other venues to spark discussion around scientific advances and other topics at the intersection of science and religion. These films, created through the production company Fourth Line Films, were designed to present scientific topics in an understandable, approachable, and inspiring way, focusing on novel science topics and not theological arguments. They were intended to serve as a jumping-off point from which professors and students could then provide reflection appropriate to their ecclesial approaches and course content.

The first video series, "Science: The Wide Angle," includes thirteen videos ranging from two- to ten-minutes long, designed to spark discussion of various science topics, including evolution, neuroscience, biology, physics, astronomy, history, and philosophy (Dialogue on Science, Ethics, and Religion 2020). The videos feature seventeen leading scientists and historians of science active in these fields sharing insights about their work. Production for the first series began in 2014 and concluded in 2017.

After the success of the first series, significant funds were allocated in Phase II for a follow-up series broken into three segments. First, an eleven-video series entitled "Who Is Science?" focusing on the personal stories of scientists themselves, offering the opportunity for viewers to see science as a human endeavor rather than a collection of facts (Dialogue on Science, Ethics, and Religion 2022b). Second, a two-video series called "Becoming Human" discussing how humans survived evolution and became the sole remaining hominid species, bringing up many compelling topics for a religious audience (Dialogue on Science, Ethics, and Religion 2022a). Third and finally, a three-video series called "Humans and Race" exploring past and present intersections of science and racism. This series, completed in 2023, featured two short videos and a twenty-seven-minute documentary called "Science as Mastery: A Story about Race and Power" that explores the intersection of race, religion, and science (Dialogue on Science, Ethics, and Religion 2023). "Science as Mastery" premiered at the 2023 AAAS Annual Meeting and has been featured at the annual meetings of the American Association of Biological Anthropologists, the American Scientific Affiliation, and the American Academy of Religion.

Altogether, the videos have been viewed over 150,000 times on YouTube and widely used by grantees, with 86% of project leaders and 53% of other project faculty employing the videos to "some extent" or "a large extent" in courses and events (Damond, Sharon, and Slattery 2022, 47–48).

Evaluation and Analysis

A comprehensive evaluation of the project carried out between 2021 and 2022 analyzed the process, outcomes, and impacts of the project. This mixed methods evaluation used both archival and newly collected data, including surveys and interviews of project applicants (both those that received grants and those that did not), project leaders, other project faculty (nonproject leader faculty from granted schools who taught courses or otherwise led science engagement activities), partner organization staff, science advisors, and students/alumni. In addition, throughout Phase II of the project, all students who attended Science for Seminaries-developed courses were given pre- and post-course surveys, providing measures of impact of the modified courses (Damond, Sharon, and Slattery 2022).

Through this evaluation, six successes were clearly identified: the application process, the ability to cultivate positive attitudes toward science, the connection of seminarians with scientists, the perceived growth of dialogue between science and faith, the support and resources offered, and the sustainability of course and curriculum modifications. The biggest demonstrated lingering need was seen in seminarians' continued struggle to engage their own parishioners with science.

First, the application and award process was rated highly for clarity and support by both successful and unsuccessful applicants, indicating that the process itself was clear and fair for applicants (Table 5) (Damond, Sharon, and Slattery 2022, 37–38).

How would you rate the clarity of information provided about the grant application? (1=very unclear to 5=very clear)		
	Award project leaders (n=30)	**Applicants (n=10)**
Application review process and criteria	4.5	4.5
Submission requirements	4.67	4.8
Eligibility criteria	4.83	4.8
Overall, how satisfied are you with the following aspects of the Science for Seminaries award process? (1=very dissatisfied to 5=very satisfied)		
	Award project leaders (n=30)	**Applicants (n=10)**
Communication with project staff during the proposal development stage	4.68	4.2
Full proposal submission process and requirements	4.46	4
Letters of interest submission process	4.64	4.7

Table 5: Assessment of Science for Seminaries application clarity and process.

Second, a major goal of the project was to cultivate positive attitudes toward science. Analysis of pre- and post-course surveys indicates that students' perceptions of science changed significantly after taking the modified courses.

	Pre-course (n=2,355)	**Post-course (n=1,486)**	**Change**
Science is relevant to my current seminary studies	4.03	4.21	**+0.18***
My faith community needs to learn more from scientists	4.10	4.25	**+0.15***
Science is relevant to my current or future vocation/ ministry	4.13	4.23	**+0.10***
My faith community is generally accepting of new scientific ideas	3.67	3.76	**+0.09***
Scientists need to learn more from faith communities	4.38	4.47	**+0.09***

Table 6: Student responses from pre- and post-course surveys. Students were asked to rate their agreement with the statements on a five-point scale (1=strongly disagree and 5=strongly agree).

***** Denotes statistical significance at $p<0.05$.

In particular, students' perceptions of science as relevant to their current seminary studies as well as to their current and future ministry increased. Students' beliefs that their faith communities need to learn more from scientists also increased (Table 6) (Damond, Sharon, and Slattery 2022, 55).

Third, 72% of students/alumni interviewed stated that they interacted with a scientist during their time at seminary, most often as a guest lecturer in class. They described these interactions as "invaluable," stating that they "gave me a different perspective" and "strengthened and reinforce[d] the formation process" (Damond, Sharon, and Slattery 2022, 52). Faculty also reported very high satisfaction with their interactions with scientists. Overall, 90% of project leaders surveyed indicated that they were "very satisfied" (86%) or "satisfied" (4%) with the support they received from their science advisors. Other project faculty reported less interaction with science advisors but were still "very satisfied" (48%) or "satisfied" (33%) with their support. Eight out of ten project leaders interviewed reported continuing their relationship with at least one of their science advisors after the grant period ended (Damond, Sharon, and Slattery 2022, 49–50).

Fourth, both project leaders and other project faculty reported the grant having a strong positive impact on their engagement with science and faith. In particular, they observed "positive" or "very positive" impacts on the amount of dialogue between science and faith communities in their contexts, the level of interest in science-related topics among seminary students, and the preparation of seminary students to navigate stress points in difficult conversations about science (Table 7) (Damond, Sharon, and Slattery 2022, 67). While these results might be biased in favor of confident project leaders, the overwhelming positivity of project faculty and project leaders points to strong positive impacts across many campus communities.

	Award project leaders (n=30)	**Other project faculty (n=21)**
The amount of dialogue between science and faith communities	100%	95%
The level of interest in science-related topics among seminary students	100%	95%
Preparation of seminary students to navigate stress points in difficult conversations about science	96%	95%
The extent of collaboration between scientists and theologians	89%	86%
The ability of faculty in your school to effectively navigate stress points in difficult conversation about science and faith	89%	86%
The amount of collaboration among scholars from different faith traditions	56%	76%

Table 7: Project leaders and other project faculty who indicated the Science for Seminaries grant had a "positive" or "very positive" impact on the following engagement factors.

Fifth, ongoing support for and resourcing of seminaries were also important factors in the success of the program. Faculty reported that they were "satisfied" to "very satisfied" with the responsiveness of project staff (82%), the dissemination of information and resources (78%), and the facilitation of access to science advisors (76%) (Damond, Sharon, and Slattery 2022, 45–46). Previously mentioned curriculum meetings and retreats provided opportunities for project leaders to learn from one another and share successes, challenges, and wisdom with other faculty across denominational lines and from other ecclesial families. Attendees particularly reported that the AAAS annual meeting, summer faculty enrichment retreat, and AAAS curriculum meetings improved their knowledge about science (78–86%) and broadened their scholarly network (67–71%). The opportunity to network with both peers and scientific and theological experts through these events was consistently identified by interviewees as an important factor in the success of schools implementing Science for Seminaries projects (Damond, Sharon, and Slattery 2022, 50–51).

Sixth and finally, another important measure of the success of the project was the sustainability of the changes made as a result of the grant. To this point, 96% of project leaders reported in 2021 and 2022 that their revised courses were still being taught as modified, sometimes up to five years after originally taught. Beyond this, 100% of project leaders surveyed stated that there was continued interest within their school to engage with science in the future, and 26% reported that the grant led to additional funding for integrating science into theological education (Damond, Sharon, and Slattery 2022, 74–75).

While many positive aspects of the project were identified, the Science for Seminaries team was eager to understand the places where the project could be improved. In this vein, the biggest shortcoming identified in the evaluation was the confidence and comfort levels of seminarians when discussing scientific topics with parishioners. As shown in Table 6, students recognized the relevance of science to their ministry and felt their faith community would be receptive to new scientific ideas. As well, 44% of students and alumni surveyed reported discussing science-related topics within their faith communities at least once a week. However, only 14% indicated that they initiate most of these conversations, with 58% saying they equally initiate conversations and respond to congregants' questions and 28% saying they mostly respond to questions. This, along with the fact that 56% reported having science-related discussions once a month or less, may indicate that students do not feel prepared to proactively engage with science in their ministry context. In interviews, students and alumni expressed some hesitancy about facilitating complex and/or controversial discussions about science and religion (Damond, Sharon, and Slattery 2022, 68–69).

Overall, the evaluation demonstrated the clear success of the Science for Seminaries project in meeting, and in many cases exceeding, its goals. It also

gave insight into some of the most effective approaches for engagement and avenues for future development.

Conclusions

The Science for Seminaries project has demonstrated the success of incorporating science engagement into theological education as a way to prepare faith leaders for the challenges of a rapidly changing world. By bringing science into core required coursework, this project provided the opportunity to expose even those students who may be hesitant or mistrustful of science to science engagement in a way that may be more easily accepted and understood. The ability of project leaders to contextualize their engagement to the needs and interests of their students also helped to overcome preconceived notions of how science may relate to theological engagement and ministry.

Both the evaluation and the experiences of project participants indicate that the targeted approach of relating specific scientific issues to particular areas of theological reflection or engagement seems to be more effective than generalized engagement that seeks to examine the relationship between science and religion on a more philosophical or theoretical scale. This approach, coupled with a commitment to personal relationships with scientists and science spaces, was among the key ingredients in the long-term success of the grant.

As identified in the evaluation, there may still be a disconnect between the perceptions and attitudes of seminary graduates towards science and their comfort engaging with science in the context of their own ministry. Future projects of this type may benefit from more intentionally addressing practical ways future faith leaders can proactively bring science engagement into their ministry contexts.

Nevertheless, it is clear that the Science for Seminaries project has reaped many rewards and seen many successes since its development began in 2010 and the kickoff of the Pilot Phase in 2014. As a small token of this success, Phase II of the Science for Seminaries project was recognized with an 2020–21 Expanded Reason Award for teaching, given annually by the Joseph Ratzinger-Benedict XVI Foundation for the most impactful projects that engage science, philosophy, and religion (Expanded Reason Institute, n.d.).

A further, more significant measure of success is that the Science for Seminaries model has spawned additional ongoing projects, including a similar Science for Seminaries grant program in the UK run by Equipping Christian Leadership in an Age of Science, which is now expanding to other countries (Equipping Christian Leadership in an Age of Science, n.d.). In addition, DoSER has adapted this model of grant-making to seminaries for a new project focusing on climate change, Climate Science in Theological Education (Sloane-Barrett 2023).

Given the fast-paced nature of scientific and technological discovery, faith communities will need to continue to adapt in order to address science and technology in a changing world, and engagement with science will be essential for faith leaders who wish to provide relevant and meaningful guidance to their communities. In the face of such challenges, seminaries will continue to need proactive, regular engagement with science, scientists, and science communicators to help future religious leaders properly engage with the issues of today and tomorrow. Funding will remain a struggle, and projects like this take significant funds to see the kind of success reported here. We are hopeful that funding agencies will continue to support projects such as this for years to come.

Finally, the four authors of this article led the project at different times and in different capacities on behalf of the AAAS DoSER, but we are just four of many who contributed to the success of Science for Seminaries. We are grateful for all, including readers of this article, who have contributed in small or large ways to the success of the project over the years.

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Religious Credences as Hinges: A Commentary on Van Leeuwen's *Religion as Make-Believe*

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In this commentary, we critically discuss Neil van Leeuwen's book *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity*. We argue that his portrayal of religious credences bears remarkable similarities to what certain epistemologists refer to as "hinges." We furthermore argue that these similarities lead to a different perspective on the rationality of religious credence than the one advanced by Van Leeuwen.

In this commentary, we critically discuss Neil Van Leeuwen's book *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity*. We argue that his portrayal of religious credences bears remarkable similarities to what certain epistemologists refer to as "hinges." We furthermore argue that these similarities lead to a different perspective on the rationality of religious credence than the one advanced by Van Leeuwen.

First, we summarize Van Leeuwen's main claims. Second, we point out the similarities between religious credence and hinges. Third, we discuss Van Leeuwen's stance on the rationality of religious credence. Finally, we explore how hinge epistemology informs the rationality of religious credence. We conclude with a brief summary.

Van Leeuwen's Thesis

Neil Van Leeuwen's *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity* is an insightful contribution to the expanding debate on the cognitive science of belief and religion. His central thesis is twofold. First, religious states originate from imagination or make-believe, similar to the kind of imaginative activity children take part in when making up contents—personalities, powers, supernatural features, etc.—for their toys and play-scenarios. This makes religious states highly similar to imagined states.[1] Second, religious states are held with a different attitude than that of factually believing, an attitude van Leeuwen terms "religious credence," akin to what others would call "faith." Preliminarily, we could say that religious credence roughly consists of willingly adopting propositions and acting as if they were true. Importantly, this state is not one of merely entertaining false propositions for the sake of amusement (propositions that might later come to have a life of their own): religious credences are often central to a person's identity, and subjects often take them profoundly seriously.

Admittedly, *Religion as Make-Believe* is prone to overgeneralizations. The book leaves the reader with the impression that Van Leeuwen's claims apply to all religious states, all the time. On the one hand, we certainly disagree with this overgeneralization. For example, some religious states are clearly factual beliefs, a possibility that, as we will see, Van Leeuwen rejects. Examples are "Muhammad and his followers fled to Medina in 622 CE" or "the pope is the main authority in the Catholic Church."[2] On the other hand, however, we argue that Van Leeuwen's points are not generalized *enough*. As a matter of fact, we believe that (some of) the features Van Leeuwen attributes to religion are far from limited to this dimension of life and are actually features of states central to all worldviews (be they moral, political, aesthetic, etc.). The takeaway claim of this commentary is therefore the following: we do not disagree with Van Leeuwen's framework *per se*, but with its extension, or application. Let us start by summarizing the main claims of the book.

The book begins with a long (and surprisingly detailed) prologue, describing the adventures of Cleo, John, Kevin, and Misha. As children, the four of them played with dolls, gradually creating more and more complex imaginary scenarios in which these dolls interacted. Eventually, through various twists and turns, the group begins to suspiciously resemble a religious group, with a religious experience at its origin, a sacred text, and specific rituals. Convinced of the good that what they created could bring to the world, The Playground—as the group is now called—starts spreading their teachings. The metaphor is on the nose but effective: the story of The Playground is supposed to sketch how, according to Van Leeuwen, religions develop out of a practice of make-believe.

Chapter 1 clarifies the main theoretical remarks that emerge from this story. Van Leeuwen's main point could be summarized as follows: factually believing—the attitude that we have towards the everyday material world—should be distinguished both from fictional imagining and religious credence, the two central religious attitudes. The chapter ends with the claim that "anything can be sacralized," i.e., anything can become an object of religious credence. This is an important remark that we believe Van Leeuwen does not properly develop. We will come back to this point later.

Chapter 2 defines "factually believing" in greater detail. Van Leeuwen describes factual beliefs as having four key properties:

- involuntary
- non-compartmentalized
- evidentially vulnerable
- cognitive governance.

Involuntariness refers to the fact that one cannot voluntarily choose one's factual beliefs. Non-compartmentalization refers to the fact that factual beliefs guide our actions independently of any change in practical setting. If I move the same chair from one room to another, for example, my understanding of the chair does not change. Evidential vulnerability, then, indicates that factual beliefs are responsive to evidence, both positively and negatively. Finally, factual beliefs have cognitive governance in the sense that they determine the information background upon which other faculties (e.g., imagining or thinking) rely. Religious states would lack all four properties. In the words of Van Leeuwen (2023, 62): "Factual beliefs are the basis on which we choose, extend, and evaluate the other cognitive attitudes: factual beliefs are thus *conditions for the possibility* of having and using the other maps—the other cognitive attitudes."

Chapter 3 explores what distinguishes factual belief from religious credence. Van Leeuwen starts by stating that his is a "two-map theory" of religion: factual belief is the more fundamental cognitive map on which religion, a secondary

cognitive map, depends. This second "layer" is a product of make-believe, Van Leeuwen tells us, and is characterized by an attitude of religious credence. The first factual layer continues to shape and constrain the second layer. For example, a religious state may be that Jonah survived inside a whale for three days. The state depends on a first factual layer containing various beliefs regarding whales and human survival. The state adds a second "imagined" layer where the subject imagines the prophet being swallowed as punishment by God. The religious state mainly pertains to the second mapping but crucially relies on the first. This is highly similar to how pretend child's play is constrained by the physical properties of toys and the environment.

The main claim of chapter 4 is that religious credence is an attitude that exists and should be distinguished from factual beliefs. The extension of religious credence—i.e., in what kinds of worldviews it can be found—appears to be a surprisingly secondary concern for Van Leeuwen. Chapter 5 argues that religious credence is a cognitively specific kind of "believing" and that this is one of the senses in which people use the word "belief," even though they might not be aware of it.

Chapter 6 is, in our opinion, the turning point of *Religion as Make-Believe*. Here, Van Leeuwen argues that religion is normally a matter of group identity. A big part of this chapter is dedicated to determining what "groupish beliefs" and group identity are and how they relate to each other. The details are not relevant to our evaluation of Van Leeuwen's work. What matters for us is the relvelation in this chapter that religious "belief" behaves as it does because religion is often a matter of group identity. This "groupish" nature of religious states appears to distinguish them from pretend child's play and other forms of imagination.

Chapter 7 deals with the role of values in religious contexts, and specifically argues that their often puzzling role can be explained by reference to religious credence.

Finally, in chapter 8, Van Leeuwen proposes his framework as a solution to the "puzzle of religious rationality," i.e., the fact that despite being, for the largest part, impressively rational creatures, humans hold religious beliefs that appear to often have irrational contents or behave irrationally. The following sections discuss Van Leeuwen's treatment of religious rationality in greater detail.

Credences and Hinges

Let us now move on to our main critique of Van Leeuwen's work. As noted, Van Leeuwen argues that religious states are different from factual beliefs with regard to four properties:

- involuntariness
- cognitive governance

- no compartmentalization
- evidential vulnerability

Whereas factual beliefs have all four, religious states do not.

Another central property of these states not included in the list is their "groupish" nature. As discussed, Van Leeuwen states in chapter 6 that religious credence is a product of group thinking and can be found in contexts in which group identity takes a central role. We can therefore safely assume, despite Van Leeuwen's lack of clarity on this point, that religious credence is not unique to religion and can be found in all identity-focused worldviews. Conspiracy theories, politics, sports, and perhaps even certain academic fields can then be prone to "religious" credence.

At various points in the text, Van Leeuwen gives the reader the impression that this generalization can be taken further. For example, he claims that "[identity centrality] apparently involves the positing of another attitude type altogether [i.e., religious credence]" (Van Leeuwen 2023, 228). On the next page, he argues that "[religious credence] is 'strong' in the sense of centrality to one's identity" (Van Leeuwen 2023, 229). This subtle shift from "group identity" to "identity centrality" (whether Van Leeuwen intended it to be a shift or not) is insightful. Specifically, we believe it opens the door to the possibility of religious credence being unique to neither religion nor "groupish beliefs": religious credence might be the attitude one has towards any belief central to one's identity in general. Let us explore this possibility further.

A similar tying of some states to identity is the main concern of the developing research field of hinge epistemology. "Hinges"—a concept extrapolated from Ludwig Wittgenstein's *On Certainty* (1969)—are surprisingly slippery epistemic entities, and epistemologists are currently debating what they specifically consist in (*cf.* Moyal-Sharrock 2022). One idea that emerged from the debate is that certain beliefs can become central to a person's worldview and identity, and by doing so they stop being "beliefs" and become "hinges." The main outcome of this transition is that the belief-turned-hinge becomes invulnerable to evidence: by assuming a central position in our worldview, the hinge functions as an unquestionable, indubitable assumption or certainty; that is, by turning into a hinge, the belief becomes a starting point for our reasoning and acting in the world, and as such is largely taken for granted.[3] We could concede to Van Leeuwen that religious beliefs might be more prone to becoming hinges than other classes of states. However, in theory, any belief can become central to a person's identity and thus assume this peculiar a-evidential status: "God exists" and "God does not exist"; "humans have been to the moon" and "humans have not been to the moon"; "religion is make-believe" and "religion is not make-believe"; etc. As Van Leeuwen (2023, 27) puts it, "anything can be sacralized."

Hinge epistemology, then, suggests that the lack of evidential vulnerability Van Leeuwen attributes to religious credences has nothing to do with religion and actually concerns our core "beliefs" in general. This is confirmed by the fact that many religious beliefs are responsive to evidence, contrary to what Van Leeuwen claims (think, for example, of beliefs regarding the lives of the apostles or the belief that Christmas is celebrated on December 25th).[4] Hinge epistemology suggests that this is the case because they have a more marginal role in a person's worldview and are therefore open for revision. We could say that they are held with less fervor. Them being "religious" has nothing to do with whether or not they can be revised on the basis of evidence.

We believe evidential vulnerability is the central feature of Van Leeuwen's account of religious credence. This feature is the one he spends the most time on and, we would argue, is the most credible. We therefore believe that the symmetry between the evidential invulnerability of Van Leeuwen's religious credence and that of hinges is the most telling. However, the parallel between hinges and religious credence appears to demand a more radical restructuring of Van Leeuwen's proposal. Let us then consider how this parallel affects the other three features of religious credence, starting with involuntariness.

According to Wittgenstein, many hinges can, in theory, be given up. However, he also remarks that, during our upbringing, we internalize all sorts of beliefs that become "constitutive" of our existence (e.g., Wittgenstein 1969, 143). This is not necessarily a matter of indoctrination: all of us inevitably absorb all sorts of "certainties" from our surroundings, through school, our parents, our community, the internet, and so on. Such certainties can include "Jesus died for our sins," but also "religion is infantile," "I am a human," and "my name is Neil Van Leeuwen." Importantly, these hinges we internalize during our upbringing are not chosen and, if they have become central enough to one's life, cannot be voluntarily given up (think, for example, of an older person's incapability to change their habits). Does this defeat "involuntariness"? Not necessarily. Van Leeuwen could, for example, still argue that these internalized beliefs can *in theory* be given up and are thus "voluntary." Fair enough. It must be admitted, however, that this would be a somewhat abstruse use of the word "voluntary." We thus suggest that the parallel with hinges demands, at the bare minimum, a rethinking of the "involuntariness" criterion. If we are correct, all "beliefs" have the potential to be passively soaked up and become so central to who we are that their "giveupability" might be theoretically possible but practically unthinkable—that is, they have the potential to be "involuntary," or "voluntary" in a very peculiar sense of the word. And, as noted previously, whether they are religious or not has little to no influence on this process.

Next, what about "compartmentalization"? Van Leeuwen argues that while factual beliefs guide action across the board, religious credences do not. Religious states are instead confined to (ritual) settings in which they become activated.

Now, most hinges do not appear to have this compartmentalization. Standard examples of hinges like "there is an external world" or "I have been existing for longer than five minutes" continuously govern our actions independent of the practical setting. But what about religious hinges? Some religious hinges like "God exists" or "the Qur'an contains the guidelines for life" are clearly not easily "switched off," contrary to what Van Leeuwen states: if they truly are core commitments (hinges), they impact a person's life at multiple levels, not just on Sunday at mass or on Friday during *Jumah*. It is true, some religious hinges do not have a wide-reaching impact. For example, "the Eucharist is the body of Christ" only gets "activated" when the Eucharist is seen or mentioned. The same goes, for example, for "snakes are demonic." However, this is the case for *all* our core commitments. The hinge "my name is Neil Van Leeuwen" is only activated, for example, when that hinge becomes relevant. States that are central to our identity can therefore be more or less wide-reaching, and this seems to have nothing to do with their religiosity. The same goes for their compartmentalization: core "beliefs" (hinges) are never compartmentalized, whether religious or not; and if they are, they are simply not truly central to our identity.

Finally, let us turn to "cognitive governance." According to Van Leeuwen, factual beliefs are the material, unalterable substrate that religious credences ultimately depend on. Factual beliefs are, in other words, a first cognitive map, and religion is an imagined, second map that is superimposed, yet dependent, on the first one. Hinge epistemology suggests a different picture. Specifically, it suggests that *hinges* determine the "first map," the substrate that other beliefs must adapt to, rather than factual beliefs. Does this contradict Van Leeuwen's claim? Not necessarily. As a matter of fact, many examples of factual beliefs proposed by Van Leeuwen are quintessential examples of hinges. One of *On Certainty*'s main claims is that "there is an external world" is an unquestionable certainty, and so are many related claims, such as "there is a chair in front of me."[5] Our point then is not that Van Leeuwen's factual beliefs are not part of the first map but rather that this first map can also include other beliefs that one takes for granted and that every other belief must adapt to. For some religious people, for example, every other belief must adapt to the hinge "God exists," or "the Qur'an is the word of God" and cannot contradict it. Similarly, for some atheists, every belief must adapt to "only matter exists" and cannot contradict it. Van Leeuwen's claim that only factual beliefs have cognitive governance over other beliefs should be questioned in light of the "foundational" role other beliefs can play in people's lives.

One feature of Van Leeuwen's religious credence remains yet unaccounted for: its "groupish" character. It must be admitted that not all hinges can provide a basis for this feature. We believe two options are available to overcome this challenge. The first—our preferred option—is to decouple religious credence

from group thinking and group behavior. We argue that, as hinge epistemology suggests, "religious credence" is as much a group phenomenon as it is an individual phenomenon. If this is correct, then what we have said so far is sufficient to correct Van Leeuwen's account. A second option would be to restrict the hinges that are to substitute Van Leeuwen's religious credence to those hinges that are more likely to become central to a group's identity. Let us call them "groupish hinges" (see Mion 2023). This is a concession in Van Leeuwen's direction. However, it should be clear, these groupish hinges would be far from restricted to religion. "God exists" and "God does not exist," "religion is dangerous" and "religion is not dangerous," and "carbonara should be made with pecorino cheese" and "carbonara should be made with Swiss gruyere cheese" are all, arguably, groupish hinges.[6]

In the epilogue of *Religion as Make-Believe* Van Leeuwen (2023, 232) claims that "there is every reason to be confident that religious credence, in a form at least something like I've characterized it, exists. The question is how widespread it is." In this section, we have proposed the following answer: religious credence does indeed exist, and it can be found in any worldview ever in relation to one's core beliefs, or hinges. As should be clear, this is not a critique of Van Leeuwen's proposal but rather a call to reframe it in a way that does not unjustifiably single out religious worldviews. We have suggested what such a reframing might look like: not all core "beliefs," or hinges, are vulnerable to evidence, potentially involuntary, non-compartmentalized, or have cognitive governance. Whether they are religious, factual, both, or neither is largely irrelevant.

Let us now turn to how the parallel between hinge epistemology and religious credence might affect Van Leeuwen's solution to the "puzzle of religious rationality" explored in chapter 8.

The Rationality of Religious Credences

In chapter 8, Van Leeuwen mentions three ways in which the apparent tension between religion and rationality can be defused. The tension traces back to the lack of evidential vulnerability, which seemingly compromises rationality. He finds all but one account (his own view of religious states as religious credences) wanting.

First, one could bite the bullet in either one direction or the other and argue that religious beliefs/people truly are rational (more on this option to come) or truly irrational. A second approach consists in arguing that religious beliefs cannot be rationally appraised, or cannot be appraised in the same manner as other beliefs, because (1) their content is different than what it seems to be (e.g., they might just be different claims), (2) their content is too unclear (e.g., it can be interpreted in multiple ways), or (3) they have no content at all (e.g., they are symbolic expressions of feelings, needs, hopes, etc.). After rejecting these two approaches (and their multiple subaccounts), Van Leeuwen presents the third

approach to resolving the puzzle of religious rationality: religion involves a different attitude. He discusses first Daniel Dennett's idea that religious people only believe in religious claims because of the potential rewards, and thus do not *actually* believe them; second, he discusses the idea that religious people only "believe" in a weak sense of the word. Finally, after partially rejecting these two proposals, Van Leeuwen (2023, 228) lands on his own position: religious people can generally be considered rational, independently of their religious beliefs, because of the compartmentalization that religious credence allows.

It should be noted, however, that rather than being a claim about the rationality of religious states, this is a descriptive claim about personal character. Sure, religious people can be broadly regarded as rational, but are religious beliefs themselves rational or not? Van Leeuwen never gives a clear-cut answer. Nevertheless, the fact that he leans towards religious beliefs being irrational often seeps through the text or is mentioned *en passant*. And the main reason seems to be that religious credences, according to Van Leeuwen, do not respond to evidence, where "evidence" refers to perceptual states and recognition of contradictions or coherence between states.[7]

All proposed solutions thus differ with regard to content, attitude, responsiveness to evidence, and rationality. Van Leeuwen also distinguishes between overall rationality (i.e., whether the subject can be regarded as rational in general) and the rationality of religious states. Table 1 summarizes his discussion.

On all but one account (the "rational" option), religious states are not rational. The "rational" option is the view of religious apologetics, of which Anselm and Alvin Plantinga are clear representatives. They argue that evidential support for religious states is available. Van Leeuwen quickly dismisses the position because of their focus on a very limited set of religious states. For example, he argues that providing support for the state "God exists," as most apologists do, does little to support other religious states like "Hermes/Quetzalcoatl/Ganesh exists." In all other accounts, religious states do not respond to evidence and hence, once again, do not merit the label "rational." The "weak belief" account may be an exception, since it allows for some rationality, as religious states are held with less firmness. This may correspond to weak evidential support for those states.

Van Leeuwen's own solution to the puzzle of rationality, however, opens the road to a new approach to religious rationality. Van Leeuwen advocates a view where religious states are not factual beliefs but religious credences, and religious credences, as we have already seen, imply a different attitude towards their contents. This raises the question of whether different standards for rationality apply. After all, this is the case for other propositional attitudes. For example, desiring that *p* does not seem to require evidence for the desire to be rational (if there is such a thing as rational desires), or at least not evidence of the same kind as Van Leeuwen's requires for factual beliefs.

		Content	Attitude	Sensitive to evidence	Overall rational?	Religious states rational?
Adjust rationality approach	1. Delusion	Literal	Belief	No	No	No
	2. Gullibility	Literal	Belief	No	No	No
	3. Rational	Literal	Belief	Yes	Yes	Yes
Adjust content approach	4. Displaced content	Moral or clannish	Belief	No	Yes	No
	5. Murky content	Unclear	?	No	Yes	No
	6. No content	None	Way of life	No	Yes	No
Adjust attitude	7. Belief in belief	Meta-content	Belief	No	Yes	No
	8. Weak belief	Literal	Belief	Maybe	Yes	Maybe
	9. Religious credence	Imagined	Religious credence	No	Yes	No

Table 1: A summary of Van Leeuwen's discussion of approaches to religion and rationality.

Rationality of Hinges

Noting parallels between religious credences and hinges leads to different conclusions with regard to rationality. Especially given the central role of hinges for commonsensical beliefs, simply denying their rational status would have enormous collateral damage.

As discussed, hinges are commonly credited an a-evidential and "groundless" status. According to Wittgenstein, rational practices necessarily presuppose some "certainties" or assumptions that are taken for granted. Without these unquestioned starting points, rationality does not get off the ground, Wittgenstein tells us.

Because hinges lack evidential support, our attitude towards them has often been likened to trust (e.g., Coliva 2015). Since there is no basis for believing them to be true, our attitude towards them cannot be one of believing (believing being defined as "accepting as true"). Holding a hinge therefore always seems to imply a risk, a "leap of faith"; we hence trust in them. Importantly, some argue that trust in hinges can be rational. Crispin Wright (2004), for example, argues that one has a "rational entitlement" to trust hinges when there is no reason to believe that trust is misplaced. Annalisa Coliva (2015), on the other hand, argues that one can rationally trust some hinges because they are constitutive of rationality itself.[8]

Duncan Pritchard objects and argues that our attitude towards hinges is not one of trust but a state altogether different. This is a *sui generis* attitude he characterizes as "commitment," i.e., "an all-out conviction in the truth of the target proposition" (Pritchard 2023). For Pritchard, hinges are beyond the

scope of rationality. Nevertheless, he believes, first, that committing to hinges is justified because they are inevitable components of rationality, and second, that they are indirectly open to rational revision, in that the beliefs depending on a hinge can change, thus influencing our commitment to the hinge itself (Pritchard 2018).

To all of this we can add that in religious epistemology there is ample discussion on the rationality[9] of religious states without evidence. Plantinga and other defenders of reformed epistemology argue, for example, that religious belief without evidence is allowable if the state is produced by a properly functioning belief-forming mechanism (Plantinga 2000). Elsewhere, Plantinga argues that religious states may not (always) have evidence but do have inductive grounds for regarding them as true (Plantinga 1981). William Alston (1993) argues instead that religious states can be justified by mystical practices that are deemed acceptable within a religious community. Many religious scholars thus appear willing to grant rational status to religious states even though they may not be supported by evidence.[10]

Ultimately, if we add "conceptualizing religious states as hinges" as a tenth option to Van Leeuwen's list, we get a more favorable verdict on the rationality of religious states. While hinge epistemologists deny that our attitude towards hinges is factual, a considerable number of authors, as we have seen, do grant that they are, at the very least, reasonably acceptable.

Conclusion

There is much to like about Van Leeuwen's account of religious credences. He rightly points out that there exists an attitude, different from factual belief, that can be found in religious contexts. He also, again rightly, argues that these states do not respond to evidence in the same way beliefs about the physical world often do. We have suggested, however, that this peculiar behavior has to do neither with the fact that they are religious nor with the fact that they are more prone to becoming the defining "belief" of a group. It has to do with the fact that they are central to a person's identity. These features are, however, not unique to religious states and apply to states in many domains.

The relation between this centrality and the other features (voluntariness, compartmentalization, and no cognitive governance) of Van Leeuwen's account is less straightforward. We have nevertheless suggested various ways in which his understanding of religious credence might be reframed in a way that does not unjustifiably single out religion.

Finally, we have argued that Van Leeuwen's suggestions regarding the rationality of religious states do not hold water. Given the strong parallels with hinges, and following various accounts on the justifiability of hinges, religious states can be regarded as rationally acceptable.

Notes

[1] On many occasions, Van Leeuwen simply refers to religious states as imaginings (e.g., Van Leeuwen 2023, 9).

[2] Interestingly, earlier defenses of Van Leeuwen's account attracted the attention of some vocal opponents of religion, and some of them argue that religious beliefs are, in fact, factual beliefs (e.g., Boudry and Coyne 2016).

[3] We take this from the discussion surrounding "acquired" (Moyal-Sharrock 2004) or "de facto" (Coliva 2023) hinges. A. B. Lopez (2023) has recently proposed a reconstruction of the argument we have presented on the basis of Duncan Pritchard's work.

[4] The idea that religion only has to do with supernatural entities (as Van Leeuwen often implies, e.g., 2023, 64) is caricatural.

[5] E.g., Wittgenstein (1969, 7). In Van Leeuwen's (2023, 46) work, we can find claims such as "even if you're in a philosophy seminar skeptically supposing the external world doesn't exist, you still avoid the chair that you factually believe has a broken leg." The similarity between a sentence like this one and various claims found in *On Certainty* is quite astounding.

[6] For doubts regarding the carbonara example, see Bressanin (2023).

[7] Van Leeuwen's view on evidence is drawn from his definition of epistemic vulnerability. He states that a cognitive attitude is "prone to being extinguished if (a) it conflicts with perceptual states or if (b) it is realized to lead to a contradiction" (Van Leeuwen 2023, 55).

[8] It should be noted that Coliva believes this applies to a very limited set of hinges; first and foremost, the hinge "there is an external world" (Coliva 2015).

[9] The debate often uses slightly different properties of states like warrant or justification.

[10] It is a matter of debate whether, or to what extent, hinge epistemology and reformed epistemology are compatible. Pritchard (2011) discusses this issue mostly in relation to "quasi-fideism," the application of his version of hinge epistemology to religion.

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The Complex Relationships between Different Beliefs: A Commentary on Van Leeuwen's *Religion as Make-Believe*

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Although Van Leeuwen's *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity* contributes to a better understanding of the dynamics of religious beliefs, it raises several questions and invites a deeper discussion in order to better assess the specific features of these beliefs in relation to other belief systems. The limitations observed could help us better understand the complex relationships between different beliefs as they emerge in different social spheres, with their own codes and applications.

Research on beliefs and believing is a thriving field, with many studies published in recent years, spanning several disciplinary areas and providing new insights each year to advance our knowledge of such a fundamental, if somewhat neglected, cognitive feature. Perhaps the focus has been on a general view of the process that allows beliefs to be formed and maintained, rather than on differences between types and subtypes of beliefs, especially religious ones. Indeed, it is quite plausible that recent research on beliefs and believing has tried to avoid a traditional bias and confusion: the one that associates beliefs with a religious or transcendental semantic field, ignoring that there is much more to believing than just the religious type. If we examine Neil Van Leeuwen's *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity* (2023), we find rather a broader perspective that recognizes a greater role for beliefs and believing in human knowledge and action, much more than in previous studies in which believing could be considered a second-class cognitive feature compared to true knowledge.

The previous lines only try to provide some context to introduce Van Leeuwen's new work. This is a surprising essay that can be seen from different perspectives: as an attempt to clarify the awkward field of religious beliefs by introducing some necessary distinctions; to advance a thesis more in the field of epistemology in order to highlight some aspects of human knowledge; to go a step further and complement the limited and simplistic views developed by the cognitive science of religion (CSR) in recent years; to offer a much-needed education in belief that will allow us to address many current issues after the proliferation of fake news and the like; to develop a further deconstruction of religion, following a long tradition of trying to reduce and naturalize this embarrassingly unmanageable human feature; and as a challenge, or even a provocation, to theologians and philosophers of religion who have tried for centuries to deal with belief as a central tenet of Christian religion.

Since the commentator is a theologian, the last question may be the most interesting. Nevertheless, a first impression is that for those used to the drama and intensity of Kierkegaard's analysis of faith in *Fear and Trembling*, or for those used to the demanding and tragic experience of faith in Karl Barth's *Römerbrief*, this book might simply seem too silly to take into account, since religious belief is described from the outset in terms of a children's game, a "let's pretend" playing, far removed from the life or death questions that could motivate the classical works cited. Or take as another contrast the works of the greatest contemporary philosophers of religion, who try to show the rationality of the Christian faith, such as Swinburne or Plantinga. Again, Van Leeuwen's argument might seem too disarmingly naive and unworthy to be taken seriously.

Despite these earlier impressions, it would be a great mistake to ignore this book as something too alien to the theological and philosophical tradition and the repeated attempts to come to terms with the experience of faith at the

heart of the Christian message. In any case, it represents a remarkable effort to better explain the dynamics of religious belief and to distinguish it from other forms of belief. Theologians can learn from this interaction, and engaging with this work is a test of theology's capacity to respond to new challenges and to prove that it still has the best story to tell, the best approach to a mysterious and transforming experience, which nevertheless knows many alternative readings and theories, many attempts to naturalize it or to rescue it from religious and transcendental terms.

I have to admit that this is not the first time I have dealt with Van Leeuwen's theories on religious and other beliefs, but the previous attempt was based on a few published articles (Oviedo and Szocik 2020). Now an entire book offers the opportunity to expand and better explain and apply the original theory, and therefore a new engagement is required.

It is important to understand the central messages of the book as a condition for genuine engagement. The main point of the theory developed is that religious beliefs represent a particular cognitive attitude, closer to fictional imagination, that can be distinguished from other beliefs, called "factual beliefs." There are four distinguishing features that help to capture this distinction:

- Factual beliefs are involuntary; you cannot help believing something that can be verified, whereas religious beliefs are voluntary and you can stop believing them at will.
- Religious beliefs are compartmentalized, or only work in some situations and not in others, whereas factual beliefs have a much wider range of applications.
- Factual beliefs require cognitive governance, or help navigate many domains, whereas religious beliefs lack this quality, and are limited to a small domain.
- Factual beliefs are susceptible to contrary evidence, whereas religious beliefs tend to persist in the face of data showing otherwise.

The idea is that factual beliefs play the main cognitive role, helping us to behave rationally by providing the necessary means to navigate a complex and demanding reality, while religious beliefs, or "credences"—as Van Leeuwen prefers to call them—are a secondary cognitive attitude that might supplement some knowledge, but is limited to some less practical areas and therefore of little use when we try to manage our daily business and relationships. The author describes this as a "two-map theory," trying to emphasize the difference with those who claim that we—or most cultures—operate on a single cognitive map. This is the main part of the book. Subsequent chapters attempt to extend this model beyond the so-called WEIRD people, or Westerners, using much data from the cultural anthropological record; and to support it with a semantic

analysis of differences in the use of words like "think" and "believe." The final chapters present interesting applications of the theory. The first is the view of religious belief as a means of enforcing group identity, as possibly its main function, following a tradition that can be traced back to the sociology of Émile Durkheim; and the question of the rationality of religious belief, which the author is convinced can be better addressed within the proposed framework.

Now that the central ideas of the book have been revealed, a critical discernment is required in order to assess its heuristic capabilities. The first thing that can be said is that this is a more sophisticated theory of religious belief than those we are used to from CSR and evolutionist theories of religion. After a long period dominated by these very reductive and frustrating theories, at least for theologians and philosophers of religion, this is a clear advance. Then the main thesis about the cognitive double map and the differences that govern its application are clear and help to understand better how different belief systems work in different environments and circumstances. Van Leeuwen has even designed a language and a semantic game that allow us to proceed with new analytical tools to better describe networks of beliefs.

Having recognized these merits, several questions arise when trying to go deeper into this heuristic or theory and its suitability with regard to real religious and other forms of belief. My critical remarks will be made in a certain order, trying to establish a constructive dialogue with the author, with the aim of improving this theory and making it more appropriate, taking into account several cases that the author has neglected or simply has not been able to cover, since the territory is always larger and more complex than the maps—even considering two of them.

Too Many or Too Few Maps?

A first problem arises with the description of this double cognitive map. In my opinion, there are too few. Real social systems require more maps to circulate, or as the German sociologist Niklas Luhmann, an expert in social systems theory, described it: each subsystem has its own communication code and thus observes reality through a different map (Luhmann 1988). A similar point can be derived from other ambitious program at social structuring: the Bruno Latour investigation into "modes of existence." Such program draws a model of different areas in which our experience is configured, and again, following distinct codes depending on where we move: in an economic, a scientific, or a religious mode (Latour 2013). This applies not only to a distinction between religion and all the rest, but also to economics, politics, science, and even more to distinctive languages such as those of emotional or erotic relationships and those that regulate aesthetic communication. To put it bluntly, we use a different cognitive map when we try to negotiate a loan in a bank; when we do neurological research; when we campaign for a social or political cause; when

we try to convince someone of our love for him or her; or when we immerse ourselves in a concert or visit an art exhibition. Obviously, the religious code or map has its own characteristics, semantics, references, distinctions and style. Some have even spoken of a language and a "religious grammar," in the sense of a set of rules that allows communication and exchange between those involved (Oviedo 2015). This grammar is distinct from others, such as those used in ethical judgement—even if it often overlaps with several religions that have evolved towards more ethically concerned expressions.

So the first problem with Van Leeuwen's description is that it is too poor and limited, and that he could extend the idea of cognitive maps beyond the simple distinction between "factual beliefs" and "religious credences." I suppose he might reply that all the other systems are different from the religious one because they could be subsumed within the "factual class." I am not entirely convinced. Take the extreme case of the code of love—in the emotional sense—the game that lovers play, or the seduction process, often goes beyond the factual level, and a person would be a poor lover if he or she confined his or her loving discourse to the mere factual level. I admit that even in this case the distinction can provide some insight and help to distinguish between a set of beliefs that nourish the lovers, such as illusions, expectations, feelings, and others, as opposed to the factual beliefs about the need to take a loan to get a home where they can pursue their love in minimally realistic terms and eventually give birth to a family. Nevertheless, it would be bad if a couple lost their romantic code as a set of beliefs that nourish and support their mutual commitment. Then other codes are involved: the ethical—which demands fidelity and trust, the social—which values the respective families and other social conditions, and very practical ones, especially when they try to raise children.

It is probably not so much a matter of dealing with such different cognitive maps, but of negotiating between them and moving from one map to another. It is clear that you cannot use the scientific map to approach a person you love—indeed, scientists might feel uncomfortable using their own map in this alternative field of love and romance. However, we need to be quite fluent in using these different languages or maps, and to be able to exchange and relate to each of them.

Van Leeuwen is right in his very illustrative examples: a religious person will look for good doctors if he has a health problem, and not just pray for healing. A parish priest will have to negotiate a bank loan and contract a construction company on the best terms to carry out maintenance work in his church (I am thinking of a Catholic priest). It would be simply irrational to try to improve the building by asking God for a special intervention. In any case, the priest and his congregation would pray for divine help, which would most likely come through a successful campaign to raise more funds to carry out the work. As

I said, the problem is to relate one map to another, or to combine them in a positive way.

The good news is that most religious people have learnt to combine these different maps, even if in some cases abuse, hypocrisy, and misrepresentation feed suspicions that religious people are less sincere or only formally—not honestly—believe what they say they believe. Nevertheless, most religious believers probably try to combine these different maps in ways that help them navigate their lives and relationships better. We can call this process "cognitive conjunction," or "convergence," or "complementation," but in any case it is important to be aware of how things can get trickier and more complex, and that "religious beliefs" can be confused at some other levels.

Too Irrelevant Beliefs? How Much Cognitive Governance?

After the first question, the second concerns the range of religious beliefs and their applications. Once again, Van Leeuwen's perspective seems too reductive and simplistic, whereas things are much more complex. He probably has in mind forms of religious belief that are less relevant to one's own life and options, and less situations in which such beliefs involve matters of life and death. If we take the extreme expression of martyrdom, for those who risk their lives for holding a religious creed, as has often been the case in the past and still is in many areas with very limited religious freedom, religious beliefs can hardly be described by the four characteristics Van Leeuwen defends. Indeed, when holding a religious belief means putting one's life at risk, it means that one's whole life and behavior is under great stress, and almost everything must be seen in terms of this pressing case.

We can move on to other scenarios in which religious beliefs can again take on a special significance and intensity. Some particular beliefs are able to give meaning to one's life and avoid the emptiness that could encourage fatal choices. I am not sure how the four characteristics or rules insisted on in the book apply in these cases, where once again holding the right beliefs is a matter of life or death, but in a radically different sense from the one described in the previous paragraph: holding these beliefs does not involve the risk of death, but just the opposite: lacking them could mean that a life is not worth living. In this case, cognitive governance is radically extended to encompass a whole life, in the sense of determining the extent to which it is worth living.

Several examples in this reviewed book remind of an anecdote from the essay by Terry Eagleton, *Reason, Faith, and Revolution* (2009, 50): "He [Dennett] also commits the Ditchkins-like blunder of believing that religion is a botched attempt to explain the world, which is like seeing ballet as a botched attempt to run for a bus." Reading through the pages of this highly ironic book, it is easy to concur with its criticism when many crucially threatened developments in human and social life are contrasted with the regenerative air that Christian

faith and theology can provide. Obviously, religious credences are inappropriate for many practical tasks, but by the same token, many factual beliefs are ill-suited and badly equipped to deal with other issues or tasks that require serious commitment, values and strong ethical convictions, especially in critical times. These "credences" sometimes offer the only hope of resisting the most negative trends and of making things better. This is another sense of the "cognitive governance" issue.

On Religious Functions: Many More Than Those Suggested

One impression the reader gets from the pages of this book is that religious belief is somewhat diminished or devalued, being associated with the enforcement of group identity and little else. Not that there is anything wrong with that; it is just too little. Even within current research on religion and its functions, limiting it to the performance of a sense of belonging is frustratingly reductive and ignores many aspects that have been highlighted in recent decades. The functional approach to religion has explored more possibilities and offers a number of interesting insights. This programme has developed in different directions, some building on more abstract functions, others looking at very practical issues to describe more concrete performances. In the first case, the quoted sociologist Niklas Luhmann provides perhaps the most rigorous and demanding analysis of such a function. Religion is based on a communication code that distinguishes between transcendence and immanence, thus helping social systems to reduce their excessive complexity and to cope with unmanageable contingencies. Luhmann (1985) deepened this abstract model to describe the function of religion as an ability to address and neutralize the paradoxes that inevitably arise in self-referential social systems.

A critical eye can hardly see the relevance of these highly abstract developments to the issue at hand. In fact, in Van Leeuwen's treatment, religious "beliefs" appear as much simpler and can be described in a fanciful, childish way. The point is that such beliefs, nourished by a constant process of religious communication, become part of the fabric of the social system to such an extent that their sharp decline could pose a great danger and threat to the entire system if it lacked such functionality. Luhmann has struggled all his life with this question: to what extent can religion be replaced by functional equivalents capable of providing similar functions and performance, and to what extent have contemporary social systems become so resilient that they can even get rid of religious communication and beliefs? This is an open question, but one that places religious belief on a different level, with social functions that go much further than the simple Durkheimian paradigm of social identity formation. The question suggested by such an analysis is that religious beliefs, and the code that articulates them, take on a different character, or a very different shape, when they are related to these higher functions; or, to use Van

Leeuwen's language, they acquire a different cognitive governance and scope of application.

The other approach to religious functions is more practical and has to do with their therapeutic effects. Van Leeuwen quotes Tanya Luhrmann, but obviously each reader pays attention to different aspects in her engaging and highly informative books. She clearly describes the healing experiences and perceptions of intensely shared and celebrated religious faith. These experiences have been much more studied in recent years in a growing body of scientific literature on religion and health, under the labels of "religious coping," "religion and resilience," "religion and well-being," or "religion and flourishing." Hundreds of new studies are published each year in this area of research, almost all of which show the positive effects of religious beliefs and the practices that support or nourish them on the physical and mental health of those involved (Rosmarin and Koenig 2020). What does all this research add to our understanding of religious "credences"?

Many studies show that only more intense and shared forms of religion achieve these healing properties. Simply believing in God is of little effect unless it is translated into attitudes nourished by celebration, prayer, and other engaging practices. It is very reductive to describe these "belief" in the terms that Van Leeuwen does, without considering how much levels of belief correlate with healing and other positive effects, such as improved quality of life and relationships. We are talking about levels of religious belief, which can range on a spectrum from very weak to very strong; with little or more influence in many life matters; with more or less involvement in other areas of life and business.

Cognitive Salience, Belief Formation, and Social Support

Scanning the list of references at the end of Van Leeuwen's book, the reader may feel frustrated again after noticing the paucity of citations to recent research in the field of belief and process of believing studies. For many years, the research programme Creditions, led by Hans-Ferdinand Angel and Rüdiger Seitz, has been gathering in Graz and has published several books and a large number of research papers, which Van Leeuwen should know, since he has attended some of the recent conferences organized by these experts (Angel et al. 2017). The treatment of beliefs and the process of believing in this case benefits from neurological, cognitive, and epistemological studies and offers a model of how beliefs emerge, become stable, and eventually die, which competes with other similar models now on offer. This model has the ambition to cover all kinds of beliefs, religious and nonreligious, and to provide a guide to dealing with the thorny issue of how beliefs become reliable and can be evaluated.

Another absence concerns the epistemological side, which has been very fruitful in recent years, producing many essays that try to better understand this

process and the extent to which beliefs become a central cognitive feature. A recent example is Matthew Chrisman's (2022) book, *Belief, Agency, and Knowledge*. Several points emerge as relevant to our topic. For example, the extent to which beliefs are voluntary or less so; Chrisman claims that beliefs lack voluntariness but are subject to normative control. They appear more as mental states and less as performances, but perhaps both approaches could be legitimate. However, the main theme of the book is how we can achieve a degree of control to avoid total relativism and the social chaos that would follow. The solution points to communication, mutual testing, and interactions that allow us to test our beliefs, thereby supporting a process of formation or education. This idea obviously also applies to religious "creeds," which, despite becoming sometimes very wild, in the long run stabilize after a dynamism of mutual testing and shared control, which admittedly not always works in a smooth way, but in many other cases manages to drop false beliefs or beliefs that become damaging for the single person and society alike.

Probably that book was published too late and Van Leeuwen did not have the opportunity to read Chrisman and other epistemological analyses of belief. But this approach can help to add some nuance to the simple model Van Leeuwen has proposed. Indeed, this nuance is most lacking throughout the book. To take another example, religious beliefs appear in his model as "resistant to contrary evidence," and this is true for some religious styles—the fanatical ones—but not for many mainstream religious expressions, which are indeed very vulnerable, not only to contrary evidence, but even to the collapse of "plausibility structures," as Peter Berger liked to show half a century ago (Berger and Luckmann 1966). The result is a powerful secularization, as people lose their faith and find it no longer convenient or socially appropriate to hold those beliefs and attend religious services. The idea that Chrisman proposes is that beliefs are strongly socially anchored and therefore depend for their survival on their own social and cultural environment, but at the same time they can be subject to some filtering by social control and testing to avoid their craziest expressions. This is something we can observe in Christian beliefs throughout history and in the main discussions that have contributed to their long-term configuration.

How Much Rationality?

A final point of revision in Van Leeuwen's theory concerns the rationality of religious beliefs. In perhaps the best chapter of the book, the author offers a convincing typology of three major classes, each with three subtypes, to classify the different strategies and solutions to this question: how religious people, who are usually rational, hold beliefs that are quite far from this standard. Van Leeuwen again offers his theory of two maps to explain this strange and apparently contradictory attitude. In fact, the studies of Cristine Legare, which

he cites, empirically confirm the coexistence of two maps in many religious minds (Legare and Visala 2011; Legare et al. 2012).

However, Van Leeuwen dismisses as less convincing the third "solution" in the first class of his typology: the one that tries to show the rationality of religious belief. He even cites Anselm and Plantinga arguments (Van Leeuwen 2023, 206) to justify many Christian beliefs, but the reason for his own disbelief is that other more exotic and stranger beliefs in other religious horizons would remain unexplained. This is a difficult line of argument to follow. It would be much easier to recognize that there are sets of religious beliefs that can be explained in rational terms, as a long tradition in the philosophy of religion shows, and other "credences" that depart from this pattern and so can be described in purely mythological terms, as superstition, or in other cases as mysteries beyond rational access. In this sense, it would be much better to distinguish between religious beliefs that can be given a good deal of rational explanation; and other beliefs that are very difficult to explain in these terms, or where some rationality in holding them can only be shown indirectly. For example, if believing that Christ has risen helps one to cope better with a serious illness; or provides hope and support for difficult ethical choices, then in a pragmatic sense we might recognize a degree of rationality in it.

In this case, as in others, things appear less in black and white than in shades of grey, or in a gradation of more or less rationality in the beliefs we hold and profess. In any case, the combination of rational knowledge, mystery, and some grey areas in our perception of reality is something common not only in the religious realm, but also in science and other social areas where we do not manage to achieve a complete and satisfying rationalization and need to adopt many beliefs and intuitions that go beyond any standard of rationality, but that give meaning to our lives and relationships.

Concluding Remarks

The study of beliefs and the believing process still faces a number of challenges and unresolved issues that are becoming more prominent in the current cultural panorama. For example, the ease with which beliefs are manipulated by increasingly powerful means in social networks and intelligent systems. The issue of the involuntariness of beliefs raised by Van Leeuwen and Chrisman becomes less convincing when confronted with many cases in which beliefs are easily induced and nourished by forms of propaganda and deliberately deceptive communication. Perhaps the subjects of such messages cannot help but believe them, but the question remains as to their reach, consistency and, more seriously, the possibility of preventing and correcting them.

A second issue relates to the journal in which this book symposium appears, which is dedicated to the dialogue between science and religion. Van Leeuwen's theory contributes to a better understanding of these relations by proposing a

dual map model. Extending this model, as suggested in my first comment, we can easily imagine this exercise in terms of connecting the map of scientific knowledge and beliefs with the map of religious or transcendental ones. The big issue is to recognize that these maps can interact and be connected, helping to build a more complete and integrated knowledge of a very complex and integrated reality. In this context, it is better to avoid describing other cognitive maps as "secondary" or "imaginative," as this approach smacks of a derogatory instance towards the other. It is important to avoid the reductive dreams of those who seek a single and overarching map—a "grand theory"—that could explain and make sense of everything in our world, in our lives. These reductive dreams rather become a form of impoverishment and risk becoming exclusivist and incapable of pluralism and respect for the other, as they try to exercise forms of cognitive domination.

Lastly, it is rather unfortunate that Van Leeuwen ignored our critical points and analyses in the article we published some years ago (Oviedo and Szocik 2020), which tried to address some relevant points in his important theory of religious beliefs. Following Chrisman's suggestion, since a theory is always a belief—at least in the radical Popperian sense that it can hardly be fully and unreservedly verified—such theoretical beliefs would gain more credibility if they were able to answer critical points and engage with alternative views. Van Leeuwen's proposal about religious beliefs is another belief, and certainly not a factual one; indeed, it lies in a field between purely factual beliefs (like believing that I can find a can of beer in the fridge) and believing that my life is meaningful because I can explain what is more relevant and justify my actions. My expectation is that this belief can grow, mature, and become more plausible as it makes room for critical voices and suggestions.

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A Failed Reactivation of Enlightenment Criticism of Religion by Van Leeuwen: Content, Not Cognitive Attitude, Makes the Difference between Factual Beliefs and Religious Credence

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The subject of this article is a critique of the philosophy of religion presented by Neil Van Leeuwen in his *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity*. The article rejects his main title thesis that religion is make-believe. Van Leeuwen assumes that a religious individual has a cognitive attitude for religious content that is different from an attitude for factual beliefs. In this article, Van Leeuwen's concept is rejected. What distinguishes religious beliefs from factual beliefs is the difference in content, not cognitive attitudes.

Neil Van Leeuwen (2023) offers an interesting naturalistic and reductionist philosophy of religion, moving within the framework of analytic philosophy, philosophy of mind, and the cognitive and evolutionary sciences of religion. He takes the distinction between factual belief and religious credence as the starting point for his theory. According to his "distinct attitudes" thesis, he sees them as two different ways of processing ideas. In turn, his second key thesis, the so-called "imagination thesis," states that religious credence is different from factual belief in a way analogous to fictional imagining. Also important to Van Leeuwen is the notion of pretense.

According to Van Leeuwen, the religious individual operates two cognitive systems in parallel, which the author calls mind maps. One of these maps deals with spiritual phenomena and events, while the other deals with actual events. Religious people have a distinct cognitive attitude regarding religious credence. One of the features intended to characterize the religious cognitive system is its flexibility and dependence on the individual's religious will and intention, as opposed to factual beliefs, which can only follow facts. Van Leeuwen gives the example of acquiring and choosing a religious system to fit our needs, which is unlikely to be a feature of factual beliefs that simply follow the evidence.

This dualistic philosophy of Van Leeuwen, according to which factual beliefs follow facts, does not explain the division of people into believers, atheists, and agnostics (as well as others who doubt and are skeptical about the existence of supernatural beings, but do not declare themselves as representatives of either group). According to the logic of Van Leeuwen's reasoning, atheism is compatible with factual beliefs, because the belief that God does not exist is supposed to correspond to eyewitness facts, and the existence of God in time and space detected perceptually or deductively scientifically is not one of them. But in addition to a large group of atheists, there is an even larger population of people who believe in supernatural beings. This population, according to Van Leeuwen's philosophy, plays a game with itself, pretending that there is a God, although there is not. According to Van Leeuwen's explanation, for a variety of reasons, the greater part of humanity chooses to play and continue the religious game even if it becomes familiar with the counter-arguments. This corresponds to his hypothesis of no evidential vulnerability, but it is not applicable to religious content, which can neither be confirmed nor denied. Thus, this evidential vulnerability criterion does not allow analysis of religious beliefs when confronted with factual beliefs.

Instead of the above reasoning presented by Van Leeuwen, it is worth considering the following proposal regarding his concept of following or not following the facts. Both factual beliefs and religious credence follow facts. Neither type of belief, including religious beliefs, is a type of game or make-believe. The difference is that individuals consider different types of facts and derive different consequences from them. We have pointed this out elsewhere (with Hans Van Eyghen) when we analyzed which of the two attitudes toward religiosity and

supernatural beings, belief in them or atheism, can be considered the default. In our opinion, neither of them is the default attitude. This is determined by the cultural context. In religious societies, the default attitude is one of religious faith, while in secular societies atheism is more popular, but this does not necessarily make it the default attitude (Szocik and Van Eyghen 2021). This means that in different societies different contents have the status of facts, as well as different types of beliefs have the status of factual beliefs. It can even be said that in religious communities, religious content also becomes factual in a specific way for religious people, who treat it almost as fact. This means that Van Leeuwen's classification inappropriately distinguishes religious beliefs from factual beliefs with regard to the attribution of different cognitive attitudes to these two types.

Van Leeuwen alleges religious credence has little, if any, potential for cognitive governance. As an example, he cites petitionary prayers, in which religious people typically do not ask God to act contrary to the naturalistic order. As the author suggests, petitionary prayers thus have the character of a kind of support or reinforcement of the natural order, but not its disruption. This would suggest that religious beliefs do not have the power to influence factual beliefs, nor do they function in a way that actually opposes factual beliefs. Therefore, they are secondary cognitive attitudes. Factual beliefs remain dominant, as they set the horizon of possible meanings and set the framework for religious beliefs. Van Leeuwen's argument also continues with the observation of the fact that believers, despite petitionary prayers, do not give up in parallel taking actual actions to achieve the desired goal. Van Leeuwen takes this regularity as another example of how believers can perfectly distinguish between the factual order and the religious order and do not mix the two different levels of causality.

Such behavior can happen, and the examples cited repeatedly by Van Leeuwen of sick religious people who not only pray, but also take treatment, seem to confirm this. But religious people often combine and, in a sense, mix the order of religious beliefs with the order of factual beliefs, and the former are not just for self-deception and are not a form of role-playing. A religious person suffering from an illness or asking God for the recovery of a loved one does not treat her religious activities in terms of a game. Depending on the end of the illness, the religious person will treat the course of events either as hearing her requests or as a trial sent by God, the latter in terms of warning or punishment.

Van Leeuwen makes a considerable point that religious beliefs do not govern factual beliefs, but that the latter govern religious beliefs. This is derived from the degree of evidential vulnerability that characterizes only factual beliefs. This is the part of his book where the limitations of the naturalistic perspective he adopts are particularly apparent. Van Leeuwen adopts a very simple, rather naive naturalistic explanatory perspective that interprets religious beliefs in terms of their ability to influence reality. The author looks at religious people by adopting a position that analyzes religion and religiosity through a literal

interpretation of religious content. The examples he provides, especially those related to petitionary prayers, confirm this methodological stance. Van Leeuwen is more reminiscent here of the first attempts at a naturalistic explanation of religion proper to the philosophers of the French Enlightenment. And, as if by surprise, he discovers that religious people generally value or expect more the hope carried by religion than the faithful reflection of reality or the ability to causally alter the course of events through prayers. But this is precisely one of the essential functions of religion and religiosity.

It is worth noting here two phenomena that undermine Van Leeuwen's belief above. First, religious beliefs influence factual beliefs. This applies to the way phenomena are explained and interpreted. This can also be seen in the approach to scientific theories, which are accepted or not depending on religious beliefs. Second, Van Leeuwen's focus on explaining religious beliefs through the prism of their possible relation to real phenomena is weakened by the fact that both some scientists and some philosophers believe in God. These are people who know what the structure of reality is from a scientific, empirical, and rational point of view, and yet they share religious beliefs.

Van Leeuwen, following the tradition of analytic philosophy, formulates a series of classifications and categories, which he then applies to cases of religious belief. It is difficult to determine whether the particular characteristics attributed by the author are indeed the domain of religious beliefs alone. An example of such is the category of voluntariness, which is said to enable such three religious phenomena as creativity, syncretism, and conversion in response to incentives. As an example of how the creativity category functions at the basis of religious beliefs, Van Leeuwen gives the example of the terra cotta warriors of China, built in ancient times on the orders of an emperor. For Van Leeuwen, this is an example of creativity in the sense that it was an unprecedented construction and the Chinese emperor, believing that such warriors could protect him after death from enemy attack, was free to design and implement his idea. This freedom to create a belief, according to Van Leeuwen, is voluntary, unlike the process of creating a factual belief.

In the example given, it is not so much about forming a belief as it is about deriving consequences from the belief held. An emperor who believes in life after death could demand the building of a terra cotta army of warriors, but he could just as well demand something else, or nothing at all. But factual beliefs are no different in this regard either. The belief that climate change is happening leads to different consequences in the actions of different people, or no action at all. Van Leeuwen's examples of the specificity of factual beliefs seem to fit primarily with Aristotelian-style perceptual beliefs, that is, eyewitness perception of an object. In this case, indeed, the statement "John sees a tree" is, in a colloquial, naive, non-philosophical sense, unquestionable, while the statement "John believes he is talking to God" can only be true within the framework of religious credence. But factual beliefs that are more complex, involving social interactions, or sets

of complicated facts whose explanation requires the application of appropriate theories, despite the fact that they belong to the group of factual beliefs and not religious credence, are complicated and interpreted differently by individuals. People also react to them in different ways, and not everyone derives the same practical consequences for action. Factual beliefs equivalent to the terra cotta of warriors and the Chinese emperor may be a given nation's belief in its military might and economic strength. This is a type of factual belief. The consequences of sharing such a belief can vary and also have no precedent. The creativity of the holders of these beliefs is also unlimited.

Van Leeuwen here, like many others, operates a simplistic model of the brain–behavior relationship. It is a rather naive version of computationalism. Both factual and religious beliefs can influence, as well as fail to influence, behavioral dependence on a number of factors. Lots of types of factual beliefs related to the state and nation, which are definitely not religious credence, lead to unprecedented consequences regarding the issuance of laws, the making of new laws, the creation of monuments, public holidays, and much more. The abolition of slavery in slaveholding America was an unprecedented event. From the factual belief that there were slaves, people living in slaveholding America derived various consequences. Quite a few of them were certainly of a voluntariness nature. Did they therefore meet the criteria of religious credence?

The lack of a nuanced view of factual beliefs makes the further distinctions and categories introduced by Van Leeuwen flawed in his search for differences between religious credence and factual beliefs. This can also be seen in the case of another category, incentives. According to Van Leeuwen, religious credence is influenced by incentives, while factual beliefs are not. But again, the issue of which factual beliefs we are talking about comes back here. In the case of complex factual beliefs, external factors, including incentives, can lead to their change. In light of new knowledge or new experiences, some factual beliefs are replaced by others. This is also true of simple factual beliefs based on perception, when we interpret what we perceive incorrectly, despite the fact that it is correct from the standpoint of our perception. Science often corrects such perceptions regarding, for example, astronomical phenomena or climate change, when, for example, from the fateful occurrence of snow in winter, some conclude that climate change in the sense described by scientists is not occurring.

Van Leeuwen also devotes much attention to showing the lack of cognitive governance by religious beliefs. Since religious credence is not factual belief, religious components are complementary to instrumental actions that are geared toward achieving a given goal. It is for this reason, Van Leeuwen argues, that a religious individual does not abandon factual actions aimed at achieving a goal despite a parallel stated belief in God and providence.

It is difficult to agree with Van Leeuwen's assertion that neither intuitive nor theological conceptions of God lack cognitive governance. A more nuanced

approach to the issue is required here. It would have to be said that some religious contents do not have cognitive governance, others do sometimes, while still others may always or almost always have it. It depends on the religious individual, the degree of his or her faith. It may also depend on the type of belief and concept. Religious and theological beliefs and conceptions can have cognitive guidance in a very strong way. The sphere of human relations has been and continues to be significantly shaped by religious content. They act here as if they were factual beliefs. The belief that someone is a morally good person because she prays to God becomes a factual belief that is difficult to challenge. Instead, it is a religious credence that says that God chooses those who are morally best, that He sends graces. These religious credences cannot be challenged or modified, and they have cognitive governance. It is difficult here to accept, following Van Leeuwen, that neither intuitive nor theological religious choices have cognitive governance.

The methodological error of Van Leeuwen's philosophy is the assumption that religious beliefs are the domain of only secondary cognitive attitudes. This thesis, accepted at the outset, leads to the erroneous conclusion that religious credence is always the domain of this attitude, on a par with imagination and conjecture. Perhaps this is the biggest metatheoretical error committed by Van Leeuwen. It would be appropriate to correct this error by proposing the following assertion in place of the aforementioned thesis. People, both believers and non-believers, can adopt different cognitive attitudes to different types of beliefs. Religious beliefs may be the subject of a secondary cognitive attitude for some. However, this would be quite curious and rather unusual from the point of view of a religious person who genuinely believes in the object of her religious belief. She cannot "know" about God in the manner characteristic of factual beliefs, because God in religious and theological terminology exists outside of time and space. Therefore, God's existence cannot be proven in the terms of factual beliefs, but neither can his existence be disproven. It is resolvable by way of worldview.

Not all religious content has always the same cognitive governance, which does not distinguish it from factual beliefs in terms of cognitive governance. Van Leeuwen lacks a nuanced approach to both religious credences and factual beliefs. Complex factual beliefs can have the potential for cognitive governance very differently. We can assume that the degree of cognitive governance is generally greater for factual beliefs than for religious credence. But also add that it is not so much—at least not always—due to the nature of the type of beliefs in question, but also due to the context and the person. Feminist epistemology categories such as "standpoint" and "situated knowledge" aptly express this complexity. If there are situations in which religious beliefs have cognitive guidance and factual beliefs do not, what does this say about the interpretation proposed by Van Leeuwen? It says as much that the potential of both types of beliefs is determined to an important extent by the context, environment, and specifics of the individual. This shows that cognitive attitude is secondary

to belief type, rather than the other way around, as Van Leeuwen believes that cognitive attitude determines how a belief type is treated.

The inadequacy of the unnuanced approach that characterizes Van Leeuwen's philosophy is also evident in his analyses of the category of evidential vulnerability, which is supposed to characterize factual beliefs and of which religious credence is supposed to be devoid. Several types of factual beliefs should be distinguished here. In the case of those based on perception from a distance, the rejection of false beliefs can indeed occur immediately, at the moment of evidence. But for many other types of factual beliefs, which involve complex facts and phenomena and go beyond the realm of sensory perception, resistance to experience occurs just as often as in the case of religious credence. The phenomenon of fake news and post-truth is precisely an example of how evidence-resistant false factual beliefs can be. Despite the almost unanimous position of scientists on the existence of climate change and the effectiveness of vaccines, as well as the rather intense presence of knowledge of this in popular culture, many people believe false factual beliefs on these topics. This means, therefore, that Van Leeuwen's thesis that the feature of evidential vulnerability means the automatic elimination of a belief in the light of evidence is not formulated precisely enough, for such a definition is not met by many factual beliefs.

With Van Leeuwen's reductionist philosophy of religion outlined in this way, which denies the truthful epistemic value of religious beliefs, the next part of his discussion appears as a natural conclusion. Namely, Van Leeuwen here refers to practical functions other than cognitive functions that are played by religious components. This is an unoriginal concept, echoing the beliefs of many scholars of religion, in recent years disseminated by, among others, Ara Norenzayan (2013) in his book *Big Gods: How Religion Transformed Cooperation and Conflict*. It is a theory that recognizes that the main, and perhaps only important, function played by religious components is that of providing and marking group identities. Similar views are voiced by Jay Feierman (2009, 2016), who denies religious components a truth function in the epistemic sense, while he sees the role they play as that of in-group markers.

The two chapters of Van Leeuwen's book that follow the epistemological part, namely Chapter 6 under the title "Identity and Groupish Belief" and Chapter 7 entitled "Sacred Values" give the impression of being the weakest substantive parts of the book. They are rather loosely connected to the previous chapters on the epistemic status of religious beliefs. In these chapters, Van Leeuwen presents himself as a proponent of a trend that treats religious content in a non-epistemic way, while attributing to it a symbolic, organizational function that shapes intergroup dynamics.

It is difficult to agree with Van Leeuwen's two-map theory, and the distinct attitudes and imagination theses that underpin it. While factual and religious beliefs differ in content, they do not always differ in cognitive attitudes in the fundamental way that Van Leeuwen's theory assumes. Often, a religious person

who believes in religious content does not treat it as a game or as imagination in the same way that he or she mouths fantasy content. Religious content is just as real to the believer as the content of factual beliefs. If this is the case, the only element that differentiates the two types of beliefs is their content, not the attitude of the individual—this one, after all, is the same in both cases. The differences concern the characteristics of an entity that exists outside of time and space and that is not accessible to perceptual cognition. It seems, therefore, that Van Leeuwen's most serious methodological error is to treat the act of religious belief as a type of imagining with the nature of pretension and play. The act of religious belief differs from the mental processes accompanying factual beliefs in that it is activated with respect to those contents whose existence is not taken for granted and derived from perception, as in the case of factual beliefs based on sensory perception. Consequently, it is a mistake to reduce the functions of religious components exclusively to social functions, concerning the guarantee of group identity or providing a foundation for sacred values. These functions undoubtedly exist and are provided by religious components. However, they are not the essence of the existence of religious components, which, as Van Leeuwen suggests, are the only elements that are preserved as a result of his demystification of the alleged epistemic emptiness of religious beliefs. We can assume, following Van Leeuwen, that people have secondary cognitive attitudes, but religious credence is not a secondary cognitive attitude on par with suppositions and imaginings.

There are good reasons to question the validity of the paradigm proposed by Van Leeuwen, according to which religious beliefs form a separate class of beliefs. As Lluis Oviedo and I have pointed out elsewhere, religious beliefs can significantly influence practical actions (Oviedo and Szocik 2020). This occurs when religious beliefs determine the moral system adopted, and its consistent application in daily life influences the decisions made. This can also occur outside the context of religious places and events, making this type of religious belief settings independent, on par with factual beliefs.

Religious beliefs are the domain of such functions as a sense of meaning and significance. As we have pointed out, the categorization used by Van Leeuwen, dividing beliefs into factual and religious beliefs, does not quite work for religious credence analysis. Therefore, other categorizations, such as the division into "existential" and "immediate" beliefs, seem to more optimally account for the complexity, nuance, as well as functionality and contextuality of different types of beliefs (Oviedo and Szocik 2020). We have already pointed out in this article that Van Leeuwen's categorization is flawed for one fundamental reason. Namely, religious people do not treat religious beliefs in the manner presented by Van Leeuwen, that is, as an alternative or equivalent to factual beliefs. This fact is misinterpreted by Van Leeuwen as suggesting that a person holding religious beliefs is in some sense confabulating and self-deceiving, participating in a fictitious game. This is a misunderstanding of the role played by religious beliefs. They are recognized by religious people as true,

even on a par with factual beliefs, however they do not play the role fulfilled by factual beliefs, which in turn is often the role of providing orientation in space, growing out of perception. Even then, we noted that the epistemic function of religious beliefs is founded on their truthfulness in its own way.

Van Leeuwen does not seem to have correctly guessed the specifics of religious beliefs. Religious beliefs as faith-based religious beliefs, which are the domain of credence, are not based on evidence and facts from the very beginning. Therefore, they are the domain of faith. They may refer to certain facts, be based on intellectual reflection, and be subject at least to some degree to the rules of logic. Such examples are not lacking in the history of religious thought, and the scholasticism headed by St. Thomas Aquinas and Anselm of Aosta is an excellent example of this school of thought. In other words, a religious person does not assume that religious beliefs will explain the world in a manner analogous to factual beliefs. Nor does she expect to obtain scientific-type confirmation for her religious beliefs.

In conclusion, the philosophy of religion proposed by Van Leeuwen may be attractive to this group of thinkers and researchers who sympathize with the Enlightenment mindset, which we could call debunking arguments (but not evolutionary debunking arguments). Van Leeuwen adopted a way of categorizing beliefs based on supposedly different cognitive attitudes that are activated depending on the type of belief. This is a rather surprising approach, which makes the truthfulness and usefulness of beliefs dependent on cognitive attitudes rather than their content. This article presents a different position, which refers to the content difference, rather than cognitive attitudes, as relevant. The content of beliefs is what makes the different types of beliefs treated differently, as literal, symbolic, or imaginary. It is also worth emphasizing that Van Leeuwen's main thesis that a religious individual activates a secondary cognitive attitude toward religious beliefs is incorrect. Religious individuals do not treat their beliefs in terms of games and illusions. The Enlightenment-type arguments cited by Van Leeuwen stating that a religious person breaks the rules despite believing in an all-seeing and all-knowing God do not support his thesis of religiosity as a game and make-believe. What is relevant here is the content of beliefs. Because supernatural beings have the status of entities that exist outside of time and space, they are not detected and recorded through the senses. Nor are they confirmed scientifically. However, this does not mean that a religious person treats his beliefs as fictitious. This faulty starting assumption is the source of many misunderstandings and misinterpretations that must inevitably arise as a result of the assumptions made. Even if one could point to examples of religious people who confirm Van Leeuwen's theory, there are even more counterexamples that take exception to it. Also, there are many factual beliefs that are not automatically accepted. These situations show that the proposed categorization of beliefs based on cognitive attitude is flawed.

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Capturing Cognitive Flexibility: Responses to Cavallarin and Van Eyghen, Oviedo, and Szocik

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This is a response piece to the commentaries by Alberto Cavallarin and Hans Van Eyghen, Lluis Oviedo, and Konrad Szocik on my book *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity*.

Response Overview

I thank Alberto Cavallarin and Hans Van Eyghen, Lluis Oviedo, and Konrad Szocik for their commentaries on my book *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity* (2023). I found several points they introduced to be thought-provoking and worthy of further consideration.

At the same time, many of the points the commentaries present as critical turn out not to be, once we understand my views. So let me start by clarifying some basic features of the theory I develop.

One marvelous thing about us humans is that we can relate to ideas in a wide variety of ways. In other (more technical) terms, we can have different attitudes toward any given content.

The variation in question applies even to the most humdrum ideas: one can factually believe it will rain tomorrow; one can hypothesize it will rain tomorrow; one can imagine it will rain tomorrow (as a part of make-believe play); one can assume just to be safe it will rain tomorrow; and so on. The underlined terms indicate just a few of the many ways people can relate to and process any given content (in this case: that it will rain tomorrow). I call the dimension of variation I'm highlighting *the attitude dimension*.

Importantly, the cognitive flexibility it takes to be capable of distinct attitudes appears in the religious realm. Consider the following four psychological states:

1. Esther doubts Joseph Smith saw the angel Moroni.
2. Barry hopes Joseph Smith saw the angel Moroni.
3. John playfully imagines Joseph Smith saw the angel Moroni.
4. Sam factually believes Joseph Smith saw the angel Moroni.
5. Brigham religiously credes Joseph Smith saw the angel Moroni.[1]

Despite all mentally representing the same idea (that Joseph Smith saw the angel Moroni), Esther, Barry, John, Sam, and Brigham relate to that idea in different ways. Much research on religious belief focuses heavily on hypothesized features of the contents of religious ideation. This is true of various disciplines, but it has also been largely true of cognitive science of religion, one of the main areas to which I hope my book contributes. For example, cognitive scientists of religion have hypothesized the following content features of religious belief: religious ideas involve supernatural agents; such agents are minimally counterintuitive; these minimally counterintuitive agents have socially relevant knowledge; etc.[2] But while issues of content are important, a clear understanding of religious psychology requires that we describe what variations in attitude amount to as well. (How, for example, do Barry's and John's mental states differ?)

Religion as Make-Believe highlights this human cognitive flexibility, theorizes the space of cognitive attitudes,[3] and aims to illuminate how differences in cognitive attitudes play out in religious contexts (as well as other contexts where

group identity is salient). With that in mind, the two main theses of *Religion as Make-Believe* are as follows (appearing first on page 15):

> **Distinct attitudes thesis**: factual belief and religious credence both exist and are distinct cognitive attitudes (they are two different ways of processing ideas).
>
> **Imagination thesis**: religious credence differs from factual belief in many of the same fundamental ways that fictional imagining does—by "fictional imagining," I mean the cognitive attitude that underlies pretend play.

The basic idea is that humans often have very different attitudes that might loosely get called "beliefs" in different contexts, and researchers would do well to distinguish them. Roughly: factual belief is a matter-of-fact way of relating to ideas in which those ideas just seem like knowledge to the subject[4] (whether or not they really are); one typically factually believes many things about the layout of one's neighborhood, for example. Religious credence, on the other hand, is a reverential, identity-constituting way of relating to ideas that (if my arguments are on track) has deep cognitive similarities to imagining, albeit imagining that defines group identity (Chapter 6) and activates sacred values (Chapter 7).

To be clear, while religious credence as an attitude type is important and widespread, it is far from the only attitude that can be taken toward what might be thought of as "religious" contents, as the examples of Barry, Esther, John, Sam, and Brigham show. I put the point like this in my first chapter: "a mental state's content, though heuristic, is never a decisive indicator of its attitude type" (Van Leeuwen 2023, 20). Mixing and matching of different attitudes with different contents (religious and otherwise) is both possible and common. And as I point out at the end of Chapter 3 ("Religious Credence Is Not Factual Belief"):

> for any religious doctrine or story, it is likely that humans at large hold a range of attitudes toward it, since content and attitude vary independently, but one cognitive attitude that is both widespread and strikingly similar to fictional imagining is religious credence, which is far different from factual belief. (Van Leeuwen 2023, 97)

Since I introduce the construct of religious credence as an attitude notion and that is not definitionally meant to indicate content, it may help to think of the adverb *religiously*—which is a way that one might do, or relate to, a great many different things. After all, a running theme of my book is this: anything can be sacralized. I claim it is a virtue of my approach that it not only theorizes the differences between religious credence and factual belief but also does so in a way that does justice to the human cognitive flexibility I have been highlighting here.

In what follows, I first address a major misconception of my position that runs through all three commentaries. Clearing this up, fortunately, reveals that there is far less the commentators and I disagree about than it might have seemed. After that, I discuss the commentaries individually to address some of the points of disagreement that remain or appear to remain.

Here is the major misconception. All three commentaries rest their criticisms on the idea that I am saying that all religious beliefs are religious credences (in the sense I define) that are held for the sake of group identity. Cavallarin and Van Eyghen (2024, 1107) write: "The book leaves the reader with the impression that Van Leeuwen's claims apply to all religious states, all the time." Oviedo (2024, 1124) has a section of his piece pointing out that religious beliefs have more functions than those I suggest—"social functions that go much further than the simple Durkheimian paradigm of social identity formation"—and calls my view "reductive" for not addressing the other ones. That criticism assumes I have a totalizing view that rules out other functions than the ones I discuss. And Szocik (2024, 1135) claims I assume "that religious beliefs are the domain of only secondary cognitive attitudes" and criticizes me for holding that religious beliefs are "always . . . on a par with imagination and conjecture."

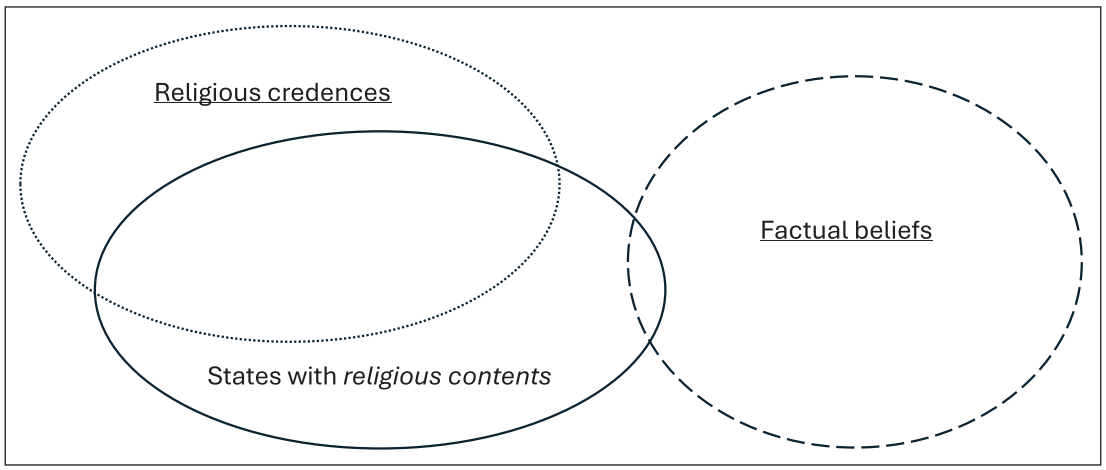
The commentators' terms "all," "reductive," and "always" present views that I myself explicitly reject in the book. As I just made clear, one of the main points of my work is to help explain the cognitive flexibility that enables humans to hold various attitudes toward any given content—religious or otherwise. While I am clear that I think religious credence, as a kind of psychological state, exists and is widespread, I am equally clear that it is an empirical question how widespread it is. From the start of Chapter 3:

> [W]e shouldn't be surprised if different groups of people or even individuals held different attitudes toward their respective religious and other supernatural ideas.
>
> My stance is this: *many* (and probably most) people around the world have two-map cognitive structures for processing their religious ideas: a factual belief layer and a religious credence layer. But empirical exploration is required when it comes to any particular religious community to work out what attitude(s) people in that community have toward their stories and doctrines. Neither a Two-Map Theory nor a One-Map Theory should be the default stance; rather, we should adopt whichever *particular* theory best explains the relevant data and then expand our explanatory scope from there as our evidence base grows. (Van Leeuwen 2023, 67)

So, it is clear that I think religious credence is widespread and has great explanatory potential. But the empirical approach I advocate rules out adopting

a totalizing view of any sort in early stages of investigation. And even if I were right that most religious minds deploy the sort of two-map cognitive structure I describe (factual belief and religious credence), that still allows for such minds to be doing many other things as well.

Here is a way to visualize my view. Let the class of particular mental states with (in some sense) religious contents be represented by the area inside the solid border. Let the class of particular mental states that involve the attitude of religious credence be represented by the area inside the dotted line. And let the class of particular mental states that involve the attitude factual belief (in the sense I characterize) be represented by the area inside the dashed line. This diagram, then, roughly captures the logic of my position.



Of course, we could add more areas for other attitudes (doubting, hoping, etc.) and for other content types (scientific, political, everyday, etc.). The important methodological point is that it is an extremely complex empirical question how much each attitude area overlaps with any given content area (and to what extent different areas shade into one another).

So, while I maintain that religious credence and its differences from factual belief are important, my views—far from being totalizing—are designed to capture human cognitive flexibility and to facilitate the formulation of clearer and more nuanced hypotheses concerning the fascinating space of cognitive attitudes—religious and otherwise.

To Cavallarin and Van Eyghen: There Are Plenty of Non-Hinge Religious Beliefs

Once the misconception just addressed is dispelled—my view is not actually a totalizing one—little disagreement between me and Cavallarin and Van Eyghen remains. I can allow that, among the myriad "beliefs" in the heads of religious practitioners around the world, some may well be hinge beliefs, as they claim.

And Cavallarin and Van Eyghen already grant that religious credence is (at least in some ways) an illuminating construct.

But there are some points of sincere disagreement. To start, let us be clear that my notion of religious credence is not the same as the notion of hinge belief, even though Cavallarin and Van Eyghen attempt to recast it that way. After that, my objection to their position is this: a great many religious "beliefs" held by religious people around the world are implausible as candidates for being hinge beliefs. Thus, while I grant there may be some religious hinge beliefs, a great many religious "beliefs" are not. If that is true, then my notion of religious credence (not conflated with the notion of hinges) will still give extensive explanatory purchase in its own right and ought not to be recast as they propose.

A typical example of a hinge belief would be someone's accepting (let that be a neutral term here) that the external world exists. Another would be someone's accepting that the world existed before she was born. A third might be G. E. Moore's example of accepting that I have two hands. The character of these hinges is threefold: first, one doesn't have any more basic evidence from which the hinge propositions could be demonstrated; second, although hinges are in the first sense without evidence, one nevertheless lacks a serious framework from which it makes sense to doubt the hinge propositions (doubting them, as it were, seems silly); third, hinge beliefs are basic in that they provide a framework in which evidence for other beliefs even makes sense (e.g., my evidence that I'll need more bricks to finish a wall makes sense in the framework of my hinge beliefs that the external world exists and that my visual capacities can detect it, etc.).

Ludwig Wittgenstein (1969) captures the relevant notion in an illuminating way in *On Certainty* paragraph 247: "What would it be like to doubt now whether I have two hands? . . . What would I believe if I didn't believe that? So far I have no system at all within which that doubt might exist." This suggests the following test for hinge beliefs:

> **System for Doubt Test**: in order for *p* to be a hinge proposition for someone, that person must *lack* a framework or system of ideas they find plausible from which *p* may be doubted (in that it includes sense-making alternatives to *p*).

Otherwise put, if a person has a plausible cognitive framework that enables them to doubt *p*, then, even if they believe that *p*, that belief is not a hinge belief. (Example: I fully believe my front door is currently locked, but that is not a hinge belief, since I have a coherent system of thought within which doubt whether *p* might exist.) Let us now apply this test to a range of propositions that many religious people in some sense "believe":

God exists
Demons exist
Prayer for healing works
The first chapter of Genesis is literally true
Jonah lived in the belly of a whale for three days
Jesus of Nazareth caused Lazarus to rise from the dead
The book of Revelation is literally true

I will grant that the first proposition, *God exists*, makes a plausible candidate for being a hinge proposition for some people. Whether it is so would depend on how the rest of their cognitive life is structured, and perhaps many people accept the idea of God's existence in the same way that they accept the external world's existence.

But it is important to note that, in point of psychological fact, many professed "believers" in God's existence admit that they often doubt and sometimes have difficulty not doubting God's existence, as Tanya Luhrmann (2012, ch. 9) and many others document. Not only does doubting not seem silly; they have a hard time dispelling doubt. So, for those believers, the proposition *God exists* fails the System for Doubt Test and hence does not qualify as a hinge proposition for them. And it is not hard to see what the relevant alternative cognitive systems might be within which the doubt can exist: there are plenty of systematic secular frameworks for thinking about what the world is like that do not include a deity; insofar as someone who is devout has cognized such frameworks and finds them plausible, they have a framework from which to doubt *God exists*, which makes that a non-hinge proposition for them.

Furthermore, the remaining propositions in the list I just gave can easily and sensibly be doubted even by most people who profess belief in them. "Are there really demons?" can sensibly be asked by pretty much anyone, so *demons exist* fails to qualify as a hinge proposition for the vast majority of people, no matter how religious. The same argument applies even more so to other items on the list. The proposition about Jonah, for example, lacks all three features of hinges and clearly fails the System for Doubt Test. That is not, of course, to say there is anything wrong with the Jonah story, only that it is not in any way a story made up of hinges. Many people have religious credence in it nonetheless, so many people have credences that are not hinges.

To speak generally, hinges tend to be beliefs concerning matters that are extremely basic, ontologically or epistemically (there is an external world; perception reveals objects). Many religious beliefs, by way of contrast, concern very specific doctrines and stories—often with florid details like those about Jonah—that accordingly do not make sense to regard as hinge beliefs.

Let me point to one other cognitive phenomenon that is relevant in this connection. In *A Diagram for Fire*, anthropologist Jon Bialecki (2017) writes the

following concerning members of the Vineyard Church and their tendency to frame the same event sometimes in religious terms (prophecy) and other times in secular terms (intuition) ["diagram" is his technical term for a comprehensive epistemic framework]:

> Vineyard believers must live in a secular world infused with countless other religious possibilities, *including the possibility of there being no religion and no transcendence at all*. . . . It is not surprising at all that when a more openly charismatic diagram decoheres, the next stable state that it collapses into should be a set of immanent relations in which the miraculous and God are not immediate forces. (Bialecki 2017, 169, emphasis added)

Bialecki calls this tendency to have two frameworks that one switches between "double coding." I discuss the phenomenon extensively in Chapters 3 and 4 of my book. The relevance to the present discussion is this: insofar as Vineyard members operate with a "double code"—one secular, one religious—they have at least *a* coherent system of ideas from which to doubt their religious beliefs. Those beliefs, as important as they may be to those who hold them, thus cannot be hinges for them according to the System for Doubt Test.

None of this, again, is to say that the notion of hinge belief has no place in the general study of religious belief. But I suspect it will end up taking up far less of the canvas than Cavallarin and Van Eyghen think. My hypothesis is that much of the canvass that hinges do not take up will be taken up by religious credences (in my intended sense).

To Oviedo: Maps Aplenty

Oviedo's commentary contains a number of interesting proposals that I find welcome. Once we jettison the false impression that my views are "reductive," it is clear that I have room for these proposals, some of which bolster the usefulness of my conceptual framework. Importantly, insofar as my approach can help inject more clarity into points Oviedo is making, his intended criticisms in fact end up advertising the theoretical utility of my ideas. I illustrate this point in relation to two of his attempted critiques.

First, Oviedo, in a section entitled "Too Many or Too Few Maps?", writes: "A first problem arises with the description of this double cognitive map. In my opinion, there are too few." Later he writes:

> [W]e use a different cognitive map when we try to negotiate a loan in a bank; when we do neurological research; when we campaign for a social or political cause; when we try to convince someone of our love for him or her; or when we immerse ourselves in a concert or visit an art exhibition. (Oviedo 2024, 1121–22)

This is in some sense obviously right. But, importantly, this list Oviedo gives conflates two senses of "map." One sense is just something like a conceptual framework within a certain content domain. That would be a content sense of the word "map." Another sense—the one I develop—is a distinct layer of processing that can apply to a given set of ideas. That would be the attitude sense of the word map that I develop in the book.

The list Oviedo gives highlights distinct "maps" in the first (content) sense; this exhibits no tension whatsoever with anything I say, since of course I grant there are various content domains and conceptual frameworks. But does that mean that there also different attitude maps corresponding to items on Oviedo's list—distinct attitudes or manners of processing? Well, the existence of different content maps does not imply a corresponding number of different attitude maps, since attitude and content are independent. Be that as it may, my view is indeed structured to be able to describe many different cognitive attitudes—people, again, can relate to ideas in all sorts of ways. My framework is meant to characterize the space of cognitive attitudes, as I emphasized above.

Why, then, do I use the phrase "two-map cognitive structure" so often if I agree that there are far more than two cognitive attitudes? As my discussions in the Prologue and in Chapter 2 make clear, my phrase "two-map cognitive structure" describes how factual beliefs and a given secondary cognitive attitude can both be implicated in guiding the same action at a given time, without collapsing into one another: there are two parallel layers of cognitive guidance (e.g., make-believe play is guided both by factual belief and by playful imagining at the same time, a two-map cognitive structure). So, the phrase, *pace* Oviedo, does *not* imply that there are only two cognitive attitudes that humans are capable of!

Importantly, my framework is designed to be able to characterize any cognitive attitude, even ones I don't explicitly address in the book. It is possible, for example, that some neuroscientists could have a special way of entertaining hypotheses that deserves to be thought of as an idiosyncratic secondary cognitive attitude in its own right. Far from ruling it out, the theory I present in Chapter 2 could be used to describe such a possibility. As I take care to point out, the attitudes I discuss (like factual belief and religious credence) are attractor positions—not monoliths—in a much larger space of cognitive possibilities.

Thus, what Oviedo thinks of as a criticism ("too few" maps) is in fact a friendly suggestion for extensions of my theory—extensions that can be stated more crisply using the framework I propose.

Second, when it comes to the functions of religious beliefs, Oviedo calls my theory "reductive" for focusing on group identity. But we have already seen that my view leaves open that there can be other functions. Emphasizing an aspect

of Luhrmann's work that highlights the "therapeutic" aspects of religious belief, Oviedo writes:

> These experiences [of healing] have been much more studied in recent years in a growing body of scientific literature on religion and health, under the labels of "religious coping," "religion and resilience," "religion and well-being," or "religion and flourishing" . . . What does all this research add to our understanding of religious "credences"?
>
> Many studies show that only more intense and shared forms of religion achieve these healing properties. Simply believing in God is of little effect unless it is translated into attitudes nourished by celebration, prayer, and other engaging practices. (Oviedo 2024, 1125)

This is all plausible. But importantly, far from being at odds with it, frameworks for understanding religious belief that emphasize group identity—such as mine or Émile Durkheim's ([1912] 2008)—can help explain these phenomena. It is not the dry cognitive representation of God that does the most therapeutic work, it is what one does in building community with others that has the greatest therapeutic effects. For understanding this phenomenon in greater empirical depth, I recommend the work of another neo-Durkheimian, Dimitris Xygalatas (2022), who summarizes his research program in his book *Ritual: How Seemingly Senseless Acts Make Life Worth Living*. That work gives empirical validation to Durkheim's notion of collective effervescence.

Importantly, however, none of that commits me to the position that constituting group identities is the only thing religious credences do for people. Yet it is likely that their other non-Groupish functions, whatever they are, also pressure them to be different from factual beliefs. I write the following in Chapter 6:

> Being Groupish is unlikely to be the *only* pressure on religious credence to differ from factual belief. Religious credences may also have non-Groupish imaginative functions in the lives of individuals, like enabling them to have certain *personal* experiences that they might not have had otherwise, as theorists from William James to Tanya Luhrmann have emphasized. One may simply find many aspects of life more meaningful when one gives them an imagined supernatural gloss. But this is compatible with the perspective of this chapter: such supernatural glosses are not likely to come from evidentially constrained factual beliefs, so the imaginative role that religious credences play in "personal religion" (to use James's phrase) most likely *also* pressures them to have properties that constitute them as secondary cognitive attitudes as opposed to factual beliefs. (Van Leeuwen 2023, 172)[5]

In sum, Oviedo's main criticisms turn into interesting complications that my views, properly understood, can put into sharper relief.[6]

To Szocik: Cognitive Flexibility Is the Point

Szocik's discussion of my book is the most polemical of the three commentaries. It also contains the most distortions—distortions on which the criticisms rest. So let me start by clarifying three basic points about *Religion as Make-Believe* for the present reader.

1. My book presents a descriptive theory of some significant aspects of religious psychology. As such, is it is not a normative appraisal or criticism.
2. Though it focuses on the attitude dimension of psychological states, my book contains ample discussion of the various ways mental state contents are relevant to psychological processing (religious and otherwise).
3. My book is designed to capture the fact that people can have various attitudes concerning religious ideas (or any ideas). Capturing this cognitive flexibility is one of my main aims.

With those points in mind, we can better evaluate Szocik's criticisms.

In his title, Szocik calls my book "a failed reactivation of Enlightenment criticism of religion." But as just stated (point 1), my book is a descriptive theory of certain aspects of people's psychology. It is not a normative criticism of anything. It is true that in the Epilogue I venture some very brief criticisms of certain self-deceptions that my work makes possible to characterize. But none of that is a criticism of religion in general; I make it clear that that form of self-deception occurs outside religion as well. Relatedly, elsewhere in the commentary Szocik casts what I am doing as a "debunking" argument. In no place in the book do I make a debunking argument, as that term is generally understood.[7] So Szocik misconceives the basic purpose of my book from the start. Also, when it comes to "Enlightenment criticism of religion," it is opaque which Enlightenment figures he has in mind; he does not say. And though it is entirely interesting, Enlightenment criticism of religion is not even a topic in my book.

Also in the title, Szocik writes, "content, not cognitive attitude, makes the difference between factual beliefs and religious credence." This is a false dichotomy (and that I think it is a false dichotomy follows from point 2 above): For any contentful mental state, both its general manner of processing (attitude) and its content[8] influence its downstream effects. Furthermore, mental states that have religious contents can involve varying cognitive attitudes, as Szocik himself explicitly says later in his piece (see the following quotation), so it cannot be even for him that content is the only difference maker.

This brings us to Szocik's most serious distortion (the one that confuses point 3).

> The methodological error of Van Leeuwen's philosophy is the assumption that religious beliefs are the domain of only secondary cognitive attitudes. . . . Perhaps this is the biggest metatheoretical error committed by Van Leeuwen. It would be appropriate to correct this error by proposing the following assertion in place of the aforementioned thesis. *People, both believers and non-believers, can adopt different cognitive attitudes to different types of beliefs.* (Szocik 2024, 1135, emphasis added)

I emphasized the last sentence, because (in addition to being at odds with Szocik's own title) it is essentially something that I myself say in multiple places, since (as I have been saying throughout this response) one of the most important points of my work is to emphasize how attitude and content vary independently. Getting readers to be clear on that independent variation is largely the point of Chapter 1. And on the topic of religious "belief" in particular, I wrote this toward the end of Chapter 3 (also quoted in the general discussion above):

> *for any religious doctrine or story, it is likely that humans at large hold a range of attitudes toward it, since content and attitude vary independently*, but one cognitive attitude that is both widespread and strikingly similar to fictional imagining is religious credence, which is far different from factual belief. (Van Leeuwen 2023, 97, emphasis added)

Just compare the italicized lines in the two preceding quotations; they are basically different formulations of the same point.

So, to review, the "biggest metatheoretical error" Szocik can attribute to me is one that my framework is designed not only to avoid but to correct. And his suggested way to "correct" this error involves his proposing an "assertion" that is a notational variant of a point that I make explicitly in numerous places in the book as a whole.

I can only say that I am gratified to realize that Szocik, at the end of the day, in fact agrees with one of the major points of my book.[9]

Conclusion: A Welcome Discussion

Once again, I thank Alberto Cavallarin and Hans van Eyghen, Lluis Oviedo, and Konrad Szocik for their commentaries. I hope I have been able to dispel the misconceptions on which their main criticisms rested and thereby to have clarified my views. More than anything, I am glad we share an appreciation of this important topic.

Notes

[1] In items 4 and 5, I introduce phrases that become terms of art in my theory for important attitudes that need to be clarified and distinguished. Note that "to crede" is a rare verb, but it has the sense one would expect: to have credence. I use it occasionally both for brevity and to have a somewhat specialized parallel to other attitude verbs, like "think."

[2] These sorts of views are near standard by now; see Pascal Boyer (2001) for a classic treatment.

[3] A "cognitive attitude" is one that treats its content as describing how things are or might be; the contrast is with "conative attitude," which is one that treats its content as, in some sense, how one would like things to be.

[4] This way of putting it is variation on Dan Sperber's (1982, 171) formulation concerning factual belief.

[5] The references in this passage concern William James (1902) and Luhrmann (2012, 2020).

[6] One serious criticism of Oviedo's that I do not have space here to address concerns the "extreme expression" of religious belief in forms like "martyrdom." My view in fact does have resources for addressing religious extremism. See my discussions of fanaticism and extremism in the later parts of Chapter 6 (165 ff.) and of violent symbolic action in Chapter 7 on sacred values.

[7] Someone else, who was fond of making debunking arguments, might attempt to use elements of my descriptive theory as premises; I would be as curious as anyone reading this to see that carried out.

[8] Which in some cases may be semi propositions; see Sperber (1982) and my Chapter 8 on that possibility.

[9] Szocik does have one substantive criticism of my views that doesn't rest on an obvious misconception: "The phenomenon of fake news and post-truth is precisely an example of how evidence-resistant false factual beliefs can be." This is a criticism of my inclusion of evidential vulnerability in the characterization of factual belief. But this criticism is essentially identical to one I address directly and dispel in Chapter 1 (24–26), so I refer the reader to that discussion.

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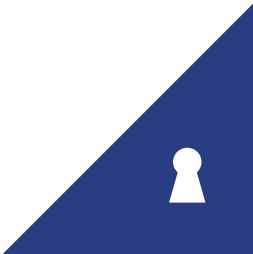

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Is Religion Natural? Boyle Lecture 2024

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A commitment to religion as natural has commanded widespread support in the history of theology and philosophy. This has often been used apologetically, whether through arguments for religious innatism or from a *consensus gentium*, neither of which now seems plausible. This article, originally delivered as the 2024 Boyle Lecture, explores these issues in conversation with recent work in the cognitive science of religion (CSR), where support can be found for religion as natural to our evolved condition. One upshot of this is that, if we are by nature disposed towards religion, then *pace* the standard secularization thesis, it is unlikely to disappear. Yet, while acknowledging the success of CSR, several theological questions are raised about its explanatory reach. The essay concludes by suggesting where a complementarity of scientific and theological description might lead in this domain.

Introduction

Despite some recent doubts, the question "is religion natural?" has long been answered in the affirmative. Several early series of Boyle Lectures offered a range of confident arguments for the naturalness of religion. These had an obvious apologetic function in confirming the existence of God, though the effort expended had in part to be explained by rising levels of skepticism and heterodoxy. In 1717–18, John Leng, later Bishop of Norwich, offered three complementary accounts for the rise of religion. These comprised the force of education and tradition, the evidences for design, and the constitution of the human mind. As a cumulative case, this explains the universality of religious belief and practice; the *consensus gentium* can be considered rational. Leng then continues his argument by seeking to refute accounts of atheist societies in the travel literature of his time (Leng 1730; Mills 2021, 119).

Most of the leading theologians of the church have affirmed that religion is natural to our human condition and that its fulfilment in whatever form is our intended end. We reach our goal as human creatures only in right relation to God. "You have made us for yourself," Augustine (1992, 3) writes at the beginning of his *Confessions*, "and our heart is restless until it rests in you." This assumption about the human condition is also evident in classical philosophy, for example in the Stoicism of Cicero. He writes that the contemplation of the heavens gives rise to the sense of a superior power. This faith is constant across the ages and generations of humankind, even as superstitions and fantasies die out. In this way the gods declare their presence to us (Cicero 1972, 125). Even a skeptic like David Hume tended towards the view that human beings were inclined to be religious so that the task was not the abolition but the moderation of religion, purging it of superstition and fanaticism. Hume, it seems, did not envisage a society without religion despite judging its causes to be pathological (Harris 2015, 344). If this is broadly correct, then we should not expect religion steadily to disappear under the conditions of modernity. Instead, it is more likely to be refracted in different ways as its traditional institutional expressions are weakened.

While affirmations of the naturalness of religion could be viewed positively or negatively by theologians—both trends are apparent in the Bible—the prospect of collective indifference to religion does not seem to have been entertained. The apostle Paul writes of universal human religiosity that has become corrupt (Romans 1:19–20), whereas, according to Acts, he suggests that an initially sound if minimal knowledge of God is given from our awareness of the regularity of nature (Acts 14:17). Religion may be distorted and idolatrous in which case it has to be corrected, or religion may provide a bedrock of belief which can be clarified and extended by appeal to divine revelation. Either way, this is a force to be described and understood. John Calvin (1960, 43–47) postulated a *sensus divinitatis* which he took to be an inherent feature of every human society. He

does not rate this highly and claims that we need the "spectacles" of scripture to clarify our vision. Nevertheless, there is something out there that matters. Since then, others have continued to offer modified proposals. Schleiermacher believed that all religion reflected a universal sense of absolute dependence, God being the co-determinant of this feeling (Schleiermacher 2016, 18–27). In the twentieth century, Karl Rahner (1978, 31–34) has suggested something similar in his idea of the unconditioned that informs all human awareness and activity. Life is inherently mysterious in its origin and striving. At the horizon of our consciousness, we are aware of a presence that eludes us. In this striving upwards, God meets us in the event of revelation, thus by grace fulfilling but surpassing our natural capacities. To cite one further example, Wolfhart Pannenberg claims that the trust in what lies beyond us and on which we are dependent normally begins in the relationship of a child to its mother. Later it can quickly lead to an acquired awareness of God as the transcendent source of our existence (Pannenberg 1991, 114–15).

Despite this notable consensus amongst ancient and modern thinkers, there is some ambiguity about the sense of God. Whence does this arise? Cicero seems to elide two notions. Belief in God may be considered ineluctable, as if impressed upon us from the outset, as with believing in the external world and other minds. Alternatively, we might consider it a judgment that we quickly form once we consider the order and majesty of the cosmos. Calvin can also be read either way. In the early modern era, Descartes claimed that the belief in God was innate. Such an idea could only be the imprint of God for how else would we have conceived of an infinite and perfect being? John Locke regarded this as a flimsy notion. We do not have an innate idea of God though we can frame a reasonable notion that is supported by the evidence (Locke 1973, 67–78; Mills 2021). In what follows, I suggest that evolutionary psychology might offer a way of mediating between these innatist and acquisitivist positions.

The mere fact that most or all people have believed in God or the gods does not of course guarantee the veracity of such belief (Meierding 1998). Considered as an argument for God's existence, this is hardly watertight. As Pierre Bayle once noted, neither general tradition nor unanimous consent can place any injunction upon truth (Edwards 1972, 148). Moreover, beliefs about the gods vary considerably. They can't all be true, given some obvious inconsistencies, for example polytheism versus monotheism. The greater the variety uncovered, the less likely that there is any convergence upon a single core set beliefs or practices (De Roover 2014). Instead of a distinct belief in God much of the argument shifted in modernity to the universality of religion in human societies, this functioning in a more capacious manner. Yet, in the modern era we are also faced with many people for whom belief in God has ceased to be the default position. I recall a conversation with a scientist who remarked, "*Your* problem is people like me who just don't get it." This was not

a hostile observation; lacking any inclination towards faith, he could see no need for it. And his suggestion was that this must tell against any claim for a fundamental human need for God. Pascal's "*misère de l'homme sans Dieu*" seems unrepresentative of many in our midst. Perhaps theologians have always been apt to overestimate the extent to which our fellow citizens are preoccupied with the question of God as they go about their daily lives.

Such skeptical musings may be too swift. Most people who have ever lived have practiced some form of faith. We have no trace of a human society that lacked religious expression. This deserves the kind of serious consideration that is often lacking in a secular culture. Since about 85% of the global population continues to adhere in some way to religion, the consensus remains pretty strong. This merits serious scholarly study, though it cannot constitute a sufficient justification of belief. John Stuart Mill dismissed the idea that a consensus in favor of religion could become an argument for its veracity. The facts of religious divergence count against this, and, even more importantly, we should seek for sound evidence rather than merely counting heads (Mill 1969, 441–43).

Nevertheless, in his critique of the *consensus gentium* argument, Mill gestures towards one possible revision. If most people believe in God or the gods, then this might be explained as the result of a benevolent creator so ordering the natural world that in the process of evolution human beings are drawn towards their source and end. As a disposition, it might be explained not merely as a natural phenomenon but one which has a spiritual function and goal. In this way, our natural inclinations can be made consistent with a theological purpose; though neither actually entails the other, the possibility of a complementarity of descriptions remains open. Yet, to the skeptic, this will appear an easy apologetic move that fails to engage a host of salient issues.

Key Terms in the Debate

The key terms require some initial clarification; these are contested and resistant to simple definition. Although the concept of "religion" is often reduced to a set of beliefs or a worldview, scholars have long been aware that a simple essentialist definition will fail to capture the complexity of the phenomena. Religion is as much about what people do in terms of ritual, codes of behavior, forms of social organization, diet, clothing, and devotional practices. To reduce it to its theoretical or speculative content is to distort its wider expressions and embeddedness in communities. Grace Davie (1994) has written about the phenomenon of believing without belonging. She refers to persistent forms of belief in the supernatural, amidst the decline of institutional affiliation, especially in Europe. Yet the converse may also be true as a longstanding feature of religion—belonging without believing. People can practice faith by attending to ritual, devotions practice, and ethical mores even amid some

uncertainty or unclarity about what they actually believe. Steve Bruce refers to this as "secularization from within" yet this seems to presuppose that religion is essentially about holding a peculiar set of beliefs (Bruce 2011, 11–13). Even people within the same close-knit group can believe quite different things or be unsure about how much or exactly what they believe.

Nevertheless, a coherent account of religion will have to say something about its cognitive commitments and how these contribute to emotion and behavior. Agustín Fuentes, an evolutionary anthropologist, has adopted an approach that views beliefs as socially and materially embedded. Religion is the "capacity for belief in the transcendent to establish powerful, persuasive, and long-lasting moods and motivations," a capacity that he detects in the archaeological record from at least 200,000–300,000 years ago, and co-extensive with other significant developments in tool making, language, and ritual practice (Fuentes 2019, 144–45).

The term "natural" is similarly open-textured. At least, three senses along a spectrum of meaning can be discerned. As animals, we need to eat, walk and sleep. These are natural activities that require little if any instruction. Instinctive or intuitive, we quickly acquire them even before we can speak. Other skills have to be learned though these might also be considered natural, for example speaking one's mother tongue. Activities can be quickly acquired to the extent that they are performed as if by "second nature." Riding a bicycle for example requires some practice but, once mastered in childhood, the skill is likely to remain ingrained until late in life. I am often surprised in Cambridge by how many people who seem in other respects quite frail and elderly can ride a bike without difficulty—I may soon be one of them. Nature can also be thought of teleologically, that is, in terms of what constitutes a fulfilled human life. We are social and rational by nature. This in turn generates a series of capabilities or functions that some philosophers regard as natural and morally significant for the fulfilment of our nature (Nussbaum 2011). To function well we need, for example, health, education, work, and friendship. Disputes inevitably arise over what else to include amongst the capabilities and functions that constitute a fulfilled life, these reflecting rival visions. But religion could be considered by its advocates to be natural in the second and third of these senses. By virtue of our constitution, we are disposed to act and think religiously by habit, though admittedly enculturation into a faith may be a more arduous process than learning one's mother tongue—Dennett (2007, 309) points out that learning a religion is more like reading than talking. And, with many theological traditions, one might hold that the fulfilment of our nature requires entering into a relationship with God, however understood, which imposes meaning, direction, and order upon our lives (Warner 2014).

On this reckoning religion may be affirmed as natural, though this should be distinguished from the idea of a single natural religion. The most sustained defense of this notion was offered by the deists in the early modern period. One

of their standard claims was that we have been constitutionally designed to know God, to intuit our moral duties, and to offer right worship. To this extent, it was a simple moral faith. The historical expressions of religion, according to the standard deist position, had tended to corrupt this natural faith by introducing a variety of particular doctrines, practices and institutional forms. But with some effort, it was judged possible to return to a pared-down natural religion held in common by all people (Byrne 1989). For this reason, divine revelation could offer at best only a "republication" of the truths available to reason. Yet, deism, as a discernible movement, had faltered by the late eighteenth century. First, there was no agreement on the actual content of natural religion. Both maximalist and minimalist interpretations were offered. For example, was the belief in life after death natural or the product only of some traditions? A further challenge arose from the historical study of religion. The more one studied the phenomena, the more the variety of religious forms became apparent (Harrison 1990, 99–129). As the evidence was sifted, assumptions about a common core became increasingly implausible. If monotheism was the natural default setting of religion, then polytheism must be a later corruption. Yet, the empirical evidence for such claims seemed thin, derived largely from a conjectural history based on the early chapters of scripture. In any case, could a natural religion be spiritually satisfying? Something deeper and more engaging was necessary for the human soul. The consequence was that a more emotional pietism flourished, partly as a reaction to an excessively rational approach to faith. The claim that every human being has the same or similar idea of God, i.e., a natural religion, manifestly ignores the evidence of religious diversity. What was then needed was a clearer distinction between religion as natural and a natural religion.

A Secular Narrative

The obvious objection to any claim today for religion as natural, in the sense that language acquisition is natural, is the seeming absence of faith in the lives of many, particularly in western societies. The position of "no religion" is fast becoming the default setting in the UK and elsewhere, with growing numbers of people ticking this box in surveys and censuses—37.2% in the 2021 census for England and Wales, a rise of 12% in a decade, and increasingly the preference of younger citizens. In Scotland, the 2022 figure was even higher at 51.1%. For many, "no religion" has become the assumed norm, as if it is religion that now has to be explained as unnatural, unnecessary, and implausible (Woodhead 2016). This set of assumptions might draw support from two related types of theory. The first is akin to the standard version of the secularization thesis. Under conditions of economic, scientific, and cultural advancement, religion will gradually cease to be of widespread public significance, becoming instead a fringe activity, a private lifestyle choice for the few rather than the many. This in itself is a complex story about the rise of personal autonomy, scientific and

technological advance, religious pluralism, and state neutrality. But for many the decline in religion in western democracies is to be explained by reference to these and other factors. The predictive consequence is that where these conditions obtain, we should expect the public and institutional expressions of religion to diminish. A second theory that informs the aforementioned assumption might be described as an "error theory" about the origin of religion. If religious belief is an irrational delusion then a natural rather than a theological account of its origin is required. An error theory will look at non-theological options for a story of origins. Once this is in place, we will recognize that religious adherence may be the result of some combination of social indoctrination, ancestral inheritance and psychological compulsion. Under the conditions of modernity, however, the autonomous human subject will tend to discard or significantly to modify earlier assumptions and practices around supernatural agency, divine commands, and post-mortem existence. At the very least, a more open mind on such matters is to be encouraged (Dennett 2007, 308–39).

This alliance of sociological and psychological theory can offer support for the default assumption that religion is an outmoded and largely irrelevant form of human activity that is becoming unnatural. If it persists, it can do so harmlessly as a leisure time pursuit. Where religion manifests itself more potently, it should be tamed by education, economic prosperity, and democratic forces. This story, I suspect, is regarded as highly credible by many of our fellow citizens. Yet, despite its prima facie plausibility, there is some internal tension between these types of theory, the sociological and the psychological. If religion is ingrained in human beings by deep evolutionary forces, then its disappearance seems less likely than its refraction. An explanation of religion as "second nature" may prove hard to reconcile with a theory about its disappearance under specified economic and social conditions. Given a persuasive story about the embeddedness of religion in human societies and its meaning-making habits, the primary *explanandum* will no longer be the persistence of religion in some quarters but its absence under specified conditions. What causes such a pervasive natural impulse to be suddenly deactivated? Why are some societies swiftly deviating from patterns that stretch back hundreds of millennia? Is religion more likely to evolve in different ways than abruptly to disappear? I shall return to these questions later.

Cognitive Science of Religion

Although the historical expressions of faith do not seem to have been preceded by a simple universal form of religion that can be excavated, the fact that human beings are disposed to believe and act religiously may be natural in important ways. In this context, the most significant recent development in the field has been the emergence of the cognitive science of religion as an established research program—two *Oxford Handbooks* dedicated to the subject have already

appeared (Liddle and Shakelford 2016; Barrett 2022). Located within the wider field of "evolutionary psychology," this approach no longer views religion as a unique and *sui generis* subject requiring a peculiar set of explanations. Instead, evolutionary psychology understands religion with reference to the capacities and dispositions that have evolved with the human brain. No longer to be compartmentalized, religion is an activity that has a similar evolutionary set of explanations to other forms of belief and behavior. Justin Barrett (2012, 19–20) offers the following summary:

> [G]iven a certain kind of biological endowment and the ordinary sort of world we are typically born into, we will typically develop certain properties and attributes. These sorts of traits—those that are almost inevitable because of our biology plus the regular sorts of environments people grew up in—are natural traits. We can leave the "hardwired" talk to electricians.

There are several recurrent explanatory elements in the cognitive science of religion (CSR) though these are assigned a different weighting by theorists. Our cognitive systems come already with capacities that are not culturally acquired—we are naturally equipped for some activities. Although these require initial instruction, they can be quickly learned after which they function intuitively. Robert McCauley (2011, 31–32) describes this in terms of a "maturational naturalness." Unless impeded in some way, we are conditioned to acquire a language in our early years, maybe more than one. Our minds are not blank slates but have various built-in biases. These are inherited as a result of long processes of biological adaptation. "Natural" in this sense does not mean innate. Instead, the concept refers to a set of capacities which under normal conditions will result in beliefs, skills, and practices. In the case of religion, these conditions result in beliefs in supernatural agents, practical responses to these within communities, and a series of rituals through which people orient themselves towards those invisible agencies.

The best-known explanatory element is the hyperactive agent detection device by which we over-attribute intentionality to our environment. This is apparent in other animals—a dog will bark at a sudden noise, for example snow falling off the roof, even when this is not caused by another agent. As a survival mechanism this is useful, particularly when detecting predators. An animal is safer in over-determining agency in its environment, than in under-determination which carries much greater risks. In infants, a capacity to grasp the significance of intentional agency is already apparent. Within several months, a baby can develop what has been called a "naïve physics," a sense of how objects can be moved by pushing and pulling, and how other agents have their own power of movement unlike stationary toys. This puts us on the lookout for agents that are nonhuman and unseen. As this capacity quickly develops, it

becomes easy for young children to think about gods and to believe in them (Barrett 2012, 41–42). Related to this is the early ability discerned in children to use "teleological reasoning." The "why" question is frequently raised. Research indicates that when pressed on why natural objects exist, about half the child respondents said that some*thing* made it. In the case of animals, three-quarters stated that some*one* made them (Barrett 2012, 49). Our natural tendency is to ascribe forms of personal agency to the making of the world and its inhabitants.

Related to this is a second recurrent theme in CSR, namely our capacity to conceive of counterintuitive agency. This involves a grasp of agents who cut across the more familiar categories of classification. Again, experiments with children show how well adapted they are for this sort of activity. They can imagine objects as animate and animals as personal, these possessing characteristics and behaving in ways that transcend their normal categories. This capacity to absorb counter-intuitive information is apparent in the case of religious concepts, for example investing natural objects with unusual powers or conceiving of invisible agents. Pascal Boyer outlines ways in which minimally counter-intuitive ideas (MCIs) are memorable and therefore more easily transmitted amongst people than more difficult and maximally counterintuitive notions. Those that have the most practical advantages will tend to be preserved and developed (Boyer 2001, 155–81; Liddle and Shackelford 2020, 5).

A minimally counterintuitive concept of a powerful supernatural agent with information and intentions can prove useful in organizing one's environment. Religion is closely connected with the expression and enforcement of moral codes. Here CSR theorizing has further traction. Minimal counterintuitive agents become potentially relevant in enforcing ethical norms given their capacity to influence the world through counterintuitive properties (such as invisibility and/or the ability to know human thoughts). These allow them to witness kindness or treachery and subsequently to reward or punish human agents. Because of this connection between MCI agents and morality, beliefs about MCI agents causing fortune and misfortune become intuitively plausible. While human beings may not have a general urge to explain everything in the world around them, they tend to seek explanations for events with significant consequences for their own survival and fitness. Having an explanation of misfortunes such as catastrophic illnesses, famines, and accidents might allow for the averting of such events in the future.

These are amongst the standard explanatory elements of recent work in the cognitive science of religion. No doubt they will continue to be discussed, developed and refined through further research programs. But what they suggest is that religion is "maturationally natural" in the same way that language acquisition can be considered natural. Experiments with children provide strong evidence that our minds have evolved in ways that dispose us to think, act and function individually and communally as religious. This field of study has

proved particularly attractive to scholars of comparative religion in offering an explanatory account via human evolution of the more pervasive features of religion long identified by social anthropologists and historians (Lawson 2022). We cannot find a society that lacked forms of religious expression—the cognitive science of religion can explain this by an evolutionary account of its universality and recurrent features. Religion, as an embedded element of human culture, has been around for over 200,000 years and sets us apart from other animals.

Commentary

In relation to the evolutionary psychology of religion, the recent theological literature remains underdeveloped with only a few scholars hazarding comments (Messer 2023). Others may think it not worth the effort, a reaction which I regard as mistaken. The following queries are offered as a modest contribution.

Is Cognitive Science of Religion Reductionist?

What do we do with these insights? Not surprisingly, the exponents of cognitive science of religion are divided over its theological significance. On one side, Daniel Dennett seems confident that it will provide a useful error-theory to explain why our brains have tended to delude us into believing and acting religiously. Once this is exposed, then the philosophical critique of religion that he favors is reinforced by a reductive account of religion. His use of cognitive psychology is part of a downward explanation in terms of material forces; a crane rather than a sky-hook, it represents a further extension of Darwinian commitments. Other practitioners of cognitive science of religions to share this skepticism, though often it is implicit rather than declared. The subtitle of Pascal Boyer's oft-quoted work *Religion Explained* is "*The human instincts that fashion Gods, Spirits and Ancestors*." This explanatory claim has some plausibility. The classical projectionist accounts of religion of Feuerbach, Marx and Freud struggled with empirical fit, their speculative quality often being noted. Yet we now have a putative theory rooted in robust scientific research programs and drawing strength from a wider body of work in evolutionary psychology.

But here we must distinguish causes and reasons. Much of the literature appears to lean towards theological skepticism, as if an evolutionary account of the emergence of belief will settle the issue of validity. Explaining becomes explaining away, since the causal factors must undercut any reasons for holding that religious belief might be true. Yet this is largely a question begging exercise. If we begin from a skeptical position, then a psychological theory might explain for us why so many people are gripped by an illusion. But the skeptical position is here presupposed rather than demonstrated. Causes and reasons belong to different frames of reference that are dependent upon the kind of explanation in view. We can tell a plausible causal story about the evolutionary factors that determine the emergence of religious belief in general. But further downstream

this doesn't answer the "why" questions about the specific beliefs, devotional habits, and practices that people intentionally pursue (Murray 2009). These demand evaluation in social scientific, philosophical, theological, and ethical terms. What reasons do people offer in support of them and are these valid? This evaluative exercise attends to a different order of understanding. An evolutionary predisposition towards certain types of belief does not exclude a subsequent exercise in determining their veracity.

One might of course reach a skeptical conclusion on the reasons for belief and then seek to explain its persistence in psychological or other terms. This is an entirely legitimate procedure, but we should be clear that there is still a different type of evaluation alongside evolutionary psychology. On this view, we might see religion as an evolutionary spandrel, an outgrowth of successive survival strategies that have shaped our brains. If we are skeptical about the claims of religion, then this will also function as an explanation for its prevalence, to which is perhaps added the hope that it can be suppressed or dissipated under specific cultural conditions. Paul Bloom claims that religion has no adaptive value for human beings; it lacks the obvious benefits that accrue from holding other sorts of belief about the world. Instead, he regards religion as an evolutionary by-product of pre-existing adaptations (Bloom 2009). As an epiphenomenon it is natural, but without much significance for human flourishing. This in itself is not a reason for rejecting its truth claims, he concedes, though he suggests that as a natural explanation it resists such positive evaluation. In principle, this might be right, but it requires an assumption of a different sort, namely that religion is unreasonable which of course must be a judgment less about psychology and more about theology. Other criteria of assessment need to be employed in this domain. And it remains open to the theist to claim that God might use this evolutionary outcome to dispose human beings towards belief in the supernatural. Thus, Peter Inwagen asks, "Why shouldn't [God] allow those features to be the cause of the thing he wants?— rather as the human designer of a vehicle might use the waste heat from its engine to keep its passengers warm" (van Inwagen 2009, 136).

Much of what takes place inside a religious community is intentional, shaped by tradition, interpretation of authoritative texts, and development of earlier positions. Other forms of description are required—these might be ethnographic, historical, philosophical, and theological. Religion is a multi-disciplinary field of study and should not be reduced to one totalizing theory. The temptation to assume that evolutionary psychology can do all the explanatory work should therefore be resisted. The study of religion is a multi-disciplinary pursuit, not the province of one method only; a plurality of forms of description is to be admitted (Laidlaw 2007; Jenkins 2022).

Barrett gestures towards something akin to a design argument (Barrett 2012). This evolutionary process reflects a divine intention which enables us to know God. Or to put the case more cautiously, what the science teaches

is not inconsistent with the hypothesis that this is what God intends. Just as the architecture of our brains equips us to perceive and interact with the physical world, so we have a capacity to know the spiritual world of invisible and supernatural forces. In this way, CSR can be aligned with Plantinga's reprise of Calvin. "The *sensus divinitatis* is a disposition or set of dispositions to form theistic beliefs in various circumstances, in response to the sorts of conditions and stimuli that trigger the working of this sense of divinity" (Plantinga 2000, 173). Yet Barrett is less inclined to see any convergence upon a single belief or set of beliefs. Our natural religious leanings are to be distinguished from the theologies of institutionalized forms of religion. These work in different ways, often requiring us to adapt, correct, and develop what seems natural in childhood. Natural religion is merely a beginning from which it will be formed and directed by the sources and norms of tradition.

If religion is deeply implicated in making patterns of meaning and providing a lived framework for a wider set of commitments, then its eradication looks less secure. Jonathan Sacks frequently argued for "the persistence of religion" through its capacity to offer meaning beyond the self, to generate a trust in an order that is not of our own making, to articulate a sense of responsibility, to evoke compassion, and to sustain communities of trust and friendship (Sacks 1991). Although this involves much more than giving intellectual assent to a worldview, an outline of what this entails theologically might proceed along the following lines. Our natural tendencies towards religious belief and practice develop into a sense of trust and dependence on what lies beyond us. In this outward movement, we encounter a correlative movement of God towards us. This interaction shapes and directs our forms of life. We do not begin with a clear and distinct idea of God and probably cannot attain one, but our naturally evolved religious tendencies may provide the setting for divine disclosure. In this way our nature can be said to find its fulfilment through grace. We reach our telos only through encounter with God, yet the conditions of possibility are established in our evolutionary make-up, especially in those ways in which we are "maturationally natural." Reconfigured in this way, the earlier assumptions of thinkers like Cicero and Calvin retain some plausibility.

Is There Too Narrow a Focus in CSR?

One worry is that these research programs concentrate only on the "weird stuff," with the result that the lives of faithful people are often distorted. By focusing on fairies, ghosts, apparitions and seemingly bizarre practices, the research ignores the more mundane activities that take place within a faith community—sharing meals, holding study groups, praying each day, participating in charitable work, trying to lead a decent life by loving God and one's neighbor. Many people might adhere to faith on account of friendship, loyalty to their family tradition, a conviction that their community is a force for good, and an overriding sense that this adherence generates

a meaning and structure otherwise lacking in their lives. Cognitive commitments can be quite minimal here though adherence will struggle in their absence or in the face of wholescale doubt. But a broader scope may be needed to avoid an overly cognitive approach to religion, though these explanatory elements will continue to have a place. Religion is deeply connected with making meaning out of our lives, rather than merely believing in strange supernatural objects. Patterns of adherence are better captured by Wittgenstein's parallel with tools and pictures for living, than by Russell's analogy with belief in a celestial tea pot orbiting the earth. In this context, Fiona Ellis defends a form of "expansive naturalism" which displays an openness to embedded practices and beliefs of faith (Ellis 2014). Through seeking to develop a pattern, an order, in which we make sense of our world and our place in it, the practice of a faith has both a practical and holistic character. Its broad scope connects with art, science, ethics, and politics. A framework is generated in which people experience, understand, and interact with the natural and social worlds. A sense of the divine is given only in, with, and under the world in forms of "mediated immediacy" (John Baillie 1939, 178–98).

Though cognitive science of religion can broaden its range, some critics have charged it with neglecting the more practical and integrative features of religion. The reductionist account looks more plausible if we misconstrue religion as merely about the "weird stuff." We can overcome superstitious habits of thought, at least in our better moments. Yet the broader scope of religion should make us wary of a narrowing of perspective with the consequence that the dismissal of faith becomes too easy for the skeptic.

Should Theologians Declare Independence?

A more drastic option is simply to dismiss the whole project on theological grounds as showing the error and confusion that surrounds our natural religious inclinations. The cognitive science of religion would then serve the purpose only of showing how unreliable these tendencies are in relation to a genuine knowledge of God. In this context, the program has been dubbed by several authors as the "cognitive psychology of idolatry," given the very different shape of classical theism (Jong et al. 2015). This manoeuvre is an overture to a positive theology that appeals not to nature but to grace. A genuine knowledge of God and of ourselves derives from Christ, Scripture, and the teaching of the church.

Despite its attractions, this disjunction of nature and revelation, and of science and theology may be too forced. The separation implied here between popular religion and classical theism seems to be purchased at the high price of ring fencing an abstract, philosophical form of theism. Since we can learn much about ourselves from the natural and social sciences; it is incumbent upon the theologian to show how this is consistent with the core convictions of faith. Moreover, much of what we find in established religions appears to transpose earlier layers of ritual, bonding, behaviors, and experience; these are not simply

discarded. The elements of ancestral religion remain present, albeit in different forms (Pannenberg 1991, 105).

> One reason for claiming that the ancestral immersive forms of religion still underpin doctrinal religions is the fact that most of the elements that are used to bond small-scale communities, and which form part of shamanic or immersive forms of religion, are still present in all the doctrinal religions. These include singing, dancing, synchronized behaviours, the telling of emotionally charged stories, ritual fasting and feasting. (Dunbar 2022, 262–63)

Almost all theologians have seen our nature not to be destroyed but to be transformed by the practice of faith. Rituals, ethical codes, a belief in supernatural agency, and the practice of prayer are enduring features of our religious traditions. These are inflected in manifold ways, though there is an obvious elemental continuity that cannot be ignored (Gornandt 2023). Much of this activity now takes places outside of traditional institutional locations. As David Brown has remarked, if ten times as many people outside the church believe in God, then it behooves theologians to pay attention to this phenomenon and not merely to discard it as idolatrous (Brown 2017, 74). A complete disjunction of nature from grace seems impossible; hence, a conversation with evolutionary psychology is well worth having.

Do Theology and Science Share Some "Unnatural" Similarities?

The distinction between natural religion and theology recalls the cautionary remarks that theologians have often made about our natural religious impulses. These require to be scrutinized, sifted, and at times overcome—the verbs that are deployed will signify the degree of modification proposed. Iain McGilchrist represents this in terms of left and right hemispherical activity in the brain (McGilchrist 2021, 1193–304). All the major religions of the world reflect not merely the unchecked impulses of nature but centuries of reflection upon sacred texts, devotional practices, rituals, and moral codes. Shifts in thought and action are evident across space and time. Much of what is taught may be at odds with some of the religious dispositions that evolutionary psychology has described. Examples that are offered include monotheism. This seems not at all obvious from the perspective of childhood tendencies to believe in an array of invisible agencies. Yet it is an axiom of at least the Abrahamic faiths. One might also point to other key theological themes. The unity of the church across space and time may be an ideal that seems at odds with the tendency for religion to define an in-group that excludes outsiders. This might explain in part why factionalism and schism are so rife in Christian history and why theories of universal salvation engender vehement criticism.

The doctrine of justification by grace also cuts across instincts about getting our just deserts. A sense of unfairness is never far away when we learn that the

unrighteous are to be rewarded instead of punished, though in our own case this is an injustice of which we are unlikely to complain. Christian people have long felt some sympathy for the resentment of the elder brother upon learning from the servants that his father has thrown a party to celebrate the return of his waster sibling to the household. And did Martha really get a fair deal when Jesus commended her sister who had failed to help with the dinner? These illustrations expose the ways in which church teaching sometimes confronts our natural instincts, seeking to raise us to a better understanding of God and ourselves. Such teachings are hard and are often resisted in subtle ways. In this respect, theology may be more like science in the contribution it makes to our knowledge. The scientist seeks not to manipulate the world but to understand it through theorizing of an abstract quality. While this has often produced results of stunning practical importance, the drive to understand and explain often requires thinking in counterintuitive ways (Macaulay 2011, 107–10).

The reason for this is that the world is not always the way it seems to us by virtue of our natural cognitive inclinations. Hence the Copernican hypothesis is not how the solar system initially appears. Micro-organisms were discovered in the seventeenth century, but only later were these recognized as the cause of diseases, these causes being seemingly disproportionate to their effects. And, as has often been pointed out, Darwinism has proved difficult for many people owing to its complexity in the face of earlier hypotheses of divine design. How could an organ like the eye evolve incrementally? How could very different species be the products of common ancestral origins? "Science becomes cognitively unnatural because it reliably traffics, usually sooner rather than later, in representations that are *radically counterintuitive*" (McCauley 2011, 107). This applies a fortiori to quantum theory, string theory, and concepts of anti-matter.

There may be something similar happening in theology. In distinguishing our religious instincts from the convictions of longstanding faith traditions, we start to see the importance of theology. As a second-order reflection on what we do in devotion, ritual, prayer, and practice, it applies a critical standard that can variously confirm, contest or correct what is happening inside a community of faith. This task is a continuous one in face of new challenges, cultural shifts and intellectual advances. Religion needs to be saved from its own distortions and pathologies, and from becoming coopted for political and violent purposes. To this end, secular as well as internal criticism is necessary.

Will Faith Persist?

If the claims of evolutionary psychology have some validity, then we need to revisit the standard model of secularization. This predicts that religious adherence will decline irreversibly as societies become better educated, wealthier, more diverse and tolerant, and less capable of enforcing a single religious identity (Bruce 2011). There is some strong evidence for this if we consider the rapid decline in churchgoing in western Europe since the 1960s.

But if the aforementioned evolutionary explanations have plausibility, then this thesis will need to be revised in two ways. First, religious decline should be more cautiously characterized as local and time-bound—secularity may prove to be the exception rather than the rule. A scrutiny of global patterns reveals a complex mosaic of religious affiliation, some of it increasingly strong in societies that are undergoing rapid modernization. And if we consider the history of the UK, we find earlier patterns of decline followed by "fresh expressions" in the form of new movements, revival, and institutional readjustments (Martin 2005).

A second query concerns the likely effect of the decline of institutionalized religion in our own context. Given our natural dispositions, we might expect a manifestation of religious tendencies in different ways. The phenomenon of the "spiritual but not religious" is receiving increasing attention, though whether this offers much in terms of cohesion and commitment is doubted. Much of the green movement has a spiritual dimension with its language of the sacred, its reverence for nature, and its quest for creaturely harmony. Different forms of spiritual awakening make the so-called new atheism of the earlier part of this century now look dated. And merely to dismiss successful adaptations of faith as ways of internalizing secular values or hollowing them out from within seems somewhat contrived (Bruce 2011, 171). As T. S. Eliot averred, a religion is always adapting itself into something that can be believed (Eliot 1940).

The secularization thesis does however characterize changes that have become evident in many western societies. There is little likelihood of a return to an earlier era in which one expression of faith was the default setting for our society. Nevertheless, a sudden heat death of faith followed by an era of indefinite indifference seems an improbable prospect. More likely we will see a plurality of forms marked by what Charles Taylor has called "fragilization" — the fragility of faith in the presence of so many available options, this fragility extending also to forms of atheism and agnosticism. Many people will hover over the borderline between belief and radical doubt. Taylor wagers that faith will persist albeit in new ways since the secular alternatives offer no adequate substitute in our striving for meaning, order, transcendence, transformation, and wholeness (Taylor 2007, 426–37). Where this will lead is hard to predict—prognostications of irreversible decline or a return to the status quo ante are hazardous, but it seems highly unlikely that religion is set to disappear irreversibly here or anywhere else.

Many may find themselves on the borderland country of a half-forgotten faith that can still ambush us, an experience evocatively expressed by Carol Ann Duffy in her poem on "Prayer." If meaning making, a sense of the sacred, and ritual expression continue to shape our lives then the ways we live will reflect something of the inherently religious setting of the human condition. Even in the absence of intellectual clarity and institutional commitment, manifestations of our religious nature can be expected.

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Is Religion Natural? Response to David Fergusson

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This response to the 2024 Boyle Lecture takes David Fergusson's lecture "Is Religion Natural?" as a starting point from which to discuss some of the philosophical issues that arise in this context. It raises the question of how we are to think about the limits of the natural, expresses some doubts about the explanatory pretensions of cognitive science of religion, and draws out the implications for the topic at hand, drawing upon an expansive naturalist framework.

David Fergusson has offered a rich and hugely interesting response to the question of whether religion is natural. He has identified some important methodological themes (What is the best way to approach this question? Is it adequately comprehended in scientific terms?); made explicit the question's relevance for the atheist/theist debate; and made clear that there are obscurities in the very terms of the question—obscurities that should make us hesitate before jumping too quickly to a conclusion. In what follows I want to touch upon all these themes, using my discussion to expand upon some of the central insights of Fergusson's magnificent lecture.

Let me begin by saying something about the significance of the question "is religion natural?" It is of particular significance in the current intellectual climate, for the default position in much (but not all) philosophy and science is that naturalism is true and the only intellectually respectable position. Naturalism is defined negatively as anti-supernaturalism, where this is said to involve an opposition to things like God, gods, souls, and all the other spooky supernatural things taken seriously by the supernaturalist. This leaves us with the suitably sanitized natural realm, which has been shorn of the offending items (Ellis 2014, 8–15; De Caro and Macarthur 2004, 21–35). Understood from this perspective, the question "is x natural?" is appropriately loaded. A negative answer suggests that x is supernatural, spooky, and not to be taken seriously; a positive answer suggests that x can be taken seriously after all. The implication here is that we need to be able to say that religion is natural if we are to take it seriously.

Things are rather more complex than this simple narrative suggests for several reasons. First, it needs to be made clear how the notions of naturalism and the natural are to be understood at a more positive level, that is, once we have made clear what is to be avoided (the supernatural, that is, the spooky). Second, the notion of religion is itself rather difficult to pin down. For example, it can be taken to be synonymous with "the religious" (as when we say that human existence involves a religious dimension or when we talk of a religious person or a religious experience). However, it can also be understood as a social phenomenon, as when we talk of organized religion or following a particular religion or losing one's religion. This is not to deny that the two interpretations can be and often are intertwined. The point is simply that they can be separated too, and, depending upon one's focus, can yield very different questions—Are religious experiences natural? Is it natural for humans to be religious? Are religions, or some religions, natural? Add to this the worry about the very meaning of "natural" and a kind of vertigo begins to descend.

We can begin to get a grip on this vertigo by turning, as Fergusson does, to the cognitive science of religion. This turn is significant for my purposes because one way of addressing the question of what "natural" means at a more positive level is to define it in scientific terms. Thus understood, the natural is

equivalent to the scientific and the question of whether some x is natural (and hence respectable) becomes the question of whether it can be comprehended scientifically. There are some inevitable oversimplifications here, but the claim to be explored now is that religion counts as natural to the extent that it can be comprehended in scientific terms, and one significant science in this context is cognitive science. More specifically, the idea is that religion and the religious are, in a sense to be further explained, the products of natural cognitive processes. But what does this mean? Is the idea that religion and the religious can be shown to be mere constructions of human cognition? Or is it that the relevant cognitive processes put us in a position to discern what is really there? These metaphysical questions must surely exceed the limits of the cognitive science of religion alone, although as Fergusson illustrates, there are attempts to vindicate a theistic approach along such lines through the idea of a hyperactive agent detection device—the human mind can discern agential characteristics in things, and this is how we are prompted to believe in God. Yet, this does nothing to resolve the metaphysical question of whether the activation of this natural tendency in a religious context puts us in a position to discern what is really there or whether it is just one more example of the mind's tendency to spread itself on things. The cognitive scientist who is an atheist will insist upon this latter response.

Where does this leave the question of whether religion is natural? Cognitive science can tell us an awful lot about the cognitive processes without which we should be unable to enjoy religious states of mind and engage meaningfully in religious practices, and, to the extent that this approach is scientifically legitimated, we can say that religion and the religious can be naturalized to this degree at least. However, this level of explanation must remain silent on the question of the truth or falsity of religious experiences or religions and whether we should be theists or atheists. For the resolution of these matters, we need to ascend to a different, nonscientific level of explanation, and we must be prepared to also allow that, at a certain limit, explanations themselves must come to an end. We are, after all, operating at the blurry limits of our capacity to comprehend in such contexts, and we can reject this limitation only at the cost of lapsing into idolatry.

Am I denying that religion is natural? Certainly I am if this means no more than that it cannot be comprehended without remainder in scientific terms, and it should hopefully be clear that this is not a rejection of science but a rejection of scientism—the assumption that science is the only respectable measure of reality. So, I am suggesting that there is more to religion (and the religious) than what can be comprehended scientifically—it goes beyond "the natural" in this scientific sense. However, and bearing in mind the seal of intellectual respectability that comes with the "naturalist" label, I see no reason to deny that religion and the religious could be natural in a more expansive sense.

What could this mean? It involves allowing that there is more to the natural than what can be measured scientifically, that this does not preclude the possibility of saying something intelligible and explanatory about the relevant phenomena (there is more to explanation than scientific explanation), and that there will be instances where our explanations just give out. But is this not the point where the supernatural comes into the picture, and with it all the spooky phenomena that the naturalist is desperate to avoid and which religion and the religious surely involve? My considered response to this—as an expansive naturalist—is to challenge this pejorative way of characterizing religious phenomena and to make a plea for a conception of the natural world—and our natural human being—that is broad enough and open-minded enough to accommodate the possibility that, *pace* a certain kind of dualist, we are not, as Williams James (1987, 641) put it, "left outside of the deepest reality in the universe" but "substantially fused into it." There is a sea of philosophy and theology in this important idea, but it is one that suggests that religion and the religious are the most natural things of all and that they put us in touch with the deepest realities. The atheist will naturally protest that this is way too spooky to be taken seriously, but there are two responses to this. First, it certainly does sound rather spooky if it is a matter of allowing that our hyperactive agent detection devices do, after all, put us in touch with a super-weird being who exists at the deepest recesses of the universe (Nicholas Lash (2009, 39–50) called this "Loch Ness theology"). Second, however, we must challenge the assumption that this is an appropriate model through which to comprehend what it could mean to relate to God and consider the possibility that the supposedly more mundane activities Fergusson details—being decent, living a decent life, loving—are genuine parts of what it means to be truly religious and that it is at this level of interaction that we are "substantially fused" into the deepest reality in the universe.

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Should Theologians Answer the Question "Is Religion Natural?": Panel Contribution on the 2024 Boyle Lecture

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In his 2024 Boyle Lecture, David Fergusson takes up the question "is religion natural?" In response, this panel contribution provides four reasons why theologians should be hesitant to offer answers to this question. Debates on the naturalness of religion are (1) frustrated by intractable disagreements about the definition of key terms, (2) a trap for theologians, (3) often exclusionary to autistic people, and (4) serve no practical purpose. I conclude by conceding that Fergusson's unique combination of deep theological reflection and concrete predictions for the church relieves many of these worries.

I want to thank David Fergusson for this very clear and illuminating discussion of the question "is religion natural?" I have never been a particularly big fan of this question, not because I think its uninteresting, not at all, but because I have often concluded that silence is probably best theological response we can give. Those who will know me may be somewhat surprised to hear this—so, I will give four reasons for this silence shortly.

However, I want to start off by saying that Fergusson has gone some way towards convincing me this is a topic that a theologian can engage with profitably and that the hard work of grappling with the various dimensions of this question is work that, if done well, may yet be worth doing. Let me explain my prior skepticism about engaging this topic.

The first reason, expressed most eloquently and insightfully by both David Fergusson as well as in Fiona Ellis's response, is the realization that so much in debate depends on the definition of the quite undefinable, key terms. The concepts of "religion" and "natural" are not only difficult, multifaceted, or historically contingent; they are not just open concepts identifiable through examples but not definitions; they are not even just family resemblance terms with fuzzy boundaries, and they are not just invented in modernity and so treated with some measure of suspicion by theologians. The situation, I suggest, is even worse than this. "Nature" and "religion" are what the philosopher W. B. Gallie (1956) called "essentially contested concepts." "Religion" and "nature" are normative concepts that admit no one authoritative definition, because all parties willingly recognize that there are a variety of seemingly legitimate meanings for these terms *and* agreement cannot be reached through evidence or logical argumentation. Instead, there seems something permanently intractable about disagreements on the proper use of the terms "religion" and "natural." Further, as Fergusson points out, the way much cognitive science of religion (CSR) has operationalized the term "religion" to refer almost exclusively to "the weird stuff" is further cause for theological dismay. Such a situation tempts me towards a kind of exasperated reticence on this issue.

The second reason for silence is the lingering feeling that the question "is religion natural?" is something of a trap for the theist. As Ellis outlines, if we answer "no," then, in an intellectual climate dominated by naturalism, this answer seems to give our colleagues license to dismiss religion as an intellectual indefensible superstition. But, if we answer affirmatively—"yes, religion is natural"—then we risk inviting reductionist claims of explaining away religion as epiphenomenal or something humans will grow out of as we continue to evolve. As Fergusson notes, such conclusions are often presupposed rather than demonstrated. As such, the empirical evidence makes little to no difference to the ultimately metaphysical debate about the veracity of religious beliefs. Fergusson's lecture aside, theistic explanations for the naturalness of religion relying entirely on divine providence as an explanation seem too deistic and

defensive to garner much theological enthusiasm. Whether answered "yes" or "no," therefore, responding to the question "is religion natural?" seems to leave the believer in a worse position than with which she started. Again, this situation pushes me towards a more prudent form of silence.

As an aside, it might be of interest to note that not all agnostic naturalistic philosophers have taken a reductionist line in response to the naturalness of religion. In his 2019 book *Religion after Science,* J. L. Schellenberg argues that, in the perspective of deep time, the human brain should be considered woefully immature, and we should expect cognitive mechanisms for divine detection to improve considerably over the next 10,000 years. His plea, mostly aimed at the religious "nones," is that religion is far more complex a topic than science, and whereas we've reached a suitable evolved state for scientific progress, we need to wait another 10,000 years before we should expect to see comparable religious progress. I do not fully agree with this argument, but I offer it as a highly original and creative perspective on this otherwise well-worn topic.

Returning to my reasons for silence, my third reason for hesitance arises out of my current research project on autism and theology. In brief, many of the main theories in CSR, such as the hyper-agency detection device, counter-intuitive concepts, and theory of mind mechanisms, have argued that we know religion manifests through these cognitive mechanisms because autistic people an impaired in these mechanisms and tend to be less religious (see McCauley and Graham 2020, 157–210). And yet, autistic people clearly *are* religious and deeply spiritual. Reasons for lower attendance in institutionalized religion are more likely social, sensory, and linguistic than cognitive or affective. I think that leading theories of CSR have yet to consider autism seriously and holistically, and that, if they do, they will find that, autistic spirituality provides important counterevidence to current thinking and offers new avenues for future research. That is, I remain hesitant to fully endorse contemporary theories in CSR because I worry it stands on shaky foundation of neurotypical normativity that needs to be revised, and I do not know how the field (CSR) will look after it has wrestled with this challenge.

Finally, my fourth reason for reticence is the culmination of the previous three. After the hard work of defending one's preferred definitions of these essential contested concepts, carefully surveying the empirical evidence and realizing that it makes no substantial difference in apologetic debates, and may stand on ableist foundations, I want to throw my hands in the air and ask what was the point in all this anyway. What is really at stake in the question "is religion natural?" Why should we care?

To this, Fergusson provides an innovative answer: affirming the naturalness of religion allows us to contextualize the apparent decline in traditional, institutional religion in Western liberal democracies to provide both comfort and challenge to traditional churches.

Fergusson does this by, somewhat unusually for theologians, offering a prediction. In fact, it is an empirically testable hypothesis: religion is unlikely to disappear so much as be refracted in the future. The comfort in this prediction is in how it rejects the more pessimistic predictions of the secular narrative. But predictions do not merely comfort, they can also impact and direct contemporary behavior. The challenge then is the implication that churches should attend to, and cultivate engagement with, the places where natural religiosity is manifesting in our local contexts, outside of traditional institutions, rather than decry these as idolatrous—the spirituality of the green movement is one Fergusson points to, another might be the persisting cultural interest in ghosts and seances and the popularity of the religiously saturated horror genre in literature, theatre, music, and film.

Does such advice irresponsibly ignore the plausible connection between the naturalness of religion and John Calvin's description of the human heart as "a perpetual factory of idols" (Calvin 1960, I.11.8, 108)? It need not. Humans are as likely to make idols within traditional institutional religion, which draws on our natural tendencies, as it is to extra-institutional spiritualities. It is for this reason that we perhaps urgently need neurodivergent people, whose natural religiosity manifests differently and so will have different biases, in our churches to help, as Fergusson says, "prevent us from believing too much in the wrong things."

What I appreciate most about Fergusson's lecture is how he links this ultimately very practical and pragmatic challenge for the church to a deeply theological picture of God's grace not fulfilling but surpassing our natural capacities. His prediction does not merely lead to evangelistic opportunism but a theologically rich picture of the God who rushes from his house to meet the prodigal son and whose grace can ambush us as a memory, a longing, or a prayer that utters itself.

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What Is Natural: Religion, Nonreligion, or Theology? Panel Contribution on the 2024 Boyle Lecture

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This brief panel contribution responds to David Fergusson's 2024 Boyle Lecture that explored the central questions and controversies raised by a consideration of the claim that religion is natural. I pick up and further develop consideration of two aspects of this much larger discussion to offer some pointers for additional reflection on this fascinating cluster of debates. First, I consider the impact on Fergusson's argument of increased attention to the category of "nonreligion," raising the question of whether it might be nonreligion, as opposed to both belief and unbelief, that might be considered natural. Second, I turn from religion to theology, suggesting the importance of considering the naturalness of theology via Paul Tilllich's neglected notion of *Grundoffenbarung*.

David Fergusson's 2024 Boyle Lecture expertly explored the central questions and controversies raised by consideration of the claim that religion is natural. In my brief panel contribution, I simply pick up and further develop consideration of two aspects of this much larger discussion. In doing so, I do not intend to express any significant disagreement with Fergusson's analyses, but rather offer what I hope are some helpful pointers for additional reflection on this fascinating cluster of debates.

First, as Fergusson rightly notes, one of the most helpful ways to approach the question of the naturalness of religion is to ask what religion might be if it is not natural. For some—and indeed this is clearly the response with the greatest historical precedent (at least in the Christian tradition)—religion is not natural precisely because it is directly dependent on God and God's self-revelatory activity. Encapsulated by the dictum that there can be "no Christianity without Christ," on such a view a claim to the naturalness of religion is an affront to the origins and sustenance of religion as a response to the divine gift of God's own self revelation. To claim that religion is natural risks presupposing, in T. F. Torrance's phrase, that there is some kind of natural remainder "behind the back of Jesus"; instead, the Christian religion is what it is in fidelity to God's unveiling and the confidence in God's ongoing presence to history.

For others, by contrast, religion is not said to be natural in as much as it is held to be the constructed—artificial—product of humanity. Religion, according to this view, is as much a part of human culture as the arts and the sciences, and, just like these other conventional phenomena, religion is subject to the same forms of historical or scientific explanation. Whether based on analyses of their common characteristics or, conversely, the cultural diversity of religious beliefs and practices, such explanations tend to endorse a debunking approach that finds the roots of religion in human culture and societies as a superstruct or optional extra to the natural necessities and desires of human existence.

An alternative view Fergusson discusses at length in his Boyle Lecture suggests, largely as a corrective to the cultural accounts of religion, that there is a natural (scientific) basis for religion in human evolution. As Fergusson notes, the claim that religion belongs to us by nature, as much as language or reason, is in itself agnostic about the truth value of religious beliefs and practices, but nonetheless provokes important reflections for both believers and skeptics alike regarding the extent and ways in which religion seems bound up with the natural evolutionary emergence of humans as the sort of creatures we have come to be. In other words, irrespective of whether research in the evolutionary sciences of religion is put to apologetic or antagonistic use, what is striking is that this is a research program that takes seriously the reality of religion. The upsurge of debate surrounding new atheism the rise of work in the evolutionary sciences of religion has not only rekindled interest in Fergusson's question but has also

ensured that an affirmative answer—that religion is indeed natural, albeit in a different sense than traditionally held—is a serious option.

More recently, however, developments in the scientific study of religion and notable demographic shifts in many societies have started to concentrate on a subtly different, whilst related question: "Is nonreligion natural?" The rise of the so-called "nones" draws attention to the seemingly increasing prevalence of those for whom religious affiliation, beliefs, and practices are not so much contested as irrelevant. As Linda Woodhead helpfully clarifies, these non believers are not primarily opposed to religion but are rather indifferent to it: they are neither militant atheists nor are they appropriately classified as the "spiritual but not religious," for whom the questions and meanings of traditional religions are still of interest, even while rejected in favor of newer or revived forms of "spirituality." While the methodologies and conceptual tools for the study of "nonreligion" are still being refined and the quantitative data underlying the investigations is—quite naturally—hotly disputed, what does seem clear is that there is a significant (and likely growing) proportion of humanity that is "without religion," suggesting perhaps that it is nonreligion that is natural.

In some ways, a confirmation of the grand theory of secularization, the claim to the naturalness of nonreligion, affirms both more and less than the kinds of scientific atheism and metaphysical naturalism that had previously occupied the vanguard ranks of the army of cultured despisers of religion. The claim to the naturalness of nonreligion is, in important ways, a more limited claim in that it is precisely non-antagonistic: the nones tend to affirm an inclusive tolerance of religious beliefs and practices, provided these are themselves inclusive and tolerant. Lacking a positive credo, nones are, on the whole, ambivalent towards those who wish to affirm a religious affiliation, on the understanding that religion is a matter of personal choice, like many other characteristics formerly understood as essentialist, such as race, sex, and gender.

At the same time, however, a robust account of nonreligion raises a more significant challenge to those, such as Fergusson, for whom the question of the naturalness of religion ought to remain a valid, if not uncontested, one. "None-ism" is, in important ways, more than simply a novel opponent to religion; instead, the refusal to endorse—or crucially, to oppose—any particular religious affiliation, belief, or practice raises the prospect of a really radical alternative to the whole religious–nonreligious dichotomy. Reminiscent perhaps of Nietzsche's "last man" (*Letzter Mensch*), the nones may be considered a contemporary realization of the archetypal passive nihilists for whom any form of commitment or positive affirmation is anathema. Indifferent and apathetic, the nones are without political and ideological affiliation as much as they are without metaphysical and ultimate concern, such that the very question of what is natural is itself suspect. If nonreligion is the norm, then it is, to an important

extent, not itself natural: neither the presence nor absence of religion is natural because there is no definable natural state of humanity beyond indifference.

My second discussion point follows from the challenge, as I have presented it, of a robust account of nonreligion for the question of the naturalness of religion. My provocation, in short, is that the cluster of issues Fergusson addresses through the lens of the question "is religion natural?" might more productively be engaged, in a post-religious context, by a further shifting of focus from religion to theology. The question "is theology natural?" asks not about the truth or otherwise of any particular religion, nor indeed the normativity of religion *per se*, but rather is a question about the naturalness or otherwise of theological enquiry. That is to say, to affirm the naturalness of theology is to affirm the legitimacy the horizon of the ultimate for humanity. Rather than restricting—with Karl Barth, for example—theology to an activity of the religious (or anti-religious), the enterprise of natural theology extends the exercise of ultimate concern to even those without any religious affiliation or disaffiliation. Indifference in the face of religion ("none of the above") is not the same as indifference to the basic theological question of why there is something rather than nothing, and the affirmation of the naturalness of such theologizing stands as an effective response to the otherwise all-pervasive apathy of the Nietzschean last man.

Here we might turn, unexpectedly perhaps, to a reconsideration of the concept of revelation, and more specifically, Paul Tillich's notion of *Grundoffenbarung*. Difficult to translate adequately into English, Tillich sets up *Grundoffenbarung* alongside what he calls *Heilsoffenbarung* and seeks to draw a dialectical account of a distinction between the specific content of revelation (for example, in the case of Christianity, the saving act of God as Christ) and the content-less revelation of ultimate reality. To put it in decidedly non-Tillichian terms, *Grundoffenbarung* is that "natural revelation" that legitimates the very possibility of theological enquiry *per se* prior to any specific religious beliefs or practices. On this account, theology is natural insofar as the indifference of nonreligion is overcome in the risked venture of an ultimate concern: that inkling, available to us all in one way or another, of the richer naturalism that characterizes the world's diverse religious and spiritual traditions.

David Fergusson has given us a welcome invitation to continue to reflect on the importance of the question of naturalness in religion and theology and has shown that such reflections take us far beyond the reductive either/or of pious dogmatics versus scientific atheism. To explore whether and in what ways religion might be said to be natural—and by extension the naturalness of theology—is to engage with profound considerations at the heart of the science-and-religion field as we move further into our post-religious, but surely not post-theological, future.

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