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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 Religious expression in our time, however, has not drawn similarly on modern science, which has superseded the ancient forms of understanding.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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Contact Information. Editor-in-Chief: Professor Arthur C. Petersen, arthur.petersen@ucl.ac.uk, Department of Science, Technology, Engineering and Public Policy, University College London, Gower Street, London WC1E 6BT, UK. Book Symposium Editor: Professor Mladen Turk, turkm@elmhurst.edu, Department of Religious Studies, Elmhurst University, USA. Address for Corporate Affairs: 5416 S Cornell Avenue, Fourth Floor, Chicago, IL 60615, USA.

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Editorial

Orthodoxy and Popular Culture

In this Editorial for the March 2025 issue, you will find a brief overview of the articles included in this issue, both in the general section and in two thematic sections, as well as an overview of books reviewed in the latest edition of *Reviews in Science, Religion and Theology*.

Articles

This issue contains four general articles. Jaime Tatay localizes and contextualizes the science-and-religion debate by examining the growing literature on sacred natural sites; he shows how mutual engagement between religious studies and conservation biology on this topic will benefit both. Junghyung Kim flags the importance in discussions on highly advanced artificial intelligences (AIs) to move beyond a focus on human–AI interaction; he emphasizes humility and pushes for ethical–political consideration from a planetary perspective. David Jalajel and Shoaib Malik assess the role of classical Sunnī theology in Islam-and-science; they propose that many perceived conflicts between Islam and science stem from misunderstandings, and that classical Islamic theology holds untapped potential for constructive engagement with scientific developments. Finally, Zachery Moffatt provides a study of miracles; he challenges philosophical and theological orthodoxy and argues that Augustine’s alternative conception of miracles upholds an intimate connection between God and nature while respecting the intrinsic wonder of miracles.

Popular Culture and Science and Religion (by Anthony K. Nairn)

Popular culture plays a significant role in most of our lives. Whether we are children developing interests, teenagers learning about the greater world, or adults navigating our way through an increasingly changing world, popular culture surrounds and informs us. We see examples of it waiting for the bus or the train, and we hear examples of it on the radio, in the car, or the shop. We are ever surrounded by popular culture in its many mediums, directly or indirectly. The fact that the music, film, video game, and social media industries are some of the largest, most lucrative, and pervasive, amounting to around half

a trillion dollars combined, should not be a surprise. It has long been understood that popular culture influences, informs, and shapes the psychophysical profiles of people all across the globe. Yet, this powerful, pervasive area of study is still relegated to the outskirts of the academic arena.

This thematic section was brought together over the course of the summer of 2023, where I organized two panels at two separate conferences, one in America and one in the UK. I aimed to bring together scholars who work on popular culture and touch upon areas of our field of science and religion. Having a rather direct role in the field of science and religion, given my role with the International Society for Science and Religion (ISSR), I wanted to bring popular culture more visibility than I felt it had received, while simultaneously broadening the horizons of what constitutes avenues of engagement with “science” and “religion.”

In my own article, I aim to present a helpful source of instruction for our field of science and religion, highlighting important texts that have influenced my thinking on science and religion. Although scholarship on science and religion has expanded, its insights remain estranged from popular culture. I use Christopher Nolan’s *Interstellar* to show how theological motifs such as the Trinity, resurrection, and divine intervention coexist with hard-science frameworks, exemplifying a nuanced bridge between secular and spiritual narratives. I urge scholars to engage critically with popular culture.

Mark Alan Lokensgard looks at the CBS/Paramount program *Evil*, a horror genre show that draws dramatic and sometimes comic tension from the clashes among psychologist Kristen Bouchard, seminarian-in-training David Acosta, and tech expert Ben Shakir, whose divergent faith journeys shape their investigations of Church-commissioned paranormal cases. By staging their conflicting epistemologies against popular notions of science and religion, the series critiques rigid dogmas and, via its minor characters, intimates a more courageous, undogmatic way of confronting the unknown.

Emma St. Lawrence offers a unique perspective for science and religion scholars, showing that while the COVID-19 pandemic’s upheaval dissolved once-stable social frameworks, the “reality shifters” collective experiments at the nexus of science and spirituality reconfigure experience from the inside out, using intentional techniques to traverse and mold alternative worlds. Eschewing debates over empirical proof, the article frames reality shifting within a wider cultural pivot toward epistemic fluidity, positioning it as a liberatory prompt to reconsider how we construct and may reimagine our reality.

Ademola Kazeem Fayemi, Akinmayowa Akin-Otiko, and Emmanuel Ofuasia combine conceptual reasoning with thematic analysis of interviews with seven priests in southwestern Nigeria to scrutinize the moral and epistemic quandaries that arise when sacred oracular knowledge meets algorithmic mediation amid mounting ambitions to digitize *Ifá* divination. The respondents are sharply divided: while some praise computerized *Ifá* as a progressive confluence of technology and spirituality, others warn that automation risks

corpus misuse, spiritual dilution, and indiscriminate public dissemination, leaving the tradition's future uncertain.

I hope that with this collection of articles, a door opens that was previously closed, that more time is directed towards understanding the ways that popular culture is central to the role of perceptions of science and religion, broadly conceived, on the broader public.

Science and Orthodoxy around the World

(by Gayle Woloschak, Perry Hamalis, and Elizabeth Theokritoff)

The relationship of science and Orthodox Christianity has been shaped by theological, cultural, and historical contexts that have influenced scientific and religious inquiry. This relationship has been explored by different groups, among the most prominent of which has been the “Science and Orthodoxy around the World” project (SOW), funded by the Templeton World Charity Foundation. This program was led by Efthymios Nicolaidis and his team at the National Hellenic Research Foundation in Athens and ran from 2016–2023. Scholars interested in the relationship between Orthodoxy and science were brought together to present their work and discuss a broad range of topics including bioethics, creation and evolution, anthropology, physics, and more. SOW's efforts resulted in four edited books published by Brepols, two documentaries, a series of videos and podcasts, and several regional conferences that could be used to introduce new scholars to the discussion. More information is available at project-sow.org.

The collection of articles in this thematic section represents the results of one such regional conference held at North Central College in Naperville, IL, USA on June 6 and 7, 2022. The conference focused predominantly on biological, ethical, and environmental themes similar to those that had been discussed at the larger scale conferences in Athens. Parallel regional conferences on themes relating to physics were also conducted at approximately the same time.

The first set of articles deals with approaches to handling disease using modern technologies. Ana Iltis examines stem cell sciences from a bioethical perspective, exploring questions about how stem cell research should be conducted and what limitations should be placed on the use of stem cells in biomedical situations. Related to this, Katarina Trajković considers stem cell biology and the eventual transplantation of stem cells including transplantation to oneself. Gayle Woloschak's article considers an earlier step in the process of therapy, the use of new gene therapy technologies to treat or even prevent the development of particular diseases that have a genetic component. Katherine McCray considers the question of how best to respond to those who are disabled and particularly working to develop a theology of disability built upon an ontology of dependence. The final article in the set on ethical concerns in

the area of health is by Carrie Frederick Frost, who engages with the theology of motherhood and childbearing.

The second set of articles in this series is focused on issues related to evolution and environment. Andrew Nosal examines how one should regard animals whose natural behavior is “offensive”—animals who eat their young, kill their mates, etc. How should such species and behaviors be viewed theologically in a “good” creation? Tatjana Paunesku explores the biology of evolution from the perspective of sexual reproduction and natural selection, inviting the community to think about biology as a mystery. Kalliopi Stara takes a turn toward the intersection of spirituality and ecology, discussing the tradition of “sacred forests” in parts of central Greece and its continuing role in the preservation of centuries-old trees and habitats. She discusses the importance of preserving these not only on environmental grounds, but also for theological and cultural reasons. Crina Gschwandtner considers the theological and philosophical concept of “decay” and its importance in the traditional Orthodox Christian understanding of salvation and the problems in reconciling it with a scientific understanding of the physical world. Bruce Foltz takes a poetic approach as he introduces a novel symbolic ontology of creation that is grounded in the Orthodox patristic tradition. Finally, Paul Ladouceur continues the theme of how modern Orthodox thought envisions the natural world by exploring the debates among theologians over the concept of panentheism.

By examining how Orthodox thought engages with scientific development, these articles provide valuable insights into the developing discourse between the disciplines. Whether addressing the role of Orthodox theology in shaping scientific approaches or investigating how modern scientific discoveries challenge traditional doctrines, the articles in this thematic section highlight the dynamic interplay between faith and science, providing a broader understanding of how science and Orthodox Christianity continue to shape cultures and intellectual traditions around the world.

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, December 2024):

- Hans Madueme, *Defending Sin: A Response to the Challenges of Evolution and the Natural Sciences*, Ada, MI: Baker Academic, 2024
- Mark Harris, *La naturaleza de la creación: Un estudio de la relación entre la Biblia y la ciencia*, Madrid: Universidad Pontificia de Comillas, 2019 (Spanish translation of *The Nature of Creation: Examining the Bible and Science*, 2013)

- Finlay Malcolm and Michael Scott, *A Philosophy of Faith: Belief, Truth and Varieties of Commitment*, New York and London: Routledge, 2023

ARTHUR C. PETERSEN

Department of Science, Technology, Engineering and Public Policy,
University College London, London, UK
arthur.petersen@ucl.ac.uk



A Conservation Biologist and a Religion Scholar Walk into a Sacred Natural Site

Jaime Tatay, Department of Theology, Universidad Pontificia Comillas, Madrid, Spain, jtatay@comillas.edu

The increasing interest among conservationists in sacred natural sites (SNS) prompts an exploration into how environmental scientists perceive and interpret the sacredness of these sites. The growing body of literature on SNS reveals an emerging dialogue within the science-and-religion debate, presenting an opportunity to reexamine the local and contextual character of the debate. The trend also underscores the potential for mutual learning. If religion scholars pay attention to scientific research on SNS and engage with its findings, they could enhance their comprehension of secularization, explore the dynamic character of the sacred, and embrace interreligious perspectives. In contrast, conservationists could also benefit from the insights of religious studies, theology, and cultural anthropology. These insights offer a nuanced understanding of cultural practices such as taboo and ritual, a recognition of the value of indigenous knowledge systems, and a caution against the limitations of scientific reductionism.



Conservation Biology Meets Religion

Sacred natural sites (SNS) are “natural features or areas of land or water having special spiritual significance to peoples and communities” (Wild and McLeod 2008). Since the first academic paper on sacred forests was published almost fifty years ago (Gadgil and Vartak 1976), there has been a remarkable growth of international interest in SNS, traditional ecological knowledge, and indigenous and community-conserved areas as alternative forms of nature protection (Berkes 2012; Corrigan and Granziera 2010; Verschuuren 2007; Wild and McLeod 2008; see also the IUCN WCPA Cultural and Spiritual Values of Protected Areas Specialist Group). This trend is reflected in the continuous growth and diversification of scholarly literature on SNS.

In an influential paper, Nigel Dudley, Liza Higgins-Zogib, and Stephanie Mansourian (2008) affirmed that “sacred natural sites are almost certainly the world’s oldest form of habitat protection,” and there is mounting evidence that SNS form “a largely unrecognized shadow conservation network.” A recent systematic review of the literature concludes: “SNS have positive effects on biodiversity across continents and geographical settings, as found in a number of local studies and earlier overviews” (Zannini et al. 2021, 3747; see also Sullivan et al. 2023). Another review, however, warned that the understanding of “sacredness” in the literature is under-researched and suffers from reductive associations, binary thinking, instrumental views, Western-centric perspectives, a lack of clear definitions, overlooked power dynamics, and limited interdisciplinary approaches (Tatay and Merino 2023).

Historian of science David Livingstone (2003) argues that the location of a scientific endeavor makes a difference to the conduct of science, even affecting its content. The cultural milieu, local expertise, institutional structures, channels of knowledge transmission, and geographical influences significantly impact the reception of ideas, the practice of science, and how knowledge spreads and interacts with religion (Brooke and Numbers 2011; Smedes 2008). More recently, James Chappel (2020, 18), reflecting on the “spatial turn in religious studies,” suggests that the “logic of sanctuary” is an appropriate spatial metaphor for the study of contemporary religion. It is also useful for the study of SNS and protected areas.

Contextuality and locality matter and need to be brought into the science-and-religion dialogue. Moreover, since there is no single methodology in science and religion, and since conservation disciplines also vary in their methods, a “focus on local and particular themes” (Visala and Vainio 2018) seems more promising to bring the dialogue forward. SNS research offers a privileged venue for testing the possibilities and limits of this dialogue because, in most faith traditions, “place itself is the primary locus of devotion” (Eck 1981, 323).

In this article, I intend to fill in a gap in the literature by exploring the potential for mutual enrichment the conversation around SNS is offering both

conservationists and religion scholars. With this purpose in mind, I first analyze the possibilities for learning and enrichment the scientific study of these sites offers to theologians and scholars of religion more broadly. Then, I explore the contribution the latter can make to conservation biologists (as well as protected areas managers and policymakers) to deepen their knowledge and thus open new lines of research and practice.

What Can Religion Scholars Learn from Conservationists?

Enhanced Understanding of Secularization

The idea of sacredness and the particular ways it is experienced in local contexts varies widely, even for people belonging to the same religion or belief system (as well as between formal and folk religion), making it a very complex phenomenon. Despite this, the frequent reference to the term “sacred” in scientific publications on nature conservation speaks to the surprising contemporary relevance of religion. The new scientific interest in religion, the integration of indigenous epistemologies and postcolonial viewpoints, and the trend towards pluralism in SNS research may indicate a shift towards a “post-secular” age (Berger 1999). This trend embraces diverse spiritual expressions, with environmentalism notably prominent (see Taylor 2007, 345–51), coexisting alongside a predominantly secular mindset influenced by modern science and technology.

It is true that research on SNS has not explored the multiple meanings of the term or explicitly tackled secularization (a central debate in the sociology of religion over the past sixty years). However, it has indirectly helped deepen understandings by highlighting how religion and spirituality continue to influence contemporary environmental conservation efforts in both secularized and non-secularized cultural contexts.

Given the growing interest in characterizing culture’s influence on land systems (Hodel, le Polain de Waroux, and Garrett 2024), the exploration of SNS across different geographical locations offers valuable insights into how global conservation practices are adapting to very diverse cultural and religious contexts (see, for example, the case of Tibet in Sehnalova 2019). This reflects the complex interaction between global conservation initiatives and local religious practices, contributing to a diversified understanding of secularization as a nonlinear, nonhomogeneous, and context-dependent process. It also reveals the complex, dynamic, and nuanced types of sacralization, desacralization, resacralization, and mutation of the sacred currently taking place in these sites (Tatay and Merino 2023), challenging the dominant narrative of secularization as a historical inevitability that follows the path of the West (Davie 2010).

By examining and comparing how SNS are valued and protected in particular places, religion scholars could explore the ways in which the sacred persists, reawakens, or is even created anew in supposedly secularized societies such as

Norway (Kraft 2010) and Finland (Mantsinen 2020), or how it sometimes mutates or declines in deeply religious societies such as in Benin (Ouré et al. 2023) and India (Chandran and Hughes 2000), offering valuable insights into the complex interplay between religion, culture, globalization, and nature conservation.

Conservationists' discoveries, emphasizing the endurance and variety of sacred sites, align with the concept of a pluralistic society that respects and integrates various religious beliefs alongside a secular, science-driven worldview. The SNS literature offers theologians and scholars of religion a fresh perspective on the intricate discourse of secularization in Western—and non-Western—contexts, echoing Peter Berger's (1999) "desecularization thesis" and his later pluralistic stance in *The Many Altars of Modernity* (Berger 2014). In summary, SNS research challenges assumptions about modernization inevitably leading to religious decline and delves into the concept of the post-secular (Habermas 2008; Taylor 2007; Berger 2014), highlighting the coexistence of scientific, non-metaphysical rationality with emerging post-metaphysical forms of reasoning alongside pervasive premodern worldviews. The renewed scholarly interest in SNS suggests a nuanced understanding of secularization, where secular conservation efforts do not entirely disregard or supplant spiritual and religious values but rather integrate them into more comprehensive conservation strategies.

Embrace Interreligious Perspectives, Consider Indigenous Knowledge Systems, and Revisit Animistic Understandings of the Sacred

Research on SNS necessitates a cross-cultural understanding, as these sites exist in most faith traditions and are inhabited by communities that share diverse beliefs (Hegde, Ziegler, and Joosten 2020) or indigenous groups who combine animistic beliefs and theistic elements borrowed from world religions (Shaygozova, Muzafarov, and Sultanova 2018; Tatay and Merino 2023).

The inevitably pluralistic perspective of these studies highlights shared values and similar practices in environmental stewardship and conservation efforts across different faiths. By examining the diverse religious narratives and practices associated with these sites, religion scholars can explore universal themes of sacredness, respect for nature, and communal responsibility. They can also gain insights into the mechanisms identified by conservationists in relation to taboo, ritual, pilgrimage, ancestor worship, and narrative, fostering a dialogue that transcends religious boundaries and enriches ecumenical and interreligious discourse on ecology (Bahr 2015; Tatay and Devitt 2017). For instance, it is particularly revealing how some sites in India and Africa have kept their sacredness after the arrival of theism (mainly Hinduism, Christianity, and Islam).

Moreover, SNS studies offer religion scholars and theologians new avenues to explore the concept of the sacred through various interreligious approaches and insights:

1. Showcasing the ways in which different cultures and religious traditions understand and interact with the sacred while protecting it through analogous mechanisms. This “convergence in diversity” encourages theologians to consider more inclusive and multifaceted interpretations of sacredness that go beyond their own religious dogmas while reconsidering animistic insights (Harvey 2006).
2. Highlighting the intrinsic connection between ecological systems and sacred values. Religion scholars can explore how the sanctity of nature is perceived and enacted across different faiths, enriching interreligious discussions on creation care and environmental stewardship (see, for instance, the United Nations Environment Programme’s Faith for Earth Initiative).

The emphasis on local perspectives in the literature also highlights the importance of indigenous knowledge systems and native peoples’ spiritualities in understanding the sacred. Again, the focus on specific locations underlines the importance of place in spiritual practice and belief, reflecting the recent “spatial turn in research on religion studies” (Knott 2010) and showing—as Elizabeth Allison (2015) puts it in a study on Himalayan local deities—that religion is “inscribed in the landscape.” Religion scholars could learn from these approaches, which often integrate spirituality and traditional ecological knowledge, for instance, exploring place-based spirituality and examining how the sacredness of a particular site informs and shapes local religious experience and practice.

Finally, animism (Harvey 2006), panpsychism (Leidenhag 2021), and conservation biology present differing, often conflicting views on the agency and role of objects, plants, and animals. Some scholars, however, argue that these differences reflect alternative—or even complementary—ways of understanding the world rather than direct conflicts (Verschuuren et al. 2010; Van Eyghen 2023). For example, many SNS across the world are believed to have “guardians” or “spirits” associated with them (see the extensive review by Verschuuren et al. 2010). In fact, the recognition of sacredness aligns with some of the principles of animism, which sees nature as inhabited by spiritual beings or forces, suggesting an approach to conservation that transcends utilitarian views while respecting both biological diversity and cultural traditions (Sinthumule 2022). By recognizing the intrinsic value and interconnectedness of all living beings and natural elements, indigenous knowledge systems often encourage a holistic approach to environmental stewardship.

In sum, by engaging with the literature on SNS, religion scholars can expand their understanding of the sacred, incorporating insights from diverse cultures, faith traditions, and academic disciplines (see, for instance, the “new animism” and the ecological reading of the Hebrew Bible by Mari Joerstad (2019), or the literature on panpsychism). This may in turn lead to a richer, more profound science-engaged study of religion that takes into account cultural dynamics, incorporates recent findings from the conservation literature, and responds to mounting conservation challenges.

Collaborate with Scientists Engaged in Research on Sacred Natural Sites and be Informed of Developments in the Literature

Conservation studies draw from different disciplines and rely heavily on quantitative data to assess biodiversity, ecosystem health, and conservation outcomes. As the father of conservation biology Michael Soulé (1985) points out, the discipline's synthetic, multidisciplinary character integrates ecology, biogeography, population biology, sociology, anthropology, ethics, and ecophilosophy. Recent studies on SNS have confirmed the need for multidisciplinary. For instance, conservation biologists often utilize social science methods to conduct surveys and interviews with stakeholders. They also use Geographic Information Systems to map biodiversity hotspots and conservation areas, analyzing their distribution, ecological significance, and potential threats.

Religion scholars are finding inspiration in this multidisciplinary research to grasp a deeper understanding of the spatial dynamics of the sacred (on “sacred geography,” see, for instance, Diana L. Eck (1981)), its relationship with secular values (Knott 2015), and specific features of the sacred (see, for instance, Jaime Tatay-Nieto and Jaime Muñoz-Igualada (2019)). Since SNS research emphasizes the importance of understanding local contexts within global biodiversity conservation frameworks, religion scholars can also learn from this literature to reexamine how global religions are, in practice, adapted and lived out in diverse local, biocultural contexts. For example, recent publications on Hindu (Acharya and Ormsby 2017), Buddhist (Sehnałova 2019), and Christian (Kraft 2010) SNS reveal the cross-fertilization potential that exists between cultural politics, conservation, and specific theologies.

Likewise, by considering social scientists' and conservation biologists' use of ethnographic methods and case studies, religion scholars could also gain insights into how spiritual beliefs (like taboo, sin, healing, or karma) interact with TEK, influencing environmental attitudes and behaviors (Woodhouse et al. 2015; Zeng 2018). This can lead to more nuanced understandings of how the sacred is lived and experienced in local contexts. For instance, Catharina de Pater et al. (2024) recently explored how spiritual values are articulated in forest management practices in the Netherlands, shedding light on the role of “forest spirituality.” Relatedly, religion scholars may learn from recent studies on the impact of religious practices on environmental stewardship to understand attitudes towards environmentalism (Roux et al. 2022). Since conservationists frequently use participatory approaches and engagement with local communities, religion scholars (as well as theologians and religious leaders) should be informed about recent findings in conservation science so they can foster better discussions within their respective religious communities.

Finally, at the advocacy level, the conservation of SNS often involves navigating complex moral and political terrain, balancing conservation goals with respect for local cultural and spiritual values. Since, as Soulé (1985, 727)

argues, “ethical norms are a genuine part of conservation biology,” religion scholars may explore how moral considerations are addressed in conservation research (Tiedje 2007; Manfredo et al. 2016). In fact, Christian and Muslim leaders are already applying these insights to develop more nuanced theological arguments about the ethical imperatives of environmental stewardship or “creation care” (see Francis 2015; Llewellyn and Khalid 2024).

In essence, conservation sciences have the potential to inspire religion scholars to embrace inclusive strategies and perspectives when exploring sacred phenomena in natural environments. Spiritual leaders informed by religion scholars and theologians could then potentially influence their followers in nature conservation (for instance, in some places, monastic communities are already an example of sustainable resource management). This approach can foster a type of science-engaged religion (Perry and Leidenhag 2023) that, in turn, can inspire a religion-engaged conservation science. To this pole of the dialogue, I now turn.

What Can Conservationists Learn from Religion Scholars?

Incorporate Insights from Cultural Anthropology and Sacramental Theology

Cultural anthropologist Kristina Tiedje (2007) warns that the concept of “nature as sacred,” when intentionally borrowed from indigenous worldviews by conservationists, may overlook the complexity of tribal differences and the subtleties of religious worldviews. Nature is already sacred to most indigenous communities but in ways environmentalists often do not fully understand (Milton 1999). Sacramental theologians and cultural anthropologists, with their emphasis on the symbolic presence of the divine in the material world, offer scientists a way to understand how different cultures perceive and interact with particular elements of nature (see Hart 2006; Deane-Drummond 2008, 56–68). They also bring a more granular understanding of the secular/sacred continuum, preventing dichotomous, binary interpretations of these categories (Rappaport 1971; Tatay and Merino 2023, 7)—a nuanced understanding that can enrich conservationists’ view of nature and biodiversity by framing these sites not just as ecological treasures but as places imbued with spiritual significance (see John Inge (2017) for a theological analysis of the difference between space and place).

For most indigenous peoples, the physical and spiritual realms overlap, with the material world seen as a vehicle of divine grace. SNS, in particular, are “powerspots” (Rots 2019; see also Keller 2014, 89) that connect the living with their ancestral identity and imply reciprocity and some type of ritual exchange. For instance, as Muslim theologians have indicated, an Islamic nature preserve (*hima*) “is sacred by virtue of the sanctity conferred on it by God” (Llewellyn et al. 2024, 46). These are sites where a contractual relationship (Byers, Cunliffe, and Hudak 2001) between the local community and the god(s), ancestors, or spirits

is established, binding individuals together in a web of reciprocal commitments, fostering social cohesion and solidarity within communities (see the classical work on the importance of gift exchange by Marcel Mauss ([1925] 2016)).

In other words, SNS are “manifestations of a deep emotional bond between people and nature,” a form of “place attachment” learned “through the process of socialization involving rituals, use of artifacts, storytelling, and place visits” (Mazumdar and Mazumdar 2004, 385). This is why conservation of these sites is not primarily motivated by ecological considerations but rather by a profound reverence for a numinous presence that needs to be reenacted. The values that underlie these motivations cannot be easily changed or instrumentalized for the sake of conservation (Manfredo et al. 2016).

Most, if not all, religious traditions involve narratives, rituals, and practices that express a sacramental, reverential attachment to particular sites. By learning about and taking into account these locale-dependent beliefs and practices associated with SNS, scientists and managers will interact more effectively with local communities, integrating these insights into theology-engaged conservation strategies. For example, conservationists’ explorations in “resource and habitat taboos” (see the seminal work of Johan Colding and Carl Folke (2001)) are being contextualized, enriched, and deepened with these anthropological and theological insights.

Appreciate Indigenous Epistemologies and Religious Wisdom

Religion scholars, theologians, and cultural anthropologists are experts in interpreting religious beliefs, ideas, and concepts (such as profane, pure, holy, or sacred), as well as cultural institutions and practices (such as ritual, taboo, pilgrimage or ancestor worship), that are relevant to nature conservation. They provide critical perspectives on the relationship between religion and conservation across cultures, highlighting the potential for both conflict and cooperation between these domains. They can thus assist conservationists working on SNS to gain a more nuanced understanding of cultural practices by providing insights into the historical, cultural, and theological contexts that shape these practices and institutions exploring the potential of a “sacred ecology” (Berkes 2012) and “belief-based nature conservation” (Hegde, Ziegler, and Joosten 2020).

Theologians and cultural anthropologists can also help conservation biologists interpret religious texts and narratives that are relevant to conservation while expanding literal and reductive scientific readings (Zeng 2018). For example, they can help identify passages in sacred texts and oral traditions that emphasize the importance of preserving the natural world, which can be used to build support for conservation efforts among religious communities. As anthropologist Selnich Vivas (2015, 144) points out, the role of storytelling, singing, and dancing in the *minika* from Colombia, is “an indispensable tool for biodiversity conservation.” In relation to the importance of narrative and naming particular

places, Vivas argues that, for this indigenous people, “to know its name is to know its ecosystemic value, its history” (Vivas 2015, 135). In South Africa, like in Colombia, Ndidzulafhi I. Sinthumule (2022) studied community attitudes and traditional practices that help protect two Vhutanda SNS. Sinthumule (2022, 1) “examined the role of spirits in governing and managing SNS” and showed their importance as a prerequisite for protecting biophysical resources. As mentioned, recent research on animism and panpsychism could also prove helpful to expand understandings of the agency of nature.

From a social science perspective, institutional economists are also increasingly interested in the role of SNS as “commons” and are gaining valuable insights from the emerging research on “sacred commons” (Rutte 2011) and “spiritual commons” (Samakov and Berkes 2017). Elinor Ostrom et al. (1999) highlighted that “institutional diversity may be as important as biological diversity for our long-term survival.” The knowledge and wisdom accumulated by world religions, characterized by a global institutional structure and a robust grassroots presence, in articulating the universal and the local through subsidiarity can offer significant contributions to conservation. Recent Christian (Francis 2015, 2020) and Muslim (Llewellyn and Khalid 2024) theological developments reflect this trend. For instance, by delving into the historical context and evolution of local taboos and ritual practices in particular SNS, religion scholars can shed light on the intricate relationship between spiritual beliefs and environmental practices.

On a practical level, fostering dialogue and collaboration between conservationists, protected area managers, and religious communities through the facilitation of local spiritual leaders can significantly enhance trust and mutual understanding between these groups (see the work led by the IUCN in Mallarach 2008). This inclusive approach recognizes the value of integrating science-based management and indigenous knowledge (traditional ecological knowledge), as recently exemplified by the joint workshop organized by the Pontifical Academy of Sciences and the Pontifical Academy of Social Sciences (2024). By engaging with religious leaders (such as priests, monks, rabbis, imams, and shamans), learning from ancient spiritual wisdom, and paying attention to modern religious initiatives, natural scientists and protected area managers can develop culturally sensitive conservation strategies that respect local traditions and practices, ultimately contributing to long-term nature conservation.

Be Cautious about the Limitations of Scientific Reductionism

Science is not a placeless or ahistorical activity. It is profoundly embedded in specific places, times, and cultures. The literature on SNS supports Livingstone’s (2003) thesis of a place-based science by highlighting the importance of location and history in shaping knowledge. In a similar way, Jared Diamond (2005) argued that a society’s success in sustainably managing natural resources relies on both its technological capabilities and its cultural values, emphasizing

the interplay between these factors in ecological sustainability. This perspective is also a warning against the “exclusive stress upon sense perception for the provision of data respecting nature,” since, as Alfred N. Whitehead (1968, 133) persuasively argued in his critique of modern science, “pure sense perception does not provide the data for its own interpretation.”

To interpret SNS, natural scientists (as well as managers and policymakers) should keep in mind that these sites are significant for custodians and native peoples not only due to their biocultural diversity but especially for their role in shaping and preserving local identities and traditions (Tiedje 2007; Woodhouse et al. 2015). Since SNS have been successfully managed and governed by indigenous communities using traditional knowledge—which is closely tied to specific locales—interacting with these ancient cultural institutions requires caution against global generalizations and utilitarian approaches. As several authors have pointed out, in incorporating local taboos into conservation initiatives, there is the risk that scientists use “culturally sophisticated institutions” in a reductionist manner (Osterhoudt 2018) or interpret the sacred “in a binary, dichotomous way, as opposed to the profane and wild related” (Tatay and Merino 2023, 1).

The conservation of SNS thus requires assuming holistic approaches to knowledge and management that value the interconnectedness of the natural world alongside cultural, spiritual, and ecological dimensions. Major world religions have emphasized both the limitations of scientific knowledge and the importance of understanding the environment in its entirety, including its cultural and spiritual significance, rather than reducing it to purely materialistic terms (Francis 2015, n. 63; Llewellyn et al. 2024, 2.22; see also Kauffman 2008). This holistic worldview stands in contrast to specialized scientific approaches that tend to fragment knowledge (for instance, focusing only on biodiversity), overlooking the complexity of socio-ecological systems.

In essence, SNS are rich repositories of local knowledge and practices that reveal the spiritual, intrinsic value of the environment beyond its material, instrumental dimensions. These sites act as living examples of how embracing religious insights and diverse disciplinary understandings of the natural world can counteract scientific reductionism by highlighting the importance of cultural, spiritual, and ecological dimensions in shaping our relationship with the environment. Religion scholars offer complementary perspectives that challenge the reductionist views prevalent in mainstream conservation science, preventing it from falling into the traps of “simplification, functionalism and misappropriation” (Osterhoudt 2018, 5).

Conclusion

I have argued that recent academic exploration of SNS in the context of conservation biology, landscape ecology, and protected areas management reveals the emergence of a new, promising dialogue within the contemporary

science-and-religion debate. This research offers, as far as I can see, an opportunity to articulate “conjunctive explanations” (Finnegan et al. 2023) and reexamine the contextual, local character of the debate (Visala and Vainio 2018, 3–4), emphasizing the potential for mutual learning.

Religion scholars can benefit from paying more attention to scientific research on SNS. Science-engaged religious studies will enhance their comprehension of the secularization process, better understand the dynamic character of the sacred, and value the importance of place while adopting interreligious perspectives. By exploring universal themes of respect for nature and communal responsibility, they can also gain insights into the mechanisms identified by conservationists in relation to taboo, ritual, pilgrimage, ancestor worship, and narrative. This dialogue can enrich ecumenical and interreligious discourse on ecology while preventing theological dogmatism.

Natural scientists and protected area managers, on the other hand, can also benefit from the insights of religious studies, theology, and cultural anthropology. Their contributions offer a nuanced understanding of cultural practices, a recognition of the value of indigenous knowledge systems, and a caution against the limitations of scientific reductionism. By embracing these perspectives, they can develop religion-engaged, culturally sensitive conservation strategies that respect local traditions and practices, ultimately fostering understanding and collaboration between custodians, indigenous communities, conservationists, and managers.

In sum, a growing body of research on SNS is showing that science-engaged religious studies and religion-engaged natural sciences offer better conjunctive explanations—and hopefully better conservation practices—of these valuable biocultural hotspots. Conservation biologists, protected area managers, policymakers, anthropologists, historians, and theologians should learn from each other and work together to preserve this precious conservation network for the sake of a more sustainable future.

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Artificial Intelligence and the Sustainable Future of Co-Creation

Junghyung Kim, Associate Professor of Philosophy of Religion, Yonsei University, Seoul, South Korea, junghyungkim@gmail.com

Today's world is being shaped, to a large extent, by the wide-ranging infiltration of artificial intelligence (AI) into the entire Earth system and our human society. However, due to the narrow focus on human-centered interests, current discourses on AI tend to overlook or underestimate the intricacies and subtleties surrounding the AI ecosystem. In light of this situation, this article aims to introduce a broader and deeper planetary perspective encompassing more than just human–AI interactions. From this perspective, suggestions for the future of cultural evolution will be made regarding sustainable AI and a sense of humility, response-ability to others, and greater accountability for ethical–political interventions.



Introduction

Today's world is being shaped, to a large extent, by the wide-ranging infiltration of artificial intelligence (AI) into the entire Earth system and our human society. However, due to the narrow focus on human-centered interests, current discourses on AI tend to overlook or underestimate the intricacies and subtleties surrounding the AI ecosystem. In light of this situation, this article aims to introduce a broader and deeper planetary perspective encompassing more than just human–AI interactions. From this perspective, suggestions for the future of cultural evolution will be made. To be specific, once the limitations of human-centered discussions on AI are made clear, I argue that the anthropocentric biases underlying current discussions need to be corrected by recent insights into the symbiotic and sympoietic interactions among human and nonhuman actors within the Earth system. From the post-anthropocentric planetary perspective, I then present three distinct yet interconnected proposals in terms of sustainable AI and a sense of humility, response-ability to others, and greater accountability for ethical–political interventions.

Narrow Human-Centered Focus in Dominant AI Discourses

It is well known that the potential impacts of AIs on human destiny are the single most pressing concern among prominent figures in the AI field. For instance, Nick Bostrom (2014) warns that once an AI achieves human-level general intelligence, its accelerated self-development could lead to the emergence of superintelligence out of human control. James Barratt (2013) also warns against the potential demise of humankind as a result of the rise of an AI surpassing human intelligence. Similarly, Yuval Harari (2016) predicts a bleak future when AIs deeply penetrate human life and control the decisions of individuals. “Open letter on artificial intelligence,” signed by thousands of individuals including Stephen Hawking, Elon Musk, and other prominent figures,¹ focuses on maximizing the societal benefits of AIs while avoiding AIs’ threats to humanity. Although some optimistic futurists, such as Ray Kurzweil (2005), anticipate that someday AIs will eventually enable the spread of intelligence beyond the confines of Earth and throughout the universe, even this cosmic vision of an intelligence-filled universe fails to transcend limited human-centered interests. In fact, it has a much narrower focus on a small group of individuals capable of enjoying such great technological achievements. It should be pointed out that the wellbeing of the majority of the human population and nonhuman creatures, whose lives are intricately intertwined with various existing ecosystems within the current Earth system, is not their primary concern.

Most discussions in AI ethics predominantly center around the existential risks posed by emerging AI technologies to humanity. This narrow focus on human interests is evident in the so-called “standardized” guidelines prepared by various organizations and countries (e.g., the EU, Google, Microsoft, IBM, and

the Vatican).² Pope Francis received signatories of the Rome Call for AI Ethics (Pontifical Academy for Life and Renaissance Foundation 2020), applauding “their efforts to safeguard the good of the human family” (Lubov 2023). It is commonly assumed that the proper objective of and guideline for AI development should be “human well-being” (IEEE 2018) or “human compatibility” (Russell 2020). The mottos “AI for humanity” (Braunschweig and Ghallab 2021) and “human-centered AI” (Shneiderman 2022)³ are frequently encountered in this context. Even when environmental issues are addressed in terms of “AI for Earth” (Microsoft),⁴ the discussions revolve primarily around “AI’s actual and potential contribution to sustainable development,” while neglecting “its current ecological footprint and contribution to global warming” (Maclure and Stuart 2021, 122; cf. Brevini 2020).⁵ Moreover, even in such environmentally friendly discourses, nonhuman or nonorganic creatures, including human artifacts, are often treated merely as means to achieve human ends.

Philosophical debates in general are no better than the others. Philosophers engaged in AI discourses are primarily concerned with the ontological status of AI—for instance, in terms of strong versus weak AI (Bringsjord and Govindarajulu 2022). In this respect, they inquire whether AI can attain what has traditionally been considered uniquely human faculties or qualities, such as understanding, free will, self-awareness, emotion, and authentic relationship (Dreyfus 1972; Searle 1984; Herzfeld 2023). While asking whether AI can be recognized as a person like a human, philosophers seek to clarify similarities and differences between humankind and AI. No one would deny that these questions are relevant and even crucial for human self-understanding. However, the problem is that in many philosophical discussions, this almost exclusively human-centered approach not only presupposes but also reinforces the ideology of human exceptionalism—the idea that humanity is fundamentally distinct from all other creatures. Furthermore, it tends to divert our attention from the urgent need for a more comprehensive ontology that covers the broader networks of relationships underlying human–AI interactions.

Anthropocentric Biases Exposed and Challenged

Given the prevailing human-centered focus in AI discourses, I have suspicions that the myth of the great chain of being or the related concept of ladders of nature (*scala naturae*) is taken for granted (Lovejoy 1964). According to this concept, which has long served as a classical explanation for humanity’s position in the universe, there exists a hierarchical order of beings, with gods and angels at the top, followed by humans, animals, plants, and minerals. This hierarchical structure implies humans are inferior to supernatural beings but superior to all other mundane creatures. In this way, the concept of *scala naturae* represents a prevalent form of anthropocentrism, human exceptionalism, and the ideology of human supremacy, at least with regard to the dynamic history of the Earth.

Historically, Aristotle's *The History of Animals* appears to have provided a "scientific" foundation for this hierarchical order of beings in the universe. According to Aristotle (1910), humans are rational animals, which grants them superiority over nonrational animals and nonliving entities. Animals capable of independent movement are considered superior to immobile plants, and living plants are considered superior to lifeless minerals. Similarly, in the Western tradition, Christian theologians have emphasized the unique status of humans as created in the image of God (*imago Dei*), thereby contributing to the perpetuation of anthropocentric biases. This perspective still holds true for a number of contemporary theologians (Dorobantu 2022; Herzfeld 2023), though some keep open the possibility of applying the concept of *imago Dei* to nonhuman beings like artificial general intelligence as well (Molhoek 2022; Kaunda 2020; Hefner 2003; Hefner 1993).

Moreover, it is crucial to note that within the hierarchical order of beings, not all human beings enjoy equal status. Traditional anthropocentrism is an ideology that grants privilege to a specific group of individuals while marginalizing others (Braidotti 2013). Consider, for instance, women in a male-centered society, people of color in a white-centered society, non-Europeans in a Eurocentric society, and disabled individuals in an ableist society. Similar to how different species are assigned different positions within the hierarchical order of the universe, human beings too are placed within a strictly hierarchical social order based on factors such as race, sex, gender, and disability.

As discussed in the next section, this hierarchical worldview, with its anthropocentric biases, has faced severe criticisms over the past few centuries. However, it still seems to have a strong presence in current discussions on AI.

A Post-Anthropocentric Perspective

Considering the limitations of human-centered perspectives and the obsolescence of anthropocentric biases, our discussions on human–AI relationships must transcend the narrow confines of human history. Instead, a broader perspective that incorporates no less than the planetary system as the very field in which human–AI interactions unfold is postulated. Hence, I suggest developing a posthuman or post-anthropocentric understanding of cultural evolution from a planetary perspective (Malone and Bozalek 2022; Braidotti 2013), which I believe will shed light on the desirable trajectory of future AI developments.

To begin with, I would like to note that over the past hundreds of years, the evolutionary, ecological, and planetary perspectives have effectively challenged Aristotle's essentialist biology, which has traditionally served as the theoretical foundation for the hierarchical order of beings. These perspectives are strongly supported by recent scientific and meta-scientific theories, including further elaboration of the phylogenetic tree of life (Leonhard Eisenberg 2017),⁶ ecological insights into the co-evolutionary web of life (Capra 1996), and holistic

theories of the Earth as a symbiotic planet, a living Gaia, or a system composed of subsystems (Margulis 1998; Lovelock 2000). These perspectives suggest that entanglement, symbiosis, interdependence, interpenetration, and sympoiesis are essential for comprehending the Earth system and all its inhabitants (Keller and Rubenstein 2017). Human and nonhuman creatures not only coexist in symbiotic interdependence but also participate in sympoietic interactions (Stöckelová, Senft, and Kolářová 2023; Sheldrake 2021). In the process, each of them respectively contributes to the co-creation of an ever-new Earth.

The evolutionary, ecological, and planetary perspectives enable a fresh engagement with the perennial question of humanity's place in the universe, for the traditional view that positions humans at the center of the world or considers them the pinnacle of creation seems no longer tenable. Even if one acknowledges the unique human features, such as their use of symbolic language and abstract thinking, the essentialist notion that sharply distinguishes humans from other creatures has lost its persuasive power (Mayr 1998, ch. 11). That is, humans are no less a part of nature than other creatures, as their lives are intricately intertwined with other creatures through the symbiotic and sympoietic relationships.⁷

To be more specific, human beings, who emerged relatively recently, have played little role in shaping the current Earth system, at least prior to the Industrial Revolution. Even before the advent of self-conscious humans, symbiotic and sympoietic processes among various creatures laid the groundwork for the present-day Earth system. For instance, photosynthetic organisms enriched the atmosphere with oxygen, drastically transforming the inhospitable environment of the early Earth and paving the way for the evolution of oxygen-breathing organisms, including humans. During the Mesozoic Cretaceous, the existential threats posed by dinosaurs stimulated the brain development of small creatures hiding in the shadows, leading to significant progress towards highly sophisticated self-awareness. The colossal asteroid impact that triggered an ice age and caused the extinction of dinosaurs sixty-five million years ago served as a turning point for the evolution of mammals, which eventually enabled the emergence of *Homo sapiens*.

It is also worth reminding that humans were neither perfect nor complete upon their initial appearance but have undergone coevolutionary interactions with nonhuman actors, such as predators, fruits, fire, tools, and changing climates. For instance, our symbiotic relationship with dogs over thousands of years has enabled the coevolution and co-constitution of both dogs and humans (Haraway 2003). Similarly, during the COVID-19 pandemic, viruses and antivirus drugs not only transformed human lifestyle but also reshaped human physiology (cf. Ihde and Malafouris 2019).

According to this post-anthropocentric understanding of human history, humans have always been in a process of becoming through constant interactions with other companions within the boundaries of the Earth system.⁸

Tripartite Relationships Surrounding AI-Powered Culture

These evolutionary, ecological, and planetary understandings of humanity's place in the universe provide us with a posthumanist perspective from which the meaning and significance of human culture, particularly emerging technologies like AI, can be reappreciated. That is, human culture in general and AIs in particular are revealed as integral parts of the "natural" system and therefore always entangled in the symbiotic and sympoietic processes within the Earth system. This perspective opens a new way to transcend the narrow focus on human–AI interactions, by bringing into our view the tripartite relationships between human nature, human culture, and the Earth system.

Concerning the tripartite relationships, I would like first to emphasize a non-dualistic understanding of nature and culture. Let us consider a scenario of someone constructing a small cottage in a forest. Does this human-made structure belong to the ecosystem or not? Now, let us suppose that the person eventually abandons the cottage and does not return to it. Over time, the cottage is worn out and decays, becoming a habitat not only for fungi but also for various plants. Animals residing in the forest enter and exit the cottage, and some even build their nests there. At what point has the cottage become part of the ecosystem? I would argue that it was part of the ecosystem from its very inception. This illustrates that nature and culture are intertwined to such an extent that it is impossible to think of them as separate entities.

To capture this idea, Donna Haraway (2003) intentionally employs a new terminology: *natureculture*, without hyphen or space between the two words.⁹ According to Nicholas Malone and Kathryn Ovenden's (2017, 1) brief yet succinct definition of the term, "[n]atureculture is a synthesis of nature and culture that recognizes their inseparability in ecological relationships that are both biophysically and socially formed." In other words, the commonly held dichotomy between nature and culture is no longer justifiable. Not only are nature and culture entangled with each other in their symbiotic interdependence, but they also recreate each other through their sympoietic interactions.

Returning to the tripartite relationships, this non-dualistic understanding of nature and culture is crucial not only for understanding human–AI interactions but at the same time for overcoming the narrow focus on them alone. Note that the concept of nature can refer to both human nature and the natural world. In this respect, the symbiotic and sympoietic relationship applies, on the one hand, to the co-creative interactions between AIs and human nature and, on the other, to the relationship between AI-assisted human culture and the Earth system.

Humans create AIs, while AIs transform human nature as well as human life. This idea is not a new one at all. Philosophers of technology have already explored the mutually shaping process between humanity and technology (Ihde and Malafouris 2019). Phenomenological studies of technology shed light on the reciprocal processes through which humanity and technology shape each other, highlighting the technologically textured or mediated nature of human

life (Ihde 1990).¹⁰ Similarly, Haraway (1991) in her *Cyborg Manifesto* celebrates the hybridity of human nature, whereas Andy Clarke (2003) refers to the human species as natural-born cyborg. Nowadays, we witness how rapidly AI technologies advance and how drastically they transform and reshape human life in searching, driving, shopping, translating, writing, painting, chatting, data analyzing, and so forth. In this sense, today's cultural evolution is being driven or powered by AIs. This is our reality, if not a desirable one.

Meanwhile, these dynamic processes take place within the boundaries and potentialities of the Earth system. In other words, we also need to consider the relationship between AI-powered cultural evolution and the entire Earth system. AI technologies would be unthinkable without communications and collaborations with nonhuman inhabitants in the Earth system, like impressive amounts of energy and scarce natural resources (Brevini 2020). Conversely, once a new AI technology emerges, it immediately enters dynamic interactions with various human and nonhuman inhabitants in the system and begins to transform its surrounding environments. As AIs progressively actualize the potentialities already present within the Earth system, the Earth system too undergoes radical transformations in terms of the reorganization and redistribution of its constituting members. This cycle of renewal enables new technologies and an ever-new Earth.

In fact, from the inception of human history, technology was an integral part of nature, as illustrated in the use of stone axes in the Paleolithic era. However, the current climate crisis, in an unprecedented way, demonstrates the deep entanglement between the Earth system and technological civilizations. As an expanding portion of the Earth's surface is falling under human influence,¹¹ it becomes clearer that the natural world is not as "pure" as commonly perceived. As the new terminology *Anthropocene* suggests, human technologies have even more profoundly penetrated the Earth system. Don Ihde (1990, 3) refers to this technologically reorganized natural world as a "technosystem." This is particularly evident in the case of AIs, which are bringing dramatic changes to the Earth's entire surface at an accelerated rate. I may put it differently, building on Pierre Teilhard de Chardin's terminology. With the advent of the Anthropocene, a technosphere is emerging on top of the geosphere, biosphere, and noosphere that had already emerged in Earth's history (Teilhard 1966). In this context, AIs are expected to bring about even more radical transformations by forging closer integration between the technosphere and other spheres. Through the development of AIs, humans are not detached from the Earth system but rather brought even deeper into it. This aligns with the concept of Gaia 2.0 proposed by Timothy Lenton and Bruno Latour (2018) to describe a new phase of Earth permeated by human technologies.

AI, Sustainability, and the Virtue of Humility

Thus far, I explicated the tripartite relationships between human nature, human culture, and the Earth system in terms of their symbiotic and sympoietic entanglements. With this post-anthropocentric planetary perspective in mind, in

the rest of this article, I present three proposals for future discussions regarding AI-accompanying cultural evolution.

First, the tripartite relationships mentioned entail that the sustainability of the planetary system should be considered a limiting condition of cultural evolution. Given the interpenetrating networks of both human and nonhuman actors within the Earth system, the dynamic history of human–AI interactions cannot unfold on an infinite horizon but only within the finite boundaries of the Earth system. If the system were to exceed certain boundaries and collapse, it would jeopardize the future of the human technological culture. In other words, there are certain “planetary boundaries” (Rockström et al. 2009) that are crucial to the sustainability of the Earth system itself. These boundaries define the limits within which human–AI interactions can take place.

The idea that planetary sustainability should be considered a limiting condition for AI-driven cultural evolution is related to and yet distinct from the proposal for deploying AI for sustainability. AIs may help us better predict climate change and assist in coping with impending catastrophes. However, it is questionable to assume that highly advanced technologies will provide humans the ultimate solution to the climate crisis or other sustainability issues,¹² for there would be no AI without a carbon footprint or ecological waste. The jury is still out on the energy efficiency gains from utilizing AI versus the energy consumption of using AI to do this work (Brevini 2020). Though it would not be fair to foreclose the possibility of developing AIs for sustainability (Petersen 2022), it would be too risky to believe the technocrats’ promise that technological innovations will effectively address sustainability issues.

It should be reminded that the current climate crisis was caused by technological civilizations that exploited the Earth system. Furthermore, human technologies will always remain part of the system, never attaining absolute control over the whole system. This implies that any group of human individuals, even with the aid of however highly advanced AI, cannot completely dictate the future. Therefore, in my opinion, relying solely on new technologies to address the climate crisis or other sustainability issues seems self-defeating. The presumption that humans on their own can and must solve all the problems related to sustainability is not helpful at all but in fact harmful. Instead, humans are advised to humbly acknowledge the inherent limitations of their own capacities even with the assistance of technologies like AI, while respecting the planetary boundaries and resilience capacities of the Earth system itself (Wynsberghe 2021).

Response-ability to the Others

Next, it is not the planetary boundaries alone that set limits on the future of cultural evolution. According to the post-anthropocentric understanding of human evolution, humans are in symbiotic and sym-poietic interaction not only with their artifacts like AIs but also with nonhuman companions within the Earth system, including electricity, natural resources, and greenhouse gases. Moreover,

these nonhuman companions are understood as relatively independent actors with their own capacities. This entails that even the collaboration between humans and AIs cannot exert complete control over their spontaneous and unpredictable (re)actions. In this context, humanity turns out to be just one of numerous actors within a highly complex system, and no single actor, even humanity, can solely determine the future of the whole system. In other words, the future always remains beyond human control.

In this regard, the intricacies of networks among diverse actors surrounding human–AI interactions are to be highlighted in two respects. First, humans engaging with AIs are not homogenous. They can be categorized into various groups, including global tech CEOs, algorithm designers, policymakers, ethical supervisors, service users, data providers, data labeling workers, and more. They do not share the same interests or concerns regarding the advancing AI technologies. Their diverse voices should not be ignored. Second, human–AI relationships do not encompass all the different types of relationships that need to be considered within the planetary-scale AI ecosystems. Alongside human–AI relationships, there are also AI-mediated human–human,¹³ human–nature, and nature–nature relationships. It is important to note that various human and nonhuman beings are also engaged in the processes of cultural evolution, sometimes enabling and furthering and sometimes resisting and interfering with AI-driven transformations. In this sense, not only humans but also nonhuman companions, including human artifacts, can be referred to as “actors” (Latour 1997) or “co-creators” (Kim 2022).

Given that even AI-aided humanity is just one of numerous actors entangled in the intricate networks constituting the Earth system, what is expected from humanity cannot have complete control over the whole system. Instead, in addition to the virtue of humility mentioned earlier, humanity needs to cultivate “response-ability” (Park 2021; Hofman 2023), an ability to properly and prudently respond to spontaneous and unpredictable (re)actions from all other human and nonhuman companions; or, the best role of humanity would be, like an orchestra conductor, that of a facilitator seeking a greater resonance among diverse members of the Earth system while preserving and even empowering their respective capacities.

For this mission, it is necessary for humans to overcome anthropocentric biases and open their minds to various forms of “others,” especially the most vulnerable members of the Earth system in the process of AI-driven cultural evolution. Low-wage workers are involved in big data labeling (Hao and Hernandez 2022), while huge amounts of energy and natural resources are consumed for AI developments and operations. We must also consider those individuals most vulnerable to potential unemployment and various endangered species. Depleted natural resources and an increasingly hotter climate ought to count as well. The sustainable future should be one in which all existing actors, whether human or nonhuman, enjoy the fruits of their respective contributions to the flourishing of the Earth system.

Call for Ethical, Political Interventions

Finally, the increasing influence of human–AI collaborations on the entire planet and its inhabitants entails humans’ greater responsibility rather than humans’ intrinsic superiority, whereas the under-determination of the future by technical feasibility postulates humans’ ethical and political interventions for the purpose-driven technological development.

The human role within the Earth system has undergone constant shifts. Over the past few centuries, the impact of human technologies on the planetary scale has exponentially increased, nearly initiating even a new geological era. However, this heightened influence does not grant humans a privileged position within the system; instead, the greater power means the greater responsibility. If one still wishes to adhere to anthropocentrism in the era of Anthropocene, I believe the focus should be emphasizing the increasing human responsibility rather than asserting human supremacy.

Therefore, despite the two fundamental restraints on cultural evolution—namely, planetary boundaries and unpredictable nonhuman (re)actions—it is still possible for AI-powered civilization to have a profound impact on the entire Earth system and its inhabitants, as suggested by the concepts of the Anthropocene or Gaia 2.0. In other words, even though human capacities have their own limit and the future remains beyond human control, our vision for a desirable future can and should guide us in making responsible ethical and political decisions regarding the direction and pace of technological innovations.

Besides, the future of technology remains uncertain. Discourses on the future of cultural evolution, whether optimistic or pessimistic, often assume that the emergence of artificial general intelligence or artificial superintelligence is inevitable and merely a matter of time. However, the trajectory of AI developments will be heavily dependent upon human aspirations and ethical–political decisions. Hence, it is important to emphasize that technical feasibility alone cannot and should not determine our future. As Andrew Feenberg (2017, 44) aptly puts it, “[t]echnologies are under-determined by their strictly technical basis. They are realized through the intervention of actors who interpret their purpose and nature.” The gaps between technical possibilities and practical implementations need to be bridged and regulated by ethical and political decisions that align with our aspirations and societal values. Consequently, the central question we face today is not whether or when artificial general intelligence or artificial superintelligence will emerge but rather why we should develop such highly advanced AIs, or what we are aspiring to in the future. In focusing on the latter questions, we need to ensure that the future of AI-powered cultural evolution should follow the path of purpose-driven technological development (Son 2020).

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Notes

- ¹ This letter was released on October 28, 2015 and has been signed by over ten thousand individuals, including such prominent figures as Geoffrey Hinton, Demis Hassabis, Eric Horvitz, Yann LeCunn, Nick Bostrom, and Martin Rees. <https://futureoflife.org/open-letter/ai-open-letter/>.
- ² Most documents on AI ethics share the primary ethical principles proposed by the Vatican. Those principles are transparency, inclusion, responsibility, impartiality, reliability, security, and privacy (Pontifical Academy for Life and Renaissance Foundation 2020).
- ³ One can find numerous research groups and organizations working together under the motto “human-centered AI” on the webpage <https://hcai.site/>.
- ⁴ <https://www.microsoft.com/en-us/ai/ai-for-earth>.
- ⁵ European discussion of “sustainable and environmentally friendly AI” refers to the environmental impacts of AI system’s life cycle (AL HLEG 2019, 30–31), though only in two sentences, to our regret.
- ⁶ Leonhard Eisenberg’s tree of life image is found in <https://www.evogeneao.com/en>.
- ⁷ However, each species or each kind of being has its own uniqueness that cannot be exhaustively reduced simply to a “thing.” Hence, I do not support flat ontology (cf. Hendlin 2023). In this vein, as I discuss later, I am also convinced that humanity has a special role and increasing responsibility in the current Earth system.
- ⁸ According to Junghyung Kim, these histories of symbiosis and sympoiesis among living and non-living entities on and around Earth can be interpreted theologically as a process of God’s co-creation through and with all creatures. In this vein, he suggests applying Philip Hefner’s concept of co-creator to nonhuman creatures as well as humans (Kim 2022; cf. Hefner 1993). Meanwhile, the term “companion” is borrowed from Robert John Russell (2003), who refers to human and nonhuman creatures as “eschatological companions.”
- ⁹ In a similar vein, Rosi Braidotti (2013, 2) speaks of “the nature–culture continuum.”
- ¹⁰ In this respect, Willem Drees (2015) and others define humanity as “techno sapiens.”
- ¹¹ According to a recent study, “[a]lmost 95% of the Earth’s surface has been modified by humans” (LePan 2020).
- ¹² In this vein, I disagree with Anthony Levandowski’s expectation (cf. Harris 2017).
- ¹³ For example, a group of people may pose a threat to another group of people through the use of AI technologies. In such cases, the power dynamic exists not between humans and AIs but between different groups of people.

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The Role of Classical Sunnī Theology in Islam and Science: Responding to Nidhal Guessoum

David Solomon Jalajel, Researcher, Prince Sultan Research Institute, King Saud University, Riyadh, Saudi Arabia, shdave2@gmail.com

Shoaib Ahmed Malik, Lecturer, University of Edinburgh, Edinburgh, Scotland, shoaib.malik@ed.ac.uk

This article critically examines the current engagement between Islam and science, focusing on the role of theology in shaping this discourse. While previous efforts have centered on Islamizing science and aligning Qurʾānic verses with modern scientific knowledge, recent discussions have shifted towards methodological inquiries and specific theological issues. Nidhal Guessoum advocates for reinterpreting Islamic theology to align with modern scientific paradigms, suggesting that traditional frameworks are in tension with contemporary science. This article challenges that view, arguing that classical Sunnī theology, when rigorously applied, offers a no-conflict stance with modern science that does not require radical reinterpretation. By revisiting and carefully examining the metaphysical and hermeneutical foundations of Sunnī thought, we propose that many perceived conflicts between Islam and science stem from misunderstandings, and that classical Islamic theology holds untapped potential for constructive engagement with scientific developments while preserving the integrity of Islamic beliefs.



Introduction

The broader engagement between science and religion has passed through two phases and is now moving into a third (Davison 2022, 21). The first phase was typified by determining the various kinds of relationships that exist between science and religion. A famous development at this time was Ian Barbour's four-part taxonomy of conflict, independence, dialogue, and integration (Drees 2010, 2; Moritz 2017) and the different responses, variations, and critiques it generated (Cantor and Kenny 2001). An important stance developed at this juncture was that of Stephen Jay Gould (1997, 1999), whose theory of non-overlapping magisteria (NOMA) argued for a form of *a priori* independence for the two pursuits, where science covers the empirical realm and religion covers the sphere of ultimate meaning and moral value. An agnostic himself, he determines the magisterium of religion without considering religious teachings themselves and how those teachings address the nature of God and His relationship to the world. Though it assumes a no-conflict outcome for science and religion, which we authors also do, it does so at the cost of curtailing the scope of religious discourse and neglecting the theological and metaphysical commitments various religions have that would shape the unique ways each religious tradition would determine that scope.

The Divine Action Project (DAP) exemplifies the second phase, seeking to find a place for God within certain scientific constraints (Davison 2022, 22–24; Wildman 2004, 2005). It emerged as a pioneering project, marked by its enthusiasm and scope. This initiative was a collaborative effort between the Centre of Theology and Natural Science and the Vatican Observatory. It brought together eminent Christian philosophers, theologians, and scientists such as Ian Barbour, Thomas Tracy, Philip Clayton, John Polkinghorne, Wesley Wildman, Nancey Murphy, Keith Ward, William Drees, and William J. Stoeger. These participants engaged in a series of conferences and produced multiple volumes exploring the connections between science and theology across different scientific domains, including evolution, neuroscience, quantum mechanics, and chaos theory. Robert Russell played a key role as a principal coordinator and editor for each volume, working alongside various coeditors for different books (Malik 2021, 187). This phase has recently been critiqued for being too much in favor of science and not giving theology its due. This critique has resulted in more theology-centric proposals, a *theological turn*, which prioritizes theology in determining the God-world relationship from a metaphysical standpoint (Ritchie 2019; Feser 2019; Silva 2022; Kopf 2023; Tabaczek 2023). Moving away from such big-picture narratives, the third phase is a move towards more localised intersections in science and theology, known as *science-engaged theology*, as well as the explorations of the Special Divine Action Project (SDAP) (Perry and Leidenhag 2021).

To connect this broader discourse with Islam's specific context, it is important to note that the field of Islam and science has followed a different historical

trajectory. This distinct development will be the focus of this analysis as we explore how Islamic theology in particular interacts with scientific paradigms.

The relationship between Islam and modern science during the late nineteenth and early twentieth centuries was shaped by diverse scholarly responses to the shifting political and economic landscape, as Muslims grappled with the forces of colonialism, imperialism, and orientalism. Figures like Jamāl al-Dīn al-Afghānī (d. 1897), Sayyid Aḥmad Khān (d. 1898), Muḥammad ‘Abduh (d. 1905), and Rashīd Riḍā (d. 1935) sought to reconcile Islamic thought with modern science, countering narratives that portrayed Islam as backward and incompatible with progress. Alongside these thinkers, figures such as Muhammad b. Aḥmad al-Iskandarānī (d. 1889), who authored five volumes on the Qur’ān and science from the 1860s to the 1880s, and Ṭanṭāwī Jawharī (d. 1940), known for his multi-volume exegesis in the 1930s, also played crucial roles (Daneshgar 2017, 2023c). Their works, deeply influenced by the realities of French, British, and Ottoman colonialism, reflected attempts to engage with modern scientific paradigms while maintaining an Islamic worldview. These efforts were individual rather than part of a collective movement, with each thinker responding to the intellectual and cultural dominance of Western powers in their own way (Elshakry 2013).

For example, in *Islam and Christianity in Relation to Science and Civilisation* (*Al-Islām wa-l-Naṣrāniyya ma’ al-‘Ilm wa-l-Madaniyya*), ‘Abduh argues that Islam historically fostered scientific inquiry and compared its relationship with science to that of Christianity, which he claimed had been less accommodating (Scharbrodt 2022). This was a direct response to orientalist critiques that sought to frame Islam as inherently resistant to modernity. Similarly, Sayyid Aḥmad Khān and Jamāl al-Dīn al-Afghānī saw rationalism and scientific thinking as essential to revitalizing Islam in the face of Western imperialism (Keddie 1983; Qidwai 2019).

Despite their intellectual significance, these efforts remained largely disconnected and did not form a cohesive field of discourse. It was not until the 1980s that Islam and science began to emerge as distinct and recognizable field marked by a more organized, collective approach. This period saw the production of scholarly books, the convening of academic conferences, and a more formal recognition of Islam and science as an area of academic inquiry.

The first phase of the Islam and science discourse was characterized by two significant approaches (Guessoum 2015, 856): (1) the Islamization of sciences, and (2) scientific miracles in scripture, each of which offered distinct outlooks on how Islam could engage with modern scientific knowledge.

The Islamization of science trend emerged as a multifaceted response to the dominance of Western scientific paradigms, which were perceived by some Muslim intellectuals as tied to materialism and secularism (Abaza 2002; Furlow 2005). While the phrase “Islamization of science” has been used as a

general descriptor (Stenberg 1996), it encapsulates a diversity of approaches that differed significantly among thinkers. For example, Ismāʿīl Rājī al-Fārūqī (d. 1986) emphasized integrating Islamic metaphysical principles with the structure of knowledge to reformulate scientific disciplines, whereas Sayyid Muḥammad Naqīb al-Aṭṭās critiqued the epistemological foundations of Western science, which he saw as inherently secular and disconnected from spiritual realities. Ziauddin Sardar, by contrast, focused on the socio-ethical implications of science, advocating for reforms that would address the specific needs of Muslim societies without necessarily discarding modern scientific methods. Seyyed Hossein Nasr called for a return to sacred science, critiquing modern science's materialism and environmental consequences while emphasizing the spiritual dimensions of knowledge. Despite their differences and inner criticisms, these thinkers sought to create a framework for science that would harmonize with Islamic teachings, offering an alternative to the perceived ideological biases of Western science, thus grounding scientific practice that acknowledged divine principles rather than adhering to purely materialistic explanations (Guessoum 2011, 101–39).

Advocates of scientific miracles in scripture (*iʿjāz ʿilmi*) adopted a markedly different approach to engaging Islam and science. Their primary aim was to demonstrate the divine origin of the Qurʾān by identifying verses that were believed to allude to modern scientific discoveries (Daneshgar 2023a, 2023b, 2023c; Malik 2023b). Figures such as Maurice Bucaille argued that the Qurʾān contained precise descriptions of phenomena that modern science had only recently uncovered, including embryology, astronomy, and the expansion of the universe. This movement was not limited to academic circles; during the mid-twentieth century, *iʿjāz ʿilmi* became a central tool for Muslim preachers to counter atheism, serving as a theological corrective and inviting atheists to embrace theism by showcasing the Qurʾān's perceived alignment with scientific knowledge (Daneshgar 2023c). The movement gained considerable popularity among Muslims who saw it as a powerful argument for the compatibility of Islam with modern science and as validation of the Qurʾān's divine foresight. However, this approach often relied on retroactively reading modern scientific concepts into Qurʾānic verses, raising critical questions about its interpretive methodology and the broader limitations of such a hermeneutic (Mir 2004).

While both movements sought to bridge the gap between Islam and science, they did so in very different ways: one by reconstructing scientific knowledge within an Islamic framework and the other by retroactively interpreting Islamic scripture through the lens of modern scientific discoveries. Suffice it to say that both approaches have received their respective criticisms (Nasr 1991; Loo 1996; Abaza 2002; Mir 2004; Furlow 2005; Guessoum 2011, 100–72; Daneshgar 2023c).

The second phase, which began in the 2000s, saw a diversification of approaches within the field. This phase included ongoing discussions about the methodology for relating Islam and science—though not necessarily following the Islamization approach—alongside explorations of divine action and various localized interfaces between Islam and scientific disciplines. Unlike the DAP in the Christian context, this phase lacked a coordinated initiative but nonetheless witnessed significant scholarly activity. During this second phase, discussions expanded beyond the earlier movements to address new topics such as quantum mechanics, evolution, Islamic psychology, Islamic bioethics, and the nature of miracles. This broadening of focus could be seen as the beginning of an Islamic version of science-engaged theology, where specific scientific developments are engaged within the framework of Islamic thought (Malik 2023b).

However, this emerging discourse also brings to light differing perspectives on furthering the engagement between Islamic thought and modern science. Nidhal Guessoum (2011a, 13–14) proposes one such perspective and suggests that the next step should be the development of a theistic interpretation of science to conform with modern science as it stands and to harmonize Islamic belief with science. He says that “theologies that are fully consistent with modern science and methodological naturalism are far from trivial and require some sophisticated work. But they can be constructed” (Guessoum 2015, 873). This assertion specifically identifies theology and presupposes that existing theological frameworks within the Islamic tradition are inherently in tension or even in disharmony with the general acceptance of science and methodological naturalism. Consequently, Guessoum expresses skepticism toward classical theological models, suggesting they are ill-suited to address contemporary scientific challenges. For example, in his critique of David Jalajel’s 2009 book *Islam and Biological Evolution*, which analyzes evolutionary theory from a classical Sunnī perspective, Guessoum (2011b, 476) challenges the reliance on “views of scholars of a thousand years ago when discussing issues that have only become understood in, at earliest, the past century.”¹ This critique overlooks a crucial aspect: the views examined in that book are not the admittedly outdated scientific models entertained by past scholars; instead, the book examines the general metaphysical commitments and hermeneutical methods of the Sunnī theological traditions and explores what implications those commitments might have for the reception of modern scientific theories.

Following the work of Stefano Bigliardi (2014a), in an article called “Islam and Science: The Next Phase of Debates,” Guessoum (2015) reviews the emergence of a “new generation” of Muslim thinkers who harmonize Islamic thought with modern science, emphasizing the need to address pressing challenges like evolution, methodological naturalism, and divine action. While this framing highlights critical issues for contemporary discourse, it largely

sidesteps the potential of classical theological frameworks to address these same challenges. We contend that classical models, far from being irrelevant, can offer profound metaphysical and hermeneutical resources for meaningfully engaging with modern scientific paradigms. Rather than framing the next phase of debates solely in terms of harmonization or adaptation to modernity, we propose a new meta-narrative that recognizes the enduring relevance of classical theology. This approach neither dismisses the importance of methodological naturalism and the other challenges identified by Guessoum nor reduces them to external impositions. Instead, it reaffirms the capacity of traditional Islamic thought to engage with these issues on its own terms, thereby enriching the broader Islam and science discourse (Jalajel 2009 and Malik 2023a).

In the following sections, we delve deeper into the nuances of traditional Islamic theology, particularly within the Sunnī framework, to explore how it can engage with modern scientific paradigms without the need for radical reinterpretation. We first examine these theological traditions' enduring metaphysical commitments and hermeneutical methods, highlighting their relevance in contemporary discourse. Then, we critique Guessoum's assertion that classical theological models are inherently incompatible with modern science, demonstrating that his approach may overlook the potential for a more harmonious relationship. Through this analysis, we aim to show that traditional Islamic theology, when carefully and rigorously examined, possesses the flexibility and depth to coexist with scientific developments without the need for harmonization or reconciliation, challenging the assumption of an inevitable conflict between science and traditional understandings of the Islamic faith.

Sunnī Theology

Sunnī Islam is professed by an estimated 85–90% of Muslims worldwide (Lugo et al. 2009, 8). Admittedly, the picture is complicated by the fact that many who identify as Sunnī Muslims might also have cultural, philosophical, mystical, political, or social commitments that put them at odds with various Sunnī theological teachings. The broad overlap between Sufism and Sunnism is an important case in point. Indeed, the existence of these other influences means that when traditionally minded Muslim communities resist science or particular scientific theories, it cannot be assumed that this is a result of the theological teachings those communities identify with, since other influences might be the cause. The only way to determine the role played by Sunnī theological commitments is to examine those commitments directly. Since many Sunnī Muslims identify with one or another of the Sunnī theological schools, it indicates the relevance of paying attention to those schools in the context of an Islamically informed theological turn.

As a major branch of Islam, Sunnism is typified by a professed adherence to scripture and a commitment to the received traditions from the Prophet Muhammad and the early Muslim community that followed him. There are three widely recognized formal theological schools with which many adherents to Sunnī Islam today openly identify. These are the Ashʿarī, Māturīdī, and Salafī schools. The Ashʿarī school traces back to the Iraqi theologian Abū al-Ḥasan al-Ashʿarī (874–936). The Māturīdī school is named after the central Asian theologian Abū Maṣṣūr al-Māturīdī (853–944). These two schools developed in Sunnī Islam in the early tenth century as a reaction to the earlier formal theological development in Islam of the Muʿtazilīs and their scholastic (*kalām*) rationalism. These two Sunnī schools adopted their methods of argument to respond to them and became known as the Sunnī *kalām* schools (Leaman 2008, 84–89).

The third Sunnī theological school originates in an earlier Traditionalism (Atharism), an anti-scholastic tendency that advocated strict adherence to received prophetic traditions while rejecting excessive formal rationalization to defend the doctrine. Aḥmad b. Ḥanbal (780–855) was an important adherent of these views. In the fourteenth century, Taqī ad-Dīn Aḥmad b. Taymiyya (1263–1328) sought to respond to the Ashʿarī dominance by providing a formal theological defence of Atharī teachings, which resulted in the Salafī theological school (Jackson 2009, 135–36).²

The three Sunnī schools differ on several issues but share many common theological commitments relevant to science and religion issues. These commitments relate to two broad areas: (1) the nature of God and His relationship to cause and effect in the created world, and (2) God's particular actions and determining from scripture what He did or did not do in His creation.

God and Causality

With respect to the first consideration, Sunnī theologians developed divine action models to account for causation in the natural world, as well as for human volition, while maintaining belief in a creator God. The two most important models are occasionalism, advocated by Ashʿarī and Māturīdī theologians, and instrumentalism, advanced by Ibn Taymiyya. Occasionalism is a model where cause and effect in nature come about as the result of God creating one object on the occasion of another as a consistent, customary habit that provides an unvarying pattern in His creative act (Ibn Fūrak 2005, 297). Instrumentalism is a model of causation where God creates immediately at the time of action causal power directly in one created object and receptivity in another to bring about a resultant effect.³ The difference between these two models can be illustrated with the classic example of fire burning cotton. With occasionalism, God habitually creates ash in the place of cotton fibers on any occasion where He brings fire into contact with cotton. With instrumentalism, God creates ash through a divine act of directly imposing combustive potency in a particular instance of fire and

receptivity in a particular instance of cotton, and possibly resistive potency in the cotton's moisture (Hoover 2007, 160–61; Ibn Taymiyyah 1995, 3:113, 8:136).

An important feature these models have in common is that a wholly transcendent God is maximally active in His creation by directly creating every entity and event in the world. The world in turn is maximally contingent on God's will and action. God does not act in nature; instead, He enacts nature. This makes the notion of God's intervention in the world meaningless, since it is impossible to intervene in one's own direct action. This removes the problem of determining a causal joint where God's action can be accommodated within a causally closed system. These models are purely metaphysical accounts of God's relationship to Creation. They are theological belief commitments. Admittedly, they are immune to scientific critique. There is no point where a purely empirical science could observe to confirm or negate any aspect of either of these models.

Sarah Lane Ritchie (2017, 376–77) finds this to be a shortcoming of such an approach that, while fully embracing science and its conclusions, “divorces scientific knowledge from theology” so that their models “are virtually immune to scientific critique.” She sees it as problematic, given that science has proven extraordinarily successful in explaining the natural world, that this entails placing artificial boundaries on science. She says this in the context of critiquing specific Christian models of divine action.

However, these Sunnī divine action models metaphysically account for the astounding success of science in explaining the physical world because, while God is absolutely transcendent, He enacts every aspect of that world at every moment with perfect regularity and causal coherence. As for “taking the explanatory success of science seriously” (Ritchie 2017, 362), these models assume, and even demand, that very explanatory success. Therefore, the lack of scientific critique for the models that Ritchie sees as a problem does not pose any real challenge since the models themselves are, on the one hand, purely metaphysical, and on the other, perfectly harmonious with an expectation of science being able to fully explain the physical world. However, science can only describe the observed unbroken and regular physical processes that unfold in nature, which Sunnī theologians would argue is to be expected from a wise and perfect Creator. It does not and cannot address the existentionation of causality itself, which is a purely metaphysical question. This will remain true if science one day achieves a natural causal account for the origin of matter and even the origin of space-time.

The Sunnī theological commitment to a maximally contingent world brings about a no-conflict stance between religious metaphysical commitments, on the one hand, and modern science with its assumption of methodological naturalism, on the other. Whatever a scientist might suggest as a naturalistic model to account for a natural phenomenon, it will fall within the realm of

possibility for a pattern that God could manifest in nature by His power and will. In this way, all naturalistic explanations of worldly phenomena are by necessity metaphysically neutral under Sunnī accounts of divine action. What specifically happens in a maximally contingent world cannot be determined by pure reason nor constrained by metaphysics; therefore, knowledge of worldly phenomena must be taken from observation and based on evidence. On the metaphysical level, a conflict between science and religion is simply not there. So “theism does not enter into the scientific process” (Bigliardi 2014b, 162) because the Sunnī commitment to a maximally active God and maximally contingent world leaves all possible physical relationships open to scientific investigation. Natural causation, furthermore, is never seen as a rival explanation for God’s action but rather as the manifestation of His action. This means that an assumption of methodological naturalism for human engagement with the natural world is completely in line with the outlook engendered by Sunnī metaphysics and does not have to be integrated into it. This is why Abū Ḥāmid al-Ghazālī (1998, 4:379), though a strong advocate of occasionalism, describes it as “madness” for a person to ever expect natural causes to be circumvented. This answers what Guessoum (2015, 862) identifies as a challenge to the methodological naturalism of modern science:

Clearly such a framework for science poses a challenge to at least some Islamic conceptions of the world and nature, given that often Muslims claim and insist that God acts physically and directly in the world, in cases of miracles or in everyday events, either at large scales (earthquakes, floods, etc.) or small, individual, personal scales (in responses to prayers, in particular).

In this passage, God’s direct action in the world is pitted against a naturalistic outlook. However, from the Sunnī metaphysical perspective, the naturalistic explanation is precisely what God’s direct action existentiates for the world. There is no tension between the existence of complete, regular, and unbroken causal processes for everything in nature on the one hand and God’s ubiquitous action on the other because they are regarded as one and the same. God’s action is not an intervention, not limited to miracles or answering prayers. His action existentiates the natural causal order at every place, on every level, and at every moment in time.

This does not mean that methodological naturalism is metaphysically neutral, as it is sometimes claimed (Guessoum 2015, 873), since it is easy to imagine a person upholding metaphysical ideas that would make metaphysical naturalism untenable for them. What matters is that the metaphysical commitments of Sunnī Islam, as we have seen, are inherently conducive to methodological naturalism. Its theistic vision is already amicable to the methodologies of modern science. This leaves science, as Bigliardi (2014a,

175) expresses it, “a field of knowledge with its own methods and internal dynamics that need to be fully grasped and not further reshaped” without any effort needed to reconcile Islam and science, the effort he identifies as preoccupying the new generation of Muslim thinkers.

This is in stark contrast to the underlying assumptions of the proponents of the “Islamization of science,” who attempt to bring modern science in line with what they judge to be correct metaphysical and epistemological principles (Al-Attas 1993, 133–35; 1995, 113–14). They hold that the approach of modern science is not in harmony with those principles (Nasr 1989, 27, 39, 94–95; 2001, 39–40). Based on what we have shown here, this suggests that the metaphysical and epistemological principles they advocate are not fully aligned with those of classical Sunnī theology but brought in from elsewhere, potentially Hellenistic philosophy, esoterism, or cultural norms. These are fruitful areas for future research.

Theological Hermeneutics

The second consideration is how Sunnī theologians approach scripture to determine theologically binding doctrine regarding what God actually did or did not do in creation. They developed a very cautious theological hermeneutics, which requires direct and explicit scriptural evidence to make any doctrinal claim about God’s action, be it an affirmation or negation; in other words, what God did or did not do in creation. For any matter or detail about which scripture is not clearly forthcoming, theological non-commitment (*tawaqquf*) must be exercised. This caution derives directly from their metaphysical commitments to a transcendent, maximally active God and a maximally contingent world. Since God can do anything logically possible, the only way to determine what God did in the world, barring our empirical experience, is through explicit scripture. The connection between this hermeneutical caution and theological commitments can be seen with the Ash‘arī theologian al-Ghazālī (1988, 132), who says:

What is known only by way of textual evidence (*samʿ*) is where one of the rational possibilities is actualized (by God), since it is all permitted by reason. These things are only known by way of revelation and inspiration, and we know about them from the revelation that reaches us, like the resurrection, the gathering of souls, reward and punishment, and the like.

Al-Māturīdī (2010, 254) likewise discusses why there is a need for God to send revelation via prophets:

There are three foundations—impossibility, necessity, and, between them, contingency—upon which rest all the world’s matters. Necessity is where reason does not permit a proposition to assert otherwise. The same goes for impossibility.

It can be [otherwise] with contingency, since it vacillates from one circumstance to another, from one hand to another, from one domain to another. Therefore, reason cannot necessitate any tendency or rule it out as impossible. Therefore, the Messengers came to explain what is apposite in each circumstance.

The Māturīdī theologian Nur al-Dīn al-Ṣābūnī (1969, 86) says in the same context:

Rational premises are three: necessary, impossible, and contingent. Reason makes judgments about the necessary and the impossible, but it must be noncommittal (*yatawaqqaf*) about the possible, so it does not pass judgment, neither negating it nor affirming it.

Likewise, Ibn Taymiyya's student, Muḥammad Ibn Qayyim al-Jawziyya, says (1998, 2:721–22): “[A] claim about God's actions, if it is not established by Him declaring it about Himself, is a claim fabricated against Him without knowledge.”

For any detail about God's actions in the world to be obligated as doctrine, the theologian must affirm what the scriptures explicitly state, negate what the scriptures negate, and exercise theological non-commitment about anything scripture does not directly address. As a result, theological hermeneutics, which explores matters of binding religious doctrine, is the strictest hermeneutical register. It is applied to texts deemed to bequeath certainty or near certainty in the authenticity of their attribution and meaning.

Theological hermeneutics can be contrasted with two other hermeneutical registers in Sunnī Islam, the legal and exegetical registers, which allow greater latitude for interpretation (see Table 1). The legal register determines legal rulings from textual evidence. Legal hermeneutics was developed to address the wide range of practical contingencies Islamic Law must address, many of which are not resolved by direct scriptural pronouncements, and its primary purpose is to navigate uncertain evidence to derive the legal verdict that best represents the divine intent. Hermeneutical strategies outlined in the works of Islamic jurisprudence (*uṣūl al-fiqh*) are used to determine appropriate legal rulings from

Register	Purpose	Minimum epistemological demand
Theological	Determining binding doctrine (<i>‘aqīda</i>)	Certainty/near certainty
Legal	Determining legal rulings (<i>shar‘a</i>)	Preponderance of uncertain evidence
Exegetical	Determining what the scriptures convey (<i>tafsīr</i>)	Possibility

Table 1: Hermeneutical registers and their epistemological demands (Jalajel 2024, 108).

less-than-decisive scriptural evidence. Another hermeneutical register can be discerned in the works of Qur'ān exegesis (*tafsīr*) and ḥadīth commentary. This register permits exploring meanings of scripture for all of its possibilities while ruling out what is determined to be false. This is why exegetical works often present multiple and even contradictory interpretations side by side.

This means that exegetes will address questions in works of exegesis, particularly about matters of the unseen and scriptural possibilities open to interpretation, that theologians do not typically address in their theological works. These exegetical explorations might suggest matters that are at variance with modern scientific conclusions, but those suggestions are not necessarily intended to be binding doctrine upon Muslims. Therefore, apparent conflict between some interpretations suggested in exegetical works should not lead us to the conclusion that Islamic theology is in tension with science or with a particular scientific claim. An example of this is the extent of Noah's flood. This question is discussed in works of exegesis, with some exegetes suggesting it was global in scope while others argued it was regional (Jalajel 2009, 53–63). The question is not usually discussed in theological works, nor is the extent of the flood asserted in statements of creed. Those who advocate that the flood had a regional extent are neither censured nor declared wrong for doing so. The matter remains on an exegetical level and is not considered a point of doctrine.

Where theologically binding doctrine is concerned, the methodological rigor required to establish doctrine about contingent matters of the unseen mitigates the possibility of conflict with science. Theories and models posited by science to explain natural phenomena will not be read into scripture where scripture does not make clear and direct pronouncements, since theological non-commitment (*tawaqquf*) is maintained for all matters not explicitly, directly, and unambiguously addressed by scripture. Therefore, scripture would neither be reinterpreted to conform with science nor its apparent meanings assumed to be in conflict with science. Questions of science are simply left alone, since they are not and—considering the Qur'ān's focus, rhetorical style, and composition—really would not be addressed in scripture with a directness of language enabling theologically binding critiques of science to be grounded in it. There is no need to harmonize scripture with science (Bigliardi 2014b, 159) or vice versa, since no disharmony is supposed. It should be obvious how this is in stark opposition to modern scientific miracle tendencies.

Miracles

Another issue relevant to science and religion that involves scripture and God's actions is scriptural accounts of miracles. How are these understood within a Sunnī theological context? Guessoum (2015, 864) says: "Belief in miracles constitutes one of the most contentious issues in the debates on religion, science, and modernity."

The Sunnī theological stance on miracles is closely tied in with the metaphysical commitments that inform its divine action models, namely the idea of a maximally active transcendent God and a maximally contingent created world. A miracle in Sunnī theological discourse is referred to as a “breach of [God’s] habit” (*kharq ‘āda*). This relates back to the metaphysical understanding that natural causes are patterns in God’s habitual actions. The Ash‘arī theologian Fakhr al-Dīn al-Rāzī (2000, 4:27; 2015, 3:556)⁴ identifies two ways God’s breach of habit can manifest: (1) something could happen on an occasion that does not conform to the normal causal pattern, or (2) something fails to happen on the occasion when it would be expected. The Red Sea splitting on the occasion when Moses raised his staff, the birth of Jesus without a father, or Jesus’s touch being the occasion of the dead coming to life are examples of the former. Abraham being unharmed on the occasion of being placed in a bonfire is an example of the latter. Miracles might appear as uncaused events, genuine breaks in causality, as in *ex nihilo* appearances, or as unprecedented and customarily impossible causal sequences, which seems to be the understanding favored by Ibn Taymiyya (1995, 8:177). In all cases, God acts contrary to His habit and brings about the unexpected at the occasion where something else is expected, so miracles are cases of God acting differently than usual, not cases of His intervening in some other ongoing course of action.

This contrasts with the contextualization Guessoum (2015, 864) gives to miracles, where he defines them as: “[P]henomena which seem to contradict nature’s laws or course’ (something that would imply divine action or intervention), not phenomena which cannot be explained by science today.” The parenthetical insertion is telling. Phenomena that seem to contradict the laws of nature are conspicuous as cases of divine action in contrast to those that conform with natural laws, which do not imply divine action. God’s actions are understood as interventions in an otherwise ongoing and autonomous natural process.

Within the Sunnī theological tradition, miracles are not interventions. They are rather understood as instances where God, instead of directly acting according to His usual custom, acts in a non-customary manner in His direct existention of the world’s objects and events, manifesting a pattern in the world different from the one He normally manifests. In either case, God’s direct action is a metaphysical possibility He can enact. Miracles, however, are recognized as impossible events from the perspective of human onlookers. This is referred to in Sunnī theological discourse as “customary impossibility” (*mustaḥīl ‘ādatan*) (al-Sanūsī 2003, 59–61). The human mind, from lived experience, is compelled to judge the norms of nature to be inviolable and exceptionless due to their unwavering consistency. This, however, is a customary or nomic judgment, not a logical judgment in the way that something simultaneously existing and not existing would be judged to be a logically impossible contradiction in terms. In Sunnī theology, miracles are exceptions to “laws” (*sunan*) that are customarily

exceptionless in nature but not logically exceptionless like the idea that a whole must be larger than any of its parts. This distinction between logical and nomic judgments avoids David Hume's conundrum of exceptionless laws and miraculous exceptions (Horst 2014, 325). The laws are, in the framework of nature and human experience, exceptionless and inviolable. But as purely logical possibilities, they remain objects of God's power. Sunnī theology, unlike Descartes, does not deem that God's will encompasses violations of the canons of logic (Horst 2014, 324).

Miraculous and non-miraculous events are metaphysically identical; they are both manifestations of God's direct action where He existentiates the world's objects and events. Every action in the world belongs equally to God. The world has natural laws enabling us to practice science because God acts consistently. Humans experience the world's material regularity, with its pleasures and pains, joys, and tragedies, because God creates those experiences for them. Guessoum (2015, 868) argues that the possibility of miracles makes "the accusations of a capricious or uncaring God (why didn't He stop the Holocaust and other genocides?) become valid." This, of course, is not a scientific objection to the possibility of miracles but rather one involving the problem of evil, which the Sunnī theological schools address in various ways. What is relevant to our present concerns is that Guessoum's objection here is built upon understanding miracles as interventions in otherwise autonomous processes. From a Sunnī perspective, every physical action and outcome that occurs on Earth during a genocide, including every cessation of life, is inescapably part of God's direct action in existentiating the physical world, with the sinfulness being restricted to the intentionality of the human participants. Al- Ṭahāwī famously expresses this as: "The actions of the servants are God's creation and an acquisition of the servants" (Ibn Abī al-ʿIzz 2003, 2:662). Human sin is not an active force in the world but merely a description of the human actor's choice to disobey God or act unjustly. The evil of the act is an attribute of the actor's intention. The physical act itself is, by contrast, none other than the very act God chooses to existentiate in the world by His wisdom. There is no occasion for intervention and no need for any miracles to prevent an unwanted outcome. Everything in the world, without exception, is God's direct action. Nothing is a result of His inaction.

An important question to investigate is the Sunnī perspective on the purpose of miracles. According to Sunnī divine action models, God can manifest any effect in the world at any time and in any way He pleases. He can, therefore, bring about whatever He wishes without contravening His habits. This means miracles are not conceived as means for God to bring about His will in the world, change the course of events, or achieve some worldly object that He could not otherwise realize. God does not need miracles to affect His will in the world, since He does not have to act in any particular way to bring about any particular consequences. Therefore,

miracles are never invoked to explain natural phenomena, no matter how complex they are, as if they could not have come about in a non-miraculous manner.

What, then, do Sunnī theologians understand the function of miracles to be? Miracles are seen to have various expressive, communicative functions and for this reason, both al-Māturīdī (2006, 2:49) and Ibn Taymiyya (2000, 2:793) refer to them as signs (*āyāt*). Their important communicative functions are: (1) challenge (*muʿjizah*) as proof of a prophet's claim to prophethood; (2) prelude (*irhās*) to foreshadow a prophet's future prophethood; (3) graciousness (*karāmah*) to honor a righteous person; (4) succor (*maʿūnah*) to show support to a common believer; and (5) disgrace (*ihānah*) to shame someone or discredit their claim to prophethood (al-Bayjūrī 1983, 133). As with speech acts, these different expressive functions are dependent on the context in which they are manifested (al-Rāzī 1987, 8:61; 2015, 3:551–53). Miracles depend on our ability to distinguish the customarily possible from the customarily impossible. This requires an otherwise causally consistent world.

Miracles must be extremely rare or they would lose their expressive power. If miracles were common enough to become part of human experience, even on isolated occasions, they would be regarded as a normal part of the world's functioning instead of manifesting the customarily impossible (al-Rāzī 2000, 4:27; 2015, 3:556). For people to genuinely regard them as impossible—scientifically impossible in today's parlance—the overwhelming majority of people must never experience them. Human experience, in other words, must render them conceptually impossible within the world of experience, framing a phenomenal epistemological grounding for judging them to be impossible. For the few people who do experience them, they are unrepeatable, so they could never be subjected to sustained empirical scrutiny. This is why Sunnī theologians do not see belief in such miracles as undermining the world's causal consistency. Miracles depend on an absolute causally consistent world, and, in the effectiveness of their expressive power, they validate that consistency. A universe without consistent and invariant natural laws, whose invariability provides an epistemological basis for determining what can and cannot happen, would undermine the meaning of miracles.

This theological stance of restricting miracles to extremely rare expressive events addresses the concerns of those who argue that the acceptance of supernatural miracles is in irreconcilable conflict with the acceptance of the scientific worldview and the viable practice of science as a field. The concern they have is that any acceptance of the possibility that God could or would create any object or event in nature contrary to natural law fundamentally undermines the epistemological grounding of science. Clayton (2008, 178) says that “merely knowing that a system could at any instant begin acting in a manner completely inconsistent with natural law because of a divine intervention would be enough, I fear, to undercut the practice of science.” The concern here is that if a miracle can occur, it would become impossible for an observer, observing

what is presumed to be a natural phenomenon, to know in any instance whether God is performing a miracle.

This is not a problem from the standpoint of classical Sunnī theology, which holds that God's will is for miracles to take place only in very unambiguous and narrow contexts against a backdrop of His habit of universal causal uniformity. Though it is within God's power to act contrary to His habitual pattern of natural laws, Sunnī theologians insist that it is never His will to do so arbitrarily. Apart from those particular and unambiguous expressive contexts, the observer will be certain that what they observe in nature has a natural cause for it provided by God's habitual action and is not a habit-breaking miracle. We have already discussed how al-Ghazālī (1998, 4:379) describes any expectation of a miracle on a person's part to be "madness." Consequently, miracles are never assumed to be the explanation for any natural phenomenon. Likewise, they are not to be invoked as an explanation for any peculiar firsthand experience, no matter how inexplicable it seems, in the absence of those very restricted contexts where their expressive functions are discerned, or indeed, as in the case of prophetic challenges, explicitly declared as such. Al-Rāzī (2000, 21:170) invokes Mary's incredulous reaction in Qur'ān 3:43 and Qur'ān 19:20 to hearing she was going to have a child as proof of this principle, saying:

She only expressed surprise at the glad tidings that Gabriel gave her, because she knew that the norm is that bearing a child does not come about except with a man's participation. Norms are what people of knowledge take into consideration in matters, even when they concede that other things are possible by God's power.

For anyone other than eyewitnesses to the event, only scripture can confirm a miracle, and here it becomes a lesson and a test of faith for those hearing or reading the scripture. Indeed, belief in these miracles is seen in the tradition as a trial of faith, as the epithet of "al-Ṣiddīq" was given to Abū Bakr because he did not hesitate to believe when the Prophet told his followers about his miraculous night journey from Mecca to Jerusalem (al-Bayhaqī 1988, 2:361), and this is precisely because of the difficulty of such ready belief in the face of something customarily impossible.

The assumption of causal uniformity is what is needed for a meaningful practice of science. Most significantly, the Sunnī theological approach to the possibility and occurrence of miracles is consistent with methodological naturalism, since supernatural entities are never appealed to in explaining natural phenomena. Miracles are never provided as rival explanations to naturalistic models or as arguments that certain complex entities in nature cannot have natural explanations. On the other hand, a scientific mindset is needed to identify

that something is a miracle, since a person must be able to judge the event to be scientifically impossible. When a miracle occurs, the “law” claim with respect to nature remains valid and inviolable; its violation remains nomically impossible, but the impossible has happened, and it is the recognition of this that signals a communicative expression from God. Sunnī theologians embrace this judgment since it is precisely this scientific—or customary—impossibility that gives miracles their expressiveness. This, of course, means a rejection of metaphysical naturalism, since it acknowledges that supernatural events can occur and that God can do the impossible as long as the impossibility is customary in its nature and not an explicit logical contradiction like a square circle. Miracles are the purely logically possible exceptions to customarily exceptionless natural laws, and this customary judgment of the human mind is the epistemological grounding that requires human beings to adopt an assumption of methodological naturalism for all their engagements with the natural world.

Guessoum seems to acknowledge this distinction between accepting something as an object of God’s power and accepting its actual occurrence as an object of His will when He says:

But because He is omnipotent it does not mean that He is just going to violate His own laws. So I am not saying that God *cannot*, I am saying that God put together the laws so that things function in an orderly manner. Otherwise, what is the point of putting together laws, and then doing whatever one wants every now and then? (Bigliardi 2014b, 175).

Methodological naturalism requires negating the expectation of supernatural occurrences, but it does not deny the logical possibility that God has the power to enact them. Once this distinction is made, the absence of supernatural occurrences is effectively indistinguishable from a situation where they occur only for specific, narrow, and unambiguous communicative purposes. In both scenarios, an observer studying nature will categorically rule out supernatural explanations in normal circumstances, assuming even the most inexplicable phenomena have natural causes. This ensures methodological naturalism remains intact.

However, the idea that God will not act otherwise because it would mean His breaking His own laws would be rejected by Sunnī theologians. In their divine action models, God enacts a causally coherent world because He wants it so. For Ash‘arīs, who stress God’s volition, it is simply because that is God’s will, and He has made this known to us. Māturīdīs stress God’s wisdom and argue that a wise God would only want to create a coherent, rationally discernible world. Salafīs, who emphasize God’s perfection, say that a perfect being would not want things to be otherwise (see Jalajel 2022, 7–9). In the end, however, it is God’s wish to act habitually in His creation so that the

world is coherent and not a case of His upholding laws for Himself as He expects us to be law abiding as well.

All of that aside, what is being argued for here is that religious believers who adhere to the Sunnī theological doctrine on miracles will have a no-conflict stance towards all aspects of science in its methods (as long as they are deemed ethical), epistemological grounding, claims, and theoretical models. Their commitment to miracles will not result in their objecting to the principle of methodological naturalism or to any scientific claim. We are not arguing that all scientifically minded people will find their stance on miracles agreeable. If those who embrace this Sunnī theological doctrine are challenged, for instance, that Abraham's unprotected skin being left unharmed by the fire is scientifically impossible, they will wholeheartedly agree that it is. If they are told that science indicates certain things about exothermic chemical reactions, they will argue that they have no problem with this because the miracle is not meant to explain anything about the natural world. In the following section, the example of Adam's miraculous creation and the question of human evolution is discussed as a case in point. This is a no-conflict stance, and it is significant because it entails a complete absence of any objection to science within a strict, traditional theological framework, even for questions like human evolution, without any reinterpretation of texts or adjustments of doctrine or accommodations of any kind. It is the default stance engendered by the theological framework.

Human Evolution: A Case Study

The theory of evolution provides a natural causal account of the development and proliferation of the various species on Earth. Human evolution is the application of the evolutionary model to account for the genus *Homo* and the species *Homo sapiens* and all aspects of that species' genetic, physical, and mental traits. It proposes that modern humans evolved from preexisting species with common descent going back to the earliest life forms. This is an issue where Muslim engagement has taken place with various degrees of rigor, with a wide array of opinions on display, even within a Sunnī context (Elshakry 2011; Shavit 2015; Malik and Kulieva 2020). The value of the theological turn is to take a step back and examine the theological tradition's broad metaphysical framework and methodological approaches to determine the effect this could have on the question.

Biological evolution in general, and human evolution in particular, falls squarely within the realm of logical possibility with respect to Sunnī metaphysics. Sunnī divine action models fully accommodate them as patterns God could manifest in the world as His creative act. Claiming human evolution is metaphysically impossible could be seen as tantamount to unbelief since it implies a negation of God's power. It would imply that God cannot manifest

that particular causal pattern in the world. Within a Sunnī framework, it is not a question of God using evolution as a “means” to create certain living things. The idea of God using means to bring about His creations would be contrary to Sunnī understandings of God’s action. Instead, it is a simple question of God choosing to manifest one pattern in the world over time instead of another.

As for the requirements of scripture, Sunnī doctrine derives the following from what it determines to be direct and explicit pronouncements: (1) Adam and Eve were created without parents, and (2) all people on Earth are their direct descendants. This much is clear from Sunnī discussions on the matter. However, a claim that human evolution is theologically false is implicitly a claim that God never created extremely similar biological entities before Adam. To assert such a doctrinal position would require scripture to clearly and directly establish that biologically human entities did not evolve on Earth before Adam’s appearance. In the absence of any explicit pronouncements to that effect, a stance of theological non-commitment would be required on the matter. Likewise, to negate the common descent of today’s humans from earlier biological ancestors, it would be required to determine that Adam’s immediate descendants did not intermarry with preexisting entities. Since scripture explicitly requires only that all people on Earth today are descended from Adam and Eve, it does not rule out the possibility of intermarriage where such descent is maintained. Consequently, the story of Adam’s miraculous creation without parents does not provide a rival explanation to the scientific account of human biological origins. That is what is at stake. Guessoum (2012, 303) observes:

Adam is the central issue for Muslims with regard to evolution—at least nowadays. Contemporary religious scholars find it so impossible to conceive a pre-Adam species or even a possible multiplicity of Adams and lineages that have ended up disappearing (like Neanderthals, Java men etc.) that they’re willing to reject the theory of evolution wholesale for that reason.

What can be determined from a Sunnī theological perspective is that pre-Adamic species and lineages are neither metaphysically impossible nor scripturally ruled out. This is the value of the theological turn. If the methodology, metaphysical framework, and hermeneutics of classical Islamic theology are engaged, it could be determined that this issue, so central to Muslim hearts, is a non-issue. Guessoum rightly points out that the question of Adam is used to reject evolution wholesale, where the truth is, if analyzed within the rigorous framework of Sunnī theology, it is not even an obstacle for human evolution.

Of course, the creation of Adam and Eve without parents does require an acceptance of supernatural miracles (for Adam and Eve themselves), which Guessoum finds problematic, but that is a separate issue from the question of accepting human evolution as an account for the natural origins of the

biological species, which could have happened separately from and prior to Adam's appearance on Earth (Jalajel 2009, 154–55; [2019] 2021, 24–27, 30; Malik 2023c).

By engaging with the theological turn, it is possible to identify what is and is not an issue for religion and science. From the viewpoint of Sunnī theology, human evolution is not a controversial issue. This is because Sunnī metaphysical principles assert that anything, including evolution, must be within God's power to enact. Additionally, Sunnī theology's cautious approach to interpretation insists there is no doctrinal basis to deny evolution. An attempt to appeal to scripture to reject evolution would not be a case of prioritizing scripture over science but rather a case of deliberately interpreting scripture with the intent to instrumentalize it against science. This is because rejecting evolution would mean adding unnecessary assumptions and interpretations to the scriptures, which only offer minimal information on the origins of life. It is important to stress that this no-conflict stance is purely a consequence of Sunnī theology taken on its own terms and not a response to evolution or a maneuver to accommodate it. It is merely that the extreme hermeneutical caution of Sunnī theology has a consequence of allowing human evolution to be a matter of complete indifference. Therefore, going back to what the centuries-old theological tradition suggests through its metaphysical vision and its consequent hermeneutical methodologies allows for a more relevant engagement with what actually concerns today's Muslims, at least those who subscribe to Sunnī models, and provides an answer that does not suggest a conflict between science and faith.

It has been argued that the idea that Adam and Eve were specially created, even if they do not serve as the biological explanation for the origins of the species *Homo sapiens*, is a form of creationism and that a person who believes this should be classified as a creationist (Guessoum, 2011b). This confuses a general commitment to the possibility of miracles, which Sunnī theology upholds, with a specific doctrinal commitment to oppose a scientific explanation for the origin of a species, which Sunnī theology does not require. Creationism is a rival account to a naturalistic, scientific explanation for the origin of a species, and the investigation of species origins is a question about something that takes place in the natural world. The Sunnī commitment to Adam and Eve's miraculous creation does not oppose the scientific theory about the origins of the species *Homo sapiens* determined from observing the natural world. What it does entail is the belief in something scientifically impossible: the appearance of two particular, fully formed, complex living beings named Adam and Eve who have no biological progenitors, but this impossibility is also conceded by these believers in miracles. This is a separate issue from the issue of rejecting evolution as an entirely satisfactory scientific explanation for the origin of the species. The belief in Adam and Eve's unique origins does not

violate methodological naturalism, since it does not appeal to a supernatural explanation to explain any natural phenomenon. It fully accommodates the naturalistic explanation for the origins of the various human species, including *Homo sapiens*, and for all matters related to human physiology that are open to scientific observation and testability. It only posits a supernatural event relating to two individuals who are part of the unseen and therefore belief in whom is grounded wholly in scripture.

Interestingly, Joshua Swamidass (2019, 79–80) shares how even atheist scientists concede this point: “This finding is a secular claim about evidence, which does not require belief in a *de novo* created Adam and Eve to affirm. For example, several atheist scientists participated in the workshops, and all agreed there was no evidence against a couple specially created within a larger population. They agreed with this evidential conclusion even though they personally do not think Adam and Eve were real, nor do they believe that God exists.”

Adam and Eve’s miraculous creation would undermine the scientific account of human evolution if it were theologically asserted as the explanation for human biological origins (or for certain purportedly uniquely human traits like sapience) in opposition to a naturalistic scientific model. That would be a form of creationism since it negates modeling natural processes for the occurrence of a natural species or a natural biological trait by insisting on direct *ex nihilo* creation for the same. We have demonstrated here that such a position is scripturally not sustainable.

Conclusion

The theological turn proposed in this article may offer a refreshing perspective on the relationship between Islam and science. We argue for two claims, one general and one specific. The general claim is to recommend a theological turn in determining the relationship between science and religion within an Islamic framework. This has the potential to reveal possibilities that have so far been neglected in defining that relationship. To support this general assertion, we explored the example of classical Sunnī theology, engaging with the metaphysics and hermeneutical underpinnings of its three highly developed theological schools, the Ash‘arī, Māturīdī, and Salafī.

By doing this, we determined that Sunnī metaphysics holds all natural, material relationships between natural objects to be contingent relationships within the scope of God’s power and volition; therefore, any purely scientific claim about the natural world will, in principle, never be in metaphysical conflict with Sunnī theology. This metaphysical orientation of maximal divine activity and maximal worldly contingency leads, in turn, to a particularly cautious approach to scriptural hermeneutics. When scripture is engaged to derive theologically binding assertions about contingent matters of creation, the epistemic bar is so high that it nearly precludes the possibility of conflict between scriptural assertions and

scientific claims about the natural world. However, we also identified that the same metaphysical orientation results in a firm commitment to the possibility of isolated miraculous happenings that, by definition, go against scientific norms. However, those miracles are understood to serve rare expressive functions and are not seen as interventions in the world or as rival explanations for natural phenomena. Therefore, they will never be invoked to negate or supplant scientific explanations or theories about any aspect of the natural world. This leads to our specific claim: that the framework of classical Sunnī theology provides, or is very likely to provide, a no-conflict stance with respect to the reception of science in general, its assumption of methodological naturalism, and the various assertions scientific theories make about the natural world.

This no-conflict stance allows for the harmonious coexistence of scientific inquiry and religious faith. Rooted in the belief in a transcendent, maximally active God and a maximally contingent world, this stance suggests that the natural sciences, as understood and practiced today, can be pursued without the need for reconciliation with religious doctrine.

One of the key strengths of this result is its resilience to changes in scientific theories or knowledge. By focusing on the empirical investigation of natural relationships, science remains inherently compatible with religious beliefs, regardless of advancements in scientific understanding. Moreover, the no-conflict stance encourages scientific exploration without imposing religious biases or restrictions, fostering an environment where scientists are free to follow science-based inquiries (Malik and Muhtaroglu 2022). Furthermore, this stance empowers believers to resist attempts by ontological naturalists and materialist atheists to instrumentalize science for their own agendas. By recognizing the boundaries between scientific inquiry and religious doctrine, the no-conflict stance ensures that Islamic law and ethics guide the application of science without dictating claims about the physical reality of the world. The no-conflict stance should not be confused with a stance of independence for each field, because the full scientific freedom it affords scientists is determined by Sunnī metaphysical commitments, nor is it one of integration, because each field remains intact and with its own methods and domain of inquiry.

The theological turn, in the case of classical Sunnī theology, reveals that a conflict and reconciliation narrative should not be assumed as the only outcome for science and the Islamic tradition, showing the value of this approach. It also opens up many avenues for further research. For instance, it must be acknowledged that people who profess to be Sunnī Muslims may have other influences on their thoughts, whether philosophical, mystical, cultural, or political, that could lead them to conclusions in conflict with scientific claims. It is clear that many members of the Muslim public who identify with traditional Sunnī Islam have problems with science or with some of its theories. These influences can also lead them to approaches that are in conflict with Sunnī theological commitments, like

the “Islamization of the sciences” efforts that conflict with Sunnī metaphysical and epistemological assumptions, and “Qur’ānic miracle” tendencies that violate the principles of Sunnī theological hermeneutics. The theological explorations we have done are of value since they can assist in pinpointing the actual drivers or motivators for these movements and for other prevailing tensions with science and particular scientific theories. This prevents drawing a hasty conclusion that tensions with science within traditionally minded Sunnī communities stem from their traditional theological commitments.

Likewise, our work encourages similar efforts to be made for other theological frameworks, like the various classical Shi‘ī traditions, as well as certain important “late tradition” syntheses of much later post-classical historical periods that incorporate Neoplatonic, Aristotelian, and Akbarian thought with Sunnī and Shi‘ī theology. Employing a theological turn within these frameworks may lead to different outcomes than the ones we have determined here for classical Sunnī theology. Also, our no-conflict conclusion could be challenged by convincingly demonstrating, using classical Sunnī theological sources, that the application of Sunnī metaphysics and theological hermeneutics is likely to result in claims that conflict with the modern practice of science in general or with some of its particular theories.

In essence, the stance suggested in this article offers a promising path forward, promoting dialogue, understanding, and mutual respect between these two domains. By embracing Islam’s longstanding theological traditions, we can navigate complex questions with nuance and wisdom, ultimately enriching our scientific endeavors and religious faith.

Notes

- ¹ In describing Guessoum's approach. Rüdiger Lohker and Margareta Wetchy (2021) also recognise this point.
 - ² We use the term "Salafī" instead of "Taymiyyan" to distinguish Ibn Taymiyya's school from the earlier Atharī tradition since the designation "Salafī" was supported by Ibn Taymiyya himself (1995, 4:149) and by his student Ibn Qayyim al-Jawziyya (1987, 1:226). Secondly, it is the preferred self-attribution of many of the theological school's professed followers since its modern revival (al-'Uthaymīn 2000, 1:54). For the usages "Salafi methodology" and "Salafi hermeneutic" in this context, see Jon Hoover (2009).
 - ³ Jon Hoover (2007, 160–61) uses the term "instrumentalism" to describe Ibn Taymiyya's DAM. See also Ibn Taymiyya (1995, 3:113, 8:136–8:137, and 8:389).
 - ⁴ Al-Rāzī's classification as an Ash'arī theologian might be questioned due to the prominent role of *falsafa* in his works. However, this reflects his eclectic approach, where he engaged with, appropriated, and modified ideas from both the *kalām* and *falsafa* traditions, characteristic of the post-classical Islamic intellectual landscape. While we interpret him as an Ash'arī theologian, his methodology and outlook mark a significant methodological and stylistic departure from his predecessors. For a detailed discussion, see Frank Griffel (2021).
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Augustinian Miracles: An Alternative to Prevailing Orthodoxies?

Zachery Moffatt, DPhil Candidate in Theology (Science and Religion), Exeter College, University of Oxford, UK, zachery.moffatt@exeter.ox.ac.uk

This article explores Augustine of Hippo's conception of miracles. It places a particular emphasis on the metaphysics of the natural order in Augustine's works *The Trinity* and *The Literal Meaning of Genesis* to dispute subjectivist and interventionist readings of Augustinian miracles. Rather, this article argues that Augustine offers a metaphysically robust conception of miracles that upholds an intimate connection between God and nature while respecting the intrinsic wonder of miracles. In light of this, this article considers how a deep and wide engagement with Augustine's thought may help provide alternative approaches to the prevailing philosophical and theological orthodoxies regarding miracles.



Historical analysis has served as a powerful tool in the field of science and religion. A deep engagement with the historical relationship between science and religion has helped undermine the narrative, which has been so pervasive since the nineteenth century, that science and religion are in perpetual conflict. The historical work by figures such as John Hedley Brooke and Peter Harrison has highlighted the complex, multifaceted relationship between science and religion.¹ As the field of science and religion has matured, moving beyond solely looking at the general relationship between the global categories of “science” and “religion” and examining more finely grained questions about specific areas of science and religion, the value of a deep historical engagement must not be forgotten.²

Harrison (2023, 99) emphasizes this point, arguing that knowledge of the historical relationship between science and religion informs and enriches contemporary discussion in the field. It helps one to better recognize that many of the problems faced in the science and religion dialogue are contingent upon the mode of engagement one adopts between the disciplines and that the adoption of a different mode of engagement may resolve, dissolve, or alleviate these problems. Furthermore, a historical analysis will provide insight into various modes of engagement that may not have been available to the science-and-religion scholar’s eyes if they had been exclusively focused on the present. This insight, therefore, provides new tools to tackle the current issues and topics within the field of science and religion.

In this article, I aim to show how a deep historical engagement with Augustine’s thought on miracles may enhance the contemporary discussion regarding the nature of miracles. To achieve this, in the first section, I examine the state of the contemporary discussion regarding the nature of miracles, highlighting the key challenges with the prevailing interventionist approach, and outline how this discussion may benefit from deeper historical engagement, specifically with the thought of Augustine. In the second section, I analyze Augustine’s writings on miracles, placing a particular emphasis on the God–nature relationship assumed in Augustine’s account of miracles. In turn, I argue that Augustine proposes a more metaphysically robust conception of miracles than he is typically given credit for. In section three, I outline various ways Augustine’s thought on miracles may contribute to the contemporary discussion regarding the nature of miracles. In particular, I argue that Augustine’s thought can help develop an alternative approach to miracles that relies on more theologically appealing conceptions of the God–nature relationship and divine intervention compared to the prevailing interventionist approach.

The Contemporary Discussion of the Nature of Miracles

The scholarship regarding the question “what is a miracle?” is in a state of flux. In much contemporary discussion, an interventionist understanding of miracles has been paradigmatic. In this approach, miracles are understood as occurring

through God's intervention in nature and violation of its laws. Eminent philosopher Charles Taylor (2007, 547) expresses this thought, describing the "modern concept of 'miracle'" as being "a kind of punctual hole blown in the regular order of things from outside, that is, from the transcendent." Such a conception of miracles sees nature as a self-sufficient entity, the boundaries of which God must pierce through and intervene to cause miracles.

An illustrative example of this interventionist approach can be found in John Leslie Mackie's (1982) description of miracles in *The Miracle of Theism*. In this work, Mackie (1982, 20) writes that "a miracle occurs when the world is not left to itself, when something distinct from the natural order as a whole intrudes into it." Building upon this idea, he speaks of "the notion of the natural world in contrast with which the theistic doctrines stand out as asserting a supernatural reality" (Mackie 1982, 13). The natural world is self-sufficient, running by itself, where "everything that happens results from factors within that system in accordance with its laws of working" (Mackie 1982, 21). A miracle then occurs through "a supernatural intervention . . . into that system from outside the natural world as a whole" (Mackie 1982, 21).

Despite the prevalence of understanding miracles as God intervening in nature, this approach is plagued with difficulties. For instance, John Macquarrie (1966, 248) argues that an interventionist understanding of miracles "cannot commend itself in a post-mythological climate of thought" because it is irreconcilable with modern science. He supports the perspective that science relies on the worldview that the universe is a causally closed system that runs according to the laws of nature. Since interventionist miracles stand in direct contrast to this worldview, requiring God to violate the laws of nature, they are contrary to modern science.

Key participants in the Divine Action Project (DAP), 1988–2003, the most influential and systematic examination of special divine action in recent times, raised more theologically focused objections. Many members of the DAP were worried that God intervening in the natural order and violating the laws of nature may entail an inconsistency in the nature of God. Robert Russell (2009, 354), a key figurehead of the DAP, writes: "[T]his approach [i.e., interventionism] is theologically problematic because it pits God's special acts against God's regular action, the latter of which is seen to be the underlying cause of nature's regularities."

Expressing the general view of participants in the DAP, Wesley Wildman (2008, 141) states:

The DAP project tried to be sensitive to issues of theological consistency. For example, the idea of God sustaining nature and its law-like regularities with one hand while miraculously intervening, abrogating, or ignoring those regularities with the other hand struck most members as dangerously close to outright contradiction.

More generally, it has been contended that the idea of God intervening in nature relies on a theologically impoverished conception of God's relation to nature. Andrew Davison (2019, 232) develops this objection, writing:

[The language of intervention] accords too great a degree of independence to creation, as if it stood over and against God in such a way that he would need to find a way to enter into it. If the whole of creation's being already derives from God at every moment, God does not need some special means . . . in order to act, given that every action, in every case, already proceeds on account of God's action.

In a similar vein, E. L. Mascall (1971, 151) writes that the idea of God intervening in nature entails a relation between the natural and the supernatural where "the two orders [i.e., the natural and the supernatural] are thought of rather as if they were two apartments on adjacent floors, with a layer of soundproof packing between the natural ceiling below and the supernatural floor above."

This conception of the natural and the supernatural is inadequate because it undermines both the immanence and transcendence of God. God's transcendence is undermined because God exists in the same way that natural things exist, it is just that God exists in the "supernatural apartment" while natural things exist in the "natural apartment." In a sense, God is reduced and confined to the supernatural apartment. This undermines the immanence of God, because God is expelled from the natural world, existing in a supernatural realm extrinsic or added to a complete nature that exists in and of itself.

In light of these challenges for interventionism, alternative accounts of miracles and divine action have been formulated. For instance, a central contribution of the DAP was the systematic development of the non-interventionist objective divine action (NIODA) approach. This approach argues that there are pockets of ontological indeterminism in the natural order that allow God to objectively act within the world without intervening in nature.³ Alternatively, theistic naturalist approaches hold that all of the natural order is inherently involved with God's active presence, meaning God can act in the world exclusively through secondary causes.⁴ Thirdly, neo-Thomist approaches argue that a Thomistic framework provides a strong theological foundation for understanding divine action and can be developed to be compatible with modern science.⁵

It is not the aim of this article to systematically examine these alternative approaches to miracles and divine action. I merely want to point out that the contemporary discussion regarding the nature of miracles and divine action is at an exciting point; the prevailing interventionist approach largely has been dismissed and new alternatives are being offered.⁶ In this article, I aim to show

how a deep historical engagement with Augustine's thought on miracles may benefit this contemporary discussion.

First, a more general point: Why may historical engagement benefit contemporary scholarship regarding the nature of miracles? As highlighted, a key issue with the interventionist approach is that it relies on an inadequate God–nature relationship, where nature exists apart from God in a self-sufficient bubble such that God must intervene in the world in order to act.⁷ Alister McGrath (2015, 10) proposes that this God–nature relationship is largely a product of modern sensibilities. Thus, studying the thought of pre-modern theologians may offer alternative ways of understanding the relationship between God and nature that are more theologically palatable.⁸

Next, why engage more specifically with the thought of Augustine on miracles? John Hardon (1954, 230) writes that Augustine “formulated the first theological definition of *miraculum*.” Similarly, Harrison (1995, 533) considers Augustine “the first to attempt a formal definition of ‘miracle’.” Furthermore, Augustine's thought heavily influenced subsequent scholastic thought on miracles. Lydia Schumacher (2022, 3) writes that “in the medieval period, Augustine's ideas were formulated in new ways by Anselm of Canterbury (d. 1109), Peter Lombard (1100–60), Albert the Great (d. 1280), and Thomas Aquinas (1225–74).” Due to the historical influence of Augustine's thought on miracles, it seems apt that we should engage with his writings in contemporary times.

Second, as I argue in the next section, contemporary scholarly engagement with Augustine's writings on miracles has typically focused on a particular strand of Augustine's thought. While this strand is helpful, I argue that it does not do justice to the full richness of Augustine's writings on miracles. Thus, I do not think the full contributions Augustine's thought on miracles may have to the contemporary discussion have been sufficiently appreciated. It is the aim of this article to explore how a deep engagement with Augustine's thought may offer alternative and fruitful ways of approaching the question of what a miracle is.

With this in mind, in the next section, I seek to engage with Augustine's thought on miracles on its own terms, placing a particular emphasis on the God–nature relationship assumed in Augustine's account of miracles. Then, in the third and final section, I seek to outline how Augustine's thought on miracles may benefit the contemporary discussion of miracles and respond to key challenges with this endeavor.

Augustine's Metaphysics of Nature and Miracles

Augustine's discussion of the nature of miracles primarily arises in two contexts. First, he focuses on the theological significance of miracles. Second, he seeks to demonstrate the occurrence of miracles, including contemporary miracles attested to by himself and other believers.

Regarding the first of these contexts, Augustine sees the main role of miracles to be to instill faith in others. Miracles are exemplifications of God's divine power and serve as signs for truths about God. Speaking of miracles such as the rod of Moses turning into a serpent (Exodus 4:3) and Jesus turning water into wine (John 4), Augustine holds that these events could only have occurred through divine power. Indeed, the inherently wondrous nature of miracles serves to persuade even the foolish of God's divine power, although they fail to recognize that all events are ultimately exemplifications of God's power (Augustine 1991, 3.1.11).

Augustine primarily focuses on the miracles performed by Jesus and his apostles. He holds that these miracles vitalize people's faith in Christ. For example, in *The Usefulness of Belief*, Augustine (2006, 32) writes: "What was the purpose of so many great miracles? He [Christ] said himself that they were done for no other purpose than that men should believe in him." This theme runs throughout Augustine's discussions on miracles. In *Concerning the City of God against the Pagans* (hereafter, *City of God*), Augustine (2003, 22.6) discusses "all those great miracles" performed by Jesus, his apostles, and those with faith in Christ who persuade individuals that Christ was God.

With Augustine's view that the miracles of Christ and his followers justify the Christian faith, in Book XXII of *City of God*, he argues extensively for the occurrence of certain miracles witnessed by himself and other contemporaries. Augustine speaks of seeing a blind man being restored to sight in Milan at the location of the remains of the martyrs Protasius and Gervasius. He claims to have seen with his brother Alypius the miraculous healing of Innocentius at Carthage. Alongside these two events, Augustine speaks of twenty-one other miracles he claims to know for certain happened in his time.

Augustine's Subjective Definition of "Miracle"

Discussions of Augustine on miracles often give central focus to his definition offered in *The Usefulness of Belief* (Hardon 1954, 230; Harrison 1995, 533). In this early work, Augustine (2006, 34) defines a miracle as "something strange and difficult which exceeds the expectation and capacity of him who marvels at it." Here, Augustine offers a subjective account of miracles; nothing intrinsic to the event determines whether it is or is not a miracle (Harrison 1995, 533). Rather, whether an event is miraculous depends entirely on how the subject understands the event and, in particular, whether the event appears unusual to them.

Building upon this thought, Augustine suggests that every event should be considered miraculous because, in a sense, every event is unusual. He writes:

God's daily miracles were disesteemed, not for their easiness but their constant repetition . . . When the water was made wine, men saw it and were amazed;

what else takes place with the rain along the root of the vine? He did the one, He does the other. (Mourant 1973, 104)

More briefly, Augustine writes: "Is not the daily course of nature itself something to be amazed at? All things are full of miracles, but our wonder is lessened by their repetition" (Mourant 1973, 104). Here, Augustine seems to be using "unusual" in a rather unique way. For Augustine, "unusual" does not refer to events that rarely happen, since he speaks of "daily miracles" and miracles whose wonder is lessened by repetition.

Instead, "unusual" for Augustine refers to the radical contingency of all events. One of the claims Augustine seems to be making is that nothing in nature occurs through fate or necessity—as supposed by the Stoics—but rather everything occurs through the will of God (Grant 1952, 219). Emphasizing this point, Augustine (1982, 5.21) references Matthew 10:29, writing: "Our Savior with His own lips tells us that not a single sparrow falls to earth without God willing it, and that God Himself clothes the grass of the field, which soon is to be thrown into the oven."

Since every event occurs through the will of God, every event can be understood as a sign of God's providence. In the same way that Jesus turning water into wine is so unusual and wonderful that it must be a sign of God's providence, Augustine suggests that the development of wine through its natural process is also so unusual and wonderful that it must be a sign of God's providence. It is just that our wonder at the natural development of wine is lessened by its constant repetition.

In these quotations, Augustine is proposing a conception of miracles that is radically different from the interventionist approach prominent in modern thought. First, he offers a conception of miracles that is subjective. What makes an event a miracle is not any metaphysical feature of the event itself—such as whether it is caused by a divine intervention or breaks the laws of nature—but rather whether an individual finds the event unusual. Second, he proposes that every event ought to be understood as a miracle because every event is "unusual" in the sense that every event occurs not by necessity but through the will of God. Third, whereas interventionist accounts of miracles rely on a conception of nature as existing self-sufficiently apart from God, Augustine emphasizes that nature is inextricably connected to and dependent upon God.

One question that may arise from this discussion of Augustine's conception of miracles is whether he pays due respect to the unique category of miracles. By affirming the miraculousness of every event, it seems Augustine does not conceive there to be a unique category of miracles that stands in contrast to natural events; Jesus turning water into wine and feeding the five thousand seem to be of the same metaphysical status as wine being made through fermenting grapes and a piece of bread nourishing one person. If there is no such unique

category of miracles, there may be a concern that the theological significance of miracles is undermined. John Mouton (1973, 105) expresses this view, writing: “Obviously the wondrous can have meaning only in contrast to that which is non-wondrous. Without the ordinary repetition of events in nature there could not appear the extraordinary which distinguishes the miraculous.”

While certain scholars have understood Augustine as denying a unique category of miracles, upholding every event to be miraculous, I think limiting Augustine’s understanding of miracles to this interpretation inadequately reflects the depth of his thought on miracles.⁹ Augustine used the term *miraculum* in various ways (Haddon 1954, 230). In the way considered here, he emphasizes the unusualness and wonderful nature of all events. However, in *The Trinity* and *The Literal Meaning of Genesis*, Augustine offers a more metaphysically robust conception of miracles that upholds the unique category of miracles and contrasts them with natural events. It is this more metaphysically robust conception of miracles offered by Augustine I focus on for the remainder of this section and which I think can be particularly useful for offering an alternative to prevailing orthodoxies in the contemporary discussion of miracles.

Augustine’s Metaphysics of the Natural Order

To gain greater insight into Augustine’s more metaphysically robust conception of miracles, it will help to first understand what Augustine means by “the natural order.” In *The Trinity*, Augustine (1991, 3.3.19) recognizes that events within the usual course of nature occur at “frequent intervals.” Such events include the rising and setting of stars, the generations and deaths of animals, the snow and rain, the lightning and thunder, cold and heat, and other like things.

Indeed, even rarer events such as “eclipses and comets and earthquakes and monstrous births and similar things” belong to the usual course of nature (Augustine 1991, 3.1.7). Although, *prima facie*, they are unusual and wondrous, a deeper inquiry into these events shows they are “often repeated and known over several generations and known to more and more educated people” (Augustine 1991, 3.1.7). Here, Augustine seems to suggest that a deeper knowledge of these events allows one to recognize that they occur in a regular, albeit infrequent, fashion that can be predicted. Augustine considers events belonging to the usual course of nature to be natural events. He writes: “[W]hen these things happen in the continuous flow and flux of things, traveling the usual road from darkness into light, and from the light back into the darkness, they are called natural” (Augustine 1991, 3.1.11).

For Augustine, there is a metaphysics that underpins whether events belong to the usual course of nature. While today we typically conceptualize the regularities of nature in terms of the laws of nature, Augustine drew upon the Stoic idea of seminal reasons (*rationes seminales*) deployed by the Neoplatonists

(Oliver 2016, 387).¹⁰ Augustine introduces the idea of seminal reasons in *The Literal Meaning of Genesis* to tackle two related problems.

First, there is the issue of repetition in the first two chapters of Genesis. Augustine wonders why we are told in the first chapter what God created on the various days of creation and then again in second chapter told that God brought forth from the ground the trees, the birds, and the animals (Brady 1964, 142). Second, Augustine considers the issue of how creation was complete on the seventh day while we still see the production and reproduction of new life in current times (Mourant 1973, 113).

To tackle these questions, Augustine (1982, 9.17) supposes that in the act of creation, God endowed creaturely entities with seminal reasons that determine “for each thing what it can do or not do and what can be done or not done with it.”¹¹ He compares these seminal reasons to seeds concealed within corporal elements that require “suitable combinations of circumstances” for “particular species to burst into being and carry on their career” (Augustine 1991, 3.2.13). The world, like mothers heavy with young, “is heavy with the causes of things that are coming to birth” (Augustine 1991, 3.2.16).

Mariusz Tabaczek (2020, 952) describes each seminal reason as “a very specific type of potentiality of a particular and fixed type of entity or natural kind.” Within each creature is a particular potentiality that is actualized given particular circumstances. For instance, within the acorn is the potentiality for becoming an oak tree, given the acorn is provided with the right conditions. The seminal reason within a natural creature serves as “a sort of secondary efficient cause of the development of the living being” that accounts for the creature having its particular nature and powers (Brady 1964, 156).

Augustine seeks to resolve these two challenges in light of his theory of seminal reasons. Augustine denies that there is repetition in the first two chapters of Genesis because the first chapter speaks of God implanting the seminal reasons within the natural order and the second chapter speaks of how the seminal reasons led to the development of visible living beings (Brady 1964, 143). On the question of whether creation was complete on the seventh day, Augustine answers that creation was complete on the seventh day in the sense that all seminal reasons were implanted in the created order, but the development and reproduction of new life occurs today as these seminal reasons still lead to new life (Mourant 1973, 113).

Augustine’s theory of seminal reasons also serves as a metaphysical basis for the order of nature. Creaturely entities are endowed with a given seminal reason that governs the development of that creature. Provided the particular circumstances are met, the creature will develop into its particular nature with its particular set of powers. Thus, the natural order occurs in a regular and predictable way because each seminal reason endowed in each creaturely entity ensures that the development of that entity is uniform.

There has been much debate regarding the metaphysical status of seminal reasons, particularly whether seminal reasons are intrinsic or extrinsic to corporeal entities. Simon Oliver (2016, 379) notes that Augustine's account of seminal reasons has faced charges from two sides. He has been accused of rendering seminal reasons as external to corporeal entities, i.e., not existing within corporeal entities but rather only in the mind of God. This entails that corporeal entities are innately powerless, completely passive like chess pieces on the board that can only move by the external imposition of God (Nawar 2021). Alternatively, Augustine has also been accused of rendering seminal reasons internal to corporeal entities, leading to a form of proto-deism (Gunton 1988, 83). God simply plants the seminal reasons into corporeal entities and then steps back, becoming completely irrelevant to the development of corporeal entities.

Oliver argues that both accusations distort Augustine's thought on seminal reasons. He proposes that the seminal reasons endowed within creatures exceed intrinsic or extrinsic classifications. Seminal reasons are intrinsic to creatures in the sense that they do exist within creatures rather than, say, the mind of God. Nevertheless, they are also extrinsic to creatures in the sense that the being and nature of seminal reasons continually depend upon God. Oliver (2016, 392) expresses this idea, describing seminal reasons as "created expressions of the eternal reasons that lie in the Word of God's Wisdom."

Jules Brady (1964, 156) supports this interpretation too, stating that as well as creating seminal reasons within creatures, God "makes the seminal principles continually exist" and "moves the seminal reasons towards Himself who is true rest and joy." Through this understanding of seminal reasons, Augustine avoids the two poles of rendering seminal reasons wholly intrinsic to natural creatures, leading to a form of proto-deism, and making seminal reasons wholly extrinsic to natural creatures, leading to a form of occasionalism. Instead, while seminal reasons are intrinsic to creatures and endow creatures with a particular nature and causal powers, they are extrinsically orientated towards and dependent upon God.¹²

Such a conception of seminal reasons allows Augustine to uphold an intimate connection between God and nature while still respecting God's transcendence and distinction from the created order. Oliver (2016, 385) expresses this view, writing:

Creation has within itself the rational principles of its own perfection and is drawn towards its goal by God's continual providential care and guidance. God is both within and beyond the creature in such a way that we find the blending of intrinsic and extrinsic aspects of divine providence and creation's orientation to specific ends. Whilst in no sense being like creation, God is both immanent to creation and wholly transcendent.

Here, we can see that Augustine's conception of the relationship between God and nature is radically different to the conception assumed in modern interventionist accounts of miracles. Modern interventionist accounts conceive of nature as a self-sufficient entity that God is excluded and contrasted from, as God exists in a separate supernatural realm. In contrast, Augustine emphasizes both the inextricable connection and radical difference between God and nature as the seminal reasons intrinsic to natural creatures are orientated towards and dependent upon God.

Augustine's Metaphysics of Miracles and Exceptions to the Natural Order

With a sound understanding of Augustine's metaphysics of the natural order, we are now in a position to consider his more metaphysically robust conception of miracles. While Augustine's theory of seminal reasons serves as the basis for the uniformity of the natural order, in Book Six of *The Literal Meaning of Genesis*, he considers how miracles may be accommodated. Augustine supposes that while many creaturely entities develop in a natural manner, there are entities that develop miraculously, in a manner contrary to that entity's natural mode of development. For instance, Augustine references Jesus turning water into wine as an example of a miracle where the entity develops into its final form instantaneously. How are we to account for this form of miraculous development?

To accommodate this question, Augustine develops his theory of seminal reasons. He proposes that the seminal reason within each creature is endowed with a dual potentiality, one that allows for the natural development of the creature and another that allows for the miraculous development of the creature. Expressing this idea, Augustine (1982, 6.13) writes:

[T]hat these reasons were created to exercise their causality in either one way or the other: by providing for the ordinary development of new creatures in appropriate periods of time, or by providing for the rare occurrence of a miraculous production of a creature, in accordance with what God wills as proper for the occasion.

Such a dual potentiality allows Augustine to uphold a metaphysical distinction between natural events and miracles. Natural events occur through the natural potentiality within the seminal reasons of creatures being exercised, and miracles occur through the miraculous potentiality within the seminal reasons of creatures being exercised.

Augustine expands upon the nature of this miraculous potentiality by speaking of the creation of Eve. He writes that in the original creation, God did not determine Eve was to be created in precisely the way she was created,

namely, from the rib of Adam. Rather, “[t]his act of creation determined only the possibility that it could be done thus,” and the fact that it actually came to pass is due to a cause that “was hidden in God, the Creator of all things” (Augustine 1982, 9.18). Augustine (1982, 9.18) considers this event to be paradigmatic of all miracles because “all things that have been made not in the natural development of things, but in a miraculous way to signify this grace, have had their causes also hidden in God.”¹³

This further elucidates Augustine’s metaphysical distinction between miracles and natural events. Natural events occur through the natural potentialities of creatures being exercised. In contrast, miracles occur through a cause hidden in God that activates a miraculous potentiality and leads to creatures behaving in a manner contrary to their usual disposition. As an example, water turns into wine naturally as grapes absorb water through their vines and then ferment. This process of fermentation occurs through the natural potentiality of the seminal reason possessed by grapes. In contrast, water miraculously turns into wine through a cause hidden in God activating the miraculous potentiality of the seminal reason possessed by water to instantaneously turn into wine.

A tendency in scholarship is to describe the act of God activating the miraculous potentiality of an entity through a hidden cause as an act of divine intervention. For instance, Hardon (1954, 231) writes that miracles occur through creaturely entities possessing a potency “which only a direct intervention of God can actuate.” Similarly, discussing Augustine’s theory of miracles, Brady (1964, 150) writes: “When miracles or extraordinary events occur, the seminal reasons are passive capacities from which the divine intervention produces a miraculous effect.” Lydia Schumacher (2023) endorses Brady’s interpretation, describing Augustinian miracles as occurring through divine intervention. Tabaczek (2020, 947) writes that miracles occur for Augustine through “God’s instantaneous and direct intervention” activating a miraculous potentiality within creatures.

By describing Augustinian miracles as occurring through divine intervention, these scholars should not be understood as attributing to Augustine the prevailing interventionist approach to miracles that is paradigmatic in modern thought. As stated earlier, the modern interventionist approach relies on a theologically problematic God–nature relation wherein God is expelled from the workings of nature such that God must intervene to act. This is emphatically not Augustine’s conception of the God–nature relationship, for he conceives nature to be inextricably connected to, dependent upon, and orientated towards God in a manner that preserves divine immanence and transcendence.

So, how should we understand the concept of divine intervention within Augustine’s metaphysics? Mirela Oliva offers a useful conception of divine intervention distinct from the modern interventionist approach. While Oliva discusses the concept of divine intervention in the thought of Thomas Aquinas,

I think her discussion also relevantly bears on Augustine's metaphysics. She writes: "An intervention is not the exception to an otherwise inactive God but the intensification of an ongoing divine action" (Oliva 2024, 2). She uses the metaphor of a music conductor to clarify her idea: "Like a conductor that becomes more energetic when the rhythm turns more dynamic or dramatic, divine action intensifies in certain moments while leading human life on its path. Intervention is this intensified action" (Oliva 2024, 3). On this understanding, the concept of divine intervention is only intelligible in the framework of continual divine providence because it is an intensification of already ongoing divine action rather than a rare action from an otherwise absent God.

I think such a conception of divine intervention maps onto Augustine's conception of the natural order and miracles. As stated, he affirms God's intimate role in the usual course of nature because the seminal reasons implanted in creatures are inextricably connected to, dependent upon, and orientated towards God. Nevertheless, miracles are an intensification of divine action for Augustine because they occur through God activating the miraculous potentiality within creatures. This constitutes an intensification of divine action because the miraculous potentiality within creatures is activated through a cause hidden within God. So, while the usual course of nature occurs through the seminal reasons within creatures being dependent upon and orientated towards God, miracles occur more directly through a hidden cause within God.

Augustine's Contribution to the Contemporary Discussion

In light of this exposition of Augustine's understanding of miracles, how may Augustine's thought inform the contemporary discussion of the nature of miracles? In the first section, I highlighted three central issues with the prevailing interventionist approach. First, it relies on a problematic God–nature relationship that undermines the immanence and transcendence of God. Second, it seems to pit God's special acts against God's regular actions. Third, there is the issue of whether the idea of God intervening in nature is unscientific. I now outline how my engagement with Augustine's thought on miracles may help develop an alternative approach to miracles that can better resolve, dissolve, or alleviate these issues.

First, I have outlined how Augustine offers a radically different conception of the God–nature relationship compared to the modern interventionist approach. While the interventionist approach withdraws God from the natural world such that God must intervene in order to act, Augustine sees God as both immanent to creation and wholly transcendent. He conceives natural creatures to have their own causal powers by virtue of their seminal reasons. Nevertheless, these seminal reasons, while intrinsic to creatures, are extrinsically orientated and dependent upon God. Such a conception preserves the causal integrity of nature while simultaneously respecting the immanence and transcendence of God.

Seeking to replicate such a God–nature relationship in contemporary accounts of miracles is theologically preferable to the prevailing modern interventionist conception of this relationship.

Second, Augustine's writings on miracles serve as a basis to reformulate the concept of divine intervention in a more satisfying way that avoids the issue of pitting God's special acts against God's regular actions. The contemporary interventionist approach typically "entails a separation between moments of divine action on the one hand and moments of non-action on the other" (Oliva 2024, 2). Such a conception of intervention does not fit into Augustine's metaphysics that affirms God's constant providential action within the natural order. Rather, divine intervention in Augustine's thought ought to be understood as an intensification of divine activity since a hidden cause in God activates miraculous potentialities within creatures.

I think the concern of God's general actions being pitted against God's special acts is eased by Augustine's conception of divine intervention. For Augustine, God's enacting of miracles does not stand against God's providential role in the usual course of nature. Rather, miracles serve as an intensification of God's continual providence in the world. There is a certain harmony between natural events and miracles; both are a result of divine action, it is just that miracles occur through a more intense form of divine action. Thus, miracles serve as a development of God's continued action in the natural world rather than a dramatic departure from it. In turn, there is no contradiction in God causing miracles at particular times and upholding the usual course of nature at others.

A further virtue of Augustine's approach is that it preserves God's providential role in the usual course of nature while still respecting the unique category of miracles. Although great focus has been given to Augustine's subjective definition of miracles in *The Usefulness of Belief*, a key concern with this definition is that there is no longer a unique category of miracles that is distinguished from natural events. However, this concern is remedied when Augustine's more metaphysically robust conception of miracles is considered. In this conception, miracles are metaphysically distinguished from natural events because miracles occur through God activating a miraculous potentiality by a hidden cause, whereas natural events occur through the regular actualization of seminal reasons within creatures. Thus, the unique metaphysical category of the miraculous is preserved.

However, one concern regarding the applicability of Augustine's thought to the contemporary discussion regarding miracles is whether Augustine's thought is compatible with modern science. It may be argued that Augustine's conception of miracles is unscientific and therefore has little relevance to modern thought regarding miracles. Indeed, while some scholars have interpreted Augustine's theory of seminal reasons as a prescient conception of evolution, Tabaczek (2020, 945) convincingly argues that Augustine's theory is incompatible with

the modern theory of evolution. He justifies this claim by stating that the idea of one species arising from another would be unacceptable within “the context of [Augustine’s] neo-Platonist theory of forms as eternal and unchangeable ideas in the mind of God, participated by created beings” (Tabaczek 2020, 956). For Augustine, the potentiality of the development of each species was implanted in the beginning of creation, thus not allowing for new species to develop spontaneously from other pre-existing species.

In response to this concern, I stress that I am not suggesting a return to Augustine’s theory of seminal reasons. Nevertheless, I think a deep engagement with Augustine’s thought on miracles can contribute to the contemporary discussion. The general themes of Augustine’s thought, in terms of understanding the God–nature relationship and the concept of divine intervention in ways that do justice to divine transcendence and immanence, provide a useful set of theological standards in contemporary discussion that have not been sufficiently reflected upon in the prevailing interventionist paradigm.

Nonetheless, the relevance of Augustine’s thought to the contemporary discussion of miracles does not need to be limited to establishing broad theological standards. As I have mentioned, a key difference between Augustine’s thought and modern thought is that Augustine understood the natural order to be grounded in the Stoic notion of seminal reasons, whereas in modern thought the natural order is typically grounded in the concept of the laws of nature.¹⁴

In contemporary philosophy, the laws of nature have been understood in various ways. Some scholars adopt a neo-Humean approach, understanding the laws of nature to be descriptions of particular regularities in the universe.¹⁵ Others propose that the laws of nature are necessary connections between properties.¹⁶ A third prominent way of understanding the laws of nature in modern thought is dispositionalism, in which the laws of nature are grounded by the dispositional or causal character of properties. Each property has a particular causal character such that any entity that possesses that property will behave in particular ways given particular circumstances.¹⁷ There is a certain parallel between Augustine’s theory of seminal reasons and contemporary dispositionalism. On a broad level, both understand the usual order of nature as grounded in powers intrinsic within creaturely entities.¹⁸

In light of this, it seems that more particular aspects of Augustine’s thought on miracles could be relevant to those who understand the laws of nature in a dispositionalist fashion. For instance, as I have argued, Augustine’s theory of seminal reasons exceeds both intrinsic and extrinsic classifications, avoiding the two opposing threats of deism and occasionalism. Thus, Augustine’s writings on seminal reasons may inform contemporary discussion on how to understand the dispositions of an entity in a theologically satisfying manner that pays due respect to both the entity’s own causal power and dependence upon God. Such a theologically grounded conception of dispositions would ensure the

problematic God–nature relationship widespread in modern interventionist accounts is avoided.¹⁹

Furthermore, Augustine's thought on miracles provides some tools to tackle the objection that a commitment to miracles is unscientific. Recall Macquarrie's (1966, 248) concern that a commitment to miracles as divine interventions "is irreconcilable with modern science" because modern science relies on a conception of the universe as a causally closed system where all events are caused by preceding events in the same system. I think Augustine's conception of the dual potentiality of seminal reasons can help advance a response to Macquarrie.

Augustine supposes the usual course of nature occurs when the natural potentiality of creatures is exercised and miracles occur when God intervenes to actualize the miraculous potentiality within creatures. One may understand the dispositions of natural entities in a similar fashion; each entity has natural dispositions that regulate the natural causal behavior of that entity, and each entity also has miraculous dispositions that are actualized by divine intervention and lead to the entity behaving in a miraculous fashion contrary to its usual behavior. On this position, the universe would be causally closed when only natural dispositions of entities are exercised. The universe would not be causally closed when God intervenes to exercise the miraculous dispositions of entities.

In light of this, one could dispute Macquarrie's claim that modern science relies on a conception of the universe as always being a causally closed system. Instead, one could suppose that the domain of science is limited to only examining the world when it is causally closed. Any instance in which the universe is not causally closed is beyond the realm of science to investigate. Framing this in terms of the dispositionalist understanding of the laws of nature, it is the role of science to examine events where only natural dispositions are being exercised. Any instance where God intervenes to exercise miraculous dispositions is beyond the realm of science to investigate. Thus, miracles, strictly speaking, do not conflict with the laws of nature or the findings of modern science because the domain of science is limited to when only natural dispositions are being exercised, which is not the case when miracles occur.²⁰

Conclusion

In this article, I have sought to highlight how a deep engagement with Augustine's thought on miracles may contribute to the contemporary discussion regarding the nature of miracles.

First, I noted how, in recent times, it has been recognized that the prevailing modern interventionist approach to miracles is plagued with philosophical and theological difficulties. This has led to alternative approaches to miracles being developed, and I sketched out how historical analysis, in particular an engagement with Augustine's thought, may help this endeavor.

Second, I engaged with Augustine's writings on miracles, arguing that limiting his understanding of miracles to a purely subjective understanding inadequately reflects the depth of his thoughts. I proposed that Augustine also offers a more metaphysically robust conception of miracles, wherein miracles occur through God intervening and activating the miraculous potentiality within creatures; such a conception upholds the unique category of miracles, metaphysically distinguishing them from natural events.

Third, I sought to highlight how Augustine's thought on miracles may contribute to the contemporary discussion regarding the nature of miracles. I noted how the prevailing interventionist approach mainly fails due to its theologically inadequate conception of the God–nature relationship and divine intervention. I argued that Augustine offers a far more appealing conception of the God–nature relationship and divine intervention that ought to be emulated in contemporary accounts. Finally, I outlined more specific ways Augustine's thought may contribute to the contemporary debate in terms of offering a theological conception of dispositions and responding to the objection that a commitment to miracles as divine interventions is unscientific.

Notes

- ¹ See Brooke (1991) and Harrison (1998).
- ² For arguments in favor of this shift in the field of science and religion, see John Perry and Joanna Leidenhag (2021) and Paul Tyson (2022).
- ³ One clarificatory point is that the NIODA approach is not typically related to miracles. Throughout the DAP, miracles received limited attention, with participants focusing more generally on special divine action. For more on this, see Wildman (2008).
- ⁴ For instance, Denis Edwards (2010) and Christopher Knight (2007) offer theistic naturalist accounts of miracles and divine action. For an analysis of various accounts of theistic naturalism, see Sarah Lane Ritchie (2019).
- ⁵ Such an approach understands divine action in the context of Aquinas's doctrine of primary and secondary causation and his analogical analysis of "cause." Ignacio Silva (2022) and Simon Maria Kopf (2023) are two key proponents of a neo-Thomist approach to miracles and divine action.
- ⁶ There are those who still defend the interventionist approach and argue that the aforementioned criticisms can be circumvented. For example, see Alvin Plantinga (2008).
- ⁷ Indeed, it has been argued that alternatives to interventionism, such as NIODA, still implicitly rely on this problematic God–nature relationship. For this criticism of NIODA, see Ritchie (2019).
- ⁸ Of course, the fact that pre-modern theologians worked in a radically different intellectual framework raises the question of whether their thought is relevant to the contemporary intellectual climate. I will address this concern relating to Augustine towards the end of the article.
- ⁹ For example, Wolfhart Pannenberg (2004) supposes that Augustine solely offered a subjective conception of miracles.
- ¹⁰ For an analysis of the development of the modern concept of the laws of nature, see John Henry (2004).
- ¹¹ Lydia Schumacher (2023) notes that Augustine also calls seminal reasons "causal reasons" (*rationes causales*) or "primordial reasons" (*rationes primordiales*). Jules Brady (1964, 145) proposes that other terms equivalent or partially equivalent to seminal reasons are reason (*ratio*), quality (*qualitas*), power (*virtus*), cause (*causa*), potency (*potentia*), principle (*principium*), origin (*primordium*), seed (*semen*), and rule (*regula*).
- ¹² For a deeper analysis of the dependence of creaturely entities upon God and the broader Christian theme of participation, see Andrew Davison (2019).
- ¹³ Peter Lombard develops Augustine's discussion of the creation of Eve in *The Sentences*. Lombard (2008, 18.6) describes the creation of Eve as "beyond nature" (*praeter naturam*) because Adam's rib contained the potentiality—in virtue of its seminal reason—for the development of Eve, but this potentiality needed to be actualized by a cause within God. I am grateful to an anonymous reviewer for highlighting this point.
- ¹⁴ There are certain scholars who dispute whether the universe should be understood in terms of the laws of nature. For instance, see Nancy Cartwright and Keith Ward (2016) and Stephen Mumford (1998).
- ¹⁵ For instance, see David Lewis (1983).
- ¹⁶ For instance, see David Armstrong (1983).
- ¹⁷ For a deeper outline of dispositionalist approaches to the laws of nature, see Alexander Bird (2007).
- ¹⁸ This is not to neglect their differences. Augustine's theory of seminal reasons is primarily concerned with explaining the development of creatures rather than systematizing various causal powers and their given manifestation and stimulus conditions.
- ¹⁹ Providing a theological foundation to the concept of the laws of nature has historical precedence. Indeed, the development of the modern concept of the laws of nature has theological origins. See Harrison (2019).

- ²⁰ This style of response is similar to Plantinga's (2008) argument that the laws of nature only describe the universe when it is causally closed, meaning miracles do not violate the laws of nature. Where this Augustine-inspired response differs from Plantinga's is that it is based on a dispositionalist understanding of the laws of nature whereas Plantinga uses a more general conception of the laws.

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“Science and Religion” Meets Popular Culture

Anthony K. Nairn, ISSR Executive Assistant and PhD candidate, Department of Humanities, York University, Toronto, Canada, anairn@yorku.ca

The field of science and religion has grown significantly in recent decades, yet its insights remain largely disconnected from popular culture, where the conflict thesis persists. This article argues that popular culture is a primary vehicle for shaping public perceptions of science–religion interactions and therefore must be meaningfully integrated into scholarly analysis in the field of science and religion. This article, an introduction to science and religion for popular culture scholars, first outlines the complexity model, which challenges simplistic narratives by emphasizing historical and cultural contexts. It then examines the portrayal of science and religion in media, highlighting their reconfiguration within popular culture. Using Christopher Nolan’s *Interstellar* as a case study, the article demonstrates how the film employs theological motifs—such as the Holy Trinity, resurrection, and divine intervention—within a framework of hard science fiction. *Interstellar* exemplifies the complexity of science–religion engagement by bridging secular and spiritual narratives, underscoring the need for scholars to engage with media to reshape public understanding critically.

Introduction

The field of science and religion has seen tremendous growth over the past twenty years, with several academic societies, an increasing number of regular conferences, and a growing population of scholars (many of whom are younger) joining the fray. This growing attention has only benefited the field as new approaches, greater diversity, and increased dialogue have been changing and maturing the field. Since the 1990s, virtually all humanities (primarily historical) work on science and religion has operated under the principle of complexity, a seemingly simple premise from which science and religion studies paradigmatically operates. Complexity insists that interactions between science and religion are just that—complex. Complexity entails that there are no, or at least it is difficult to establish, master narratives from which science and religion can be categorized. The suggestion is that all research done at the crossroads of science and religion (broadly construed) must proceed with as much openness, reflexivity, and plasticity as a scholar can muster, as context—in its entirety—is the only stability a scholar of science and religion can depend on.

However, there has been and continues to be a polarizing disconnect between the epistemic claims of scholars working in the field and the general public. The conflict thesis, the position that science and religion are fundamentally at odds (and in conflict), holds firmly to the popular mind. The idea of conflict gets attention in news articles, movies, television programs, video games, and more. This is expressed regardless of religious and/or spiritual commitments, as Thomas Aechtner (2020, 3) argues, “mass media is a decisive component of science-religion controversies.” Popular culture, as a reflection of the culture that produces it, portrays science and religion with the stereotypes and fallacies scholars have been trying to extinguish for decades. But is it that simple? Has media content forgone the warnings and pleas of scholarship for clicks, likes, and views?

It is my intention in this article to achieve three things. The first is to offer a brief overview of the field of science and religion as I see it right now, as I want to have a quick beginner’s resource for scholars of media and popular culture interested in science and religion as a starting point; after all, this article was designed to be a small introduction to science and religion to those presenting at and attending the Popular Culture Association’s conference. My second objective is to argue that science and religion studies must gain traction in scholarship on popular culture—media, film, television, etc. In not doing so more purposively in these areas, scholars who engage with the field of science and religion and are trying to dispel the conflict myth are setting themselves up for sustained disappointment, as conflict narratives will continue to remain in public and popular discourses unless the requisite frameworks that take into account the diverse practices, affects, and theories of media/popular culture studies are put to use. I offer here preliminary suggestions of ways in which science and religion generally can be incorporated into scholarly work on popular

culture and why it would be important to do so. My final component is offering an example of work on popular culture that demonstrates complexity in science and religion. I do this using the 2014 Christopher Nolan film *Interstellar*. I show how science and religion enter into mainstream media and what the narratives of such texts suggest.

Science and Religion

Despite being a relatively newly defined field of study within the academy, science and religion has nonetheless been long discussed as the two subjects that make the field's namesake individually have long and rich histories of inquiry and study. Religion has been the subject of scholarly work since the foundations of the Western canon were committed to clay well before "science" arrived on the stage of the human drama, and science, while much younger in its conceptual status, has such powerful influence today that many disciplines have subfields dedicated to it and new fields have developed around it, such as science and technology studies, history, sociology, philosophy, and so on. However, only relatively recently were attempts made to formalize the two together.¹

Many excellent introductory resources exist today as the field has matured sufficiently over the course of the last few decades. Oxford's *Very Short Introduction* series now has a second edition of *Science and Religion* from Thomas Dixon and Adam Shapiro (2022). The always-reliable *Stanford Encyclopedia of Philosophy* has an entry too on "Religion and Science" written by Helen De Cruz, the Danforth Chair in Humanities at Saint Louis University. There are also volumes that, while not introductions per se, provide broad and excellent perspectives from a diversity of disciplines. Peter Harrison's (2010) *Cambridge Companion to Science and Religion* is a staple of the field, with contributions from psychology (Fraser Watts), history (e.g., Jon Topham), sociology (John Evans), astrobiology (Simon Conway Morris), and other fields and disciplines. Of course, any introduction to the field would be incomplete without reading Harrison's (2015) *The Territories of Science and Religion*, which did so much for reckoning with the history and deployment of the terms that make up the field's name, not to mention the late Ronald L. Numbers' (2009) volume, *Galileo Goes to Jail and Other Myths About Science and Religion*. This last edited collection gives a sweeping correction of the "myths" (in the falsehood sense) about science and religion, tackling everything from early Christian history to Darwin to physics, biology, and more. These resources not only speak to the wealth and breadth of the scholarship happening in this field but also to one of the most lingering myths our field continues to wrangle.

Some nineteenth-century natural philosophers and naturalists were among the first to formalize and organize around the idea that science is so fundamentally at odds with religion (in this case, typically, Anglican Christianity, though other Protestant denominations and Catholicism too) that the progress of, say,

England would be hampered or halted altogether.² When, in the nineteenth century, science popularization and communication—through theatre, periodicals, public lectures, new technological spectacles, etc. (Lightman 2007)—was becoming rapidly fashionable, there were new and growing numbers of venues and ever-increasing audiences to hear such conflict-themed messages should the presenter/writer choose to include them.

The bulk of the misconception is most often associated with two end-of-nineteenth century American-dwelling writers who independently concluded very similar theses: Andrew Dickson White (1832–1918) and John William Draper (1811–82), who wrote *The History of the Warfare of Science with Theology in Christendom* (1896) and *The History of the Conflict Between Science and Religion* (1874), respectively. As the titles so boldly suggest, science and religion are in a state of warfare, fundamentally in conflict. These books were very popular, selling well across the United States and Europe. But, as the complexity model urges, the context of these two texts is important for understanding the claims made, and recent scholarship has shown just how contextual each case is. For example, both men were deeply critical of Catholicism as they were liberal Protestants (White was even cofounder of Cornell University).

However, while Whiggish history formulated the conflict thesis, it was a historian of science who provided the prominent framework for the field of science and religion, at least for humanities and social science scholars. This took shape in John Hedley Brooke's (1991) *Science and Religion: Some Historical Perspectives*. Brooke offered us a framework, which Numbers (2010, 263) would title the "complexity thesis" in his review of Brooke's "landmark book," as the primary principle for science and religion humanities scholarship. This also opened the door for more scholars to engage in this topic directly, as prior research would typically touch on but not directly engage with science and religion (for example, Chadwick 1975).³ Complexity, as outlined in the introduction, urges the scholar to think about their own biases, widen the scope of their research to engage with as many variables as possible, and (critically, in my opinion) pay attention to the cultural and psychological contexts of those involved.

This complexity can be witnessed across fields and disciplines engaging with science and religion. For example, one area of contemporary philosophy on science and religion is an increasingly intricate nexus where science, theology, environmental thought, aesthetics, and ethics converge. A renewed Kantian interest in moral obligation intersects with Latour's earlier insistence on according agent-like status to nonhuman entities: scholars such as Emily Brady (2013), Christopher K. Chapple (1993, 1994) and Mary Midgley (2004) contend that, once nature is conceived as an interdependent network on which humanity wholly relies, it must be scaffolded by a categorical-imperative-style duty to prevent environmental degradation, a view often articulated through

Lovelock's metaphor of "Gaia." Such an interpretation can perhaps be seen as analogous to some theological moves dating back to William Paley's (1802) *Natural Theology* and the Bridgewater Treatises of 1822 (Topham 2022). Yet, its most dynamic contemporary expression lies in environmental theology, where shifting cultural attitudes toward climate change has spurred theologians, such as Thomas R. Dunlap (2004), Paul Shutz (2019) and others, to reemphasize stewardship imperatives, echoing Carl Sagan's (1990) early call for religious leadership in confronting ecological and existential threats. A similar momentum has arisen in the social sciences: in psychology, complex reciprocal perceptions between scientific and religious communities are a rich area of research. Elaine Howard Ecklund's (2010; 2018; 2021) large scale mixed-methods programs exemplify how diversified empirical inquiry now complements philosophical and theological discourses, collectively underscoring the multifaceted entanglement of belief, knowledge, and moral responsibility in the twenty-first century.

But, as mentioned, it is worth coming to terms with the fact that even though this field has published incredible, accessible introductions to science and religion as a topic of scholarly investigation, our work is not reaching the public in a way that dispels the misinformation of the many myths that exist. I argue in this article that one of the causes of this disconnect is that the medium from which the continued source of such misinformation arises is almost absent from academic discussions in groups engaged in science and religion. It is underappreciated just how intuitive the conflict thesis is. As Numbers's volume speaks to, everyone knows Galileo went to jail for believing the Earth went around the sun, and everyone knows evolution is universally denied by the religious. However, as complexity urges us to consider, the real story is more complex than such conflict claims suggest. We must work to dispel these myths by approaching the very medium in which they are propagated.

Science and Religion in Popular Culture

That science and religion has not made much ground in popular culture is a problem that must be addressed. As stated, we must be willing to take seriously the texts and content, frameworks and theories used to probe popular culture, as it is the source location of the perpetually reproduced conflict thesis. As sociology has provided quantitative and qualitative data for the complexity principle, popular culture must be engaged with it as well.

The reasons for conflict framing in popular culture are mostly a matter of simple economics. The conflict narrative sells. Since the nineteenth century, the growing popularity of science presentations, the creation of cheap and accessible print leading to periodicals and newspapers *en masse*, the discoveries and theories of worldview-changing propositions by naturalists and natural philosophers and later scientists, along with the changing political attitudes

sweeping across Europe and North America, have created ripe conditions for the questioning of religious establishments and the ideals of progress propagated by science and humanism. Religion was an easy target as a blockade in the way of scientific advance, since established religions in Europe—Catholicism and Protestantism—were increasingly suspect, perceived as overstepping their bounds of authority. That science was making naturalizing claims about human origins, cosmic scale, Earth dynamism, and more all touched on and literally went against Christian scripture. This convergence of differences and ideals occupies a unique space, simultaneously being what one is born into (Christianity as a source of stability and socialization) and what one hopes for the future (progress, patriotic pride, better living). As such, it is ripe for intuitive gestures of conflict, but more importantly, it speaks to issues everyone has thoughts on and likely a stake in. When articles were published in periodicals or newspapers, or shows demonstrated the latest “magics” of science, they sold well.

This historical precedent was a trendsetter, a “meme” in the sense first introduced by Richard Dawkins (1976), a cultural and historical artifact from a time of great hopes and great ambitions that still reveals itself today in popular culture. But the field of science and religion, for all its work written on the falsity of the conflict narrative, has yet to convince the population (or the rest of the academy for that matter [Lightman 2019]) that any interaction between science and religion is a complex set of contextual arrangements that cannot be simply categorized into a single descriptive, often incorrect, thesis.

Popular culture, media, communication, and other related fields of “studies” can contribute to science and religion by offering new analytic tools with which to assess the interactions between science and religion. For example, science and religion would likely benefit significantly from research that looked at participant attitudes and behaviors towards texts that deal with science and religion, revealing the biases before consumption, the interpretations after consumption, and whether such interpretations translate to embodied practices that carry forward into new modes of discourse with others, as per the so-called “Columbia School.”

Further, science and religion would benefit from being able to better engage with the role media has in shaping, motivating, and structuring our perceptions and thoughts as per the “Toronto School,” made notable by Marshall McLuhan. McLuhan has seen a revival since around 2010, one that has brought his work to bear on everything from surveillance (Evans 2015) to ecology (Rose 2016). However, what McLuhan got incorrect or overemphasized is not as crucial as his substantial work bringing to bear the importance of understanding how media shapes our lives. It is here that the field of science and religion has much to attend to.

Let us consider that in 2021, the average American spent 485 minutes per day using digital media services like social media platforms, web-based video

content like streaming apps, YouTube, podcasts, and audiobooks. This should raise an eyebrow to media's profound impact (Guttmann 2023). Many works have explored the lasting impact of popular culture (media generally), its narratives, and visuals on viewers; the way it shapes and alters culture; and its norms (Berger 1997; Herman et al. 2012). Moving away from the conflict thesis is not only sound regarding the scholarship but could potentially ease present tensions in the cultural sphere, perhaps even with the so-called "culture wars." Moving away from conflict enforces a sensitivity to context, which demands thought and reflexivity, conversation and openness, attributes that can only contribute positively. Should the field of science and religion accept such studies into its fold, and actively engage with and encourage such research, then a real possibility for change could be at hand.

Echoing what John T. Caldwell (1995) claims in *Televisuality*, science and religion has had much more interest in "high theory," symptomatic of the disciplines that make up the bulk of the field generally. Having closely experienced the professional makeup and interests of one of the premier societies on science and religion, and having been present since the inception of one of its newest societies, there is a noticeable, palpable difference between the two groups. One comprises historians, theologians, philosophers, and working scientists, while the other is mainly social sciences and "studies" fields (with some overlap in both). These worlds must be connected and brought to bear on each other, as the increased diversity only maximizes the potential for novel and valuable insights and contributions to the field.

Discussions have been increasingly prevalent lately on the use of the very terms "science" and "religion" for the field of "science and religion" and the problems such terms imply (Watts et al. 2022).⁴ While science communication and popularization are about science, two important questions arise when dealing with media and popular culture more generally regarding the field of science and religion: What counts as science, and what counts as religion? For myself, what I find helpful here is not thinking about religion and science as methods, worldviews, or cultures but as affects. This way, the focus is less on science per se and more on those things science influences in a wide range of affects. Religion too. Affects are not only subjective, emotion-based feelings and tingles, they are also embodied forms, ways in which, according to Brinkman (2014), affects are displayed through emotion-motivating themes. Affects are also, for Schaefer (2015), motivated embodied movements through space and time that become, through evolutionary paths, structural forms of religion (of emotive generating systems). Schaefer (2022) similarly challenges scientific knowledge, arguing that feeling is deeply embedded in rationality. Let us run with this idea of the affects of science and religion. This opens the doors to many possibilities of texts that may not directly deal with science or religion yet are religious, as S. Brent Plate (2017) would argue,

or religiously inspired, and related to science, like science fiction, fantasy, radio, comedy, etc.

Lastly, I want to acknowledge that there are some strong examples of historians working in (or touching upon) the field of science and religion who do work with popular culture (broadly conceived), such as Bernard Lightman, Alexander Hall, Jonathan Topham, Ed Larson, James Secord, etc. The discipline of history provides a shield against perceptible gatekeeping of whatever it may be that keeps more scholarship on popular culture and media to the fringe of the field. I do not wish to point fingers but rather suggest a systemic, cultural practice I have noticed in the academy that I have made my task to overcome.

Case Study: *Interstellar*

The field of science and religion needs to embrace the scholarship of popular culture studies to more robustly tackle the continued abrasiveness of the conflict thesis. This work needs to be systematically approached by opening doors for a wider degree of scholars and scholarship that do not necessarily fit within the “defined” borders of what the established groups conceive religion to be. One way to bring those established groups into dialogue with popular culture studies is by creating an example of scholarship that borrows from science and religion and applies it to popular culture. This is my task now. Using the example of Christopher Nolan’s 2011 film *Interstellar*, I aim to show how science and religion discourses are at play in the film, what the function of those portrayals may be, and why this film represents and affirms the complexity principle.

Christopher Nolan is well known for presenting complex concepts and interesting, conversational topics from philosophy as central components of his films’ narrative. Nolan’s 2011 film *Interstellar* is no different, as it explores topics of human nature, time, STEM, love, and motivation to tell the story of the end of the world and humanity’s attempt to save itself. *Interstellar* is an example of “hard science fiction” in that science and those things science details are depicted as accurate or (in)world-accurate. The primary plot revolves around this basis. At the same time, however, the use of science portrays what I argue is a highly suggestive Christian-influenced narrative that is very conscious of its relationship with theological motifs. I have narrowed these motifs to the following Christian symbols: the Holy Trinity, Adam and Eve, divine “supernatural” beings (angels), and death and resurrection. Each of these is housed within a scientific fact or speculative theory, yet is used to reflect Christian theological doctrine.

The Holy Trinity is a central component of the Christian faith. Coming to prominence after the Council of Nicaea in 325 CE, the Greek term *homoousios* was pronounced to denote the oneness of the three entities of the Father, the Son, and the Holy Spirit (Beatrice 2002). After the fall of the Roman Empire, the Latin word *trinitas*, meaning threefold, became the standard term to refer to the

three persons or entities of Christian belief (Beatrice 2002). While there is still debate among some theologians as to the proper interpretation of the Trinity, generally, it can be understood that the three components of the Trinity are, in fact, one God but in three distinct forms, so that all things are “from the Father, through the Son, and in the Holy Spirit” (The Holy See). That Jesus Christ is the Son of God (Luke 3:22) (literally the central pillar of ‘Christ’-ianity) reflects the manifestation of God in flesh and blood upon His Creation. While Christ is the Son, he is not subordinate but equal (John 1:1). It can be understood that “It is the Father who generates, the Son who is begotten, and the Holy Spirit who proceeds” (The Holy See). Together, they symbolically reflect the three visual components of the crucifixion of Christ, which is physically mapped out in the ritual of the trinitarian formula.

In the film *Interstellar*, the Holy Trinity is represented in such a way as to reconfigure the mapping of the Trinity to fit the secular content of the film while retaining its highly suggestive Christian symbolism. I offer that the Trinity is expressed by the characters of Coop, Murph, and the “laws of nature,” which science reveals and all abide by. Coop, the protagonist of the film, is the father of Murph. The film’s first act takes place on Earth, where Coop, a farmer, looks out for his family as best he can while the world suffers from a global food crisis due to blight. Murph is Coop’s daughter, a young girl of incredible intellect, nurtured by her father’s love, bearing, and STEM approach. However, the desperate mission to save humanity pulls them apart when she is only eleven, and, due to the power of gravity and its effect on time, when the mission is challenged by one of the crew members, twenty-three years pass in a matter of minutes. Thus, she is separated from her father for most of the film, and her life.

During Coop’s absence from Murph, Professor Brand (Dr. Brand’s father) looks after Murph. Since he is the lead scientist at what remains of NASA, Murph is encouraged to pursue intellectual discourses, specifically theoretical physics. When the audience sees Murph as an adult for the first time, she is a physicist working for Professor Brand, helping him try to solve the “problem of gravity,” which would allow for massive objects to break free from Earth’s gravity, thus saving those alive on Earth (Plan A). Murph’s role as a scientist is important not only for the plot but also for revealing the final component of the Trinity, the Holy Spirit. In this film, the Holy Spirit can be understood as the universal laws of nature, made clear by the constant references to, and extensive use of, gravity and time in the plot. One of the film’s centerpieces is the supermassive black hole, Gargantua—the literal, physical embodiment of space–time. The theology of this film, that which probes the Holy Spirit (read: laws of nature), therefore, is physics, the basis of the “religion” of science.

Another tenet of the Christian faith played on in *Interstellar* is the first man and woman: Adam and Eve. In the Hebrew Bible/Christian Old Testament,

this story is found in Genesis. Adam, and later Eve, are created by God in his image to live in the Garden of Eden as stewards of creation (Genesis 2:15). Living in innocence and with humility, Eve is tempted by a serpent to eat a fruit from the forbidden tree (Genesis 3:1). Plucking the fruit and sharing it with Adam, their eating of the fruit granted them knowledge beyond what was available to them by merely existing as per God's wishes, but part of the knowledge was that of the vices, including shame in their nakedness (Genesis 3:6–7). God, deeply disappointed by their defiance, banished the first couple from Eden, forever condemning humanity to the pains of mortality (Genesis 3:16–22). After leaving Eden, Adam and Eve wandered creation until giving birth to their first children, and the first of the Genesis genealogy, Cain and Abel, later followed by Seth, thus beginning the genealogy of humanity (Genesis 4:1–25).

The Earth represents the Garden of Eden in the film *Interstellar*. Coop, speaking to his father-in-law, calls the Earth a “treasure,” similar to the details used to describe Eden in Genesis (1:28–31), but that it “has been telling us to leave for a while now,” as the toll of human activity had “plucked” the fertility of Earth, causing irreversible consequences. The cost of human activity unchecked by forward-thinking, progressive, and actively conscious policy to protect the biosphere of Earth has irrevocably damaged the fertility of the Earth, causing an unknown blight to drive Earth's plant life to extinction systematically. Viewers are told in the film that Murph (as a child) will be the last generation.

The Earth, due to reckless and unchecked exploitation, has become infertile and is “forcing” humanity to either leave or die. Like Eden, human practices have caused humanity to be ejected from their home once again. However, in *Interstellar*, it is science (read: knowledge) that may be humanity's salvation, allowing the species to survive beyond the design capacity of its evolution. It is knowledge that is key to humanity's survival, something that New Atheists, for example, would claim is a truism, but here it is used as an interesting twist on the classical biblical narrative, like how the Son is now the Daughter.⁵

Later in the film, it is revealed that the human species' fate was sealed when the team left Earth because Professor Brand knew the gravity equation for Plan A could not be solved. After some critical character developments lead to a surprise confrontation that leaves Coop and Brand (with two AI companions named TARS and CASE) the last two humans alive on the mission, with a room full of human DNA samples, they are solely responsible for the survival of the human species. The two astronauts become Adam and Eve, the literal father and mother of the new population of the human species. However, Coop disagrees with Plan B due to its complete abandonment of those still on Earth. Coop decides that NASA (read: authority) is wrong and that condemning the remaining humans on Earth to die is unacceptable without doing everything he can to try and save them.

In the secular sense, supernatural beings are the biblical canon entities of divine origin. In the Abrahamic religions, such supernatural beings are most associated with angels, referenced in all the significant works of the Abrahamic lineage. Angels are the link between the divine and the mortal, acting as messengers, protectors, or guides to the human “heroes” of religious faith. Angels of the New Testament are present, for example, during the birth of Jesus Christ (Matthew 1:20–25), during his trial against the temptations of Satan (Matthew 4:1–11), and at his death (Luke 22:43), acting as foreshadowing metaphors for the importance of the event or divine aid at critical times of need. Angels have since become very popular subjects in both high and popular culture. For example, the works of Michelangelo (1475–1564) and Raphael (1483–1520) are well known for the use of angels, notably in *The Last Judgement* (1541) and *Sistine Madonna* (1512), respectively. Furthermore, the Precious Moments collection series, widely popular in the 1980s and 1990s, relied primarily on Christian imagery of angels for their collectors’ pieces.

In *Interstellar*, supernatural beings are referred to by the main characters as “them.” This “them” is speculated by the characters after Coop first discovers NASA (believed to have shut down) as being extra-dimensional beings capable of manipulating and controlling space–time, who opened a wormhole near Saturn to a location in another part of the galaxy with planets that could support life. These “them” would therefore appear to be manipulating the future of humanity by guiding their efforts to save themselves, acting directly through the laws of nature (the Holy Spirit) to aid humanity’s most desperate hour.

When the astronauts finally make it to the wormhole purportedly created by these extra-dimensional superbeings, they begin their descent into it by passing through the “bulk,” the transition between points in space beyond space–time’s standard dimensions. It is here that first contact with the beings occurs. There is a moment when a distortion appears near Dr. Brand and, extending her hand toward it, the distortion and Dr. Brand seem to hold together for a moment. Upon fully transitioning to the other side of the wormhole, one of the crew asks Dr. Brand what that was, to which she replies, “a handshake.”

This scene reflects the famous section of the fresco painting by Michelangelo in the Sistine Chapel known as *The Creation of Adam* (c. 1512). This section of the ceiling depicts God, surrounded by angels, reaching out and pointing towards the newly created Adam, who lies upon the grassy fields of creation. While the two do not touch, this most famous painting demonstrates the creation of Adam and the connection between the divine (read: “them”) and humanity. The handshake in *Interstellar* seems to reflect some kind of relationship shared between the “them” and the human crew. A handshake is a strictly human practice, and though not practiced by all cultures across the globe, it is widely recognized.

While the Holy Trinity, Adam and Eve, and divine beings are no doubt important components of the Christian faith, the resurrection of Jesus Christ following his crucifixion is the most important for Christianity. Jesus appeared to his followers three days after his crucifixion, talking with them, joining them to eat (Luke 24:30), and allowing them to see the holes in his hands and side (Luke 24:39). Forty days after his resurrection, Jesus ascended to heaven to be at the right side of the Father (Acts 1:3–9). The resurrection of Jesus Christ is the miracle of faith that provides the foundation of belief in not only the validity of Jesus's position as the Son of God but also that the sin of humanity in its ignorance was and can be forgiven, representing the ultimate of both sacrifice and forgiveness (Luke 24:46–47). The example Jesus provided has been the prototypical representation of what a good Christian should strive to be. In the practice of Christian faith, one may be forgiven of sin by trusting in God and repenting, being able to be spiritually resurrected as Jesus had been of the body (2 Corinthians 5:16–18).

In *Interstellar*, this central tenet of the Christian faith is also explored, and some of the threads established in the previous themes are tied up. Near the film's end, only Coop and Dr. Brand are left alive (along with the robots TARS and CASE). All options seemingly extinguished for Plan A (solving the gravity problem), Coop and Dr. Brand plan to use the gravity of the supermassive blackhole Gargantua to “slingshot” their spacecraft to the final planet where humanity could establish a new home. With little fuel left, the slingshot maneuver will use the gravity of Gargantua and the remaining fuel in their landing craft to accelerate toward the final planet.

While passing Gargantua, it is revealed that for the mission to succeed, both landing craft (used as boosters) must be ejected from the spacecraft to reduce mass and maintain escape velocity. However, each landing craft must be manually ejected, meaning that TARS and Coop must sacrifice themselves for the mission to continue. Not known to Dr. Brand or the audience, she pleads with Coop to think of an alternative and not leave her. Coop references their agreement to be only ninety percent honest with each other and quotes Isaac Newton's third law (for every action, there is an equal and opposite reaction). He then detaches from the spacecraft, giving the future of humanity the best chance with the spacecraft carrying Dr. Brand and the vault of human DNA safely away from the gravity of Gargantua.

Coop sacrifices himself for the greater good of the human species. Coop's reference to Newton's third law has little to do with the physics of the events occurring while he said the words but more with the psychological events occurring at the time. To begin with, Coop's primary determination for undertaking the mission was to save his family. Upon realizing he cannot return to the Earth, Coop refocuses on ensuring the human species survives (hence, leaving something behind). This act allows Dr. Brand to

escape Gargantua's tremendous gravity and make it safely to the final planet, revealed to viewers at the film's end. Coop allows himself to be sacrificed so that humanity may survive.

However, plunging into the spinning supermassive blackhole is not the end of Coop. He finds himself in a strange place of string-like images repeated *ad infinitum*, including, surprisingly, Murph's bedroom before he leaves on the mission. Coop is scared, confused, and alone. Coop does not know how to process what he is experiencing. But then, to his great fortune and relief, TARS appears on comms (TARS ejected in the first landing craft). TARS helps Coop understand that what he sees is a construction of a dimension beyond space and time, and that the "them" must be able to construct such a system that reveals time as a physical representation of space.

Coop then understands why he is seeing his daughter's room. At the film's beginning, the young Murph claimed a ghost lived in her bedroom, causing strange phenomena with sand and pushing specific books off her shelf. It is now made clear the ghost was Coop. Manipulating the force of gravity, Coop had been drawing Murph's attention to random anomalies of gravity since she was young. Coop realizes he was/is the ghost and that the "them" made this strange time structure for Coop to help Murph save the world by manipulating natural law. Coop transmits the black hole data to Murph through the watch he gave her before he left. Since he has been transferring the data since she was a child, in the real time (the present of the film), Murph has the revelation while fatefully visiting her room one last time as an adult. Recalling the watch Coop gave her as a child, she realizes the second hand is transmitting Morse code, and after translating the code, shouts "eureka," as the missing component of the gravity equation had now been discovered.

With the data transmitted, the time structure begins to collapse. As it does, Coop realizes the "them" are humans from the distant future who have used science to understand space and time to such a degree as to allow for control at an intra-dimensional scale. The screen goes white, and Coop finds himself back in the "bulk" with the spacecraft he entered the "bulk" in moving toward him. He extends his hand here, and Dr. Brand reaches out, and they touch. The screen goes black again, and when it comes back, Coop is floating near Saturn, where the wormhole once was, with a small shuttle approaching him. He then wakes up in a hospital on a massive space station, and the film concludes with Coop seeing Murph one last time, very old and dying, surrounded by her family, and Coop heading back out to find Dr. Brand.

Coop's sacrifice leading to his "death," followed by his manipulation of space-time revealing that he was the "them" who shook hands with Dr. Brand and also the ghost Murph reported, brings together much of what was discussed earlier. Like God and his use of his angels, Coop is omnipresent at the most critical moments of humanity's need, acting through the laws of nature to

guide Murph (the Daughter/Son) to the revelation that saves humanity. Murph is shown to have a lifecycle; much like Jesus, she is born, lives, contributes the most important act for humanity at age thirty-five, and eventually dies. In contrast, Coop, as the Father, doesn't age at all in the film due to the effects of gravity on time (laws of nature). But crucially, it is not only science that saves humanity but love as well.

The role of love in *Interstellar* is an interesting site for exploring the complexity of the relationship between science and religion in popular culture. Love is the metaphysical "stuff" that binds the characters together—Coop, Murph, and Dr. Brand. Love keeps these characters connected through space and time like threads in a blanket. When the mission faces a great challenge and loss, the astronauts discuss their next move, and Dr. Brand chooses "Edmunds' Planet" (named for the scientist who went to scout it). It is revealed that Dr. Brand was in a relationship with Dr. Edmunds. It is suggested that Dr. Brand should consider her motivations biased. Dr. Brand, however, retorts that "love is observable . . . powerful . . . love is the one thing we are capable of perceiving that can transcend time and space." Dr. Brand further suggests that love is perhaps an artifact of unknown dimensions. She offers that the crew should trust these unknowns rather than the clear message being received from the one other planet left, "Mann's Planet." Dr. Brand's intuitions go directly against the data available (Mann set off his "Good Location" beacon), thereby creating a tension between trusting data and trusting intuition, in this case informed by love.

Love and trusting in love are important aspects of the Christian faith, especially amongst Protestants. Throughout the Bible, but especially in Corinthians, claims of the importance of love for one another, from and for God, and the power of love are made, as in 1 Corinthians 13. It is God's love that nourishes the Earth, and it is love that holds God in and to the people. Love transcends, bringing one as close to God as possible, as God is love, and to love is to be in accordance with God and to know him (1 John 4). Many examples in the Bible speak of the importance of love, not only of and for God, but especially of and for Jesus, along with lessons for how to treat others.

The love Coop has for Murph visually culminates in the end sequence, presenting a complicated presentation of time as physical space. After sacrificing himself to boost Dr. Brand and the Endeavour spaceship to safety away from Gargantua to save humanity (an act of love), Coop (and TARS in the other landing craft) gets swallowed into Gargantua and emerges into a complicated matrix of Murph endlessly shown throughout her childhood in her bedroom. Coop discovers that he was/is her "ghost" and is there to give the critical data missing from within the black hole that will solve the "gravity problem." Thus, love transcends time and space, saving everyone back on Earth and fulfilling Plan A.

While not all elements align perfectly, this is part of what scholars working on re-enchantment often call “reoccupation,” borrowing from Hans Blumenberg (1985). Secular stories, such as *Interstellar*, harken back to elements of narratives that have contributed to the bedrock of ways of living, altering them to befit the present knowledge and values of the culture. I have analyzed the film *Interstellar* and how it uses science and secular understandings of the world to weave a narrative deeply influenced by theological and biblical elements. This seems to have been the explicit desire of Nolan, for in the special features of the Blu-ray version of the film, he discusses, for example, selecting the church organ as the primary instrument for the film’s score because he wanted the film to have “a sense of religiosity” (Nolan 2014). This summarizes wonderfully what the film in its entirety expresses.

I have been building the case that *Interstellar* uses Christian narrative elements in interesting ways to create a seemingly secular story that follows a tradition of “hard science fiction.” However, upon inspecting the themes and narrative elements at play, we find a story that uses the building blocks of Christian theology to engage, motivate, and affect the audience by using familiar tropes but in new, surprising ways. This is a clear example of complexity. As discussed, science and religion do not operate in a single mode of engagement, as the conflict thesis suggests. Instead, the interactions are varied and unique depending on contextual circumstances, changing from one moment in time to the next. *Interstellar* shows complexity by bringing Christian theology and biblical themes into its story without suggesting conflict (or even reference to religion). Instead, what is shown seems to be an operative mode of establishing a new sense of the transcendent (through theoretical uses of space–time) and empowerment of those thematical aspects of humanity that stand as testaments of biblical goodness—love, sacrifice, ingenuity, wisdom, and faith.

When the mission is at its most dire moment and the possibility of success seems unlikely, Coop decides to sacrifice himself for the future of humanity, allowing forgiveness and hope to enter into his thoughts, giving humanity (which had erred [sinned] and “corrupted” the world to an inhospitable waste) the chance to live again in a new “Eden” and be born of that world (via artificial cell growth). Interestingly, however, in the film’s final moments, when Coop can see Murph one last time as she lies on a hospital bed, surrounded by her family and friends, old and ready to die, the hero in the film world is not Coop, but Murph. Murph tells her father that she told everyone that he was her “ghost” who gave her the information needed to solve the problem of gravity, but “no one believed [her]. They all thought [she] was doing it [her]self.”

This ending reveals deliberate, thoughtful choices by Nolan et al. to emphasize two points worth mentioning. The first is that the theories of science, encroaching at times upon the awesome and unimaginable, are not readily accessible by everyday experience and intuitive sense. Science and the

“stuff” it reveals depend on, to some extent, faith, as the complexities, expertise, time, and resources required to validate science empirically are not possible for individuals. This is similar to what Bas van Fraassen (1980) calls “Constructive Empiricism.” The second, closely connected, is that the “ghosts” or supernatural entities referred to were nothing more than Coop and human beings from the distant future, suggesting two subpoints: that intuitions and what we believe to be true, though helpful, can be incorrect, and that the supernatural (or magic, even) may be indiscernible to us from science far beyond ours (a trope played on commonly in science fiction and fantasy, such as *Star Trek*, *Star Wars*, and Marvel’s Cinematic Universe).

The themes I have outlined from *Interstellar* subvert the common misconception that science and Christianity (and religion generally) are at odds. There is no explicit reference to religion in *Interstellar* because there is no explicit conflict between them, at least in the purview of the film. Nolan’s intention to give the film a sense of “religiosity” suggests that he understands the powerful affect religion can have on individuals should they hold faith. However, in the case of *Interstellar*, Nolan appears suggest that religiosity, reflected in the strength of character and civilization, can be achieved through secular means, i.e., science, knowledge, compassion, etc. This is critical to investigate further, as it is no longer the case that statistically insignificant minorities of people do not believe in God, as recent census data from the UK and Canada have shown.

This is an invitation for scholars to look at the myths and narratives used and expressed in popular culture that either express religion—directly or indirectly through affects, themes, symbols, etc.—and science to understand better what this informative and compelling media that millions of people consume each month is showing to their audiences. Growing numbers of people claim to be “spiritual but not religious”; some find their place in the cosmos to be spiritually nourishing. *Interstellar* is an example of a text that seeks to bridge the divide between the secular and the spiritual using science as the mechanism of revelation and salvation.

Conclusion

This article serves as a preliminary statement on the claims from the field of science and religion and popular culture and how the two ought to be brought into conversation more directly. My hope in writing this and creating this thematic section for *Zygon: Journal of Religion and Science* is to bring popular culture into focus in a field that has largely missed this critical area of everyday life, as well as to bring some curiosity to this area. Regardless of the complexity principles and despite repeated attempts to claim that the conflict thesis does not hold universally, the conflict thesis continues to replicate in popular culture. I have argued that science and religion must engage with popular culture to

ensure that any interaction is understood as complex and must be explored contextually. I surveyed some of the events and themes of the film *Interstellar* to draw out the use of Christian theology and spiritualism in a hard science fiction film. I argued that this was done intentionally to “reoccupy” long-held values via secular means. I hope that any scholar interested in science, religion, and popular culture will help push the boundaries of our field further than we have before.

As mentioned in the introduction, this article was written as an introduction for scholars in the fields of popular culture studies, media, and humanities more generally. I organized two sessions and started a new “area” within the Popular Culture Association (PCA) for its 2023 conference in San Antonio, Texas. While there has long been an area in PCA for science and popular culture and an area for religion and popular culture, there has never been one for science *and* religion in popular culture. I found this confusing, given the vital role popular culture plays in knowledge and opinion distribution and the relative popularity of discourse on science and religion (think the “big questions”). Popular culture, and all that it entails, is a rich source of data that holds sway and influence on the mass public as well as in smaller, more niche circles, whether that influence comes from massive blockbusters that take in over one billion US dollars, arthouse films, television programs for kids and/or adults, or online communities gathering around strange new worlds. Science and religion studies must attempt to enter into and embrace dialogue with areas as powerful, far-reaching, and diverse as popular culture.

What follows in this collection are articles that were submitted for presentation at those sessions I organized at both the PCA meeting mentioned and (only a few months later) at the International Research Network for Science and Belief in Society’s annual conference held in Exeter, UK. These articles are situated at the boundaries of science and religion work but are nonetheless a part of the conversation. Our task at these meetings was to draw out the connections to realize just how vast the field of science and religion can be, to stretch out and see how far the horizon can reach. In setting up these groups, I was shown just how diverse, engaging, and insightful scholarship on popular culture can be when it makes contact with science and religion as a field.

As the Executive Assistant for the International Society for Science and Religion, I am privileged to regularly contact active scholars in the field. My time organizing these sessions and collecting these articles has revealed that science and religion in popular culture generally has received too little attention from scholars in our field. However, there are signs of change. Given popular culture media’s power and influence on everyday perceptions, we must take this area of popular content more seriously.

Notes

- ¹ Ian Barbour (1923–2013) is often cited as one of the founding figures for a sustained, systematic approach to science and religion. See his 1966 book, *Issues in Science and Religion*.
- ² The early writings of Thomas Henry Huxley (1825–95), “Darwin’s Bulldog,” come to mind as an example. See, for further example, his 1866 paper “On the Advisableness of Improving Natural Knowledge.”
- ³ While Brooke may be credited with a more epistemically sophisticated framework for thinking about science and religion, thought on these two subjects in relation began much earlier. Ian Barbour was the first to offer a typology of frameworks for thinking about science and religion in his 1966 book *Issues in Science and Religion*, and he is often credited with being a founder of the field of science and religion. Barbour’s frameworks were 1) conflict: fundamentally opposed; 2) independence: coexisting at a safe distance; 3) dialogue: sharing information and collaborating on differences; and 4) integration: bringing the two together. While these are seldomly referenced, I do think they have value if conceptualized as a grid operating within the term of complexity. So, for example, a text may lean more towards dialogue but have some aspects that touch on conflict and independence.
 But, what is complexity? The framework Brooke (1991, 438) offered, the current principle from which science and religion scholars begin, states that there “is no such thing as the relationship between science and religion. It is what different individuals and communities have made of it in a plethora of different contexts.” In the scholar’s investigations into moments of science and religion’s contact, they also must investigate the contextual milieu of networked factors at play. Everything is context dependent. As such, the typologies used by Barbour are presumably still at work, as in my reading, all texts specifically on science and religion thematically lean more towards one. What complexity offers, however, is a richer engagement with the context of the study, and it draws awareness to baked-in biases that are picked up throughout one’s life.
- ⁴ See also the YouTube video “ISSR@AAR – Revisiting the Categories.” <https://youtu.be/Pc7zY-UHTEo4?si=V0FIFdyLRREgzVJP>.
- ⁵ But it is not only scientific knowledge that saves the world at the film’s conclusion. I return to this shortly.

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Reality Shifting and the Case for Spiritual Science

Emma St. Lawrence, PhD graduate in Media Research and Practice, University of Colorado, Boulder, CO, emma.lawrence@coloado.edu

Since the onset of the pandemic, many of the routines and institutions that once structured our reality have been destabilized or destroyed. In the in-between space of what has been and what will be, we must learn to orient ourselves from the inside out and shape the contours of our reality with a novel intentionality. Such is the goal of the reality shifters, an experimental collective working at the junction between science and spirituality to manipulate the forces of reality and explore worlds beyond our own. Discussing methods, motivations, and the larger tradition of spiritual science, this article considers the emancipatory potential of shifting in its embrace of diverse forms of knowledge and experimentation—not its scientific legitimacy. Within a broader cultural shift toward fluidity and multiplicity, reality shifting can thus serve as a provocation to reexamine the nature of our world, our reality, and our place within it—even if we choose not to explore the multiverse ourselves.



There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy.
Hamlet, 1.5.166–167

Introduction

Imagine for a moment that you live in a world where infinite parallel realities not only exist but are accessible—easily, to everyone, without need for specialized equipment. In such a world—like in our own—you are born, you grow, you make a hundred thousand little choices that shape your life, and you invariably live to regret one or another. But unlike in our world, when this dissatisfaction hits, you may simply shift your reality. Choose something different. Be someone different.

For many of us, such a possibility is first and exclusively encountered within the realm of fiction; consider recent releases like *Everything Everywhere All at Once* (Kwan and Scheinert 2022), *Ready Player Two* (Cline 2020), or the cat's cradle of alternate realities found in Marvel and DC's respective cinematic universes. While interest in such parallel and alternate-reality content is certainly not a new phenomenon, the subgenre of science fiction has seen a reinvigoration in the past decade, with a particularly intense wave of production and popularity following the onset of the pandemic. This is no coincidence. Science fiction, like horror, is a genre bred to articulate and confront cultural, social, and political anxieties and finds particular popularity during times of crisis and change (Sontag 1986). As increasing political polarization and class inequality contribute to dramatically different lived realities, rapidly intensifying climate change alters our physical landscape, and the continued challenges of COVID-19 remake our routines, disillusionment has become a chronic feature of life for many in the United States and around the globe (World Economic Forum 2021; United Nations 2023). It is no mystery then the seductive hope to be had in the lateral thinking of multiversal media, or the comfort that can come from imagining other universes in which we may get things right.

But for some, imagining is not quite enough. For some, the hope offered by fictional alternative realities burns so brightly that it illuminates a new way forward entirely. For such questing souls, it is not just the idea of other realities but the search for them that becomes a powerful engine of agency, discovery, and, yes, hope. These are the reality shifters: an online community brought together during the COVID-19 pandemic and united by their belief that the promises of the multiverse are not restricted to the annals of fiction but tangible realities to be explored.

It is this community that lies at the heart of this article. Inspired by stories metaversal and mundane and informed by diverse approaches to spiritual exploration, magical traditions, religious practice, and scientific tradition, the shifting community demonstrates a radically encompassing approach to ontological and philosophical inquiry rooted in the challenging

of boundaries—not only around perceived limits of self, consciousness, and reality as we know it but of the explicit and implicit brackets we place on ways of knowing and experiencing the world.

As such, the reality shifting community provides a fascinating contemporary case study through which to evaluate the potential benefits of creative, combinatory cognition and the ability of a more expansive mode of inquiry, precisely because of its ability to both generate knowledge and think critically about how that knowledge is produced. In the following pages, it is those benefits of unfettered experimental inquiry that will be evaluated as we trace the emergence and formalization of shifting as a mode of exploration, the embrace of heterogeneity at the core of its practice, and its place within a long and generative genealogy of entwined spiritual and scientific discovery—a tradition that does not turn away from the ineffable but works alongside it to shed light on the structures of reality and the nature of being.

Shifting 101

If this is the first you have heard of the reality shifters, you might think I am speaking metaphorically or in the vein of the relentlessly optimistic social media content that tells us we can all create our own reality (as long as that reality falls within the acceptable norms of Western capitalist society, of course). But in this case, it is meant in the most literal sense—shifting between realities. Though the basic practice has appeared under different names and instantiations over time, *shifting* in its current usage is an encompassing term for the practice of intentionally and directedly relocating your consciousness to a different reality, either temporarily or permanently. The underlying assumptions about the structure of reality and the specific practices and rituals undertaken in shifting may differ, as we will explore momentarily, but for most shifters, such manipulation of consciousness is achieved by experimenting with the mental and physical exercises, rituals, and methods recommended by other shifters, such as “scripting” or detailed writing about the target reality to create a clear mental picture; meditation and energy work to center the body and mind; or the use of tools like binaural beats to enhance concentration and mindfulness.

Crucial to understanding the shifter mindset is a fundamental illimit on where or even when their consciousness may travel. Presuming an infinite cosmos of possible universes, shifters are empowered to dig deeply into their desires in order to craft a target reality that fulfills them. This includes the types of parallel or alternate universes we are most familiar with in popular multiversal media, with elaborations of timelines branched off from key decisions. What person would you be if you had attended a different college? Joined the Merchant Marines? Dedicated your life to the study of the majestic platypus? More interestingly, the possible realities available to shifters also include “fictional” realms depicted in books, film, TV, and other media, as well as any world conceptualized by

the shifters themselves. As one example, a shifter who is a fan of the *Harry Potter* franchise may seek to temporarily shift their consciousness into a reality inspired by Hogwarts. Drawing methodological importance from previous experiments in transformational fanworks like fanfiction, fandom-oriented shifters often place an emphasis on scripting—writing comprehensive accounts of the target reality before shifting. They may write, draw, or create a vivid mental picture of the particulars of their *Harry Potter*-inspired desired reality and the place they would like to inhabit within it (a student, teacher, creature, etc.), detailing specifics such as their name and appearance, the house they would like to be sorted into, and even details such as how long they would like to stay in that reality or when and how they will return to their core or current reality. Some may also include planned narrative arcs or key events to take place in their desired reality, as well as rules meant to govern the passage of time and eliminate threats such as illness, injury, or death. Many such scripting tips and aids advocated by early fandom shifters were initially published—and can still be found—on existing fanfiction websites and spaces such as Wattpad and Tumblr (@Ashley_Writes 2020). Once the reality is scripted to their liking, the shifter may then experiment with any combination of meditation, visualization, spellwork, prayer, and other suggested activities (such as listening to the *Harry Potter* soundtrack while sleeping or keeping their script under pillow) to catalyze their consciousness in a directed path towards the desired reality.¹

Understanding the overlap between more mainstream practices of transformative fanworks and the emergence of shifting is key to understanding its character. It was fandom-related shifting content that first piqued my interest in a digital ethnography of the community in the fall of 2020, inspired by a spate of TikTok and Tumblr posts seeming to speak literally about visiting or interacting with fictional characters and places. So too did I find that the majority of those seeking out information on shifting did so as an extension of their existing fandom involvement, often posting about shifting from fandom-identified accounts on TikTok, Tumblr, and other social media. For shifters already accustomed to using media worlds as a jumping-off point to create their own content and imagine new possibilities for characters and worlds, *fictional* does not mean *off-limits*. In large part due to this influence, the foundational precept of the shifting community came to be that if it can be conceptualized by at least one person, it is a legitimate potentiality to be realized—a type of boundlessness that ideologically departs from many popular books and movies about alternate universes (Figure 1).

Though the logic and mechanics may differ from one text to the next, modern multiversal media tends to share a sense of gravity around the importance of choice and constriction when confronted with a variety of realities that differ in small and major ways. Sometimes, this is depicted as parallel universes traceable in their alteration or moment of creation,

What if I want to shift to an animated reality? Will it look like real life? Only if you want it to. Infinite realities, blah blah blah. It can look like a cartoon, if that's what you want. It's been done before, kiddo, no need to worry about it.

Can I shift to xyz? Infinite realities, infinite possibilities. You can shift to any videogame, any book, any anything, as long as you can think of it. It doesn't have to be from media, either. You can imagine it all yourself, if you want. Go absolutely bonkers.

Figure 1: Shifting FAQ text on r/shiftingrealities (@Popkitsune 2021).

centered around key moments and intersections in which a decision is the vehicle of change. Consider *Everything Everywhere All at Once*, where pivotal decisions branch off into new parallel universes—like Evelyn (Michelle Yeoh) choosing to stay in China rather than moving to America with Waymond (Ke Huy Quan)—while unlikely choices can be strategically carried out to traverse those universes. Other times, the multiversal logic is abstract and near-impossible to ascribe motivation to, attributed only to a butterfly effect of time and meaning. Consider the perplexing, ever-shifting appearance of Batman in 2023's *The Flash* (Muschietti 2023), in each sliver of reality portrayed by actors who had previously assumed the character in other properties. Not only does it teasingly imply entanglement between universes independent of the protagonist's actions, but such wily ontologic complicates the ultimate choice each protagonist is confronted with: which reality they inhabit. And they do choose, almost without exception.

For all that multiversal media may appear to ode possibility and potential, many of the stories end the same way, as parables for the impossibility of finding the “right” universe. A mainstay of the genre is the moment of clarity in which the protagonist comes to recognize the futility of searching for the exact choreography of choices and decisions, singled out within infinity, to bring them exactly what they wish. Sweetening their acquiescence is often a newfound appreciation for their original reality and/or an “Invictus”-like sense of determination regarding their happiness. See Evelyn, now able to move between and simultaneously inhabit every possible timeline, ending her journey in the same IRS office in which it began. Such endings seem to remind us that we cannot have it all and we should not want to either. But the truth remains that the very telling of stories is a testament to the persistence of the human urge for more; an enduring curiosity, a hunger for what *could be* not satiated by everything that is and has been. Even if the text itself precludes the possibility of “having it all,” the reader or watcher may revel in it. In an age with unprecedented access to astronomical amounts of media, there is now a book or movie or podcast or TV show available for nearly every flavor of mood and desire. If at any point you grow weary of the story,

you may pick another. And if what you want does not exist in the form you want it, it is easy enough to bring it into being through an act of creation, as simple as words on a page. No one quite appreciates the importance of the latter truth like those self-same fandom writers and artists who found the shifting community a place to literalize the creative possibilities of “infinite realities, infinite possibilities.” This is crucial to understanding the “why” and “how” of contemporary reality shifters—many have grown up surrounded by a near-boundless panoply of media worlds, with myriad opportunities to contribute to the expansion of story worlds and practice conceptualizing their own realities.

While the possibilities of shifting may be unlimited, that does not mean they are easily accessible. Alongside the belief in an infinite cosmos of potential realities, foundational to the community is that reality shifting is process-based. Just as a writer goes through many drafts, great effort, and occasionally mental anguish as they strive to bring their fictional world to life, so too must the shifting be approached with sustained and committed effort and care—leading to the elucidation of those “methods” mentioned earlier, in which activities drawn from various traditions are combined and ritualized to encourage shifting success. In the introductory guides on and across many hundreds of comments on Reddit, TikTok, and Tumblr, it is reiterated that shifting is not an immediate fix to anyone’s problems or a quest without cost; it requires a great amount of experimentation, persistence, trial and error, and enduring faith in both oneself and the process. Reflecting this process, gradations of shifting have been defined: a “full shift” involves successfully and completely transporting the consciousness from the current reality to the desired reality, while “mini-shifts” refer to any partial or incomplete shifts, which are reported to be experienced by beginners and experienced shifters alike. There is no formal or informal timeline for movement through the stages of a shift, and it is, in spirit, non-hierarchical; instead, many find ways to creatively indicate their relationship to the process without the pressure to reach external benchmarks or evidence results (Figure 2). As a result, it is the questioning and questing spirit that marks one as a member of the shifting community and not the ultimate success of the endeavor; even those who never achieve a full shift can be active, participatory, and valued members of the community, contributing in a myriad of ways to the larger discourse on the process and practice of shifting.

As will be explored in greater detail further on, reality shifting is—at its core—simply one expression of a desire to understand the unseen structures of reality. This desire has persisted in various forms throughout history and drawn on combinatory forms of knowledge and creative experimentation to those ends, but the fact remains that the contemporary shifter movement is quite young. It was the COVID-19 pandemic that served as catalyst to turn sentiments



Figure 2: Customized user tags on r/shiftingrealities.

that had been percolating inchoate into a recognizable community of practice. Accordingly, reality shifting truly solidified as a recognizable designation in the late summer of 2020, consolidating earlier disparate communities such as [r/quantumjumping](#) and [r/reality_shifting](#) through the first wave of quarantine. The subreddit [r/shiftingrealities](#), founded in September 2020, particularly emerged as a gathering place for those interested in shifting, serving as a central hub for resources and methodology and providing a space for community, discussion, and negotiation of practice. This latter function is particularly important; through several years of posts, we can trace the coalescence of the community through collaborative elaboration of and experimentation with methodology, as well as the emergence of passionate debate around the more complex ontological and philosophical implications of shifting as a practice and the nature of reality itself.

Revelatory Heterogeneity

While the practical recommendations and explorations of reality are crucial to those new to shifting, perhaps more important are those posts wherein the complex discussions of what shifting could theoretically accomplish are negotiated, with anecdotal evidence and outside sources woven together to posit, critique, and reject theories. Taken together, these trends in content emphasize the maturation of reality shifting as a mode of inquiry, vacillating between individual and collective experiences of reality and navigating the practical, moral, and ethical questions such interactions arise. Crucial to the overall aim of this article, this maturation is where we truly see the creative, combinatory thinking now characteristic of community truly blossom, demonstrating how the relaxation of restrictions between ways of thinking, feeling, knowing, and believing can lead to surprising and generative lines of inquiry.

For example, one popular post asks other shifters to share their thoughts on the ethics of killing within a desired reality, while another solicits thoughts on

the existence of an afterlife within desired realities (@Cuervo-Renard 2021; @No0000ooo0 2021). Discussion and theory posts, particularly on Reddit, are also a space where historical explorations of reality are subject to examination. For instance, several shifters have posited that historical accounts of “visions” may indeed be shifting: “Across human history many people have accounted seeing visions of past, present, and future events,” user @Surgicalcanon (2021) writes. “Do you think these people were reality shifting, whether they were doing it themselves or by some form of deity?” (@Surgicalcanon 2021). Another popular post uses cultural evidence to make the same point, quoting an interview with science fiction writer Philip K. Dick in which he reportedly said that “the books he wrote were simply him documenting his experiences in parallel worlds” (@A_Beetle_Boi 2021).

Some of the even more controversial discussion and theory posts across platforms are those based on the constitution and limits of the self across current and desired realities—a digital rehashing of several centuries of philosophical inquiry into the nature of the soul. For example, one provocative post questions if there is a way for those who shift to multiple desired realities to store discrete memories within each desired reality so as not to be overburdened by memory—a deeply weighty proposition that carries with it questions of what constitutes the self: our experiences or our memory of them (@ItsGogaMyDudes 2021). Another post muses on the possibility that we are all the “side characters”² of someone else’s desired reality and, relatedly, whether certain celebrities or people in our current reality could have shifted here,³ raising ever more complex questions on the nature of these overlapping realities and if there is indeed some kind of “core” reality or an underlying structure at all (@KishBent 2021).

Though there has been widespread adoption of the terminology already introduced, like “current reality” and “desired reality,” they can imply vastly different things for different shifters—a subjective conception of reality that determines the ability of someone to mediate or manipulate reality. For example, some believe in a stable home world to shift to and from, allowing for short “trips” to alternate realities without necessarily jeopardizing the stability of the home world. Other shifters, however, argue there may be no true or continuous current reality at all. Instead, every decision we make is actually a small shift to a different timeline, a panoply of possibility expanding infinitely each time we order Chinese instead of pizza or take the bus instead of the train. As such, intentional shifting to a desired reality need not be viewed as a wholly new experience or an unfamiliar skill, but simply a new order of magnitude; a “long-range” shift (@SystemLog 2021).

In both cases, the path between the current and desired reality has detours. Many shifters conceptualize a special subset of the multiverse they term “waiting rooms.” Often described as a pocket dimension entirely unique and

customizable to each individual, they function as a kind of metaphysical pit stop “before shifting to your DR [desired reality]” (@AutoModerator 2021). Many shifters describe using their waiting rooms to rest, reset, or practice their skills in meditation and shifting (coincidentally echoing much of the characterization of quarantine). Other shifters speak of waiting rooms as a “shortcut” to further realities: once the waiting room dimension is located or constructed, some argue, a path is carved out through repeated shifting and thus requires less effort than a full shift to a novel desired universe. Within the community, waiting rooms are the subject of sustained discussion and debate on their constitution, function, and relationship to other realities. Can a waiting room become your current reality? Is there a difference in the ontological “material” of the waiting room compared to a desired reality? If someone knew the details of a personal waiting room, could they shift there as well, or would some kind of spiritual “passkey” be needed? The answer(s)—if there is one to be had—remains to be seen. The ontological complexity and attention to philosophical questions entangled with such possibilities, however, is worth noting even in the absence of solid answers. The popularity of such discourse signals that participants are extracting value not just in manipulating reality but in the act of processing, discussing, and investigating its constitution. Even without ever completing a “full shift,” participants are learning to think differently about their current reality and exert greater control over its mediation.

Such discursive exploration is perhaps at its most valuable when it comes to creatively uniting existing or scientific thought with the more spiritual and experiential dimensions of shifting—modeling a type of combinatory cognition that drives the discovery of ever-new paths for exploration and discussion. While there is no single scientific theory of alternate reality that unites the community, there are two frontrunners that structure much of the community. For those shifters who favor a more externally motivated understanding of reality, multiverse theory is the preeminent choice. Also known as the many-worlds hypothesis, it is an interpretation of quantum mechanics first theorized by Erwin Schrödinger, formalized by Hugh Everett in 1957, and popularized by Bryce DeWitt in the 1970s (Gribbin 2020). It theorizes that every possibility exists simultaneously; every single outcome of every single decision exists in some reality (very literally everything, everywhere, all at once). In DeWitt’s words, “[e]very quantum transition taking place in every star, in every galaxy, in every remote corner of the universe is splitting our local world on Earth into myriad copies of itself” (as cited in Gribbin 2020). In some many-worlds interpretations, it is our observation of one potentiality that brackets off the others and roots us in a certain reality; only once we open the box that contains Schrödinger’s cat do we solidify if we are in the reality where it survived or perished.

This is the core premise that captures shifters: the idea that they can learn to become aware of, locate, and “bracket off” one world from the myriad of

possible realities, blazing their own path directly to their desired destination. If they do not like the reality in which the cat is dead, they can simply shift to one where it is alive, or perhaps one where they are the cat. Or maybe the cat is Garfield. For shifters interested in “fictional” realities and characters, many look to physicist Max Tegmark’s interpretation of the many-worlds hypothesis to evidence their exploration. As one post explains,

Tegmark theorized that our physical reality is built from complex mathematical structures (which explains why we are able to come up with equations to describe various laws of physics). From there, we get to what he referred to as “Level IV” of his theory regarding parallel universes. It says that not only are there universes operating off our laws of physics, but there are ones that function off of an entirely different set of fundamental laws. Our universe might have a mathematical structure that says pigs cannot fly, but there could be another universe that’s math states pigs flying is perfectly normal. Hence, realities exist where magic, talking animals, or superheroes exist. (@MagicalSpaceWaffle 2022)

To understand or access worlds that function off different laws of physics then must require an expansive approach not strictly bound by the laws of science as we currently know them.

There are, however, shifters who are not convinced by the many-worlds hypothesis. Instead, they resonate with a more internally motivated explanation for multiple realities: consciousness theory. Though less formalized than many-worlds, consciousness theory operates under an idealist understanding that our external reality is a projection of our internal self, and by operationalizing our consciousness, we can shape the reality we experience. Many of those who follow this theory take inspiration—perhaps surprisingly—from a series of government experiments known as the Gateway Process.

In 1983, United States Army intelligence at Fort Meade filed a document containing the conclusions of several years of experiments into the nature of consciousness and reality. Called the “Analysis and Assessment of the Gateway Process,” it is part of a since-declassified series of documents from several decades of government investigations into psychic phenomena with a two-fold goal: first, to use quantum mechanics to “describe the nature and functioning of human consciousness . . . [and] the character of the time–space dimension,” and second, to operationalize this understanding to transcend time–space using experimental techniques of expanded consciousness (McDonnell 1983, 1). In particular, experiments focused on brain hemisphere synchronization to influence “the amplitude and frequency of brainwave output between the left and right hemispheres so as to alter consciousness, moving it outside the physical sphere so as to ultimately escape even the restrictions of time and space” (McDonnell 1983, 7).

Shifters who draw inspiration from consciousness theory believe the realities they seek to encounter do not necessarily already exist—it is exactly this power of harnessed consciousness that allows them to transcend all “restrictions” and bring their desired reality into being. To access this power, they take inspiration from, and replicate techniques described in, the Gateway Process such as binaural beats, subliminal messaging, hypnosis, transcendental meditation, and biofeedback. For example, in the “Dazzle Method,” shifters utilize a series of light frequencies to theoretically trigger a state of enhanced consciousness:

Our (Current Reality) brains are believed to react to 9HZ light frequencies stimulating occipital polarity in much the same way as Robert Monroe’s CIA-studied hemi-sync tapes, the equivalent of audio frequencies within the gamma range stimulating an area usually only reached by experienced mediators . . . Start off with a slow setting, around 5 or 6, using DELTA WAVES, then on every following attempt to shift, go up a notch each and every time. Around the 7 to 8 setting use THETA WAVES, and around the 10–12 setting, try EPSILON WAVES. Finally, when you approach the highest setting, 20, if you still haven’t shifted, use GAMMA WAVES as they stimulate the release of biophotons corresponding to the highest sensory input. (@RealityShifting101 2021)

Similarly, many shifters strategically use audio frequencies to “prime” their consciousness for shifting, usually in the form of guided audio meditations—some of which have garnered millions of views on YouTube and TikTok. Embedded within these meditations are subliminal messages and binaural frequencies—two of the techniques meant to unlock consciousness to transcend space–time in the Gateway Process. It is an approach not without mainstream scientific merit; a wealth of studies conducted over the past half-century have confirmed the ability of subliminal audio and visual messaging to have positive effects on behavior and learning, increase self-esteem, and have measurable impact on a range of other behavioral and perceptive functions (Fleming 2019; Walker 1991; Vernon 2009). Binaural beats have been similarly evidenced to enhance the “interhemispheric coherence” for possible psychological and physiological benefit, with several studies confirming their benefit in increased attention and focus, improved cognitive function, anxiety reduction, and decreased chronic pain (Solcà et. al 2016; Colzato et. al 2017; Lim et. al 2018; Yusim and Justinas Grigaitis 2020; Gkolias et. al 2020). So too are many of the audio frequencies used in binaural beats associated with alternative spiritual belief systems and practices. Often referred to as “sacred frequencies,” certain frequencies are associated with distinct properties, purposes, and numerological resonances that amplify their significance for those who incorporate sound into their spiritual exploration or religious practice—drawing meaning from multiple modes of knowledge and being (Constantinsen, n.d.).

This leads us to the final element in the maturation of the shifting community: the role of the ineffable. The community is of heterogeneous religious affiliation and individual spiritual belief, and it is not uncommon to see shifters—secular or otherwise—experiment with elements of magic and witchcraft in their shifting practice. Just as there is no single agreed-upon scientific framing within the shifting community, there is benefit to the wide range of beliefs and practices drawn upon—with plenty of healthy and passionate discussion on their purpose.

From the earliest posts, one thing the community has never been is dogmatic; both as individuals and as a collective bound by purpose, shifters are egalitarian in their approach and diverse in their influences, weaving together scientific elements like theoretical physics and quantum mechanics with diverse cosmologies, pantheons, and practices. It is, in short, a radical embrace of combinatory practice rooted in the fundamental premise that a multiplicity of realities necessitates multiplicity in ways of knowing and being. This generalized openness is not to say, however, that individual shifters do not tend to one side à la the scientific theory divide. For a not-insignificant proportion of the community, shifting is an extension of their existing religious practice or an exploratory element in their idiosyncratic spiritual journey—the science comes second. One Christian shifter of unknown denomination writes that exploring the boundaries of reality makes them feel “much closer to God,” taking pains to locate historical evidence that reconciles such experimental practices with traditional worship:

Lectio Divina is an ancient way of prayer. Doctors of the Church [sic] like Thomas Aquinas [sic] were even said to be so connected to God that he literally would float off [sic] the ground . . . when you are in this state you realize not that you are the creator of your reality but that you can control it. This is because you understand that you are a part of God, you abide in them. (@Cereal_KillerOvO 2021)

The importance of faith within shifting practice is not restricted to Christian religions; there are shifters of every major world religion, including neopaganism, and scores more who do not identify with an existing religious tradition but freely experiment with adopting rituals and practices from other shifters in their unique spiritual communions within reality. Less important than an existing set of beliefs or integration with a formal religious system is the impressive ability of participants to creatively select and apply aspects of diverse practices alongside scientific precepts to shape both their philosophical and methodological approach to shifting.

There are hundreds of posts in the vein of those pictured here, weighing approaches, religious histories, and moral quandaries with care, thoughtful consideration, and an overarching culture of respect for diverse traditions (Figure 3).

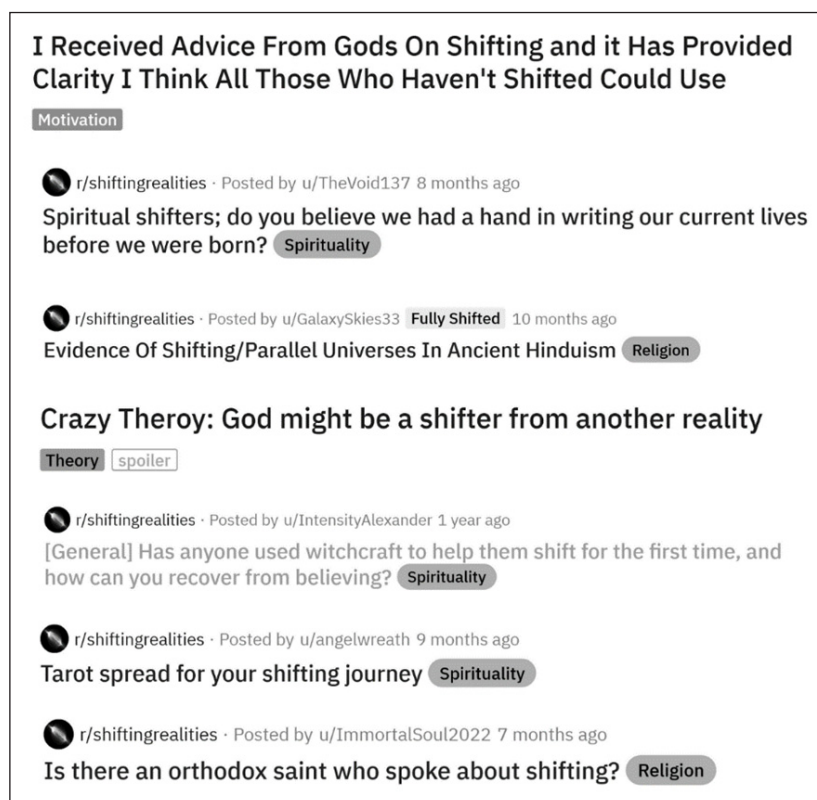


Figure 3: Faith-oriented discussion posts on r/shiftingrealities.

What is repeatedly affirmed is that an interest in the philosophical and moral aspects of shifting is not predicated on an existing religious affiliation nor pre-existing spiritual orientation more broadly but rather is something that can be experimented with and discovered as part of an individual's shifting practice. One of the most marked aspects of the community is the widespread depth of critical self-reflection and consideration of the wider impacts of their exploration that prompts participants to consider questions of belief and practice as part of the shifting process, not solely as a precursor to it. From the ethics of violence in desired realities to conceptualizing the free will of inhabitants of constructed realities to shifting as a route to immortality, the curiosity that drives shifting discourse and practice is one of candid confrontation with people's own assumptions and beliefs about how the world can and should work. It is, in short, an ecosystem of knowledge sharing with the belief that diverse experimenters drawing from each other's unique subjectivity and experience stand a better chance of finding the answers of the universe. Though shifters often seek idiosyncratic desired realities and amalgamate unique processes to get there, the culture of shared knowledge and exploration means that a breakthrough for one becomes new data for the benefit of all—a true gestalt that transcends its constituent parts. A space for all kinds is what is being offered—not only within the platforms and discussion boards of the shifter community but within the sandbox of reality.

This heterogeneity must be understood as the suturing feature of the shifting community—and a reflection of a broader cultural shift from a strict demarcation between religious and magical practices to increased fluidity in individual spiritual amalgamations (Twenge 2023; Shipley 2022). What creates the collective out of the singular is the shared belief that none of us are bound by the hand that fate plays us and the enduring faith that a better life is within our power to create—a type of magic in and of itself. As anyone who fell in love with *Halloweentown* (Dunham 1998) as a child can tell you, “magic is really very simple, all you’ve got to do is want something and then let yourself have it.” And—to take a cue from the oft-paraphrased Arthur C. Clark—what is magic but science we do not yet understand? It is with this spirit that contemporary shifters take up the task of exploration, happy to splash in the generative space that emerges when the distinctions between scientific knowledge, spiritual belief, religious practice, and magical worlds become porous and practitioners feel empowered to question the structures that do not serve them. In this way, the shifting community’s combinatory spiritual science can inspire us to reexamine and reshape our fundamental relationship to reality, even if we choose not to explore the multiverse ourselves.

A Lengthy Legacy

Though shifters represent a fascinating new direction in the creative exploration of reality, the urge to explore the boundaries of consciousness—and the belief that there are other accessible worlds somewhere out there—goes further back. Much further back. And in each phase of inquest and experimentation, so too do we see the lines between the effable and ineffable ripple and twine. In this way, the spirituality-invigorated science of shifting is less an invention and more a reinvigoration of a legacy that has lasted millennia. This, then, brings us to the final part of this article: looking to past explorations into the nature of being that similarly draw on combinatory ways of knowing to fundamentally alter our understanding of reality. In doing so, we can place the practices of contemporary reality shifting within a longer legacy of reality mediation, legitimizing the potential of creative, combinatory cognition to bring about large-scale transformations across science, spirituality, and society alike. To do this, we look to one sustained effort within the millennia-long search to elucidate the ineffable forces of our universe that cannot be seen or otherwise detected but may nevertheless hold the key to reality itself. A “Holy Grail” project for physics and philosophy that has made its greatest strides when approached with a combinatory practice of exploration and knowing: the exploration of aether.

Our story begins in ancient Greece, where Aristotle, following Plato, conceptualized an unseen element that permeates reality. He called it the fifth element, or quintessence, although now it is more commonly referred to as aether

or ether (Temple 2021, 76). Unlike the other four elements—earth, air, fire, and water—quintessence/aether was believed to be *celestial* rather than terrestrial in origin, functioning as the bridge between our physical reality and the divine. Plato spoke of it as the material “God used in the delineation of the universe,” while Aristotle characterized it as an element “more divine and prior” than its terrestrial counterparts (Plato 2021; as cited in Hahm 1982, 63). A mediator of reality itself, in many ways aether was conceptualized as functioning similarly to the constitutive webs of materiality and affect. By some accounts, Aristotle believed this fifth element to be the source of vitality and intelligence within the cosmos. He considered the possibility of beings made entirely out of aether, “intellective and perceptive deities” able to “know and think and perceive” in order to bring structure to the universe (Van Buren 2023, 16, 19)—in short, an approach to understanding aetheric reality that both adopts the language of the physical sciences and fits within the classical Greek hierarchical polytheism of personified deities.

This divine character of aether was not incommensurate with the role of physics in the Hellenistic period; John Heilbron (2015, 2) has termed the physics of the Greeks a kind of “natural theology,” its purview spanning the “the physical world from the high heavens to the Earth’s center, and from the human soul to the life of the least of living creatures.” Three centuries later, Cicero echoed this animating aspect of the mysterious fifth element when he called it “the essence of gods and souls” (as cited in Temple 2020). Fast-forwarding a fair few centuries, Islamic and European alchemists carried this tradition forward, explicitly drawing from ancient and classical texts as they explored components of divinity as part of the material plenum of the world. Part and parcel was the continuation of the theory that quintessence functioned as a bridge and/or mediator between dimensions or realities. In alchemical practice, aether was then framed as a key element—albeit undiscovered—that bound our terrestrial world to the heavenly one. As a material element, the alchemists theorized it might be manipulated to heal illness and extend life, or perhaps even be a constitutive component of that ever-elusive elixir of life (Taylor 1958, 95).

In the seventeenth and eighteenth centuries, quintessence continued to influence the understanding of being in both scientific and spiritual realms. Most famously, it served as an influence in the development of theories of gravity and electromagnetism—unseen forces that nonetheless shape the world.⁴ Isaac Newton, that grandfather of physics, used the term “aether” for not only a medium through which gravity functioned but as a potential resolution to the “puzzling problem” of how the divine (the soul) may interact with the material (the body) (Gillespie 1960, 130). Further, historical evidence shows Newton theorized aether as a force fundamental not only to “optics, chemistry and gravitation” but the “ordering of the planets and universe”—treading dangerously close to heresy

as this “deified ‘absolute space,’” suggesting aether and God “might be identical descriptions” (DeMeo 2009). In Newton’s own words:

Perhaps the whole frame of nature may be nothing but various contextures of some certain aethereal spirits . . . wrought into various forms; at first by the immediate hand of the Creator; and ever since by the power of nature... Thus perhaps may all things be originated from aether. (cited in Gillespie 1960, 129)

This may be surprising to those who only know Newton for his work on gravity, but as a thinker, he was not shy about his twining of religious and scientific purpose. In the eyes of many, he was “the rhapsodist . . . the most daringly speculative thinker about nature known to history” (Gillespie 1960, 128). As a possible model for contemporary thinking about reality and being, it is a pretty compelling appellation.

Two and a half centuries later, another one of history’s great thinkers reinvigorated the search for our unseen element. By Albert Einstein’s time, however, the Cartesian project had reached completion in strict separation between spirituality and science, thus stripping aether of its divine resonances. Aether was instead conceptualized as a practical and physical—if not yet understood—mediating element in the cosmic soup, including within a 1920 lecture by Einstein entitled “Aether and the Theory of Relativity.”⁵ In transposing the divine to the mundane, however, aether retains echoes of its historical role as a bridge or mediator between what we know and the answers we are trying to find. “The aether hypothesis was bound always to play some part in physical science,” Einstein (1922 6, 20–22) asserts, “even if at first only a latent part”:

As to the part which the new aether is to play in the physics of the future we are not yet clear. We know that it determines the metrical relations in the space–time continuum . . . but we do not know whether it has an essential share in the structure of the electrical elementary particles constituting matter . . . our present view of the universe presents two realities which are completely separated from each other conceptually, although connected causally, namely, gravitational aether and electromagnetic field, or—as they might also be called—space and matter.

The fundamental question thus became how to reconcile the dual “realities” of space and matter with aether as a mediating force somewhere in-between. Einstein and his contemporaries did not know yet where precisely aether fit within a model, but they suspected its discovery could change everything. “If we could succeed in comprehending the gravitational field and the electromagnetic field together as one unified conformation,” Einstein (1920, 22–23)⁶ continues, “the contrast between aether and matter would fade away and, through the

general theory of relativity, the whole of physics would become a complete system of thought.”

Einstein continues to assert the existence of some kind of aetheric medium in the following years, drawing on Newton’s ([1924] 2017, 2) earlier conception of aether as a kind of matrix or space he termed the “aether of mechanics.” “Aether is not to be understood as a mere hallucination of the Newtonian theory, but rather that it corresponds to something real that exists in nature,” Einstein ([1924] 2017, 2) asserted. “The mechanical aether—which Newton called ‘absolute space’—must remain for us a physical reality” (Einstein [1924] 2017, 2). At the same time, however, he highlights that such an aetheric-structure reality is something different, perhaps less intrinsically material, than the reality we have known so far: “Of course, one must not be tempted by the expression aether into thinking that, like the physicists of the nineteenth century, we have in mind something analogous to ponderable matter” ([Einstein 1924] 2017, 2). So, then, we are left with something we know must exist and must be critical to the functioning of our world as we know it but is unlike anything we currently know, are able to see, or are currently capable of analyzing—in short, something ineffable we might otherwise term as magical or divine.

Ancient Problems, Modern Solutions

Aether rarely appeared in Einstein’s work after this point, and it was largely abandoned by most physicists in the following decades. As one journalist put it in 2021, “The term ‘aether’ (or ‘ether’) lives on as a colloquial expression in the West, an abstract idea of the intangible void” (Neal 2021). After being stripped of its theological affiliations for a few odd centuries in the custody of scientists, it became, ironically, relegated to “the esoteric worlds of magic, mysticism, and the supernatural” (Neal 2021). But the search for the secrets of reality was not relinquished; it merely rebranded. Remember the experimental wing of the United States military? It was there that the tradition of spiritual science was carried forth, almost entirely removed from the public eye (at least before it was declassified and shared widely on the internet). Despite their original classified nature, government programs like the Gateway Project and MKUltra are the most well-known forays into psychic phenomena of the last century, in no small part due to the popularity of media like *Stranger Things* (Duffer Brothers 2016) and *The Men Who Stare at Goats* (Ronson 2009). The latter especially served to immortalize the more fascinating experiments of the United States government: the attempt to create psychic super soldiers in the 1980s, called Project Jedi; the deployment of subliminal messages in songs by Matchbox Twenty and Kris Kristofferson at Guantanamo Bay; and, not the least, the creation of the *First Earth Battalion Operations Manual*, which tells trainees they will learn to:

Fall in love with everyone, sense plant auras, organize a tree plant with kids, attain the power to pass through objects such as walls, bend metal with their minds, walk on fire, calculate faster than a computer, stop their own hearts with no ill effects, see into the future, have out-of-body experiences, live off nature for twenty days, be 90%+ vegetarian, have the ability to massage and cleanse the colon, stop using mindless clichés, stay out alone at night, and be able to hear and see other people's thoughts. (Ronson 2009, 14, 177, 40)

Though the military fell short of these goals in nearly every respect, it is one of life's beautiful ironies that “the institution you would expect to be the last to open the door to the greater realities” is the one largely responsible for the popular image of spiritual science that endures today (Jim Channon quoted in Ronson 2009, 43).

Everything old becomes new again, and the story of the unseen, mediating component of the universe is clearly far from over—and not just for the dogged reality shifters. The belief in the discovery of a quintessential material or force that will unlock the secrets of reality has again come to the fore as our technologies become more precise and the scale of our exploration grows both macro- and microscopically. This is seen most obviously in the rhetoric around “invisible, imponderable” dark matter—explicitly referred to as quintessence by some scientists—and theorized to make up a significant portion of the mass of the universe despite never having been observed (Ivaylo Zlatev et. al 1999; Beltrame 2020). In the last few years, some scientists have moved to officially consider dark matter as a “fifth fundamental force” that structures our universe, right alongside gravity, electromagnetism, and strong and weak nuclear forces (and neatly bringing us back to the starting point of Aristotle's original conception of the aetheric fifth element) (Neal 2021).

Interestingly, the divine legacy of aether has also reappeared in recent revelations regarding the role of plasma in the cosmic soup. Called “the fourth state of matter” alongside gas, liquids, and solids, plasma is thought to make up 99.9% of the universe (Mullen 1999). “Whereas once space was thought of as empty,” Robert Temple (2020, 107) writes in *A New Science of Heaven*, “we now know that at a subatomic and quantum level, space is a jungle of plasma, a highly charged, creative ecosystem—with matter in the form of particles being one of the things it creates.” Like aether was for the Greeks, the alchemists, and Newton, it is plasma, Temple (2020, 6) believes, that will be the key to “reconcile the ‘spiritual’ with the ‘material’” dimensions of reality. Though Temple is somewhat an outlier in the intensity of his belief in the potential of plasma—and more open than most academics to the integration of esoteric study—the ongoing studies into dark matter and plasma have ignited similar interest and debate in spiritual communities. One such place is the blog *Does God Exist*, where John Clayton, a retired physics, chemistry, and Earth science

instructor, considers scientific discoveries through the lens of divine power. Plasma, for Clayton (2021; 2017), is “a tool God uses to shape the creation and mold the world around us” while the prevalence of dark matter and energy point to “the fingerprint” of an intelligent design that facilitates “great stability over an infinite amount of time.” “The more we know of the creation,” Clayton (2021) passionately concludes most of his posts, “the more we understand the power and wisdom of the Creator.”

This belief is echoed by astronomer, particle physicist, and Catholic priest Paolo Beltrame, who similarly sees such discoveries as an opportunity for the reunification of the scientific for divine exploration. In “Dark Matter to Bright Faith,” Beltrame passionately argues that these advances in science only strengthen faith—and vice versa. After all, he points out, it was fellow theoretical physicist and Catholic priest Georges Lemaître who proposed the theory of the Big Bang and fundamentally altered our understanding of the origins of the universe (Beltrame 2020, 49). “Scientists nowadays are disclosing a God who is more God-like than ever,” Beltrame (2020, 49) writes:

The cosmos has expanded from just our solar system to the scale of hundreds of billions of galaxies, and God is even bigger than that. The creative action has been moved from a six-day narrative into almost 14 billion years of evolutionary process, and God has even more imagination than that.

So too does Beltrame advocate for the reconciliation of science and faith in a manner reminiscent of the ancient Greek’s approach—and the kind currently espoused by reality shifters. The philosophical physics that considered both “the physical world from the high heavens to the Earth’s center” as well as the ineffable world of “the human soul to the life of the least of living creatures” finds echo in Beltrame’s description of the curiosity his faith encourages toward the “totality” of life from those “inner and intimate aspects” of the psychological and spiritual to the “most social and global” issues of scientific pursuit (Heilbron 2015, 2; Beltrame 2020, 50). “Scientific interest, therefore,” Beltrame (2020, 50) asserts, “can find a comfortable home within a life of faith.”

Beltrame, Clayton, and Temple’s faith in the reconciliation of these pursuits, however, is far from the standard. As noted earlier with Einstein’s mundane aether, we have moved a fair sight far from the “natural theological” physics of Aristotle and Plato or the “theologian scientist” Newton became in his old age (DeMeo 2009). There is a persisting stigma around the cross-pollination of science either with specific religious tradition or abstract spiritual purpose, embodied by popular atheist scientist Richard Dawkins, who termed faith in an unknown divine “infantile” and “dangerous” in *The God Delusion*—a book that spent twenty-two weeks on the *New York Times* Best Seller List (2006, 80, 189; Steinfels 2007). But such a strict position does not come without a cost—and

for some, that cost is an inability to fully address the increasingly complex philosophical questions raised by physics. As Bertrand Russell ([1927] 2023, 1) writes in the opening to *The Analysis of Matter*, “In spite, however, of the extraordinary successes of physics considered as a science, the philosophical outcome is much less clear than it seemed to be when less was known.” He interprets the fundamental problem as a disjuncture between “the world of physics” and “the world of our perception”:

The world of physics must be, in some sense, continuous with the world of our perceptions, since it is the latter which supplies the evidence for the laws of physics . . . Physics must be interpreted in a way which tends towards idealism, and perception in a way which tends towards materialism. (Russell [1927] 2023, 6–7)

In this view, it is only by building this bridge between ways of knowing that physics—and other scientific ways of knowing—may reach their full potential and succeed in understanding the true complexity of reality. It is a call to action that biophysicist James DeMeo has argued passionately for in the past. The prejudice against such combinatory work, both historical and contemporary, “must [be] overcome in the sciences,” DeMeo (2009) writes. Only then do we stand a chance of ever grasping the true “nature of the substance and structure of space” (DeMeo 2009). In overcoming that prejudice, that reactionary desire to shy away from any challenge to how we have been taught to order the world, it is entirely possible that what we may learn could entirely reframe our understanding of being—individually, collectively, and cosmically. In short, opening the door to such combinatory modes of knowing and being like that of the reality shifters, and refusing to dismiss the legacy of transformative spiritual science like Newton’s—even if it means dabbling in the borders of belief—might be exactly what is needed to push forward in our search to understand the nature of reality and our selves.

Conclusion

Contemporary reality shifting, as a practice both shaped by a particular moment in time and situated within a longer legacy of experimental exploration, is a masterclass in weaving together an incredibly diverse fabric of historical, religious, popular, and cultural traditions. As a case study for experiments in the mediation of reality, shifting exemplifies the generative possibilities that arise when ideas and influences drawn from seemingly disparate fields are critiqued, syncretized, recontextualized, and tested—then shared for the benefit of the whole. This egalitarian approach transposes the long legacy of spiritual science for the modern age, well suited to the increased fluidity and multiplicity being seen across many areas of social and personal life in the wake of COVID-19. So

too does the shifting experiment exemplify the possibilities that may arise when we embrace Russell's provocation to soften the divisions between the worlds of physics and perception, the material and the ideal in a way that remains taboo in many scientific arenas. Though time will tell if their brand of combinatory cognition and spiritual science leads to great breakthroughs in our collective understanding of reality, perhaps the most crucial aspect of their work is that it has undoubtedly already changed the lives of many shifters for the better.

For some shifters, being a part of the community and learning to think and experiment in this way has provided a better understanding of the world through varied and otherwise impossible experiences, the opportunity to "do the things that my big imagination has always wanted to do," to "live for myself" and "be so grateful for living that I'd cry at the thought of having to die" (@PinkPoodleOFDOOM 2021; @Schnippleslurp 2021). For others, their shifting practice is rooted in emotion and serves as a healing method of connection with beloved figures both real and fictional, such as departed family members or a favorite comic character. The nature of contemporary reality shifting means that it empowers practioners to find a sense of agency within infinity, instilling a sense of capability, power, confidence, and control over a reality that may offer little otherwise.

Perhaps most importantly, shifting—and the unfettered purview of spiritual science more broadly—can be a tool through which to articulate our desires and dreams, find joy and inspiration, and practice unrestricted imagination in a time of uncertainty and continued crisis where such opportunities have been too few and far between. For these reasons and more, this article has endeavored to situate reality shifting as a critical case study on the benefits of creative, combinatory cognition and the transformative understanding of self and others facilitated through such expansive approaches to knowing and being in the world. As just one expression of a long history of entwined scientific and spiritual inquiry, like the story of aether and the promises of plasma, the shifters' experiments offer a siren song of possibility, irresistible in their endless potential to interrogate and reframe our relationship to our world, our reality, and our selves.

Notes

- ¹ See one list of recommended “methods” for shifting here: https://www.reddit.com/r/shiftingrealities/comments/j193d5/master_list_of_shifting_methods_comment_anything/.
- ² Part of a larger trend on social media over the past year to romanticize oneself as the “main character” or, conversely, to denigrate oneself as a side character or non-playable character (NPC). See Kyle Chayka’s *New Yorker* piece “We All Have ‘Main-Character Energy’ Now” for more.
- ³ Some suggestions provided by users: Queen Elizabeth II, Keanu Reeves, Ariana Grande, and various TikTok and K-pop stars.
- ⁴ Strictly speaking, we know gravity is not a force but an effect—as Christophe Galfard (2016, 60) puts it, “[g]ravity [is] a bending of the fabric of the universe caused by the objects it contains.” Nonetheless, its unseen existence shapes much of our daily lives.
- ⁵ It is important to note that the idea of what (an) aether specifically implied changed in the intervening years, particularly being defined—and experimentally refuted—as a medium through which light passed as “luminiferous aether” by Albert Michelson and Edward Morley in the late nineteenth century (Swenson 1972).
- ⁶ Einstein (1922, 23) makes reference to Hermann Weyl’s unified field theory of 1918 here, which he describes as “ingenius” but probably not an accurate description of reality.

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Moral Challenges and Technological Prospects of Computerized Ifá Divination

Ademola Kazeem Fayemi, Principal Investigator, Institute of African and Diaspora Studies, University of Lagos, Akoka, Nigeria, akazeem@iads.unilag.edu.ng

Akinmayowa Akin-Otiko, Principal Investigator and Data Analysis, Institute of African and Diaspora Studies, University of Lagos, Akoka, Nigeria, pakin-otiko@unilag.edu.ng

Emmanuel Ofuasie, Co-Researcher, LAUTECH University, Ogbomosho, Nigeria, ofuasie.emma@yahoo.com

Though there is an increasing interest in computerizing Ifá divination as a way of promoting accessibility, little is known about the moral and epistemic challenges linked to such digital feats. The technological breakthrough of computerized Ifá divination generates some dilemmas and poses some moral and epistemic challenges deserving critical interrogation. Through conceptual and empirical approaches, this research exposes some moral dilemmas at the intersection of spirituality and digital technology. Specifically, the research adopts a qualitative methodology with thematic analysis. It uses a deductive approach to engage with three dilemmas related to the moral and technological prospects of computerized Ifá divination. Data were gathered from structured interviews with seven Ifá priests in Lagos, Ibadan, Osogbo, Ife, and Ogun states in southwest Nigeria. Their responses were analyzed based on (1) whether to embrace automated divination amidst the potential climate of misuse of the Ifá corpus; (2) whether to accept computerized divination, which may devalue its rich spiritual recommendations for purposeful living; and (3) whether Ifá should be made publicly available through digital applications. The findings show the respondents are divided over Ifá digitization. Whereas some see it as a welcome development and advancement between technology and spirituality, others decry it.



Introduction

The overriding aim of this research is to make obvious some of the problems, challenges, and dilemmas that may be encountered following the incursion of technology into spirituality in the case of computerized *Ifá* divination. In other words, the technological and moral issues generated by the use of computerized *Ifá* divination, which are yet to gain any serious scholarly attention, is the primary concern of this research. Rather than recognizing the problem and offering suggestions, this study articulates the problems and challenges with the intention of bringing awareness to some of the issues related to the belief that one can self-conduct *Ifá* divination via gadgets like smartphones and computers. The problems recognized in digitized *Ifá* divination were informed by interviews conducted with some *Ifá* priests in different states in southwest Nigeria. The research questions were developed around three broad research interests that culminate in the dilemmas the present research wishes to study using data:

- (1) Whether to embrace automated divination amidst the potential climate of misuse, abuse, or underuse of the *Ifá* corpus
- (2) Whether to accept computerized divination or risk devaluing its rich spiritual and faith-based recommendations for purposeful living when the use of algorithms takes over making decisions about people's lives
- (3) Whether the cultural knowledge of the *Ifá* corpus should be made publicly available through digital applications or the embedded knowledge and spirituality of *Ifá* and its processes be allowed to remain without technological revolution in order to preserve source originality, epistemic certainty, and faith fidelity in the divination system.

The question of digitized *Ifá* divination in itself is not a new one. Scholars have examined it from different perspectives. However, it is still of interest to find out how it differs from the traditional mode of divination as well as what it seeks to attain. This article is divided into five sections. The first is concerned with the nature of computerized *Ifá* divination and the moral and technological dilemmas it has generated that led to this research. The second details the methodology used in generating the research data. The third section presents the findings and unpacks the responses generated from the field research. It also discloses the relevant codes and themes deduced from the data in order to see how they shed light on the dilemmas that initiated this research in the first place. The fourth section provides our critical analysis. This section rigorously situates our responses within the three dilemmas and analyzes the implications they portend for whomever wishes to entertain the practice of computerized *Ifá* divination. The fifth section concludes the article by bringing together all the arguments.

Computerized *Ifá* Divination with Its Dilemmas

Computerized *Ifá* divination is generally understood as a key route to gaining insights from *Ọrúnmìlà*, the *Yorùbá* divinity of wisdom (Balogun and Fayemi 2008). The digitization of the *Ifá* corpus aims to attain a rare feat—the practice of divination in the comfort of one’s home or at one’s convenience without the assistance of the human mediator, the *Ifá* diviner. Digitization comes in different forms such as Android and iPhone applications, which are available for free and, in some circumstances, for purchase before they can be used. Digitization makes *Ifá* divination available, at the fingertips of anyone who uses it, to engage in the practice of divination. Usually the relevant *Odùs* (chapters of the *Ifá*) are already stored in the application and become accessible once the right procedures and instructions reinforced by coding have been followed by the user.¹ Of course, the ability to undertake self-divination takes away the monopoly of knowledge from *Ifá* priests. Through digitization, it may also be possible to increase the knowledge of the *Ifá*, since *Ifá* priests will no longer be required to memorize the chapters; instead, chapters may be confirmed from the screen of a computer or smartphone. In a way, digitization brings some form of checks and balances to the excesses—or, in some situations, the incompetence—of an *Ifá* priest. In spite of these promises that computerized *Ifá* divination presents, it is important to point out that there are moral, spiritual, and economic issues that encompass the practice.

One of the most emphasized aspects during the preliminary fieldwork of this research was that the technology is not potent enough to replace diviners and is culpable or limited on several fronts. Also emphasized was the presence of quacks who are in the divination business for financial gains via swaying and misleading clients.

It is not a matter of debate that the divination process entails three profound parts. The first is the manipulation of divination tools to arrive at some random sequence. The second is the chanting of relevant verses, and the third is an interactive exchange between the diviner and the client (Bascom 1969). The first part determines the other stages. Once the first part is faulty, which is possible due to human limitations, the other parts become problematic, cumbersome, and even misleading. Before discussing how the digitization of the *Ifá* may influence these parts of *Ifá* divination, it is pertinent to offer a few comments on the rituals of *Ifá* divination. This is crucial since the *Ifá* influences the daily life of its practitioners; with technology serving as the principal mediator of the Fourth Industrial Revolution, there is no doubt the rituals and practice of the *Ifá* will be affected.

Traditionally, practitioners perceive the *Ifá* as “the word of divination which issues from the mouth of *Ọrúnmìlà*” (Abimbola 1976, 3). It is within this context that William R. Bascom (1969, 14) offers that “the word *Ifá* is used to mean both

the system of divination and the deity who controls it; and this deity is known also as *Orúnmìlà*.” It is obvious *Ifá* and *Orúnmìlà* are used as though they are synonymous (Balogun and Fayemi 2008, 377). More so, there is a general understanding among practitioners that the *Ifá* itself contains the indigenous accounts of *Yorùbá* cosmology, ontology, and cosmogony (Ofuasia 2023). These are recorded in chapters usually called *Odù*. Practitioners also attest to the fact that the corpus boasts sixteen principal chapters known as *Ojú Odù* in addition to another 240 minor chapters, popularly called *Omọ Odù*. This brings the total number of cantos to 256 (Ofuasia 2024). Practitioners maintain that the sixteen *Ojú Odù* correspond to the first sixteen disciples of *Orúnmìlà*. Later on, these sixteen also had their own disciples, hence the 240 *Omọ Odù* (Dasaolu, Ofuasia, and Oladipupo 2023).

Although there are no physical texts wherein all the verses of each of the 256 chapters are documented, these are usually memorized by diviners, who chant them once they encounter the signature of any of them during divination. These verses are usually an admixture of poetry and prose, as they detail stories in a poetic form. This is why Sophie Oluwolé (1996, 3) maintains that the verses are “poetry intermittent with prose.”

As rightfully noted by Olufemi Taiwo (2004), the practices of *Ifá* have succeeded in influencing people’s views about life, as they do not hesitate to consult *Ifá* with the assurance that it can solve or help them understand their perplexity as well as how to emerge from it. However, even when persons have a wish to “interact” with this deity through divination, there is no direct link between the supplicant and the deity but an interposer (Ofuasia et al. 2021). This interposer is the *babaláwo* (a male *Ifá* priest) or *ìyanifá* (a female *Ifá* priestess). This is the dominant structure of *Ifá dídá* (casting *Ifá*).

Among practitioners, various factors can contribute to the desire for *Ifá* divination, for example when one seeks guidance to start a new venture or go on a long journey (Ofuasia and Ibiyemi 2024). More so, *Ifá*’s opinion is sought when things are not going or when one is diagnosed with an illness that has rendered several treatment alternatives otiose (Akin-Otiko 2018). While there are innumerable factors that could instigate *Ifá dídá*, clients definitely visit the *Ifá* priest/priestess when a new baby is born (Taiwo 2004, 306). This is because they would like to “know what the child’s path through life might be” (Taiwo 2004, 306). This is called *àkọsẹ̀jàyẹ* among the *Yorùbá*.

Furthermore, practitioners maintain that divination may be conducted not only for different reasons but for different groups of people (Ofuasia et al. 2021). There is *Ifá ẹ̀ni*, divination for a specific individual. On other occasions, there is *Ifá ẹ̀gbẹ* (divination for a society or club); *Ifá ọ̀gbà* (divination for an age grade); and *Ifá ilú* (divination for a town, nation, or country). There is also *Ifá ipò* (divination for a public official) (Taiwo 2004, 305–6). These are the most common cadres of *Ifá dídá*. The traditional practices of *Ifá* divination have been well summarized by Wande Abimbola (1977, 9):

When the client enters the house of the *Ifá* priest, he salutes him and expresses a wish to “talk with the divinity.” The *Ifá* priest then takes out his divining chain and lays it on a mat or a raffia tray in front of the client. The client whispers his problem to a coin or a cowry shell and drops it on the *Ifá* instruments. Alternatively, the client could pick up the divining chain or the *ìbò* and whisper his problem to it directly. In either case, it is believed that the wishes of the client’s *Orí* (God of predestination who knows what is good for every person) have been communicated to *Ifá* who will then produce the appropriate answer through the first *Odù* which the *Ifá* priest will cast when he manipulates his divining chain.

Following the manipulation of the divination chain, a signature from any of the 256 chapters or *Odùs* is revealed. As soon as this occurs, the diviner “begins to chant verses from the *Odù* which he has seen while the client watches and listens. The priest chants as many poems as he knows from that *Odù* until he chants a poem which tells a story containing a problem similar to the client’s own problem. At that stage, the client stops him and asks for further explanation of that particular poem” (Abimbola 1977, 9–10). As a way of ascertaining if the story and the deductions from it are apposite for the client, the *ìbò* comes enters the fray. Emmanuel Ofuasia (2019, 336) defines the *ìbò* as a crucial divination apparatus made up “of a piece of bone, which stands for ‘no’ and two cowries tied together, which symbolize ‘yes.’”

Upon the conclusion of the divination, most times, sacrifices are usually recommended, usually animal sacrifice (see Abimbola 1977). Whether or not the use of these nonhuman animals for sacrifice in *Ifá* is morally justified has already been given serious consideration by Ofuasia (2018), and we shall not exert further effort on this since it does not have a direct impact on the present inquiry. Nevertheless, it is crucial to understand that the significance of sacrifice goes beyond bloodspilling. Maulana Karenga (1999, ix) reiterates that *Ifá* “calls one’s ritual performance useless, invalid or in vain if one’s character is deficient.” This means that in most cases or instances, the individual’s problems may only require a change to positive agency and character. Perhaps this informs the passing of *Ifá* as a philosophy hinged on positive character building for agency in the works of Nicholaj de Mattos Frisvold (2016) and Ofuasia (2018).

The description of the traditional sequence of *Ifá* divination given here is a mere scratch of the surface. We have offered a cursory overview of how *Ifá* divination works for the sake of the present inquiry. From the exploration undertaken thus far, the three core aspects of divination hinted at earlier have been described: (1) the manipulation of divination tools for a signature; (2) the chanting of the verses from the signature; and finally (3) the quest for solution between the diviner and the client, which is usually a collaborative venture.

In the digital age of the twenty-first century, where technology impacts nearly all parts of human living, it is doubtful whether these three aspects of divination technology can successfully mediate the spiritual yearnings of diviners and clients of *Ifá*. For the first part of the divination process, which involves random sequencing, there is no doubt digitization can assist practitioners with better precision and save time. However, even while this study hypothesizes that digitized *Ifá* divination of the entire 256 *Ifá* corpus signatures will provide a better, more reliable, and quicker personal interpretation of the body of knowledge, it is a challenge for technology to mediate aspects (2) and (3) for practitioners of *Ifá*.

One of the challenges computerized *Ifá* divination presents is its seeming capacity to replace the traditional role of the *babaláwo/ìyanifá* (male/female *Ifá* diviners) in the triad communication comprising them, the client, and *Òrúnmìlà*, the *Yorùbá* deity of wisdom and hidden phenomena. This research critically considers, based on empirical data, where spirituality and technology intertwine as well as how the moral dilemmas generated may be addressed. In other words, it forays into the moral challenges occasioned by the digitization of the *Ifá* corpus with some pertinent suggestions for how they can be addressed.

Previously, some works have considered the reliability of computerized *Ifá* divination. Professor Danoye Laguda, an academic professor of *Ifá* studies insists that some aspects of divination will be vitiated by smart phones, which may upset the effectiveness and reliability of divination.² One of the preliminary findings that commands further investigation is related to the moral dilemmas that surface in the attempt to coalesce technologically driven *Ifá* divination and the ingenuities of the *babaláwo/ìyanifá*. If computerized *Ifá* divination gains general approval, what moral duties do diviners owe clients concerning where and how to get ingredients for sacrifice or overseeing sacrifice? It is also worth considering the question of copyright. The knowledge of *Ifá* is a product of the global South. With the advent of computerized *Ifá* divination, wherein it is possible to have over 256 signatures of the corpus, it needs to be questioned if the sale of the application to iPhone users at US\$5 can ever be justified, morally speaking.³ Who really owns the knowledge? Does it continue to be the exclusive intellectual property of *Òrúnmìlà* and his 256 “disciples,” or has the right to ownership passed to the developers of the application? Since revenue will have been generated from purchases of this application, are these developers morally justified to keep the entire sum? These are some of the moral dilemmas generated by the practice of computerized *Ifá* divination.

At this juncture, it needs to be mentioned that *Ifá* divination, a practice found in *Yorùbá* society, is not limited to southwest Nigeria; it happens in the diaspora as well (Ofuasia 2019). It is a universal practice whose effectiveness is not limited by the social class or citizenship of *babaláwo/ìyanifá* or their clients. This is in line with the research of Olufemi Taiwo (2014, 305), who relays that

the *babaláwo/ìyanifá* does not demand a client be an *Ifá* initiate “before, during, or after consultation.” Yet, this does not mitigate the genuineness of divination.

Incidentally, technology is also universal. So, the crucial questions that inspire this research, then, are: Can technology, being a universal reality, with *Ifá* divination also being universal, extinguish the role of the *babaláwo/ìyanifá* without affecting the effectiveness of divination? What are the moral implications? Several professors/academic authorities of *Ifá* and local practitioners, during the preliminary assessments of this research, seem to maintain that technology can vitiate the originality and efficacy of divination. They also seem to hold the position that diviners may decide to hold back vital information in order to show that technology cannot substitute them. The outright consequence of this will be borne by the clients. Are these diviners under any moral obligation to not act thus?

For the local *babaláwo/ìyanifá* especially, digitized *Ifá* divination appears to be a shock, an aberration that necessarily questions the authenticity and veracity of *Òrúnmìlá*’s “revelations” through the diviner. What is, however, unknown to the general public is that attempts at technological interventions for *Ifá* divination have been a serious affair in the Americas. The renowned African historian Toyin Falola (2018, 919) validates this: “As far back as the 1990s, Oba Pichardo and his Lukumi collaborators in Miami (FL) were able to write codes that allowed them conduct computer-based *Ifá* divination.” This implies that the computerized divination that has surfaced in recent times underwent numerous modifications and revisions before it was finally available as an app for smartphones and tablets in Android and Apple stores.

It is of utmost importance and urgency to enquire whether or not digitized *Ifá* divination, in spite of its promises and ability to provide a check on some of the excesses and gridlocks peculiar to traditional *Ifá* divination, is not in itself flawed and limited. This is the principal motivation that informed the present research to move into the field and engage in a series of interviews with seven *Ifá* priests in order to ascertain their receptions of computerized *Ifá* divination. The methodology and their responses to questions posed to them during the interviews are described in the next two sections.

Methodology

As multidisciplinary research that straddles the humanities and the social sciences, the method adopted in this study is primarily qualitative. The primary qualitative approach used for this research relies on thematic analysis. The structured interviews with the *Ifá* priests are coded along the three themes that also inform the dilemmas. Similarly, according to the framework, there are three research approaches: deductive, inductive, and abductive research. Deductive research is appropriate for this project because it is typically employed when there is a clearly defined objective and outcome. There is consequently less room

for speculation in the research process because it relies on existing theories to generate new insights (Creswell and Creswell 2017; Taherdoost 2022). There are three dilemmas the research wishes to study via thematic analysis:

- D₁: How to deal with the breakthrough of computerized *Ifá* divination in a climate of misuse
- D₂: If computerized *Ifá* divination can handle the spiritual dimension of *Ifá* divination
- D₃: If the knowledge of *Ifá* should be made publicly available through digital applications.

Following due process of informed consent and full disclosure about the study to the respondents, there is audiovisual documentation of the interviews. The selection of respondents was done through purposive sampling. The inclusion and exclusion criteria for the purposive sampling technique are laid out in Table 1.

S/N	Inclusion criteria	Exclusion criteria
1.	<i>Ifá</i> priests who are familiar with computerized <i>Ifá</i> divination	<i>Ifá</i> priests who are not familiar with the modus operandi of computerized <i>Ifá</i> divination
2.	<i>Ifá</i> priests who have been in strict practice ten years after learning from their older and more experienced <i>Ifá</i> priests/teachers	<i>Ifá</i> priests who have practiced less than ten years after learning from their older and more experienced <i>Ifá</i> priests/teachers
3.	<i>Ifá</i> priests who live and practice in southwest Nigeria	<i>Ifá</i> priests who do not live and practice in southwest Nigeria
4.	<i>Ifá</i> priests who have reputation for truth and honesty	<i>Ifá</i> priests whose reputation for truth and honesty are questionable

Table 1: Inclusion and exclusion criteria used for the purposive sampling.

Seven priests who qualified were engaged in in-depth, structured interviews on the research's subject matter. Table 2 indicates the interview questions.

Questions on computerized divination for the diviner	Response
1. What do you make of the computerized <i>Ifá</i> divination? (After playing and demonstrating with phone/video)	
2. Do you think smartphones and laptop computers can replace you, in the triad communication comprising yourself, the client, and <i>Ọrúnmilà</i> , the <i>Yorùbá</i> deity?	
3. Does the memorization of the <i>Ifá</i> verses have a higher spiritual significance over merely consulting <i>Ifá</i> verses on smartphones?	
4. Will smartphones make divination easier and more efficient?	
5. Will technology eradicate some quack diviners?	

(Contd.)

Questions on computerized divination for the diviner	Response
6. Do you see yourself in the future using smartphones to support traditional divination?	
7. Do you think technology is trying to hijack the intellectual property of <i>Ọ̀rínmílà</i> via computerized divination?	
8. Will you be willing to assist a client who encounters difficulties, such as interpretation, midway into divination via smartphone?	
9. Will you be willing to prove technology wrong by withholding information you think technology ought to provide?	

Table 2: Interview questions with (empty) response fields.

All ethical considerations related to the use of real names and not pseudonyms, permission to be cited, as well as informed consent on the part of the diviners to use their responses strictly for research purposes were addressed as they signed a consent form. Those who participated and affirmed their willingness to be associated with the entire research process, in the order the interviews were conducted, are: (1) Áwo Sonora Ifaniyi of Ikenne, Sagamu; (2) Chief Ifalere Odegbola of Ibadan; (3) Áwo Ifalere Ifakunle of Ibadan; (4) Áwo Adeyosoye Oyelade of Osogbo; (5) Chief Owolabi Awodotun of Ile-Ife; (6) Chief Kolawole Dosunmu of Sagamu; and (7) Áwo Semiu Akinbode Sokunbi of Lagos.

Findings

In this section, extracts from interviewee responses are provided in relation to the three themes or dilemmas that inform this research. Links to videos of the interviews are given in the endnotes. Of the seven sessions, only two are elaborated on here. The next section addresses all of the sessions. The choice to focus on two here is because, upon a careful analysis of the feedback of each of the seven interviewees, two standpoints were easily noticed. On the one hand, there are apologists endorsing computerized *Ifá* divination, albeit with the caution that it will improve going forward and makes divination easier but cannot be done without the *Ifá* priests in its *modus operandi*. Those who take this stance are Áwo Sonora Ifaniyi, Chief Kolawole Dosunmu of Sagamu, Áwo Semiu Akinbode Sokunbi of Lagos, Chief Ifalere Odegbola of Ibadan, and Áwo Ifalere Ifakunle of Ibadan. Some of them, specifically Chief Ifalere Odegbola and Áwo Ifalere Ifakunle, attested to how technology, through applications such as WhatsApp, has allowed them to engage in divination and ritual practices virtually with clients in Europe and the Americas. Although they did not say the same thing verbatim, what is of interest here is that what they said falls within a similar theme of analysis.

On the other extreme, there are the polemicists/radicals who detest computerized *Ifá* divination as nothing but vitiation of *Yorùbá* religion and spirituality. Two *Ifá* priests fall into this category: Áwo Adeyosoye Oyelade of Osogbo and Chief Owolabi Awodotun of Ile-Ife.

Table 3 presents the responses from the interactive session with Áwo Sonora Ifaniyi, an *Ifá* priest who resides in Ikenne, Ogun State, Nigeria. Whereas the full version of the session with him is available on YouTube,⁴ the table indicates the relevant excerpts in relation to the questions posed as a paradigm for the set of apologist diviners who are somewhat sympathetic to computerized *Ifá* divination.

Questions on computerized divination for the diviner	Áwo Sonora Ifaniyi's response
1. What do you make of the computerized <i>Ifá</i> divination? (After playing and demonstrating with phone/video)	"I came across it on social media."
2. Do you think smartphones and laptop computers can replace you, in the triad communication comprising yourself, the client, and <i>Ọrúnmìlà</i> , the <i>Yorùbá</i> deity?	"It cannot replace us."
3. Does the memorization of the <i>Ifá</i> verses have a higher spiritual significance over merely consulting <i>Ifá</i> verses on smartphones?	"The memorized one has a higher significance."
4. Will smartphones make divination easier and more efficient?	"Yes, but due to technological malfunctions it may provide wrong information."
5. Will technology eradicate some quack diviners?	"It is not possible. Divination via the phone will make it worse."
6. Do you see yourself in the future using smartphones to support traditional divination?	"If I am privileged to possess it, I will make the effort several times. If I notice that it is showing similarities with how I do my work then I may start considering whether to use it."
7. Do you think technology is trying to hijack the intellectual property of <i>Ọrúnmìlà</i> via computerized divination?	"No! These people also reflected to see how to improve the divination process."
8. Will you be willing to assist a client who encounters difficulties, such as interpretation, midway into divination via smartphone?	"This is because theory aspect is one, practical is another. If someone is using computer to divine and does not first visit a practicing diviner that is an empty effort."
9. Will you be willing to prove technology wrong by withholding information you think technology ought to provide?	" <i>Ifá</i> did not teach us thus. Whoever comes to us came because they need assistance; we must not deny them."

Table 3: Interview questions with responses from Áwo Sonora Ifaniyi.

What needs to be understood from Table 3 is that it does not substitute for the reflections of the other priests who fall into the category of apologists. What is of interest here is that he shares, along with them, the general outlook that computerized *Ifá* divination is a welcome development for understanding *Ọrúnmìlà* both in Africa and beyond.

For the position of the polemicist, Chief Owolabi Awodotun⁵ of Ile-Ife is used to show what is displeasing about the prospects of computerized *Ifá* divination (see Table 4).

Questions for the diviner on computerized divination	Chief Owolabi Awodotun's response
1. What do you make of the computerized <i>Ifá</i> divination? (After playing and demonstrating with phone/video)	"I believe you want to understand my take on computerized <i>Ifá</i> divination. First, I see it as progress and blessing. <i>Ifá</i> that was cast aside is now receiving attention via technology. However, it is not possible for it to be perfect."
2. Do you think that smartphones and laptop computers can replace you, in the triad communication comprising yourself, the client, and <i>Ọrúnmìlà</i> , the <i>Yorùbá</i> deity?	"It is not possible to take their places. There is something called theory and practice. Having <i>Ifá</i> on technological gadgets is physical. It does not go with spiritual aspect of reality. You do not compare death with sleep. They are miles apart. Granted, we may write out all the <i>Ifá</i> chapters and put them on technological gadgets. However, the fundamental and deep meanings cannot be put inside these gadgets."
3. Does the memorization of the <i>Ifá</i> verses have a higher spiritual significance over merely consulting <i>Ifá</i> verses on smartphones?	"We cannot make such comparisons. It is memorized and aided by the consumption of 'the food of the divining chain.' Without this you cannot commit to memory."
4. Will smartphones make divination easier and more efficient?	"You will have more frauds and charlatans. Even when it had not been computerized, quack diviners are everywhere. The end product will be more fraudulent diviners."
5. Will technology eradicate some quack diviners?	"The level of quackery will rise, since each of them have access to the <i>Ifá</i> chapters on their gadgets and can interpret as they wish."
6. Do you see yourself in the future using smartphones to support traditional divination?	"It is a complex question. It is one thing to showcase African traditional religion in positive light. The tendency to search for <i>Ifá</i> and get some ideas on it is an advantage. However, it is not possible for me because of the spiritual aspects."
7. Do you think technology is trying to hijack the intellectual property of <i>Ọrúnmìlà</i> via computerized divination?	"It is a profit-making venture. The developers are fraudulent. Yes, they want to take <i>Ọrúnmìlà</i>'s intellectual property for themselves and make financial gains from same."
8. Will you be willing to assist a client who encounters difficulties, such as interpretation, midway into divination via smartphone?	"That person is a thief! If the person comes to me, I will lay a curse on him/her. You did not learn <i>Ifá</i>. You did not learn anything. You started computerized <i>Ifá</i> divination. That is the character of a fraudster. Do you understand that? S/he does not deserve pity or assistance."
9. Will you be willing to prove technology wrong by withholding information you think technology ought to provide?	"You cannot find someone who went through the rigorous process of being a priest that would be using computerized <i>Ifá</i> divination. He has already memorized it."

Table 4: Interview questions with responses from Chief Owolabi Awodotun.

Critical Analysis

Concerning the first question, all the diviners interviewed affirmed their awareness of *Ifá* divination via smartphones and computers.⁶ This shows that these traditional diviners are one way or the other aware of how technology is beginning to inform the *modus operandi* of their craft. When they answered the second question pertaining to whether the emergence of computers for divination can replace or even sweep the traditional diviners out of business, all of them unanimously affirmed that such a feat is not possible. Specifically, Chief Owolabi Awodotun, a prominent and influential *Ifá* priest in Ile-Ife, Osun State, said: “It is not possible to take their places. The reason being that even the Bible and Al-Qur’ān are also available online as technological gadgets. There is something called theory and practice. Having *Ifá* on technological gadgets is physical. It does not go with spiritual aspect of reality. You do not compare death with sleep. They are miles apart.”⁷

The common denominator among all of diviners interviewed is their emphasis on the limitations of computers and smartphones employed for divination to cater for the non-physical aspects and demands of *Ifá* divination. Chief Owolabi Awodotun and Chief Ifalere Odegbola both admitted that there are aspects—such as the purchase of the ingredients for sacrifice, how the sacrifice will be prepared, and where it will be placed for spiritual significance—that they do not believe can be ascertained by the *Ifá* Android or Apple application. They maintain that the application cannot indicate where some germane and effective charms and herbs for use can be acquired.

Again, when it comes to the memorization and chanting of *Ifá* verses, all of the interviewees unanimously concur that this is better rather than having these verses stored away on a computer hard drive and retrieved only when an *Oḍù* signature appears. As a way of buttressing the efficacy of memorization and chanting over textual storage, Áwo Sonora Ifaniyi explained that there are some herbal mixtures usually given to *Ifá* apprentices from an early age that not only enhance their memorization but afford them *ase* (a form of commanding force following incantations) to make words that are spoken or chanted carry spiritual efficacy.

On the subject of a faster and time-saving process of divination, the diviners are ambivalent. In other words, they do not share the same outlook they had relative to the first three interview questions. For instance, Chief Ifalere Odegbola, who is optimistic, provided his rationale on the grounds that “[i]t will make it easier. Especially for some who are abroad. When they send money, we gather all the ingredients of the sacrifice, we then interact with such persons on video calls. We shall bless him and he will affirm the blessings. You can see this is an aspect that computer has done.”⁸

A similar stance holds for Áwo Ifalere Ifakunle, who hinted at the capacity for divination to be conducted effortlessly via computers irrespective of time and location. On the other hand, Chief Owolabi Awodotun affirmed that such

an approach to divination is not about time-saving and efficiency. According to him: “You will have more frauds and charlatans. Even when it had not been computerized, quack diviners are everywhere. The end product will be more fraudulent diviners. Some will not learn *Ifá*. There are some that will bring traditional gadgets for public display when they know nothing of it. They will use it to deceive.”⁹

The interview question pertaining to time and efficiency is closely related to the question of whether or not computerized divination may be able to eradicate quack diviners, since the seekers can now affirm, through their computers, whether the correct *Ifá* verses are being chanted, or can even perform *Ifá* divination individually via their smartphones after seeing a diviner. Here, all of the interviewees provided a univocal answer—they seem certain that rather than checking quackery, *Ifá* divination via computers and smartphones will escalate it.

Since the priests interviewed have not directly engaged with divination via smartphones, they were asked if they saw themselves enhancing their divination crafts via this technology. Some were receptive, whereas others opposed it. Chief Awodotun explained his take: “It is one thing to showcase African traditional religion in positive light. The tendency to search for *Ifá* and get some ideas on it is an advantage. However, it is not possible for me because of the spiritual aspects.” Others who are mostly in the apologist cadre, such as Áwo Sonora Ifaniyi, Chief Ifalere Odegbola, Áwo Ifalere Ifakunle, Áwo Ifaniyi Ifalola, and Áwo Semiu Akinbode Sokunbi, declared their willingness to embrace the technology, albeit as a supplement to standard or traditional practices of divination.

Another interesting question is that of copyright. Who owns the copyright if the *Ifá* verses are transferred into an application to be purchased from the Apple and Android application stores? The interviewees provided divergent response here. Chief Awodotun, the foremost polemicist, was most critical, calling out the developers of the application as fraudsters to be legally confronted: “It is a profit-making venture. The developers are fraudulent. Yes . . . They want to take *Òrúnmìlá*’s intellectual property for themselves and make financial gains from same. It is something that serious measures must be taken to stop the practice. From whom did they receive license? Is it possible for them to do anything of such with ideas of Muslims and Christians without license? It is possible that they stumble upon wealth, and they can be sued.”¹⁰

The other priests who fall into the class of apologists were not so critical. Most of them retain their assurance that it is not possible to take away *Òrúnmìlá*’s credit or copyright through the development of applications for *Ifá* divination. The argument is that what can be stored on the computer is meager and cannot constitute a case of plagiarism. This approach was provided by Chief Kolawole Dosunmu: “The wisdom in *Ifá* is vast. The limitations of computerized divination cannot be improvised. Aside from the contents

uploaded by the application developers, there are even more ideas of *Ifá*. So, it is only few ideas of *Òrúnmìlà* that the application developers are able to put in their applications.”¹¹ This was the understanding provided by nearly all the other priests who answered this question.

There are, however, those among them who expressed their dissatisfaction with the technology and vowed to not provide any form of assistance to whomever came to them only after practicing divination via the computer. Again, Chief Awodotun took a critical stance: “That person is a thief! If the person comes to me I will lay a curse on him/her. You did not learn *Ifá*. You did not learn anything. You started computerized *Ifá* divination. That is the character of a fraudster. Do you understand that? S/he does not deserve pity or assistance.”¹²

However, Chief Odegbola was sympathetic: “It is the person who seeks help that we provide help to. However, we need to first of all know the motive of the person.” The same stance was also presented by Áwo Sonora Ifaniyi and Áwo Semiu Akinbode Sokunbi. They both affirmed that their vow as an *áwo* is to provide assistance to whomever comes to them, since this is the “command” they follow as *Ifá* practitioners. They also revealed their willingness to not withhold any information from their clients that the smartphones ought to have provided. They made this resolution because they are confident that whatever technological gadgets such as smartphones used for *Ifá* can provide, it is always limited and cannot beat the traditional approach. None of the *Ifá* priests were, however, shy about the fact that the traditional dimension of divination is full of quacks and impersonating diviners, but with the advent of a technologically driven dimension, the quackery will surge.

Having expressed the aggregate of the *Ifá* priests who were interviewed, we now return to the three dilemmas mentioned at the beginning of this article. Concerning the first dilemma—(D₁), whether to embrace automated divination amidst the potential climate of misuse, abuse, or underuse of the *Ifá* corpus—it is clear that the priests have adopted a cautious stance. They cited the impossibility of computerized *Ifá* to replace traditional diviners or even provide further guidance on how to proceed and engage with post-divination efforts. They also bemoaned the impossibility of the storage systems of computers to have more verses of the *Ifá* corpus than those memorized by the diviners. The lack of *ase* for those verses stored on the application was also mentioned as one of the reasons why it is not possible to simply embrace the technology without second thought. On a general note, however, it is safe to say that all of the interviewees still maintained that traditional *Ifá* divination overrides computerized *Ifá* divination.

The response to the second dilemma—(D₂), whether to accept computerized divination or risk devaluing its rich spiritual and faith-based recommendations for purposeful living when the use of algorithms takes over in making decisions about people’s lives—is also implied in the foregoing. Most

of the interviewees attested that computerized *Ifá* divination diminishes the spiritual significance of *Ifá*, as it is severely limited in this arena. This is the case when one recalls the paradoxical question provided by Áwo Ifalere Ifakunle: “When you have divined on computer, who will supervise the sacrifice?”¹³ Clearly, the application will not relay where to get the right ingredients for sacrifice, since there are also fake or quack dealers here too. Even if one admits for the sake of argument that it does this, the question of original and effective ingredients may not be disclosed. If the application recommends the use of a particular leaf or root as part of sacrifice, does the user of the application who is a rookie and not versed in *Ifá* and related practice know how to locate it? None of these comments are meant to vitiate the relevance of computerized *Ifá* divination, since it can actually bring to the awareness of the public that the process is not diabolic and esoteric, as generally believed. This is one great advantage computerized divination has, since it can portray African spirituality in a positive light. This response also extends to the third dilemma—(D₃), whether the esoteric and cultural knowledge of the *Ifá* corpus should be made publicly available through digital applications or the embedded knowledge and spirituality of *Ifá* and its processes be allowed to remain without technological revolution. From the analysis undertaken thus far, one of the places of agreement among the interviewees regarding the second dilemma concerns the fact that *Ifá*’s spirituality cannot be properly captured by technology.

Following the discussion undertaken thus far, it is not misplaced for a critic to counter the conclusion as being too hasty, since the sample population is small compared to the vast numbers of *Ifá* practitioners both in Nigeria and beyond. On the one hand, this may seem a valid objection. A deeper assessment reveals some important details. The inclusion/exclusion criteria used in the methodology for purposive sampling were central to the number of *Ifá* priests that qualified as respondents. For instance, what is the value of engaging five hundred or five thousand *Ifá* priests in a structured interview when they are not familiar with computerized *Ifá* divination or lack adequate experience in the craft? Whereas future research may engage further on the subject, the present analysis has been based on a first piece of field research to garner the position of *Ifá* diviners on the moral and technological dilemmas generated by computerized *Ifá* divination. The suggestion of this study is that further assessments and research are necessary in places where *Ifá* divination is done. Specifically, there are reports that *Ifá* divination is practiced in Benin Republic and Togo (see Ofuasia 2019). In the Americas, it has been reported that *Ifá* divination is conducted in countries like Cuba, Brazil, Puerto Rico, Trinidad and Tobago, Mexico, and Peru (see Falola 2018). This research therefore admits that the number of diviners assessed is too small to make a conclusive point concerning the intersection between technology and spirituality, and it is hoped that other researchers will take up the gauntlet and explore the perceptions of computerized *Ifá* divination in places other than southwest Nigeria.

Conclusion

This article offers a critical inquiry into the possible moral and technological issues that the emergence of computerized *Ifá* divination presents. We undertook fieldwork using primarily qualitative methodology, wherein thematic analysis and a deductive approach were employed. The study shows that *Ifá* priests who qualified as respondents are divided concerning the role computerized *Ifá* divination can play in its mediation of the process of communication between humans and the divine. Nevertheless, the three dilemmas that invited the need to gather the relevant data have been considered. For (D₁), the priests took a cautious stance. For (D₂), all the diviners affirmed that computerized *Ifá* divination is limited and cannot cope with the spiritual aspects of *Ifá* divination. Regarding (D₃), all the diviners affirmed the urgency to make the knowledge of *Ifá* available to the public in order to diminish or eradicate the general opinion that the craft is necessarily diabolic and evil. The inferences and validations arrived at from this research are not final; it is important to state that they merely invite the need to investigate the topic more deeply. Perhaps this research will serve as a steppingstone for future studies on this subject matter.

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Notes

- ¹ For an example of an app, see Onaje Woodbine (2011).
- ² See Ofuasia (2021) and Ademola Kazeem Fayemi (2014).
- ³ See Woodbine (2011).
- ⁴ Interview with Sonora Ifaniyi at Ikenne (<https://youtu.be/2TcIWz-pY2A>).
- ⁵ Interview with Chief Owolabi Awodotun (<https://youtu.be/o2DMdywHYvI>).
- ⁶ These are the priests who participated in the research, with links: interview with Áwo Sonora Ifaniyi at Ikenne (<https://youtu.be/2TcIWz-pY2A>); interview with Chief Owolabi Awodotun (<https://youtu.be/o2DMdywHYvI>); interview with Áwo Semiu Akinbode Shokunbi (https://youtu.be/bA_Nt1t88NA); interview with Adeyosoye Oyelade (<https://youtu.be/nMHXyeg-zy7A>); interview with Chief Dosunmu Kolawole (<https://youtu.be/AD-b7dsfEvQ>); interview with Chief Ifalere Odegbola (https://youtu.be/XLnXKJAOB_Y); and interview with Áwo Ifalere Ifakunle (<https://youtu.be/IK-RAsjfy4Y>).
- ⁷ Interview with Chief Owolabi Awodotun (<https://youtu.be/o2DMdywHYvI>).
- ⁸ Interview with Chief Ifalere Odegbola (https://youtu.be/XLnXKJAOB_Y).
- ⁹ Interview with Chief Owolabi Awodotun (<https://youtu.be/o2DMdywHYvI>).
- ¹⁰ Interview with Chief Owolabi Awodotun (<https://youtu.be/o2DMdywHYvI>).
- ¹¹ Interview with Chief Dosunmu Kolawole (<https://youtu.be/AD-b7dsfEvQ>).
- ¹² Interview with Chief Owolabi Awodotun (<https://youtu.be/o2DMdywHYvI>).
- ¹³ Interview with Áwo Ifalere Ifakunle (<https://youtu.be/IK-RAsjfy4Y>).

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The (Qualified) Triumph of *Evil*: Popular Culture Representations of Religion and Science in CBS/Paramount's Paranormal Drama

Mark Alan Lokensgard, Professor of Portuguese and Spanish, St. Mary's University, San Antonio, TX, USA, mlokensgard@stmarytx.edu

The popular CBS/Paramount Drama *Evil* most clearly falls into the genre of horror, while it uses tension caused by the differing scientific and religious worldviews of its three main characters for dramatic and humorous effect. Kristen Bouchard, a psychologist; David Acosta, an ex-journalist training to be a priest; and Ben Shakir, a science and technology expert, are hired by the Catholic Church to assess reported paranormal phenomena, often of a religious nature. Their respective faith backgrounds—a former Catholic turned agnostic, a previously lapsed Catholic turned seminarian, and a Muslim turned atheist—further inform their responses to the phenomena they investigate. The series, because of the demands of the genre and the limits of popular understandings of what science and religion are, circles the question of how to responsibly face these phenomena while at the same time implying the possibility of a more courageous, undogmatic, and responsible approach to the paranormal through its minor characters.



The (Ratings) Triumph of *Evil*

Evil has appeal. The CBS/Paramount series, despite setbacks due to the Writers' Guild of America strike in May of 2023, went ahead with a shooting a fourth season (Abdulkaki 2023), scheduled to be released in May of 2024 (Singh 2024). Raters on the Rotten Tomatoes website mention its skilled straddling of the horror and comedy genres while also functioning as a procedural as the main sources of enjoyment. Critics also cite the investigations and the "faith-versus-science" dichotomy as some of the intellectual pleasures of the show (Rotten Tomatoes 2022). The success of the series makes it an excellent object of consideration of how the (apparently) competing claims of religion and science regarding unexplained phenomena are portrayed in popular culture.

The differing perspectives and personalities in the series are fundamental to its tensions and humor. Kristen Bouchard, a psychologist; David Acosta, an ex-journalist training to be a priest; and Ben Shakir, a self-taught science and technology expert, are hired by the Catholic Church to assess reported paranormal phenomena, often of an apparently religious nature.

The definition of "paranormal" that religious studies professor Jeffrey Kripal (2010) provides will be helpful here: "The sacred in transit from the religious and scientific registers into a parascientific or 'science mysticism' register." For Kripal, the sacred is not a religious category—or at least not an exclusively religious category; instead, he takes the definition of the German theologian and historian of religions Rudolf Otto: "A particular structure of human consciousness that corresponds to a palpable presence, energy, or power encountered in the environment" (Kripal 2010). The distinction between the religious and the paranormal is, by this definition, merely one of conventions, of attempted explanations for unexplained phenomena, the first explaining such phenomena as manifestations of divine beings, the second explaining them without involving any concept of divinity. For Kripal (and for my argument), both the religious and the paranormal are part of the larger category Rudolf Otto defines as "palpable energy," as a kind of "sacred sixth sense, at once subject and object . . . the *mysterium tremendum et fascinans*," the mystical that is both terrifying and fascinating (Kripal 2022, 9).

The three investigators in *Evil*, however, are largely trapped within either religious or materialist explanations of reality, even if they find themselves torn between them at times. Their respective faith backgrounds—a former Catholic turned agnostic, a previously lapsed Catholic turned seminarian, and a Muslim turned atheist—inform their responses to the phenomena they investigate and serve as fodder for conflicts among themselves and with the representatives of the Catholic Church. The series, because of the demands of the genre and the limits of popular understandings of what science and religion are, circles the question of how to responsibly face these phenomena while at the same time implying the possibility of a more courageous, undogmatic, and responsible approach to the paranormal through its minor characters.

Evil Plots (or Plotlines)

Evil provides a tour through the principal categories of paranormal phenomena that have been reported on or talked about popularly over the last seventy or so years, such as miracles associated with religious figures or practices, unidentified aerial phenomena, and phenomena associated with dreaming. The show, despite its moments of humor, most clearly fits with the horror genre. One dictionary of literary terms defines the horror story—originally defined only as a literary genre, but which can be extended to visual genres as well—as “a fictional narrative . . . which shocks or even frightens the reader, and/or perhaps induces a feeling of repulsion or loathing” (Cuddon 1991). The show’s animated interludes and introductions, such as pop-up books that purport to explain the different types of demons, are colorful and designed to engage with both humor and fear. Additionally, all three characters suffer from vivid and usually traumatic dreams, visions, and/or hallucinations, with the characters and the spectator both struggling to decide whether what is being perceived is “real.” The characters try different strategies and techniques to deal with these traumatic experiences, revealing their individual parameters of belief. These experiences are either not shared with anyone or done so only reluctantly, and the characters often resort to material or medical explanations for them, even though their actions do not neatly fit into a purely materialist logic.

Starting in the first episode, Kristen, the psychologist, notices signs of demonic infestation in her life. Throughout the series, she continually clings to material explanations for what she sees and hears, making emergency appointments with her therapist because the antipsychotic medications he prescribes seem to be making the “hallucinations” worse. At the same time, her instincts make her less than a dogmatic materialist. In the third season (season 3, episode 3, “The Demon of Sex”), the monsignor orders an investigation into whether Sister Andrea, a nun who is an experienced warrior in dealing with demons, is mentally ill. Kristen is asked by the monsignor if she has ever seen Sister Andrea talking to people who are not there or referring to them. Kristen lies and says no, even though she does not put her faith in the nun’s ability to resolve the problems Kristen tries to resolve through the application of psychology (in this case, counseling a newly married couple with sexual problems). In a sense, Kristen is more objective and rational about Sister Andrea than she is about herself; she recognizes that just because someone claims to witness phenomena others do not does not mean that they have a distorted relationship to reality or that they are unable to contribute to society. Kristen also demonstrates her own less than dogmatic relationship to her profession when she violates her code of professional ethics to save a teenage boy from being tried for his crime as an adult. She gets Leland, a clearly creepy and evil man with demonic ties, to admit he is providing expert testimony to get the boy into the prison system so that he will become a hardened criminal and commit more evil acts (season 1, episode

3, “3 Stars”). She records this conversation, but then finds that the critical part of the recording is mysteriously comprised of static. She gets Ben to create a deepfake of the recording, using Leland’s voice to put Leland’s actual words into his mouth. She then uses this recording to disqualify his expert testimony in a pretrial hearing. Both Ben and Kristen do this in clear violation of the ethics that guide their professional lives, while also not affirming that Leland benefits from demonic powers. At the least, they do not accept the ramifications of that idea, although they both instinctively accept that he is evil, and incorrigibly so, and so must be stopped by any means necessary.

The phenomena the team investigates, and the responses of characters to their individual experiences, are often inspired by historical investigations and techniques taught by real-life practitioners. In season 3, episode 1 (“The Demon of Death”), the team observes as a well-funded group of researchers unconnected to the church attempts to reproduce a 1907 experiment (although this experiment is not mentioned) by Dr. Duncan McDougall of Haverhill, Massachusetts, which attempted to determine the weight of the soul. This experiment led to the popular notion, further popularized by the 2003 feature film *21 Grams*, that the soul’s weight can be detected by comparing the weight of a live human body with its weight immediately after death.

An attempt to reproduce this experiment was done in 2001 by L. E. Hollander, with results published in the *Journal of Scientific Exploration*; criticisms and counter criticisms followed, showing that it seems difficult to demonstrate conclusively whether any particular experiment was sloppy in its methodology or technical execution, even if “proof” of the soul as measured by a scale remains elusive (Masayoshi 2009). The researchers in the show, whose funding is not discussed, possess a gleaming lab inside a warehouse, full of cameras and sensors, with a highly sensitive electronic scale, and a lipped bed to contain any fluids released for a moribund human subject to lie on. This is a clearly idealized version of the original experiment, both in terms of resources and because it uses human subjects rather than animals.

Other phenomena investigated in the show have more recent origins. In season 2, episode 8 (“B is for Brain”), the team visits the lab of a researcher who has invented a magnetic-wave helmet that produces spiritual visions in human subjects. This appears inspired by the so-called “God Helmet,” a device invented by Stanley Koren and the trained neurologist and self-described researcher in “neurotheology” Michael Persinger in the late 1990s. The device produces a very weak magnetic field around the user’s head. Persinger, who has put forth the theory that geographical areas of high electromagnetism, such as Fátima in Portugal, produce higher numbers of paranormal and religious experiences, has claimed that this helmet can produce spiritual and even out of body experiences in human subjects. It received considerable press when the scientist and self-declared atheist Richard Dawkins agreed to use it as part of the BBC documentary

series “Horizon” in April of 2014 (British Broadcasting Corporation 2014); Dr. Dawkins claimed to have no experience out of the ordinary during his session.

While the team investigations provide drama principally because of the interactions among the characters, most of the drama comes from the attempts by characters to deal with their individual experiences. Tension results as the viewer waits to see whether any dissolution of the fear, or at least further knowledge about the characters’ extraordinary experiences, is possible. The characters’ attempts to deal with frightening dreams or visions often draw on modified and/or simplified knowledge or techniques from real-life research. Kristen, when tormented at night by a demon who calls himself George, draws on her knowledge of the brain. She writes the phrase “Are You Dreaming?” on a piece of paper and tapes it to the ceiling above her bed (season 1, episode 1). During these nighttime visions, she is paralyzed, save for the ability to move her eyes or speak, a condition mostly consistent with the natural state of sleep paralysis. She notes that during sleep, there is less activity in Wernicke’s area, a region of the brain apparently associated with written language. When George returns the next night, she looks at the piece of paper, which appears distorted and illegible, cueing her that she is dreaming and enabling her to banish George, at least temporarily.

Several episodes later (season 1, episode 6, “Let $x = 9$ ”), Kristen gets a further suggestion from her psychiatrist, Dr. Boggs, about how to deal with these “nightmares.” He tells her to put a blue thread around her wrist and set an hourly alarm on her phone during the day. When the alarm goes off, she is to look at her wrist for the thread. This will train her mind to look at her wrist during dreams, and if she does not see the thread, she will then know she is dreaming and can take control of the dream, banishing any threatening figures. Similar techniques to these can be found in books by lucid dreaming practitioners, such as Robert Waggoner’s *Lucid Dreaming*, and in lucid dreaming workshops given by Steven LaBerge. Later, Kristen passes somewhat similar suggestions on to Ben, who manages to dispatch a demon named Abby from his dreams (again, at least temporarily).

The material the team is called upon to investigate varies in its real-life inspirations. Some, like those already given, spring from real-life research; others come from hagiography, such as the body of a monk that has inexplicably not decayed, and reported miracles done by a deceased nun being considered for sainthood. Others are clearly more popular in origin, like dares adolescents might follow, such as pressing the numbers in an elevator in a sequence said to take the elevator car to hell (season 2 episode 4, “E is for Elevator”), an online video that provokes demonic possession in those who view it (season 3, episode 6, “The Demon of Algorithms”), and a stock purchase tip that both enriches and curses those who follow it (season 3, episode 9, “The Demon of Money”). A demonic presence in a multiplayer virtual reality game serves as a kind of twenty-first century updating to legends of spirits appearing in mirrors (season 1, episode 4, “Rose390”). These popular or folkloric practices provide

to the team, at least for a time, the potential for replication, something the investigations of one-time phenomena do not allow. From the standpoint of a viewer who might wish for more explanations of these phenomena, however, the lack of follow-up in the investigations can be frustrating, something the series appears to recognize and attempts to work into the plot.

“Cultural Derealization” and Explaining (Away) Anomalous Experiences

It is not only the often-frightening nature of the phenomena the team encounters, such as apparent threats to their physical wellbeing or that of their loved ones, that shakes them. At least as frightening to them is that these phenomena have no place within their worldviews. In season 3, episode 3 (“The Demon of Sex”), Ben has been acting depressed. Kristen’s four school-age daughters say among themselves that Ben is “culturally derealized.”

Putting aside the question of schoolchildren using this term, we can see that there may be something to “derealization.” *The Diagnostic and Statistical Manual of Mental Disorders* defines depersonalization/derealization disorder (DPDR), in the part referring to derealization, as a patient’s environment being perceived as “dreamlike, empty, lifeless, or visually distorted” (Murphy 2023). The qualifier “cultural” suggests that Ben suffers not from a mental illness per se but rather a dissonance between his experience and his cultural worldview. Moreover, continuing with the definition Rachel Murphy (2023) provides, patients with this disorder are “acutely aware of their problem. One stated, ‘I was not crazy because I knew that something was not right from the very moment that it became not right.’” Ben certainly has this awareness; Kristen’s daughters define “cultural derealization” for the viewer by saying that Ben has seen so many weird things that he cannot accept how strange reality really is.

Ben’s response to this derealization will be to cling to his materialist worldview. Indeed, he shows an especially strong tendency towards explanations of some of the phenomena the team has experienced that seem designed to end discussion rather than provide a deep or accurate understanding of these phenomena. One example is paranormal in nature, and the other involves potential alien spacecraft; both require some background.

Explaining (Away) Paranormal Phenomena

First, the paranormal incident: one morning (in season 2, episode 1, “N is for Night Terrors”), Kristen takes a rosary with crucifix on it out of a bathroom drawer, holding it by the beads. She hesitates a moment, then sets the crucifix in her hand. After nothing unusual happens, she breathes a sigh of relief, but an instant later, the crucifix causes a burn on the palm of her hand. She applies aloe vera to the burn and wraps a bandage around it. She then puts the rosary and crucifix in a plastic sandwich bag and takes it to work.

At a team meeting later that morning, Ben sees the bandage on her hand. He asks her about it, and she calls it a “rash.” She asks for his help to figure out the cause and gives him the sandwich bag with the crucifix for him to analyze, but when he asks to see her hand, she says no. He asks her about the blood he saw on her leg the day before, and about the fact that Orson LeRoux, a serial killer who was released on a technicality, turned up dead that same day. Ben wonders aloud if there is anything he needs to be concerned about, and she says no.

In fact, Kristen was responsible for LeRoux’s death. After she conducted a psychological evaluation of LeRoux, he told her he would kill her school-age daughters. LeRoux seems under demonic influence, in part because he correctly tells Kristen she is being tormented by dreams of the demon, George. Later, LeRoux is released on a technicality. Believing she has no other option, and seized by fear and rage, Kristen walks the short distance to his home carrying a serrated ice pick for mountain climbing that she owns. She warns LeRoux to stay away from her family or she will kill him. He replies that he is going to call the police, and when they pick her up, he will go to her house and kill her daughters. He turns his back to go to the phone and she strikes him repeatedly with the ice axe, killing him and leaving some drops of blood on her leg, which Ben notices later after she returns home.

That the murder weapon was so unusual makes her worry that analysis of the wounds will lead the police to her. She goes to her psychiatrist, and after double-checking with him about confidentiality, confesses this murder to him. She tells Dr. Boggs that before she went to LeRoux’s, she made sure LeRoux’s wife would have an alibi, so that his wife would not be blamed for his death. She further says she does not feel remorse for the murder. Boggs then asks why she is revealing it, and she mentions the effect of the crucifix, which she again calls a “rash.” Boggs suggests that even though Kristen claims not to be bothered by what she has done, her body is reacting, expressing her guilt psychosomatically at this religious symbol associated with her Catholic upbringing.

Later, Ben shows up at Kristen’s house with an explanation: the crucifix is cobalt. He says cobalt can cause a rash, but more importantly, it is a great conductor; if it heats up only a few degrees, it can cause a burn. She shows him the bathroom drawer. Ben says one of Kristen’s daughters must have used the curling iron there, that it had been cooling down in the drawer and that must have caused the burn, saying “cobalt doesn’t cause a rash on its own,” contradicting what he said earlier. He pushes this explanation hard, and she appears to accept it.

Both Ben and Kristen have resistances to the different explanations for the burn. Kristen does not want to accept the guilt she feels at causing LeRoux’s death. There are obvious objections to Ben’s theory she could raise: the crucifix only began to burn her after being in her hand painlessly for several seconds, and the crucifix, which was apparently hot enough to burn her skin, had no effect on a flimsy plastic sandwich bag just seconds later. For his part, Ben settles

on an explanation that both discounts any paranormal cause and also casts no suspicion on Kristen, with whom he enjoys a friendship and to whose daughters he has become a sort of an honorary uncle. His explanation lets him keep his materialist worldview and his regard for his friend, undermining any notion of him as a disinterested “scientific” observer. The explanation of the psychiatrist, who would be considered the most objective observer of the three, seems the most fitting, although Boggs believes Kristen’s hand has a rash, not a burn, and he is unaware of the details about the delay in the burn starting and the lack of any effect on the plastic bags, which none of the characters mentioned aloud.

Explaining (Away) Unidentified Aerial Phenomena

Ben’s skepticism of religious or spiritually related phenomena fit with his position as an atheist, but his selective “rational” and “scientific” explanations extend to other phenomena as well. Atheism by itself should prove no obstacle to belief in UFOs, specifically the acceptance of the existence of air or spacecraft that demonstrate capabilities far beyond current human technology, but Ben seems averse to the extraterrestrial hypothesis as an explanation for these phenomena; when the team is asked to investigate a Navy pilot’s report of a UFO encounter (or unidentified aerial phenomena, in preferred parlance), Ben proves the easiest to satisfy with a facile explanation.

In “U is for UFO” (season 2, episode 9), the three investigate a UFO sighting by a Navy pilot, Captain Sampson. She says the object was a bright light and then reached speeds five times faster than her F-16 fighter jet, that is, approximately ten times the speed of sound, but without a sonic boom. Then, it seemed to go through her, and she felt calm and peaceful, like an experience of God. After she reports this, the Navy grounds her, pending an investigation.

A Navy captain tells Kristen that three F-16s, including the one whose pilot reported the UAP, were launched out of a base near Atlantic City and that a civilian corporation nearby launched an informational broadband satellite around the same time. Since these “facts” contradict what Captain Sampson reported, Sampson is grounded. However, Ben finds a person online at a nearby university who also saw a UAP at the same time. The student, Asha, describes an object that went from standing still to a speed of Mach 5 straight up almost instantaneously. Ben notes that the acceleration would crush any pilot inside, and Asha remarks that if the craft had figured out a way to counteract the g-forces, then no.

Asha, like Captain Sampson, says the light went through her, making her feel calm and peaceful. However, she also volunteers that she had smoked a lot of marijuana that night before seeing it. This, along with the fact that she is seventeen years old, causes the team to discount what she said. Kristen then investigates the civilian corporation supposedly responsible for the satellite launch and finds out there was no such launch the day of the sighting.

The Navy sends the other two pilots to talk to the team, and they deny seeing anything. Ben notices that one of the pilots is particularly quiet and slips his email address to him after the meeting, saying that his own father was an Air Force mechanic and that he “understands.” Shortly thereafter, Ben receives an anonymous email with a video of the encounter. The video shows that the UAP changes its appearance, looking sometimes like a sort of black cartoon fruit or insect and then a shimmering globe with a bright “X” in it.

This episode seems to draw on three United States Navy videos of UAP that pilots recorded during training flights in 2004 and 2015, two of which were published by *The New York Times* in 2017. The videos circulated because of leaks in 2007 and 2017; in 2020, the Pentagon officially released the three videos, stating that they were authentic and that the phenomena observed were classified as UAP (Strauss 2020). The objects in the released videos appear as outlines, with considerably less detail than the object in *Evil*, while the audio records the amazement of the pilots; one of the videos registers the clear satisfaction of the pilot when he successfully places an auto trace on the mysterious, fast-moving object so that his camera keeps it in view. In the case of the UAP in *Evil*, the “X” can be interpreted as the unknown, the mysterious “variable” upon whose value people cannot agree.

After Ben, Kristen, and David have begun investigating, a team from the church in Rome comes to question Captain Sampson. They have seen the video and have more questions, which they ask in front of the three American investigators. They ask about the moment the object seemed to go through her, and if she felt a tingling feeling in her hands or feet; she says no. They ask if she felt calm, peaceful; she says yes. They ask if there was anything about this feeling that was quantified; she says that her routine medical exam post-flight showed her blood pressure as low, and her hypertension was permanently cured. They ask if she smelled anything when the object went through her; she says she might have. They have a device that gives off odors, and they want her to pick the one that most closely matches the smell. She picks one, and the team’s supervisor and the head investigator from Rome exchange meaningful looks.

The next day, Kristen is approached outside her home on her way to work by a Mr. Edgar Loudermilk. He tells her that the object the pilots saw is an example of Russian drone technology and asks the team to kindly stand down because the United States wants the Russians to believe these drones have not yet been detected.

Asha is at the church when Kristen, Ben, and David arrive. She waits outside while the three go into a meeting with a visitor, a Vincent LeConte from the Vatican, who says he is familiar with Loudermilk and knows he is lying. LeConte says he has arranged for Captain Sampson and Asha to go to Rome to testify about the incident, and he wants the three investigators to come too. The next day, however, LeConte says that both Sampson and Asha abruptly changed

their minds, and without eyewitness testimony, there is no point to the trip. Kristen goes to speak to Captain Sampson, who says she lied about the sighting, has been reinstated as a pilot, and has nothing more to say. Ben goes to speak to Asha and learns she has been admitted to her dream school, MIT, as the apparent reward for staying quiet about what she experienced.

The three investigators discuss the events, considering Loudermilk's explanation of the object being an example of drone technology. Ben accepts this explanation, citing Occam's razor, and expresses disappointment at the more conventional explanation, saying "I kind of wanted it to be true."

Here, we see another example of Ben initially seeming to be positioned as an investigator willing to keep an open mind before he accepts weak explanations that end discussion. Ben's father was an Air Force mechanic, a fact he mentions to the reticent pilot to suggest he understands the pressure to keep silent about UAPs, which seems to work to get the video leaked to him. Ben sees the video with the object's strange, shifting appearance and knows this object performed maneuvers and demonstrated speeds far exceeding any known capability of human-made craft, with or without a crew, and without producing a sonic boom. Nevertheless, when a mysterious figure appears with a one-line explanation and a request to investigate no further, Ben seems uncurious about the nature of such technology or why this "drone" appeared in plain sight of three F-16s and at least one observer on the ground with no apparent worries about detection, or how and why the object could cure Captain Sampson's hypertension.

A brief discussion of the relationship between religious beliefs and the extraterrestrial intelligence (ETI) hypothesis is warranted here. Some psychological studies suggest that ETI beliefs may serve a function like religious beliefs for some atheists and agnostics as part of a search for meaning (Routledge 2017). However, even this study, which did find an effect between a psychological need for meaning and belief in ETI, found these effect sizes were relatively small and concluded that "ETI beliefs are likely not a major source of meaning for most nonreligious individuals" (Routledge 2017, 144). This statement seems to apply to Ben. I submit that Ben's acceptance of an explanation that ignores significant parts of the eyewitnesses' reports suggests Ben is aware of the suggested link between religious beliefs and the ETI hypothesis; he therefore rejects the latter because of its association with the former. The pilot's description of the UAP passing through her and leaving her with a calm sensation "of God" makes a link between anomalies of a strict religious nature and UAPs, a link that witnesses of UAP and experiencers of encounters with apparently extraterrestrial beings also often report, a link that would increase Ben's resistance to any nonconventional explanation of these phenomena.

I further suggest that it is not actually Ben's atheism that proves to be his stumbling block but a cultural resistance to belief in any intelligent beings

superior (or, more accurately, that could be argued to be superior) to human beings. To him, I suggest, belief in beings like this is essentially equivalent to belief in fairies, angels, or djinn.

Not that belief in djinn has not gotten unconscious approval from Ben in the past. Ben, the Muslim turned atheist, found himself taking sides in a religious dispute. When the team investigates a series of mysterious fires happening around an adolescent girl, the church orders an exorcism be performed (season 2, episode 3, “F is for Fire”). Ben points out that the descriptions the girl gives of the supernatural figure she sees correspond more closely to that of a djinn, an ambivalent supernatural entity from Islamic tradition. The girl’s parents are in an interfaith marriage between a Catholic and a Muslim. Ben finds himself arguing in favor of a Muslim exorcism over a Catholic one, a position at odds with his atheism; he later admits to Kristen and David that this argument came from “religious nationalism.” Despite Ben’s declared faith in science, with all its asserted objectivity, his thinking process is subject to distortion from unexamined beliefs.

The unexamined beliefs that order Ben’s world and keep the strangeness of reality at bay begin to fall apart, leading to his informal diagnosis of “cultural derealization” by Kristen’s school-age daughters at the start of season 3. His depression catches the attention of his sister Karima who, like her brother, is a young professional, but, unlike him, maintains the Islamic faith of their Pakistani parents. She wears a hijab and is extremely knowledgeable about science. The lack of complete explanations for what the team has seen has gotten to Ben (and, perhaps, the writing team of *Evil*). Ben complains to her that he has faced numerous phenomena the team cannot explain, like a ghostly image resembling a recently deceased person on a hospital camera (season 1, episode 2), “and then we just move on.”

These are just some of the unexplained happenings Ben has seen; there are others he does not know about. Lexis, one of Kristen’s daughters, born after Kristen worked with a fertility clinic she later learns has strange, potentially demonic connections, starts to show two extra extremely sharp canine teeth growing out of her gums (season 2, episode 1). When she is put under general anesthesia to have them removed, she bites down on the oral surgeon’s finger, nearly severing it. Lexis has no memory of this. Kristen tells her the surgery went fine, and the plot point is never mentioned again. The tail Lexis starts to grow in episode 10 of season 2 is similarly brought up and then never returned to.

I suggest that Ben’s comment about seeing strange things and then “just mov[ing] on” comes partly from a need of the writers of *Evil* to address, however incompletely, this tendency in the show. However, there are deeper reasons for his comment and, more importantly, temptation to “move on” from discussions about the paranormal that the presence of his sister will highlight.

Derealization and Unrealized Hope: The “Super Secret Science League”

By way of cheering Ben up and indirectly proposing a solution to his “derealization,” Karima takes him to a meeting of the “Super Secret Science League,” a sort of social and hobby group of young people from all different branches of science. The meeting provides a space for an apparent coming together between science and religion, represented in a dialogue between the Islamic scientist and the Muslim-turned-atheist. Karima tells Ben she believes Allah created all things and wants to understand how creation works through science. She points out that science faces mysteries all the time, saying scientists should be honest about when they face things beyond their understanding. Karima promises to help her brother, saying that anything his “Catholic friends” cannot explain, she will take to the Super Secret Science League for them to solve. This is a promise neither Karima nor the series ever keeps. I suggest the reason the series cannot keep this promise lies in current limitations of popular discussions of the paranormal. I further suggest that some scholars and popular writers have pointed to a way out of these limitations.

First, these limitations and their history. I see two major identifications for the character of Karima and the Super Secret Science League. The league would be a sort of London Society for Psychical Research and New York Society for Psychical Research. Professor of Religious studies professor Jeffrey Kripal argues convincingly throughout several books that these two societies, in the late nineteenth and early twentieth centuries, represented science without the taboo of materialism. Their well-known members (William James, Sir Arthur Conan Doyle, etc.) went to seances and published research about the capabilities of mediums and psychics and the presence of psychic abilities among the general population. Kripal shows that the clear open-mindedness of these major scientific figures (including Sigmund Freud, who contributed writing to the society’s *Proceedings*) to paranormal phenomena has been almost willfully forgotten and that science has often been transformed from a method of approaching reality into a dogma that better bears the label of Scientism (Kripal 2010, 54).

Under Scientism, reality is considered to be described accurately and completely through classical (Newtonian) physics and the Cartesian separation of the body and the mind. It is important to note that Scientism is not the same as the scientific method. Instead, Scientism applies, usually in an unconscious manner, the mind/body split to scientific matters, even though scientists from neurologists to physicists (especially quantum physicists) have questioned this duality for over a century (Novick and Ross 2020). Scientism effectively erases results of scientific experiments that do not fit materialism, even though science itself has demonstrated that any separation between the observer of phenomena and the phenomena itself is not absolute. This blurring of subject and object is most well known through the famous double-slit experiment, the

results of which the physicist Richard Feynman noted in 1965 were impossible to explain in any classical way and contained the heart of quantum physics (Greene 1999, 97–98).

We need not look to the beginning of the twentieth century to find the inspiration for the Super Secret Science League. There are and have been contemporary institutions doing similar not-so-secret research projects. These include but are not limited to SRI (formerly the Stanford Research Institute), which was linked to the development of techniques and research into remote viewing to aid the United States government, the Bigelow Institute for Consciousness Studies (offering US\$1 million in grants for projects to begin in August of 2023), the Division of Perceptual Studies at the University of Virginia, the Parapsychology Laboratory at Duke University (now the Rhine Research Center in Durham, North Carolina), and the Laboratory for Advances in Consciousness and Health at the University of Arizona, whose director, Dr. Gary E. Schwartz, has published books about his experiments with mediums and psychic phenomena. The Koestler Parapsychology Unit at the University of Edinburgh and the California Institute for Human Science are further examples of active research and education centers in parapsychology. The Parapsychological Association, which has been accepted as an affiliate of the American Association for the Advancement of Science since 1969, has held yearly conventions since 1958 in sixteen different countries. It should also be recalled that much of the research conducted by American institutions and the military was spurred in part from reports of successful research into remote viewing and psychokinesis being done in the Soviet Union (May et al. 2015).

Finally, it should be noted that Brazilian universities have shown themselves more open to the scientific study of phenomena explicitly tied to religious belief, such as spirit writing. Dr. Alexander Moreira-Almeida, an associate professor of psychiatry in Brazil and a former postdoctoral fellow in religion and health at Duke University, has studied, among other things, the commonalities and differences in the experience of hearing voices among those diagnosed with psychosis and Brazilian mediums as they transcribe messages from spirits. One of his key findings is that it is not the experiences of hearing voices (categorized as anomalous experiences) per se that can lead to distress in the experiencer but how the individual and their community interpret these experiences. Those people who interpreted their experiences as compatible with some established religious practice, who had the insight that the experience was theirs and might not be everyone else's, and for whom the experience did not interfere with the person's relationships and activities, showed the least signs of having any mental disorder or distress (Machado and Moreira-Almeida 2021). Among the three main characters of *Evil*, only David, as a seminarian, would be immersed in a cultural context somewhat supportive of the notion of anomalous experiences, and even he struggles with doubts about his own mental health

and whether the origin of his experiences is divine or demonic. He discusses some of his experiences with Sister Andrea; Kristen talks about them only with her psychiatrist, while Ben discusses the experiences reluctantly or not at all.

Back to the “Secret College”

All these real-life researchers and centers of research might be considered more public manifestations of the “Invisible College” founded by Jacques Vallee, a former astronomer and computer scientist who, among other things, worked on the early predecessor of the internet and has written widely about the centuries-long history of UAP worldwide. Vallee’s interest in UAP’s began when he was a young professional astronomer in his native France. During his nighttime work as a government employee on the artificial-satellite service of the Paris Observatory, he and his colleagues observed occasional aerial phenomena that could not be identified; when this happened on July 11, 1961, his supervisor destroyed the tape (Vallee 2014, 54). Vallee later founded his “Invisible College,” an informal group of researchers who wanted to study the phenomena without taboos, restrictions, or any dogma about what these phenomena were or were not (Vallee [1975] 2014). This group was itself the intellectual descendant of the original secret society of scientists that existed in seventeenth-century England; its members exchanged ideas and support and kept each other’s secrets in a society inclined to look upon their activities as witchcraft, until the formation of the Royal Society for Improving Natural knowledge, founded in London by royal decree in 1660. Vallee’s publishing of his book *The Invisible College* in 1975 was an attempt to make such a community public from the beginning.

I interpret the Super Secret Science League as evidence for the desire for science to take religious claims and paranormal events seriously; the league is made up (apparently) of young, nerdy/hip people who do their research purely for the love of it and who harbor no scientific taboos about what a “serious” topic of research is. Similarly, I view the team at the center of *Evil* as a kind of compromise between the desire for a purely scientific research group, with abundant resources and no taboos, and the reality of the popular religious/scientific split present in our current era. The team in *Evil* is funded by the church. As such, its actions and choice of investigations are always under scrutiny, including by its three investigators.

The backgrounds of the three investigators lead them to question, at different moments, whether the church’s choice of investigations and proposed solutions are perhaps fatally biased. There are continual references to the institutional weaknesses and faults of the church; Kristen is a lapsed Catholic in part because of the child abuse scandal. David, a Black man seeking to become a priest, sees and is troubled by the church’s history of racism, and is sensitive to suggestions that he, as one of a handful of Black men seeking ordination, is being used as a

token. Racial attitudes even enter their investigations of phenomena; in season 3, episode 5 (“The Angel of Warning”), the church orders the team to interview survivors of a disaster. These survivors, who exited an apartment building just seconds before its collapse, report that a woman holding a lamb appeared to them and guided them out. The church wants the team to see if these could have been miracles performed by the apparition of a deceased Sicilian nun being considered for canonization who was known for raising sheep. One Black survivor of the collapse reports that the woman who appeared was Black, while the rest of the witnesses say she was white. This question of the racial appearance of a divine entity ends up being part of the reason for the church’s dropping of the investigation and its apparent giving up on declaring these actions as miracles done by a saint.

The Experience of *Evil*: Trapped in Dualities

With the episode of the haunted fire-starter girl, Ben demonstrated a duality of thinking between Islam and Christianity, even admitting to “religious nationalism.” I suggest that these two episodes show Ben and David, despite their differing beliefs about religion, to be trapped in a similar kind of duality of thought. In David’s case, he correctly points out the church’s history of “whitewashing” the appearance of Jesus and the saints in Catholic iconography. In particular, the episode notes this practice in images of Saint Monica, mother of the North African Saint Augustine; she is classically depicted as white, although no historical knowledge about her supports this depiction. Nevertheless, in David’s worldview (which corresponds with popular conceptions), the saints seem to need to maintain a clear racial identity even in death, making impossible the notion that witnesses could differ in their descriptions of the same figure (such as eyewitnesses of physical events often do) or the notion that a nonphysical being could, by choice or by perception, appear differently to human eyewitnesses. David is uncomfortable with a less fixed view of divine beings—just like Ben. For Ben, the fire-starter girl is being haunted by either an Islamic djinn or a Christian demon. We never hear him, or any other character, suggest less, non-dual interpretations of the phenomenon, such as that the figure is real, but its non-material nature makes its appearance and origin subject to human cultural and historical filters.

Research into the imagery of near-death experiences suggests the existence of these filters. Moreover, the psychological and life changes that often follow a near-death experience suggest that these experiences have aspects that are almost universal, even if they manifest in different culturally influenced imagery and memories of their experiencers. P. M. H. Atwater’s (2007) *Big Book of Near-Death Experiences* has documented many of these similarities and differences, including cultural differences. For example, Todd Murphy, a Buddhist theologian who has studied near-death experiences in Thailand, notes that Thai near-death experiencers are more likely to report encounters with

Lord Yama, a divinity who assigns souls to appropriate rebirths after death, and his messengers, Yamatoots, whereas Westerners are more likely to report seeing Christian divine figures or deceased friends and relatives (Murphy 2001, 176–77). Dr. Allan Kellehear specializes in researching near death experiences in non-Western cultures, covering cases from Asia, the Pacific region, Native Americans, and various preliterate hunter–gatherer peoples. He finds that near-death experiencers from non-Western cultures are less likely than Westerners to report moving through a tunnel and more likely to report things like moving through subterranean caves or emerging through the throat of a lotus flower (Kellehear 1996, 34). He also finds that within cultures with nonlinear beliefs about time, such as Aboriginal peoples of Australia, near-death experiencers tend not experience the phenomenon of life reviews often reported by Western experiencers (Kellehear 1996, 33). Perhaps we need not follow Ben and David in their conventional, unconsciously materialist thinking, which demands that if such experiences are indeed “real,” there must be either a cave or a tunnel in the equivalent of a physical place where we “go” after death, just as there is or is not a cave or a tunnel on our commute to work.

I further suggest that the choice of an Islamic character to represent a potential nondogmatic approach to paranormal phenomena has historical roots, whether the writers of *Evil* are aware of them or not. Medieval Islamic intellectuals, such as the Persians Ghazzali (1058–1111) and Suhrawardi (1170–1208), attempted to integrate rational thinking derived from Greek sources with mystical states of consciousness of God’s unity. Medhi Amin Razavi argues that Suhrawardi’s School of Illumination was central to Islamic philosophy for centuries. Razavi notes that Suhrawardi’s emphasis on light, both as a representation of a universal essence that pervades all of existence and as an empirical phenomenon to be studied, is an attempt to transcend distinctions between the imaginal and the empirical (Kripal 2022, 125–26).

Suhrawardi’s metaphysics establishes a parallel between light as a source of both spiritual reality and matter. In his system, the Light of Lights is the origin of everything, material and immaterial, and its proximity or distance from the Light of Lights, as well as its interactions with other existent lights derived from the Light of Lights, determines its ontological status. The greater the distance from its origin, the less its degree of awareness; unconscious matter is dimly lit, while human souls are brighter than matter and yearn to be closer to those sources of light that are more immediately derived from the Light of Lights. Thus, illumination for Suhrawardi is both a physical and spiritual phenomenon; the Light of Lights is both the source of all that is and possesses the highest degree of self-awareness of anything in the cosmos (Marcotte 2019).

I suggest that Karima functions as an intellectual and spiritual descendant of Ghazzali, Suhrawardi, and the later thinkers they influenced. In this way, Karima would have company in Western philosophy as well. Henry Corbin, the

twentieth-century philosopher who first translated Heidegger in France and who was the first to introduce Iranian Islamic philosophy to his country, translated the work of Suhrawardi and made the study of Suhrawardi's brand of Sufism his life's work. Many of his professors and colleagues viewed this attempt to integrate continental philosophy with Islamic philosophy as unworkable—in other words, he attempted to bridge a divide in philosophy, similar to those who view the current divide between scientific and spiritual worldviews as unbridgeable (Corbin 1978). Karima's presence in the series serves as an invitation to Ben, and to the viewer, to bridge the divide between empirical materialism and mysticism. Like the double-slit experiment, which reveals that light's nature is not reducible to either a particle or a wave, Karima's brief appearance invites us to think of ourselves and reality in a non-dual manner.

What is being bridged here besides empirical materialism and mysticism can perhaps be more simply expressed as the divide between the subject and the object. As Kripal (2022, 124) points out in his book *Superhumanities*, for the last few centuries, religion has overprivileged the transcendent, while the humanities and sciences have privileged the immanent. Kripal calls on scholars of the “superhumanities” to focus on subject and object representation simultaneously. Serious scientists know there is no hard line between the observed and the observer. Why, then, should humanists make the humanities a poor cousin not even of the sciences but of unscientific concepts and conclusions?

Conclusion: Dualities and Unconscious Repetition in *Evil*

The limitations of *Evil* are explained by two main causes. The first is its incomplete attempts to engage fully with the phenomena that are central to its stories. This is mostly due to the dualities its protagonists are trapped in. They are unable to step outside of these dualities, which can be reduced to the main duality of subject/object, and so the promise of research free from taboos and preconceived notions can only be hinted at through the minor character of Karima and her colleagues at the Super Secret Science League. The three investigators' inability to consider non-dual solutions is not due to individual quirks in character; instead, they represent the current limitations of most of society in thinking about anomalous events. The characters' individual backgrounds, with a variety of stances regarding religion and science, demonstrate the dominant tendencies of religious and scientific thought as they are popularly portrayed in most media.

The second cause is the function of the horror genre. In her discussion of horror stories in general, Victoria Nelson (2001) notes that, in genres whose readers are often described as “addicts”—horror stories, murder mysteries, and romance—readers are typically “moved not to reread it,” as readers of literature often are, “but to read another of exactly the same kind, new content cast in the same unchanging form.” She compares this to Sigmund Freud's

definition of the *Wiederholungsdrang*, a repetition compulsion he identified as being a component of certain neuroses. Ben's complaint in *Evil* about the group encountering so many unexplained events and then just "mov[ing] on" should be viewed as a slight crack in the fourth wall, a nod to the viewer that, as Nelson points out about horror stories, there is no movement "toward resolution" or any movement "deeper into self-awareness" (Nelson 2001, 132–33).

Evil holds up a mirror—a mirror distorted by the demands of commerce and genre—to our current unwillingness to separate transcendent experience from the history of religions or science from classical materialism. *Evil* also hesitatingly points a new way forward out of dualism, in the character of Karima and the Super Secret Science League, before those demands finally prevail. In this sense, the reflection the show provides paradoxically has value in that it reveals the divisions in our thinking. Whatever faults we might find with the show, it should be recognized that the academy has largely abandoned serious treatment of the transcendent and that the subject has instead moved to where it will enjoy large budgets and the rapt attention of millions: popular culture.

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Stem Cell Science and Orthodox Christianity

Ana S. Ittis, Professor of Philosophy, Wake Forest University, Winston-Salem, NC, USA,
iltisas@wfu.edu

This article examines selected developments in stem cell-based interventions and stem cell-based research from an Orthodox Christian perspective. It addresses important points of connection between these advances and research involving human embryos, embryoids or stem cell-based models of embryos, and human–animal chimeras. This article highlights some of the most salient ethical questions these developments raise, particularly, although not exclusively, from an Orthodox Christian perspective, and examines some of the resources the Orthodox tradition offers for addressing them.



There have been numerous developments in stem cell-based interventions (SCBIs) and stem cell-based research (SCBR) in recent years. Some of these developments and their important points of connection to research involving human embryos, embryoids or stem cell-based models of embryos, and human–animal chimeras warrant further inquiry. This article highlights some of the most salient ethical questions these developments raise, particularly, although not exclusively, from an Orthodox Christian perspective, and examines some of the resources the Orthodox tradition offers for addressing them.

Stem Cell-Based Interventions and Research

Any exploration of issues in bioethics needs to be informed by the facts. Many readers likely have seen circular conversations or situations in which substantive misunderstandings or miscommunications derail discussion because there is no shared starting point grounded in medical or scientific information. A greatly simplified overview of stem cell types should help readers who are less familiar with the terminology and foster a shared basis for engaging the ethical issues that recent developments in SCBIs and SCBR raise.

The terms SCBR and SCBIs refer to a wide range of practices involving different types of stem cells. Stem cells often are defined as “cells with the potential to develop into many different types of cells in the body” (Agency for Healthcare Quality and Research–Effective Health Care Program, n.d.). Unlike most cells in our bodies, stem cells “can divide and renew themselves over a long time, . . . are unspecialized, so they cannot do specific functions in the body, and . . . have the potential to become specialized cells, such as muscle cells, blood cells, and brain cells” (National Library of Medicine, n.d.). Adult stem cells can “give rise to a limited number of mature cell types that build the tissue in which they reside. Their progeny replaces cells that are lost owing to tissue turnover or injury” (Nature, n.d.). Examples include hematopoietic stem cells (HSCs) found in the bone marrow that give rise to blood cells, muscle stem cells found in skeletal muscle tissue, and adipose tissue-derived stem cells, which are found in adipose tissue or fat. Perinatal stem cells are multipotent cells that can become several different types of cells and are found in tissues that support pregnancy, such as amniotic fluid and parts of the umbilical cord (Abbaspanah et al. 2018).

Embryonic stem cells (ESCs) are pluripotent cells that can differentiate into almost all cells of the human body. They were first retrieved from human embryos in the late 1990s (Thomson et al. 1998). Typically, ESCs are extracted from a blastocyst—an embryo that is three to five days old. This process destroys the embryo. Some research has explored the possibility of extracting a single cell from an embryo as is done for pre-implantation genetic diagnosis, avoiding embryo destruction (Klimanskaya et al. 2006). ESCs can come from embryos created for IVF that are donated or embryos created specifically for research.

Induced pluripotent stem cells (iPSCs) are pluripotent cells that have been “reverse engineered” in the sense that they started out as somatic (body) cells or as adult stem cells and are stimulated to become pluripotent cells (Yoshida and Yamanaka 2010).

Stem-Cell Based Interventions and Research and the Orthodox Christian Tradition

SCBIs and SCBR utilizing various types of stem cells raise different types of ethical questions from an Orthodox Christian perspective. In assessing the use of stem cells, it is worth remembering that for Orthodox Christians there is no inherent objection to advances in science and medicine. St. Basil the Great (AD 329–79) stated that

Each of the arts is God’s gift to us, remedying the deficiencies of nature . . . And, when we were commanded to return to the earth whence we had been taken and were united with the pain-ridden flesh doomed to destruction because of sin and, for the same reason, also subject to disease, the medical art was given to us to relieve the sick, in some degree at least. (St. Basil the Great 2000, 330–31)

More recently, in his work on Orthodox theology and bioethics, Metropolitan Hierotheos of Nafpaktos and St. Vlassios (n.d., Section 2.c) reminds readers that “Orthodox theology has never wished to place obstacles in the way of scientific research that aims to benefit humankind. All the scientific successes that have contributed to the health of human beings began with many years of research.” We are not to reject any and all medical attention or advances in medicine as if seeking treatment necessarily reflects a lack of faith. Jean-Claude Larchet (2002, 103) points to the many saints and bishops who also were physicians and notes also “the interest of several Church Fathers and the esteem in which they held the medical arts. Among them were Gregory of Nyssa, St. Gregory of Nazianzu, and St. Basil who began to learn medicine in the course of their studies, Nemesius, bishop of Emessa, St Isidore of Pelusia, St. Theodore of Sykon, St. Photius, the Patriarch, and Meletios the Monk.” In short, an Orthodox Christian assessment of SCBIs and SCBR should not begin with the assumption that there is something wrong with advancing science and medicine or seeking medical help.

Stem cells are of great interest to biomedical researchers and physicians because of their potential for advancing science as well as treating a wide range of diseases and repairing or regenerating damaged tissues and organs. A wide range of potential applications have been and continue to be investigated, including regenerating damaged organs and tissues such as bladders, hearts, and blood vessels; treating injuries such as spinal cord injuries, bone injuries, and burns; treating diseases such as diabetes mellitus, multiple sclerosis, arthritis,

Crohn's disease, and graft-versus-host disease; and improving outcomes for people with neurodegenerative diseases such as Parkinson disease (Poliwoda et al. 2022; Atala 2024).

Despite those potential benefits, various aspects of SCBIs and SCBR raise concerns from an Orthodox Christian perspective. The first of these relates to safety and efficacy. Some SCBIs are long-established treatments that are relatively safe and effective, most notably peripheral stem cell transplants, which have largely replaced bone marrow transplants to treat patients with a variety of cancers. These transplants are done either using one's own cells (autologous) or donor cells (heterologous) (Keys et al. 2013). There is a great deal of interest in the possibility that SCBIs might be used to treat a wide range of conditions, and there have been significant advances through rigorous research. On the other hand, there are many SCBIs for which safety and efficacy evidence is limited or unavailable. In many cases, these interventions are offered in jurisdictions with little regulation or oversight (Bauer et al. 2018). They pose risks to patients, both in terms of the possibility of being harmed by those interventions and in terms of lost opportunity to pursue more effective treatments, as well as wasted time and money (Matthews and Iltis 2015). Some of these interventions have resulted in significant harm (The Pew Charitable Trusts 2021). For example, a young man who was injured on a trampoline at the age of twenty had gone through surgeries and rehabilitation and still had some paralysis in his arms and significant paralysis in his legs and torso. Feeling as though there were no other options, he went to Portugal and had nasal cells injected into his spinal cord at the injury site in hopes of alleviating pain and relieving some of the paralysis. He did not experience the hoped-for improvement. He ended up in more pain, and twelve years later, he noticed decreased function and more pain. Doctors found a mass on his spine; the cells in the mass were the same kinds of cells that had been transplanted into his spinal cord. They removed part of the tumor but could not remove all of it, and it might grow back (Woodworth et al. 2019). Other patients have developed serious infections, lost their eyesight, or died as a result of experimental SCBIs (Begley 2017). The COVID-19 pandemic ushered in additional "opportunities" for experimental stem cell-based interventions unbacked by careful research, many of which exposed people to risk of serious harm (Turner et al. 2021).

To be sure, all medical interventions carry risks, and experimental or innovative interventions that have not been well studied may expose patients to unknown risks of harm. Patients who receive experimental interventions in the context of well-run clinical trials face unknown risks of harm, but they also typically have the advantage of rigorous safety plans and oversight procedures meant to minimize risk. Such studies gather data on safety and efficacy, which generates knowledge necessary to improve the care of patients in the future. Receiving experimental SCBIs outside of such trials leaves patients particularly

vulnerable to harm. Many clinics in the United States and around the world currently offer unproven SCBIs to patients, and there is a lack of transparency about the evidence behind the interventions offered or their results (Master, Matthews, and Abou-el-Enein 2021).

The Orthodox Christian tradition recognizes the importance of caring for the body. One way of doing this is avoiding unsafe experimentation, such as using unproven and higher risk interventions offered by providers who are operating at the margins. The “I’m willing to try anything” attitude that sometimes leads people to clinics that offer unproven interventions is understandable but can be at odds with the duty to care for our bodies. From an Orthodox Christian perspective, the pursuit of healing should not lead to taking unreasonable risks with our lives and bodies.

This is related to a second concern for Orthodox Christians, which is that the pursuit of healing or extending life must not become an obsession or all-consuming endeavor that subordinates spiritual health and the struggle toward eternal salvation. This is why St. Basil the Great (2000, 330–31) forbids “whatever requires an undue amount of thought or trouble or involves a large expenditure of effort and causes our whole life to revolve, as it were, around solicitude for the flesh.” Nor must our appreciation for the promise science and medicine offer become so great that we are more confident in them than in God, for as St. Basil the Great (2000, 331) warned, “To place that hope of one’s health in the hands of the doctor is the act of an irrational animal.” In other words, medicine is a good to be used in the context of a life of repentance and eternal salvation.

A third concern is that medicine must not be used for sinful purposes or involve sinful choices and actions. Some SCBIs and SCBR involve ESCs and thus involve the destruction of human embryos. Some SCBIs and some areas of SCBR, such as those using adult stem cells or perinatal stem cells, do not involve embryo destruction. This distinction is of vital importance for Orthodox Christians. Numerous Orthodox theologians and scholars have noted that, as Bishop Thomas (2013, 60) articulated, “from the standpoint of traditional Christianity, the destruction of human embryos is expressly forbidden regardless of any potential positive outcomes.” The Holy Synod of the Church of Greece (2000), issued a press release in 2000, stating: “Our Church expresses its categorical opposition to performing experiments on human embryonic cells. Such experimentation entails the destruction, not of embryonic cells, but of human embryos.” The Liturgy of St. Basil the Great, for example, recognizes each person’s existence as a person in the mother’s womb: “O God, who knowest the age and the name of each, and knowest every man even from his mother’s womb” (Hapgood 1996, 109). In other words, each of us exists as a person with a name, and each is known to God and thus ought to be treated as such.

Scripture, Orthodox hymnography, and Orthodox iconography recognize the unborn as living among us. Three major church feasts celebrate conception: the Feast of the Annunciation (March 25), the Feast of the Conception of the Theotokos (December 9), and the Feast of the Conception of St. John the Forerunner (September 23). The Orthodox tradition rejects the claim that because ESCs are taken from very early embryos, sometimes called “clumps of cells,” their destruction is permissible or less problematic than the destruction of older embryos and fetuses. St. Basil was clear on this point in voiding the distinction between formed and unformed pre-born life. In one of his letters, he specifies that there is no difference between an early and a late abortion: “The woman who purposely destroys her unborn child is guilty of murder. With us there is no nice enquiry as its being formed or unformed” (St. Basil the Great 1889, 652). In rejecting the significance of any difference between formed and unformed pre-born life, St. Basil, along with many others, rejects the idea that an early abortion or the destruction of a “mere embryo” is permissible. That is, he rejects the Old Testament distinction found in Exodus 21:22–25: “If two men fight and hurt a woman with child, and her child is born imperfectly formed, he shall surely be punished accordingly as the woman’s husband imposes on him; and he shall pay as the judges determine. But if the child is perfectly formed, he shall give life for life, eye for eye, tooth for tooth, hand for hand, foot for foot, burn for burn, wound for wound, stripe for stripe.” Other Orthodox scholars and theologians similarly reject the distinction between formed and unformed embryos. Metropolitan Hierotheos of Nafpaktos and St. Vlassios (n.d., Section 2.c) notes that “because, according to Orthodox theology, the soul exists from the beginning of conception—the doctrine of ‘the existence of an autotelic human entity from the first moment of conception’—as the embryo ‘receives a soul immediately upon conception,’ according to Christological teaching. The Orthodox Church does not accept the theory about ‘the process of receiving a soul’.”

The view that humans possess a soul from the time of conception may lead to questions about the implications for monozygotic (identical) twins, who develop from a single fertilized egg sometime during the first fourteen days post-fertilization. Questions that might arise include: Is there one soul that becomes divided? Does the fertilized egg contain two souls in one body for a period of time? Is a second soul delivered upon division? If monozygotic twins form and then one absorbs the other such that there is only one child gestated and born, what happened to the soul of the twin who was absorbed? The possibility of twinning, among other reasons, has led some authors, including some Orthodox Christian authors, to challenge the position that human life begins at conception (see, e.g., Woloschak 2017). Others have responded to twinning differently. Rather than see the monozygotic twins as a challenge to the notion that humans have a soul from the moment of conception, they

have suggested that the problem is our attempt to see the soul quantitatively: “The soul does not represent a material essence that can be measured or counted, or an abstract hypostasis (essence of being) that differs from embryo to embryo . . . The division of an embryo, which yields two identical embryos, is not equivalent to the division of the soul since the soul, as a spiritual reality, no matter how many times it is split, does not divide, and no matter how many times it is combined, does not multiply or increase” (Griniezakis and Symeonides 2009, 34).

In short, where SCBIs and SCBR involve the destruction of human embryos, these practices generally are deeply problematic for Orthodox Christians. This is particularly true where they involve ongoing creation and destruction of embryos rather than relying on existing ESC lines or fetal cell lines derived from embryos or fetuses that were destroyed some time ago, where the harm already has been done (Engelhardt 2000, 261). Such cell lines remain in use today, but physicians, scientists, and patients were not party to that destruction. Some ESC research ultimately is aimed at developing customizable interventions that rely on a patient’s own cells and thus eliminate the possibility of immune rejection. These may involve ongoing creation and destruction of embryos through somatic cell nuclear transfer (SCNT) or cloning, to which I now turn.

Somatic Cell Nuclear Transfer (Cloning) and the Orthodox Tradition

Many people associate the term “cloning” with stem cells, yet not all STBIs or SCBR involve cloning. Cloning involves SCNT, which begins with an unfertilized egg (oocyte) from which the nucleus is removed and replaced with the nucleus of a cell from a different source. The egg is stimulated to divide, as a fertilized egg, i.e., embryo, would divide. This creates an embryo that is a clone, an exact genetic replica, of the individual whose nucleus was placed into the enucleated egg. The next step depends on the purpose of SCNT, or cloning. If the purpose is reproduction, as in the familiar case of Dolly the sheep, the dividing embryo is transferred to a uterus for continued gestation, much as is done in IVF. Human reproductive cloning currently is banned in many countries and jurisdictions and prohibited by the International Society for Stem Cell Research’s guidelines (Lovell-Badge et al. 2021). Recent developments in in vitro gametogenesis, the creation of sperm and egg in a lab, may raise questions similar to those associated with reproductive cloning and could challenge the moratorium (Segers et al. 2019a, 2019b). If instead the purpose of SCNT is to extract ESCs, then, after a series of divisions, stem cells are extracted from the developing egg (cloned embryo), destroying it. The difference here is that the ESCs obtained are genetically identical to the source of the replacement nuclear material. There are several goals motivating such

research. First, those extracted ESCs would be a perfect genetic match for a patient, possibly enabling scientists to create cell lines to study specific diseases. The long-term goal is not merely to understand diseases but to treat them by generating and using genetically matched tissues or organs for an individual without risking rejection. This research is still early stages in humans but there are reports dating back to 2013 of labs making progress (Tachibana et al. 2013; Ogura et al. 2013).

Claims of success in using SCNT in humans made in 2004 turned out to be mired in controversy. Woo Suk Hwang, from Seoul National University in South Korea, and colleagues published a paper in 2004 in *Science* claiming to have obtained stem cells from a cloned human embryo (Hwang et al. 2004). A variety of ethical questions emerged, including concerns about the egg donors (Baylis 2009). Subsequently, questions emerged about Hwang's data when mismatches between the allegedly patient-specific cell lines produced and the tissue samples were found not to match, which suggested either that the cells had been contaminated or that the ESC lines had not come from the allegedly cloned embryos. Further investigation revealed fabrication (Gottweis and Triendl 2006).

Sometimes, the use of SCNT for reproductive purposes is called "reproductive cloning," while SCNT aimed at scientific discoveries and, ultimately, treatment is called "therapeutic cloning." Both involve the same technology, i.e., in both cases, an embryo is created that is an exact genetic replica of the nuclear material donor source. What differs is the intent or goal. For some people, this distinction matters greatly, as they do not object to the destruction of embryos but are concerned about the risks to a person born from cloning. Many scientists, scholars, and others have defended so-called therapeutic cloning while categorically rejecting reproductive cloning (Tannert 2006). From within the Orthodox tradition, whether the aim is reproduction, research, or eventually treatment, all applications of SCNT raise concerns. All involve destroying human embryos, which the Orthodox tradition condemns.

Reproductive cloning raises additional concerns in the Orthodox tradition. Cloning introduces questions about status of the clone, especially concerning the relationship between the body and the soul. With respect to this issue, Metropolitan Hierotheos of Mafpaktos and St. Vlassios (n.d., Section 2.c) states that "[I] do not know whether God will allow the production by human cloning in a laboratory of a being with a human body, but without a soul. This does not happen now because man's life is linked in a mysterious way with his soul. However, the soul and body owe their existence to God's creative energy with the synergy of the parents (Fr. John Romanides); and according to St Maximus the Confessor, the body and the soul come into being in different ways—although this happens simultaneously at the moment of conception—since the soul is formed ineffably from the divine and life-giving inbreathing,

and the body consists of existing bodily matter. For these reasons, the possible case in which God, for our chastening, allows a separation between the soul and life, and the creation of a chimera or hybrid seems tragic.” While I would not want to speculate about whether a clone would or could have a soul, such questions generate significant concerns about the possibility of creating entities that look human but cannot have a soul or whose soul and body are separated. Such a scenario would seem to deprive these beings who are made to be almost human of the gift of a soul and would create entities whom we create solely to use for our own purposes.

Despite differences regarding the origin of the soul in the early church (see, e.g., Jones 2004, chapter 7), there has long been clarity on the importance of the unity of body and soul in the Orthodox Christian tradition (Harakas 1982; Woloschak 2003). We find in the writing of St. Irenaeus of Lyon (1885) this comment on the importance of unity of body and soul:

Now God shall be glorified in His handiwork, fitting it so as to be conformable to, and modelled after, His own Son. For by the hands of the Father, that is, by the Son and the Holy Spirit, man, and not [merely] a part of man, was made in the likeness of God. Now the soul and the spirit are certainly a *part* of the man, but certainly not *the* man; for the perfect man consists in the commingling and the union of the soul receiving the spirit of the Father, and the admixture of that fleshly nature which was moulded after the image of God.

Similarly, in *On the Making of Man*, St. Gregory of Nyssa (1893) writes:

For our purpose was to show that the seminal cause of our constitute is neither soul without body, nor a body without a soul, but that, from animated and living bodies, it is generated at the first as a living and animate being, and that our humanity takes it and cherishes it like a nursling with the resources she herself possesses, and it thus grown on both sides and makes its grown manifest correspondingly in either part.

Finally, in his analysis of Maximus the Confessor’s understanding of the soul and body, Vladimir Cvetković (2021, 264) observes that

Maximus argues that God created the human being planting his image in the soul. On the one hand the role of the soul was to cling to God by its intellectual and rational capacities in order to gain divinization. On the other hand, the role of the soul was to care for and to prudently use the body by subjecting it to the mind through virtues. By creating the soul, God endowed it with a mediatory role between God and the body. The twofold union, the necessary and reciprocal union of the soul with the body, and free and willing union of

the soul with the divine should provide, according to the divine plan, both the immutability of the soul and the immortality of the body. Thus, God, created human beings as body–soul compounds in order to give them a foretaste of the future union with the divine, which although is supernatural will be felt as natural as natural is the union of the body and the soul. Moreover, the supernatural union with God, the soul and the body will be inextricably united one to another, with a bond much stronger than the natural bond.

Cloning threatens, or at least possibly threatens, the unity of body and soul, a relationship that is of great significance for Orthodox Christians.

The investigation into the soul–body relationship helps to further explain the categorical rejection of abortion and embryo destruction in the Orthodox tradition. In her careful discussion of theories of ensoulment, Anna Usacheva (2021) distinguishes early Christian accounts of the relationship between soul and body with Aristotle's views, which informed later Western Christian accounts of the soul–body relationship. Aristotle, she demonstrates, held that “the soul cannot be alive without the body. This is why, according to Aristotle, the process of ensoulment is gradual,” rendering an early abortion “a totally decent measure” (Usacheva 2021, 153). Early Christian authors, on the other hand, “differentiated between the principles of physical formation, transmitted by the seed, and the soul provided by God” (Usacheva 2021, 153). Therefore, early Christian writers “affirmed that the bodily principles are contained in the seed, while God ensouls the embryo from the moment of conception” (Usacheva 2021, 153). It is this “conviction that ensoulment is simultaneous to conception [that] rendered every abortion as murder in the eyes of Christians” (Usacheva 2021, 154).

In light of this consistent emphasis on the unity of soul and body, and the idea that God implants, imparts, or somehow gives the soul such that it is present from conception, the possibility of asexual reproduction, including through cloning, raises concerns from within the Orthodox Christian tradition. Anything I could say about whether a clone would have a soul or whether cloning separates the body and soul would be speculative. At the same time, these possibilities generate an obligation for Orthodox Christians to humbly consider these matters and not dismiss them prematurely so as to guard against evil.

An additional concern for Orthodox Christians is that reproductive cloning would involve reproduction outside of the context of marriage of husband and wife, which the Orthodox tradition holds is the only appropriate context for procreation (Engelhardt 2000, 260). Moreover, it would involve reproduction without needing both male and female. In St. John Chrysostom's (2000, 44) homily on Ephesians, he observes that God “did not, on the one hand, fashion woman independently from man; otherwise man would think of her as essentially

different from himself. Nor did He enable woman to bear children without man; if this were the case she would be self-sufficient. Instead, just as the branches of a tree proceed from a single trunk, He made the one man Adam to be the origin of all mankind, both male and female, and made it impossible for men and women to be self-sufficient.” This suggests that independent procreation may be objectionable in the Orthodox Christian tradition.

Human Embryo Research and the Orthodox Tradition

Human embryos often are destroyed subsequent to IVF undertaken with reproductive intentions either because a couple does not want to have more children or because pre-implantation genetic diagnosis reveals an anomaly. Sometimes those embryos are discarded and sometimes they are donated for research, where they may be destroyed to obtain ESCs. There are other research endeavors beyond ESC research involving human embryos, both those created for reproductive purposes originally and embryos created for research purposes, that result in their destruction. These raise important questions for Orthodox Christians, some of which are the same as those associated with embryo destruction already noted.

There have been significant developments in human embryo research in recent years. After the first successful report of IVF in humans, a series of reports in the United States and UK recommended that research on human embryos be permitted up to fourteen days post fertilization or when the primitive streak emerges (U.S. Department of Health, Education and Welfare 1979; Warnock 1984). Different reasons were offered for this limit. For some, the possibility that this is the final point at which twinning is thought to be possible indicates that it marks individuation. For some, the primitive streak is significant because it is observable immediately before neural tube formation and indicates significant organization of the embryo (Matthews et al. 2021). Historically, scientists have been unable to keep embryos alive in vitro for anywhere close to the fourteen-day limit, so the limit was an in-principle limit but posed no barrier for research. Instead, scientists were limited by their own technical abilities. This changed in 2016 when two labs reported that they had successfully cultured human embryos in vitro up to fourteen days post fertilization (Deglincerti et al. 2016; Shahbazi et al. 2016). They destroyed the embryos to comply with the guidelines to which they were subject in the United States and the law that restricted the group working in the UK. Leading up to those announcements and subsequently, numerous scientists and scholars have called for the fourteen-day limit to be either extended, allowing embryo-destructive research to a later time, or lifted altogether. In jurisdictions where the law limits human embryo research to fourteen days post fertilization, this requires legal action. However, in jurisdictions such as the United States in which scientists have self-regulated and agreed to follow international guidelines on human embryo research but

there is no law, no legal action is required. Thus, in 2021 when the International Society for Stem Cell Research (n.d.), which describes itself as “the preeminent global, cross-disciplinary, science-based organization dedicated to stem cell research and its translation into the clinic,” issued new guidelines that no longer restricted human embryo research to fourteen days post fertilization, the door was opened in the United States for research on embryos beyond fourteen days post fertilization (Lovell-Badge et al. 2021).

The fourteen-day mark is an irrelevant distinction for Orthodox Christians given that it is impermissible to destroy embryos at any stage, as noted. It is possible that destroying more developed embryos and fetuses dulls us even more to the sinfulness of destroying human life. It may further contribute to an attitude of disrespect or disregard for vulnerable others. In that sense, permitting embryo-destructive research beyond fourteen days could introduce additional concerns in the Orthodox tradition.

The possibility of growing embryos to later stages and gestating embryos in artificial wombs introduces another option for reproduction outside of marriage and even of reproduction without any identified parents since, in theory, children could be “farmed” in laboratories full of artificial wombs. For reasons already cited, this raises specific concerns for Orthodox Christians.

Embryoids and the Orthodox Tradition

At the intersection of SCBR and human embryo research we find an emerging area of research that involves the use of various types of stem cells to build models of early human development, sometimes called embryoids or synthetic embryos. Many different names have been used to refer to a wide variety of stem cell-based models of early human development (Matthews et al. 2021). Interest in embryoids stems largely from the possibility of using them to study embryo development, organogenesis, specific diseases, and teratogenicity of drugs, among other things. They raise a host of ethical, social, and policy considerations (Iltis et al. 2023). Some embryoids are created using ESCs such that involve embryo destruction, raising the same concerns noted. Others rely on iPSCs, which come from adult stem cells. Beyond concerns about embryo destruction, embryoids raise a number of metaphysical questions about what they are and whether they are human beings with or without a soul.

How closely must a model of early human development mimic an embryo to be treated as an embryo? Currently, there are significant differences among embryoids with respect to the sources of cells used to generate them and how closely they resemble human embryos. Although the science has not yet developed to the point that these models are sophisticated enough to closely model human embryos and are able to be gestated, many believe that it will (Denker 2021; Matthews and Morali 2020). At what point, if any, ought we to treat these as embryos or do they become embryos? Some scholars speculate that embryoids

could become sophisticated enough that it would be plausible to gestate them to the point of live birth. For Orthodox Christians, that possibility raises concerns comparable to some of the concerns raised regarding cloning, including asexual reproduction and reproduction outside the union of husband and wife.

As culture techniques improve, and scientists can grow embryos in culture for longer periods of time, it is likely that it will also be possible to develop embryoids for longer periods of time. This introduces the possibility of attempting to gestate embryoids and use them for reproductive purposes or as sources of organs and tissues. All of these raise serious concerns within the Orthodox tradition for reasons outlined related to the destruction of embryos and reproduction outside the union of husband and wife. Questions regarding the possibility of creating humans deprived of a soul raises concerns comparable to those associated with cloning.

Chimeras and the Orthodox Tradition

Animal–animal and human–animal chimeras have long been of interest in science as well as in art and literature. Recent science has involved developing various chimeras, including human–animal chimeras (Wu et al. 2017; Tan et al. 2021). Chimeras are entities created with a mixture of cells from different species, and in the case of animal–human chimeras, a mixture of animal and human cells. The National Institutes of Health in the United States prohibited use of its funds for animal–human chimera research until 2016 (Kaiser 2016). Reports of first human–monkey embryos indicate that some of the embryos lived twenty days in culture and had up to 7% human cells in one embryo (Tan et al. 2021). Chimeras are of interest to scientists because of the possibilities they offer for generating new knowledge about a wide variety of important biomedical questions about human development as well as human disease (Tarifa et al. 2020). There is also interest in using chimeras to generate organs that could be used for transplantation into humans (xenotransplantation).

Human–animal chimera research raises numerous questions (Kwisda et al. 2020). These include metaphysical questions such as whether they are human and, if not, what they are. For instance, is there a percentage cut-off? Does the type of tissue involved matter? Would we treat human–animal chimeras with human neural cells differently from a chimera with human kidney cells, for instance? This research is in early stages today, but future developments likely will lead to questions regarding reproduction and permissible uses of chimeras. Many of the concerns noted here are not unique to Orthodox Christians and have been raised in the broader literature (Kwisda et al. 2020).

Conclusion

In a paper on organ transplantation and Orthodox Christianity, Gayle Woloschak (2003, 703) framed consideration of bioethics issues this way:

[C]ommitting or accepting actions that denigrate humanity creates a rift between us and our intended role in the creation; one thing that sets humanity apart from the remainder of creation is responsibility. We humans are meant to take responsibility for ourselves, for each other, for our children, for the world in which we live, for the world that we refashion, for the cosmos around us, for our actions and inactions, for our good deeds and bad deeds. Taking responsibility is human, and to not take it is to be less than human. In the ongoing debate about cloning, about xenotransplantation, and about other related biomedical research, we must not lose sight of this responsibility to ourselves, to each other, and to our world.

As Orthodox Christians contemplate SCBIs and SCBR and various connected areas of research, the overall question is: How are we to understand and approach such matters as responsible Orthodox Christians? Another way of asking that is: What does it mean to think and act as a being created in the image and likeness of God in the face of this particular issue or question? This article is offered in the spirit of informing such an assessment of SCBIs and SCBR.

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Rescue by the Self and a Fellow Human: Transplantation and Stem Cells

Katarina Trajković, Group Leader, Mediterranean Institute for Life Sciences, Split, Croatia, trajkovic.katarina@gmail.com

Although tissue regeneration is a common phenomenon in the living world, humans have restricted potential to regenerate their tissues. However, this limitation can be compensated for by various biomedical approaches, including organ transplantation and stem cell technology. Organ transplantation is the replacement of a missing or dysfunctional organ with an organ derived from a (living or deceased) human donor or an animal source, or with an artificial organ. More recently, stem cells—undifferentiated cells that can divide and differentiate into any cell type—have become a novel, highly promising tool of regenerative medicine. Even though both approaches are potentially lifesaving, their application and development are currently limited by a range of medical and ethical issues. This article presents the basic biomedical background of organ transplantation and stem cells technology, discusses the associated ethical concerns, and lists the current strategies for controlling their ethically challenging aspects while allowing exploitation of their benefits.



Introduction

Tissue regeneration in living organisms represents a natural mechanism for preservation of life, which makes cells, organs, organisms, and the entire ecosystems resilient to changes in the environment that cause disturbances and damages. All living beings have the ability to regenerate their tissues, albeit to different extents. Some animals are very efficient in regenerating their entire organs, with typical examples found in jellyfish, lobsters, or lizards. Not only can they replace an organ lost due to an external force, but they can even take advantage of this ability to defend themselves from predators by shedding an organ to avoid capture and then regrowing a new one. Other animals, including humans, have a rather limited capacity for regeneration.

While most human beings are born with the potential to develop into fully functional adults, a subset of newborn babies is challenged by various genetic or congenital defects resulting in missing or dysfunctional tissues or organs. In addition, healthy adults sometimes lose (fully or partially) tissues or organs due to accidents or through contracting various diseases. Consequently, they can experience a failure of vital organs such as the heart, kidney, lungs, liver, etc. In the absence of medical intervention, death in such cases is unavoidable. Even with timely medical intervention, if the failed organ does not recover, the patient may lose independence and continue living only with the constant engagement of medical services.

Modern medicine has been investing a lot of effort in the development of strategies to help humans with missing organs or organ failures. The right approach to handling such health challenges could extend life, improve the quality and productivity of life, and decrease the health care burden. Since drug treatments are limited in such cases, other approaches have been developed, including organ transplantation and stem cell technology.

Organ Transplantation

Historically, one of the first strategies in tackling the issue of missing tissues or organs has been organ transplantation—surgically removing a dysfunctional/damaged organ and replacing it with a new one. The idea of organ transplantation has fascinated humans since ancient times. The first mention of a transplant took place in the remote sixteenth century BC, where skin grafting was described in the Ebers Papyrus—one of the oldest and most important of ancient Egypt's medical papyri containing herbal knowledge of that period. Sushruta, the “father of surgery” from India, is believed to have performed the first skin transplantation around 600 BC (Nordham and Ninokawa 2022).

The first successful organ transplantation of the modern era happened in 1954 and was performed with a kidney from a living donor (Barker and Markmann 2013). The pioneering surgeons who made this grand achievement were Dr. Joseph Murray and Dr. David Hume from the Peter Brent Brigham

Hospital in Boston. Eight years later, the first kidney transplantation from a deceased person (cadaveric transplantation) took place (Barkerk and Markmann 2013). By now, methods have been developed for successful transplantation of the lung, liver, heart, pancreas, intestines, cornea, bone marrow, etc. Organ transplantation has been shown to significantly extend life, increase the quality of life, and decrease treatment costs (Abouna 2003). For example, the average survival of a patient with a transplanted kidney is 20–40% longer than that of a patient undergoing dialysis. Some patients can live over thirty years after receiving a donated kidney. Of note, five years of dialysis costs three times more than a transplantation surgery.

Various sources of organ transplants exist. Apart from the aforementioned living or cadaveric organ donations from humans, it is also possible to transplant an organ from a nonhuman donor (xenotransplantation) or use artificially produced organs. Pigs are the most promising source of xenotransplants due to their genetic and physiological similarities to humans (Cooper 2012). Safe procedure would include growing pigs in a pathogen-free facility to avoid the transmission of diseases from animals to humans. Such pigs can be genetically modified to increase their genetic similarity and immune compatibility with humans. Some examples of such xenotransplantation are recent successful kidney and heart transplantations into brain-dead humans (Moazami et al. 2023; Montgomery et al. 2022).

Human-made, artificially produced organs are usually devices that get incorporated into the human body to replace a missing organ or a missing function (Duguet 2016). For example, a lost limb can be replaced by prosthesis. New technologies enable relatively high levels of integration of the prostheses into the human body so that the recipient can control such an artificial limb. A bionic eye with an incorporated mini-camera and an electronic interface can transmit basic visual information from the environment onto the retina and brain. Artificial pacemakers can augment or completely bypass the need for a natural living heart pacemaker. Almost fully functional artificial lungs have been designed to assist breathing in people with removed lungs. Various other organs can be replaced by artificial organs, including livers, kidneys, testes, etc. However, these artificial organs can only replace the function of the failed organs temporarily (Wang 2019). Interestingly, a fascinating and highly promising technology of 3D bioprinting organs is currently under development (Panja et al. 2022).

Even though organ transplantation has become a routine intervention in the past decades, it still poses significant risks for the patients—both the recipients and the living donors (Abouna 2003). Obvious risks are associated with the surgery itself and include potential infection and issues with anesthesia, especially in older patients. For a living donor, there may be consequences due to the loss of an organ. A serious common problem is rejection of the transplanted

organ by the immune system of the recipient. This can happen because each person has a unique protein composition, with our immune system being built in a way that it ignores the “self” and attacks the “non-self.” “Self” is defined as a specific set of human leukocyte antigen (HLA) proteins on the surface of each cell. “Self” HLA proteins “tell” the immune system not to attack the HLA carrier cells. However, if cells or tissues that do not contain the “self” HLA set are introduced into the body, the immune system can recognize them as foreign and attack them. To avoid this problem, donor and recipient organs must be matched. The degree of similarity between HLAs of the donor and the recipient is called histocompatibility. Well-matched donor–recipient pairs have high histocompatibility, meaning their HLAs are sufficiently genetically similar. If the two organs match closely enough, a relatively tolerable immune response to the foreign organ will be induced. However, the only true match would be an organ derived from an identical twin. Interestingly, if the transplanted organ is immune-competent, it can attack the recipient’s tissues, causing a so-called “graft-versus-host reaction.” These problems can be reduced by a lifelong immunosuppressive therapy given to the recipient, but the therapy itself imposes an additional set of health risks.

A number of public health issues are associated with organ transplantation (Abouna 2003). One is a large gap between the demand and supply of organs. While the number of donors remains low, the lists of patients waiting for a transplant are rapidly increasing, with many patients dying while waiting for a transplant. Indeed, it is estimated that only 10% of the patients on the waiting lists eventually receive a transplant. The reasons for a shortage in organ supply differ for the living and cadaveric donations. While living donors are often not ready to risk their own health, cadaveric donations are hampered by a series of other issues, such as religious beliefs, family complaints, or lack of information. Public health systems have been attempting to increase the organ supply by employing several strategies. These include public education, promoting explicit consent, and a policy of presumed consent.

Public education is based on raising awareness among the general population about the merits of organ donation. In cases where explicit consent is needed, motivated individuals need to act upon their decision to provide a cadaveric transplant by registering into a database of donors. In many countries with such an opt-in policy, this wish is then stated on their driver’s license, personal ID, or organ donation card (Schulze Spuentrup 2024). However, these strategies have brought little success in increasing the number of potential donors. A policy of presumed consent (also called an opt-out policy) has proven much more successful. In this policy, society approves that every adult individual who dies is a potential organ donor (regardless of the opinion of the family) unless he or she has withdrawn their consent during their lifetime. Since a willingness to accept the default and tendency to avoid action is natural for humans, this

policy has been very efficient in increasing the supply of organs. In countries that have introduced this policy, the number of potential donors has doubled in comparison with other countries. One argument defending this policy is that most major religions, including Christianity, Judaism, and Islam, do not object to this principle. This was pronounced by Pope John Paul II in 1992, by the Jewish Rabbinical Council of America in 1991, and even by the Islamic Fatwa Committee of Kuwait, which stated in 1979 that “organ transplantation can take place from a dead donor providing that there was a necessity to save a human life” and that “permission of the family is not required since human organs belong to God and not to the family” (Abouna 1984). However, few countries have adopted the presumed consent policy.

There are other significant ethical issues associated with organ transplantation, particularly in the case of living donation (Mamode et al. 2022). Usually, related family members are the most optimal organ donors, since genetic similarities decrease the chance of immunological rejection of an organ. These family members may encounter emotional pressure and coercion from other family members or from the recipients themselves. Unrelated family members such as spouses or in-laws may also endure pressure, since they can still provide their (non-matching) organs through donor exchange programs, wherein donor/recipient pairs are entered into a system, a match offer is eventually made, and then transplants are planned.

Risk–benefit ratio assessment is very important before donating an organ. Benefits of organ donation are often psychological and social, in terms of moral reward and earning respect from other community members, but also as contribution to a system that the donor himself can benefit from, if needed. Risks include the previously discussed health risks, as well as psychosocial and financial losses. In particular, even if everything goes smoothly health-wise, a donor must dedicate time for the surgery and recovery, which means absence from work, family duties and a necessity to secure appropriate caretaking during the recovery.

Another ethical issue is related to obtaining an informed consent from the donor prior to donation. Informed consent means that an individual is competent to comprehend relevant information and to give consent. If any of these two conditions is unmet, the individual becomes merely a source of an organ, rather than a real donor.

The equitable allocation of organs is a highly debated topic in the ethics of organ transplantation (Bunnik 2023). It is important that the criteria for prioritizing potential organ recipients are fair and unbiased. Questions such as “who is the sickest or most in need,” “who is most entitled to the organ,” “whose life is more worth saving,” and “who will benefit the most from organ transplantation” decide who will be the next recipient of an organ from a newly deceased person. In addition, not all donated organs are of equal quality—organs from younger and healthier donors with proper post-extraction handling

will give better survival chances to the recipients. Another complicating issue is that some recipients are more difficult to match due to their rare HLA types, which lowers their chances of obtaining a compatible organ. All these issues contribute to the complexity of patient ranking. One simple way of ranking the patients is based on the waiting time, with advantage given to those who waited longer. However, this approach neglects many important parameters such as the age, fitness, and prospects of a patient. An alternative transplant allocation strategy has been developed with a goal of maximizing the longevity of transplanted organs. This can be achieved by giving the organs to younger and fitter individuals with high estimated post-transplantation survival. Robert Veatch weighs the eligibility of recipients based on who is worse off from an over-a-lifetime perspective. According to this principle, if there are two people with the same condition—one young and one old—the younger one would be more eligible for a transplant because they had lived less life so far and thus are worse off. Geography can also be an important factor. For example, it could be debated whether donors have the right to give preference to recipients from their local community, especially if their local community has a high number of donors in comparison to other, remote communities.

Finally, particularly concerning ethical issues in organ transplantation are organ trafficking and transplant tourism (Budiani-Saberi and Delmonico 2008; Akoh 2012; Bagheri and Delmonico 2013), both of which are driven by the gap in the demand and supply of organs, often in combination with social inequalities worldwide. Transplant tourism involves the movement of recipients and/or donors across borders to undergo transplantation surgery. Although transplant tourism does not necessarily pose ethical issues, the recipients are frequently well-off individuals traveling to developing countries where organ donation is poorly regulated by law and where they must provide significant financial compensation for the procedure. Tightly linked to transplant tourism is organ trafficking—an illegal trade of human organs. The most commonly traded organ is the kidney (Duguay et al. 2020), probably due to its bilateral nature, high demand on the organ market, relative ease of donor–recipient matching and relatively low impact on the donor's post-transplantation life, at least when done appropriately. However, both the recipients and the donors are often exposed to suboptimal medical conditions and an absence of proper long-term medical follow-up. Many medical complications may happen, and the risks of losing the transplant or even of death are several times higher for recipients receiving an illegal transplant compared to a regular one.

Organ trafficking often involves illegal activities such as the exploitation of vulnerable humans and is thus considered a form of human trafficking. Organized crime groups exist in many developing countries, in particular in North and West Africa. These groups operate the complex logistics required for transplantation—the recruitment of donors and recipients, the organization

of the entire networks of surgeons and other medical staff, and the running of the clandestine clinics and laboratories necessary for matching donors and recipients. Donors are usually the most vulnerable members of the population, such as those living in poverty, victims of other kinds of human trafficking, migrants, etc. They are sometimes coerced to donate their organs, especially if they initially accept the offer but later decide to opt out. Another problem is that even though these illegal transplants are extremely expensive—a kidney can cost up to US\$120,000—an inappropriately small amount of money reaches the donor, usually no more than 10% of the total sum. The high cost of transplantation, which must be covered entirely out of pocket, means these organs are acquired mostly by wealthy individuals, which violates equitable allocation principles and the prohibition of financial gain for organ donors. Even though organ trafficking is forbidden by international law, its eradication has proven difficult to achieve.

Xenotransplantation has its own set of issues (Dooldeniya and Warrens 2003). One of them concerns the generally shorter lifespans of animals relative to humans. For instance, a pig, which is commonly used as an organ source, lives only twenty-seven years on average, which means its organs may age at a faster rate compared to human organs. It is thus questionable whether such an organ could survive long enough to sustain a human recipient until death. Also, the transmission of animal diseases to humans might pose a problem. This can be addressed by growing an animal source in a pathogen-free environment. Finally, activists object to xenotransplantation due to violation of animal rights.

Stem Cells in Regenerative Medicine

Regenerative medicine is a relatively new branch of medicine aiming to enable structural and functional restoration of specific tissues in patients suffering from severe injuries and chronic disease conditions. Diseases characterized by the disruption of various tissues include spinal cord injuries, type 1 diabetes, Parkinson's disease, amyotrophic lateral sclerosis, Alzheimer's disease, heart disease, stroke, burns, cancer, osteoarthritis, and many others. The main approach of regenerative medicine in the attempts to treat these diseases is mimicking the natural mechanisms of healing injuries. Natural regeneration happens on the molecular, cellular, and tissue levels and includes the activity of stem cells, which can serve as source material for the replacement of lost or dysfunctional tissues.

Stem cells are the body's raw materials—unspecialized cells that can give rise to all other cells with specialized functions. Under the right conditions in the body or laboratory, stem cells divide to form more cells called daughter cells. During human development, and later, during aging, the number of stem cells and their differentiation potency generally declines. A newly fertilized egg or zygote is a totipotent cell with the highest differentiation potential. A zygote

divides to produce more totipotent cells, thus evolving into a blastocyst, whose inner cell mass is composed of pluripotent cells with somewhat decreased differentiation potential, meaning they can differentiate into a limited number of cell types. Further divisions and differentiation of these cells lead to generation of multipotent, oligopotent, and terminally differentiated cells with gradually decreasing differentiation potential.

Decrease in number and inactivation of stem cells with aging is called stem cell exhaustion (López-Otín et al. 2023). It represents one of the major hallmarks of aging and is one of the key reasons for the limited regenerative potential of human bodies. Previously, scientists believed stem cells were present only at some restricted locations in the adult body. For instance, it has been known for a long time that bone marrow is rich in hematopoietic stem cells, which serve as an active source of new blood cells throughout the lifespan. However, recent research identified stem cells in almost all organs. Stem cells exist even in the brain, meaning new neurons can be produced in adult individuals, thus enabling neural plasticity. They are, however, found only in specific brain regions, including the hippocampus, olfactory bulbs, septum, striatum, and spinal cord (Zhao and Moore 2018). Importantly, these neural stem cells, as well as stem cells present in other organs, are mostly dormant. Finding ways to activate them pharmacologically is one of the major challenges in regenerative medicine.

Stem cell research is crucial for the advancement of regenerative medicine. Potential applications of stem cells are tremendous, and they include basic research, toxicological studies, drug discovery, diseases modeling, and cell therapy (Mahla 2016). This research requires using animal- or human-derived material to generate the appropriate experimental models. Multiple types of natural stem cells could be used, including adult, perinatal, and embryonic stem cells (ESCs). Adult stem cells derived from adult organisms are limited in number and application potential. Perinatal stem cells collected at birth from the amniotic fluid and umbilical cord blood are relatively abundant and more potent than the adult stem cells. The most potent stem cells are ESCs derived from embryos. Human ESCs (hESCs), first isolated in 1998 by James Thomson, can give rise to more than 200 cell types. However, despite their potency, application of hESCs has both medical and ethical limitations (Lo and Parham 2009; King and Perrin 2014). One example of such medical limitations is stem cell therapy for patients with dysfunctional or missing tissue. Similar to organ transplantation, the ESCs might be rejected by the recipient due to insufficient immunological compatibility with the donor. This can be circumvented by donor–recipient immunological matching or by somatic cell nuclear transfer, where the nuclei of the recipient's somatic cells are transferred into the ESCs, making them genetically identical to the recipient, but with retained stem cell pluripotency.

The most serious ethical issue with hESCs is the necessity to destroy an unimplanted five-day old human embryo in order to harvest the cells. This issue

has caused one of the most heated ethical debates in the history of medicine. The main point of disagreement is the moral status of an embryo or, more specifically, whether life begins at conception, at later a time point during the uterine life, or at birth. While the proponents of hESC research argue that an embryo does not have any moral status, others are utterly against any use of hESCs since they consider an embryo to be a person whose rights need to be protected. Between the two extremes are those who claim that the moral status of an embryo is limited and that the benefits of using hESCs outweigh the harm. The attitude towards the embryos varies depending on the origin of embryos. While the opposition to using embryos generated specifically for research purposes is generally quite strong, aborted embryos and those that are unused by-products of fertility treatments are tolerated better, since they would otherwise be discarded. The delicacy of these issues triggered the need to introduce tight regulation of hESC research and application. Thus, hESC research has been subjected to guidelines stating a strict set of rules and criteria for permissible and impermissible categories of such research. Embryonic stem cell research oversight committees have been established. Statements regarding the use of stem cells have been introduced in almost all grant applications, and funding of hESC research is strictly controlled.

Other ethical issues related to hESC research include informed consent and confidentiality. Informed consent was introduced as part of the Nuremberg Code—a set of principles for any human experimentation established in one of the Nuremberg trials following the Second World War. For unused frozen embryos that remained after fertility treatments, informed consent is needed from a woman or a couple donating the embryo. A debate exists about whether consent should also be mandatory when embryos are deidentified before any further use or for embryos created in a laboratory from donated gametes. Confidentiality of donors is also important—they should be entitled to protection of their identity to avoid unwanted publicity and potential harassment by opponents of the stem cell research. Confidentiality agreements can be signed with the donors, in which cases appropriate measures must be introduced to prevent leakage of such confidential information. Security measures for protecting donors' identities include restricted access to the data, disconnecting storage computers from the internet, special background checks on the personnel that handle the data, etc.

One interesting case illustrating the ethical issues around perinatal stem cells happened in California in the 1990s. Parents of a girl affected by life-threatening leukaemia conceived through in vitro fertilization a second child as a source of bone marrow stem cells needed to save the life of their older daughter (*The New York Times* 1990). Although the newspaper story created a lot of public judgment, the action resulted in the rescue of the sick girl and a healthy and successful, now grown-up, donor sister (CBS News 2013).

Many of the ethical issues associated with hESCs have been circumvented by induced pluripotent stem cell (iPSC) technology (Moradi et al. 2019), which was established in 2006 by the Japanese scientists Kazutoshi Takahashi and Shinya Yamanaka (Takahashi and Yamanaka 2006). iPSCs are made from easily accessible somatic cells, which are then subjected to the process of in vitro de-differentiation in the laboratory to acquire stem cell-like properties.

A common source of the material for the production of iPSCs is terminally differentiated skin fibroblasts, or blood cells. These cells are subjected to a de-differentiation/reprogramming procedure, which reverts them back to their pluripotent, undifferentiated state. This is achieved by a set of pluripotency-associated transcription factors called Yamanaka factors. The introduction of these factors into cells was initially done using lentiviruses or retroviruses as Trojan horses to deliver genetic information for the production of Yamanaka factors into the host cells. These viruses can insert their genome into the host cell genome, thereby enabling stable production of the desired proteins (in this case, Yamanaka factors) by the host cells. However, since this insertion into the DNA is random, it can disturb the natural order of nucleotides in the host DNA, leading to mutagenesis in the recipient cell genome. Therefore, safer strategies for the delivery of Yamanaka factors into cells has been developed (Um 2012). These include episomal DNAs, adenovirus, Sendai virus, PiggyBac transposon, minicircles, recombinant proteins, synthetic modified mRNAs, or microRNAs.

iPSCs can be transformed into various terminally differentiated cells. Protocols have been developed for the differentiation of iPSCs into almost all cell types and subtypes, which usually takes several weeks of treating the cells with appropriate agents under laboratory conditions. Laboratory production of terminally differentiated cell types that are genetically identical to the genuine but inaccessible patient's cells offers opportunities for personalized medicine approaches to studying and treating such patients. For instance, if a patient suffers from a neurodegenerative disorder such as Parkinson's disease, it would be of great value to study their dopaminergic neurons affected by the disease. This is, however, not possible, since extracting dopaminergic neurons directly from the patient's brain would require surgically opening the skull and operating on the living brain, which could jeopardize the integrity of the brain tissue. iPSC technology enables the production of dopaminergic neurons from the patient's easily accessible skin cells; these iPSC-derived neurons can then be used as a proxy for the authentic patient's neurons. Studying such neurons could provide information about patient-specific disease features, and testing various drugs on them could identify the most promising drug candidates for a given person. iPSC-derived neurons originating from a patient's tissue represent a superior disease model over previously used neurons obtained from animal models of a disease.

Another illustration of the iPSCs' value is the possibility to replace deteriorated tissues with grafts generated from the appropriately differentiated patient-derived

iPSCs (Mahla 2016). In such an approach, the risk of immunological rejection of the graft would be minimized, since the iPSCs originate from the recipient tissue. This strategy is especially promising in cases of tissue degeneration caused by genetic mutations. Such mutations could be corrected in the iPSCs, which would then give rise to a healthy graft. Indeed, correction of genetic defects in the iPSCs represents one of the most exciting scientific achievements in the last couple of decades (Jang and Ye 2016). Several genome editing tools, such as zinc-finger nucleases, transcription activator-like effector nucleases, and clustered regularly interspaced short palindromic sequences (CRISPR) enable targeted correction of point mutations directly in the iPSCs. CRISPR-Cas9 system is currently preferred genome editing technique due to its low cost, high accuracy, and easy handling. It is an adaptation of a natural bacterial mechanism to destroy the genetic material of foreign, invading sources such as the viruses. CRISPR-Cas9 functions like a sort of molecular scissors where guide RNA recognizes the desired sequence in the cellular genome and guides Cas9 to that location in the DNA. Cas9, an enzyme specialized for cutting both DNA strands, cuts the DNA exactly where the editing should happen. Once the DNA is cut, natural DNA repair mechanisms are activated and introduce a desired change in the DNA in the process of fixing the damage.

Obviously, genetically corrected grafts can replace only a small part of the body. Since most cells in the body have the same genetic material, i.e., they carry the same inherited mutations, this strategy is only meaningful in cases where genetic defects have consequences restricted to a specific tissue. This is indeed often the case. For instance, there is a disease-specific selective vulnerability of a specific type of neuron in many familial forms of neurodegenerative diseases: dopaminergic neurons in the basal ganglia are affected in Parkinson's disease, motor neurons in amyotrophic lateral sclerosis (ALS), striatal neurons in Huntington's disease, etc. (Fu et al. 2018).

Although iPSCs are less controversial than hESCs, there are still many medical, ethical, legal, and social issues associated with iPSC application (Moradi et al. 2019). While the most serious obstacle to using iPSCs in vivo is their tumorigenicity upon injection (Lee et al. 2013), other issues are also not negligible. For instance, for the application of clinical-grade cells in humans, it would be necessary to standardize manufacturing conditions and the characterization of such cells, which poses a challenge when working with biological material. Furthermore, since these cells are derived from humans, concerns exist regarding the handling of genetic material and confidential personal information. Similar to organ donations, informed consent is needed from the donors. Nevertheless, since the iPSCs can be maintained in the laboratory for a long time, it is impossible to predict all future applications of these cells and hence give complete, accurate information to the donors. This may prevent donors from having full control over the fate of their cells in the long run. Genetic manipulations of the cells

carry potential hazards and are ethically debatable. Furthermore, when iPSCs are used in basic or applied research, a question arises regarding intellectual property and patents, as well as the profits this research or application may bring.

Finally, since the production and maintenance of all stem cells entail significant costs, social justice could be violated if the benefits of stem cell technology become accessible only to a small, wealthy portion of the human population (Yap 2016). Such potential inequality in opportunities among patients should be prevented by policymakers.

Conclusions and Summary

Biomedical research and clinical practice have made tremendous progress in the past several decades by developing organ transplantation and stem cell technology as tools of regenerative medicine. Although significant medical and ethical issues around these approaches still exist, awareness about these issues is quite high. Much effort has been invested in resolving these issues. This has been achieved mostly by introducing legal measures and research control, improving existing technologies, and developing new ones. These efforts have realistic chances to allow the evolution of these approaches into safe and powerful tools that will improve the quality of life, resulting in increased healthy longevity and reduced suffering of humans.

In summary, this article presents current biomedical approaches to replacing missing or dysfunctional tissues or entire organs, including organ transplantation and stem cell technology. Emphasis is placed on ethical considerations around these approaches and the weighing of their benefits and drawbacks. The following key points have been presented or discussed here.

- Organ transplantation is the replacement of a missing or dysfunctional organ by an organ from a living or deceased human donor or animal source, or by an artificial organ. This surgical procedure can extend the life span, increase the quality of life, and decrease the health care burden.
- Issues around organ transplantation can include medical risks and multiple ethical issues. Medical risks can arise due to surgery complications or, later, potential immunological rejection of the transplanted organ by the recipient's immune system. Ethical issues include a gap between the demand and supply of organs, equitable allocation of organs, exploitation of vulnerable populations in developing countries, and informed consent.
- Stem cells are undifferentiated cells that can divide and differentiate into any cell type. They represent a promising tool of regenerative medicine due to their tremendous application potential in basic research, disease modeling, and laboratory production of grafts that can replace missing tissues in patients. Various types of stem cells exist, including perinatal, adult, ESCs, and iPSCs.

- hESCs are derived from a pre-implantation human embryo and can give rise to almost all other cell types. To extract hESCs, it is necessary to destroy the embryo, which is why their use has become one of the most debated ethical issues in modern biomedical research.
 - iPSCs are stem cells produced in a laboratory by reprogramming somatic cells. Such cells are similar to ESCs, with the added value of reduced ethical issues and potential application in personalized medicine. They can also be genetically corrected using various genome editing tools.
 - Issues around iPSCs include the standardization of manufacturing conditions for human application, confidentiality issues, informed consent, genetic manipulation of the cells, intellectual property, and patents.
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Gene Editing Technology and the Human Gene Pool

Gayle E. Woloschak, Professor of Radiation Oncology and Radiology, Northwestern University, Chicago, IL, USA, gayle.woloschak@gmail.com

This article explores the implications of gene editing technologies, particularly focusing on medical applications and future possibilities. It also discusses approaches to gene editing, beginning with plant manipulation up until modern day, when CRISPR is being used. One limitation of gene editing considered is that gene editing technology is capable of being used to manipulate the human germ line such that the gene pool can be permanently altered. While approaches for studying effects of genetic manipulation on a single individual are possible, genetic effects that span multiple generations would be outside the realm of the standard scientific work of today and would require new approaches and new considerations.



Introduction

This article provides some reflections on questions around gene editing technologies. For this, I discuss genetic modification, which involves any process where genes are modified, either randomly by chemicals or by radiation, with specific attention to gene editing. The focus is predominantly on the gene editing technology ongoing in the medical community and the gene editing we could see in the future, including whether we should do it and if there should be limitations to its use. I consider gene editing or genetic engineering to be any technology that allows for the modification of genetic material from its natural form.

Should we do genetic modification? We already do. Among the first applications of genetic modification was the development of genetically modified crops, first produced in the 1920s using radiation and chemicals to cause genetic modification and then selecting those plants that had the desired traits (often resistance to a particular infection). As technology developed, relatively crude approaches could be used to create specific modifications rather than random generation with the selection of traits one desired. Similarly, agricultural methods for beef and pork found that conventional breeding choices already produced the meatiest animals possible and further modification was not useful. Attempts to use genetic engineering to enhance the results for beef and pork production were not beneficial compared to the conventional technology.

Should we do genetic engineering? We already do this as well (National Academies of Science, Engineering, and Medicine 2017). Technologies that came about from the use of proteins called restriction enzymes isolated from bacteria allowed for the cutting of DNA at distinct locations; what was random in the past could now be designed. For example, recently, genetic engineering approaches have been used to develop plants and crops that are resistant to certain physical stresses, such as droughts or heat, and designed to survive hostile environments. This allows for crop production in circumstances where food may be limited. As a result, gene editing (used to produce genetically modified crops) may help feed populations that might not otherwise be able to raise sufficient food. While this has been considered somewhat controversial in some areas of the world, genetically modified crops have been in use for decades and have solved some world hunger problems (Center for Food Safety and Applied Nutrition 2023).

While conventional breeding had already produced cattle and bovine that were ideal for consumption, this was not the case with fish, where breeding efforts have not been as extensive. When genetic engineering approaches provided fish genomes with additional growth hormone genes and other genes that improved growth, bigger and meatier fish were possible. In fact, some North American states (Minnesota, for example) sought to improve fishing tourism by stocking lakes with very large fish genetically engineered.

Somatic vs Germ Cell Engineering

Somatic cells are those cells that make up the body, and germ or germ line cells are eggs and sperm that lead to offspring. Much has been done in both somatic and germ cells of nonhuman species using techniques that are error-prone and inefficient. In some examples, lab animals have been used to examine research questions about how genes are turned on and off in tissues, how particular genes function in disease and normal situations, what gene changes affect function, and more (Hall et al. 2009). Often, gene editing is used as a tool to produce certain proteins needed for human treatments. For example, in the past, humans with diabetes were given insulin derived from pigs and other animals; eventually, some of the people who received these treatments became resistant to the insulin and it could no longer be used. There was a need to generate human insulin in large quantities, and so gene editing was used. Germ line DNA of cows (from cow eggs) was modified to contain human insulin driven by a piece of DNA that allows for production of the protein in cows' milk. When the cows are milked, the milk contains large quantities of insulin and can be purified for use in humans (Khodarovich et al. 2013). This allows humans to have human insulin to help treat diabetes. This technique is used to produce countless other proteins in many other organisms, from bacteria to mammals. When proteins are labeled as being "recombinant," they were usually produced using this type of gene-editing approach (Woloschak 2014).

The first genetically modified mammals were mice developed in a laboratory in 1974 (National Research Council 1994) in an effort to understand how genes are regulated (i.e., how they are turned on and off in particular cells). These were genetically engineered to contain a DNA sequence in particular tissues that made the animal glow in the dark. The work helped scientists understand how and when in development particular genes are expressed. This was revolutionary for its day. It is now considered a routine approach used in labs to examine the effects of various types of genetic changes on function and to understand how different genes with different characteristics are regulated. Like much technology, this method has developed from being difficult and complex to achieve to being a routine and mundane procedure. Initially, the work could be done in only a few labs in the world; now, it is routinely done in most molecular biology laboratories.

Gene Editing in Humans

Should we do gene editing in humans? We already do this too. All techniques currently approved for use in humans involve the use of somatic cells, i.e., those cells that make up the body, not the germ line cells that would be passed on to offspring. To date, most gene editing in humans has been used to treat single gene deficiency diseases, which are usually in a single cell type that can be modified. This actually represents a very small number of human diseases that have a genetic component. Most complicated diseases like coronary heart

disease, cognitive disorders, or diabetes have multigenic causes; therefore, approaches to gene editing to repair those abnormalities require information and technology not currently known. In addition, most gene editing approaches have used gene replacement and not modification of an existing gene (more on this later). The concept behind this approach is that if a gene is defective, the way to remedy it is to just put in the correct gene, not to try to edit the defective gene already in existence. Technology to edit the existing gene has been limited and difficult and was done employing older technologies of gene editing before the development of CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) and other methods (discussed later).

So why would one want to pursue the development of a genetically modified human being? There are genetic diseases that can be cured by the transfer of a single gene. These are genetic disorders where only one gene is dysfunctional, and thus replacement of that one gene allows for the complete correction of the problem in the person. An example would be children who have been born without an immune system and are placed inside bubbles to keep them from catching infections they cannot fight and that will be fatal for them. These children have been treated with a single gene engineered into a virus that contains the correct gene, and that gene lives alongside the altered mutated gene sitting in the child's genome. This common approach toward gene editing has some risks, but often it is used to treat a disease that is nearly fatal; therefore, the benefits outweigh the risks. These and other somatic cell modifications have been successfully attempted for a variety of different conditions, including cancer, hemophilia, certain types of blindness, and others. There are only a few genetic diseases caused by a single gene in a single cell type that can be addressed using this technology. New approaches are needed for multigenic diseases (such as diabetes) and diseases that affect multiple different types of cells in the body (Duchenne muscular dystrophy, for example).

Based on the fact that most genetic diseases fit into these categories of being either multigenic or affecting multiple cell types in the body, a significant question for humans is: Should we do gene editing in germ line cells (the eggs and sperm) so that all the cells of a person would be corrected for the problem? Until now, gene editing has not been used in human germ line cells due to concerns about the introduction of a genetic change into a person that could be passed from generation to generation and live in the human population forever. In addition, earlier technologies before CRISPR had limitations.

Prior to the development of genetic engineering, physicians employed the broad field of genetic testing and genetic counseling. This approach was initially used to confirm a suspected diagnosis of a disease, to predict the possibility of future illness, and for prenatal diagnosis. With the expansion of uses of genetics beyond testing and into therapy, genetic counseling has become even more critical. Degrees in genetic counseling are now offered by many universities in an effort to provide a workforce that is educated in the techniques and information of

molecular genetics. These counsellors are trained to explain the complicated nature of genetic disease, provide approaches to mediate and facilitate treatment among family members, and to help people prepare for future decisions. In addition to professional genetic counseling, pastoral counseling may be of great benefit to the patient and the family; one would anticipate that pastoral counseling would provide an opportunity for the patient to express concerns, but also help them cope with results, particularly if they are difficult, and aid in discussion about long-term consequences. Improved communication and collaboration among pastors and health professionals could facilitate this work. This becomes especially important as the number technologies increases the decision points in people's lives.

How CRISPR Changed Gene Editing

About a decade ago, the technology called CRISPR was discovered as a type of defense in bacteria that allows them to fight off infection. Investigators quickly learned that this could be used to cause efficient changes in a genome with few off-target effects. (Off-target effects occur when the gene that is not of interest is modified.) While CRISPR was identified in bacteria, it has been used in mammalian cells with ease (Adli 2018). One can imagine the difficulties if, in addition to correcting the mutated gene, a large number of unexpected genetic mutations were introduced at the same time. CRISPR is a protein-nucleic acid complex that can be used to snip DNA at a precisely determined location without causing changes anywhere else in the human genome. With billions of possible addresses for DNA cutting in a genome, CRISPR advances genome editing significantly; it is more accurate than other DNA cutting tools and also has the ability to be shut off (Marraffini et al. 2010).

CRISPR functions by targeting a gene sequence that is approximately twenty bases, or nucleotides or letters of the DNA, long; often, a sequence of twenty bases is unique in the genome. Because of that, one gene will be targeted and no changes introduced in any other genes. Off-target effects are minimized if not totally eliminated by the use of CRISPR. In addition, multiple CRISPR structures have been identified that have slightly different properties. This allows for modifications in how we use CRISPR proteins-nucleic acid complex (Schaefer et al. 2017; Blattner et al. 2020).

Human Gene Pool

Also important to this discussion is the human gene pool. A gene pool refers to the combination of all the genes present in a reproducing population of a species. The human gene pool contains all the genes that could ever exist in the entire human population that are capable of reproducing. A large gene pool has extensive genetic diversity and is better able to withstand environmental changes than a small gene pool. For example, in tiger species where there is little diversity among them, one or two infections can wipe out a large number of the population. A large gene pool is important to enhance the survival of a species, particularly

when faced with environmental challenges. It should be remembered that the gene pool refers to those genes in reproductive or germ line cells and not in somatic cells; thus, when modifications are made to somatic cells, those changes will not be passed onto the offspring, but when modifications are made to germ line cells, they will be passed on to the offspring for generations in the future.

The makeup of a population's gene pool can change naturally overtime through the process of evolution. This can occur by a variety of mechanisms, including natural selection, mutations, and genetic drift. The result is a gene pool that is altered to be attuned to the needs of the population's particular environment. Humanity's past gene pool contributes to the gene pool of today, and today contributes to tomorrows. Changes in the gene pool made in the past will be reflected in today's gene pool, changes in germ line gene frequencies will change the gene pool, perhaps in small ways at first, but possibly in larger ways in the future. At the moment, it is impossible to predict the impact of how interfering with humanity's gene pool will affect humanity in future generations. In general, alterations in a somatic cell genome will cause changes to that individual but will not be passed on to the offspring, and thus pose no danger to the integrity of the gene pool.

One concern with genetic manipulation of human eggs and sperm is the hubris that claims scientists can predict the impact of modification of the human gene pool for even one gene much less the many genes that would be required for gene editing of the more common multigenic diseases. Only very small components of gene function are known, and this knowledge of course changes over time as more is learned about a particular disease and a particular gene. Only for the simplest of genetic situations do we understand the impact of gene changes in somatic cells. In addition, many genes have multiple functions, and even if we know one, we may not know them all.

The example of sickle cell anemia/thalassemia demonstrates how little was understood even a few years ago. People with two mutant copies of the sickle cell hemoglobin gene die of sickle cell anemia/thalassemia. People with two normal copies living in Africa or the Mediterranean, where malaria is endemic, are very susceptible to malaria and often die of it. But in regions where malaria is endemic, people with one normal copy and one mutant copy can survive malaria and do not die of sickle cell anemia thalassemia either; there is a strong relationship here between environment and ecology that makes malaria a selection factor for one copy of the sickle cell gene. Without the sickle cell gene, humans would not have survived malaria and could not have made it "out of Africa" (de Lange 2011). Nevertheless, sickle cell anemia in North America today is thought of only as a "bad gene" to be removed from the human population. We do not appreciate its role in helping fight malaria in Mediterranean and African populations. This is an example of a "bad" gene that serves an important function in the human gene pool. Its elimination could have significant consequences for humanity.

There are other examples of “bad genes” with “good functions.” When mutated, the BRCA1 gene is associated with the development of breast cancer, which is how it was named. Nevertheless, there are some data that support the idea that women with one copy of the mutated (“bad”) BRCA1 gene and one copy of the “good” gene have increased fertility (Kwiatkowski et al. 2015). Genes associated with Alzheimer’s, which is a very complex disease, may have protection against kidney damage. Angiotensin converting enzyme genes are associated with living to an old age but also with heart disease and, more recently, poor survival from COVID-19.

The context here is that genes can be good or bad depending on the tissue, the time when they are active, the presence or absence of other genes, the sex, the life history of the person, and much, much more. For multigenic traits, even such things as a virus infection at a particular age or exposure to an environmental toxin can influence whether disease results or not; most disease is not simply genetic. It is a combination of genetics and environment. In addition, some health issues we call disease may really be variations of normal, as exemplified by the sickle cell trait, which actually allows for improved survival from malaria.

For humanity, there is a strong desire to eliminate suffering, and this too is something that must be considered here. We can imagine eliminating diseases like Duchenne’s muscular dystrophy, which leads to severe muscle breakdown by a young age (see, e.g., Chen et al. 2022); Parkinson’s Disease, which leads to neurological breakdown (see, e.g., Rahman et al. 2022); Tay-Sachs disease, which leads to death by three to five years of age; or Huntington’s disease, which leads to death between the ages of ten and twenty-five years. Some of these are single-gene disorders and could be corrected using straightforward approaches; the problem is that they must be corrected at the level of the embryo since multiple different cell types in the body become affected by the disorder. Muscular dystrophy cannot be corrected only in somatic cells because there are so many somatic cells affected by this single gene that not all could be corrected to prevent the disease development. In other examples, multiple genes are involved, and correction of all of them in the germ line would be required to prevent the genetic problem (Sivakumaran et al. 2011).

Treatment of serious neurocognitive disorders can also be considered in this therapeutic approach, but here even more complicated situations might arise. The genes associated with neurocognition may also be important in personality development. It is possible that in modifying the many genes associated with schizophrenia, for example, may produce results that affect the personality development of the individual; determining whether this has occurred would be very difficult to monitor since personality is not easily subjected to examination.

If we have the ability to cure these diseases and do not use our energy to do so, what can we think about ourselves? Alternatively, some suffering is unavoidable. It needs to be accepted and even embraced.¹ How do we work through the balance of when to treat and when not to treat? An overarching

consideration for all of these questions is economics; in some examples, treating or even curing a long-term disease may be less expensive than providing medical care through the duration of an illness for a debilitated patient. Yet, it is also likely that gene editing technologies will be expensive and available to only a few, thus enhancing the distance between the “haves” and the “have nots.”

Ethics of Human Experimentation

In the 1940s, concerns arose about the dangers of human experimentation. Many countries had performed experiments on populations without their permission. The United States is noted for exposing African American populations to syphilis, not telling them about it, reporting their symptoms, and never treating the disease. The Nazi regime conducted large numbers of experiments on human prisoners and underrepresented populations, including parachute testing, drug testing, studies to determine how different ethnic groups withstand infections, and more, all done without the consent of the population studied. When these atrocities came to light, medical populations collectively considered approaches to safeguard and protect people from such unapproved experimentation. As a result, panels to examine the ethics of human studies were developed in most major countries of the world (Woloschak 2020).

At this point in history, ethical concerns for human subject considerations are governed by institutional review boards (IRBs) that safeguard the patient and protect him or her from harm. In the United States, no experiments can be done with humans (from simple surveys to the administration of drugs to genetic modification) without first going through a series of complicated approvals and meetings to ensure the safety of the human subject is protected. This has also been developed strongly in Canada and most western European nations; approaches similar to IRBs are used wherever human studies are performed. Most IRBs in the United States are managed by hospitals, which have committees including members of the general public, clinicians, researchers, lawyers, and others all trying to discern whether a particular treatment is in the patient's best interest and whether it will contribute to scientific or medical understanding as designed. No human study can be initiated until an IRB has been approved for the work.

As noted, the purpose of an IRB is to protect individual human subjects, but who is responsible for protecting the human population and the human gene pool? IRBs do not consider anything except the individual patient. How do we balance saving individual lives and suffering with a potential risk to the human gene pool? When can we be certain the risk is low? It is clear more reflection on potential damage to the human gene pool and the human population at large is needed prior to even considering genetic manipulation of germ line cells, which will affect the human gene pool forever. Finally, most studies of effectiveness of a particular therapy involve studies of at most ten or twenty years. For gene pool studies, studies would need to be initiated to examine humans through multiple generations, an approach the scientific community has rarely attempted.

Which Genes to Edit?

A further question that has become important when considering editing the human genome at the level of eggs and sperm is the fact that some genetic engineering could be done for frivolous reasons. There are already examples of the selection of babies for IVF that have particular traits such as blue eyes and blonde hair; originally, this approach was used in order to select against offspring that might have or carry a particular unwanted genetic trait. Later, this technology was exploited to include designer babies that could have features the parents wanted. This is done in vitro so that only those embryos with the selected genes are implanted into the womb of the expected mother; generally, the selection has been made based on whether particular desirable proteins are present in the embryo.

In this example, the technology previously used to prevent disease was further expanded upon (usually for a large fee) to select for babies that have desired features (rather than undesired diseases). In the same way IVF technology has been exploited, so is it possible to turn around gene editing technologies. First, they will be developed to prevent certain diseases, but later, the approach can be expanded to include other, less damaging but perhaps also undesirable, traits. What might start out as a treatment for muscular dystrophy or Tay Sachs disease could later turn into eliminating left-handedness or introversion, for example. Are these appropriate uses for gene editing technology? If one considers that there may be some risks associated with it (for example, affecting the human gene pool), then taking the risks to eliminate disease might be a much greater priority than using the technology to select for babies that are, for example, right-handed or are very tall. It should also be noted that this technology is very expensive, at least at this juncture, and it is likely that more opportunities for genetic engineering would be available to those who can afford it rather than the broad population.

With the elimination of disease becoming a goal of gene editing technology, neurocognitive disorders and psychological diseases are likely to become a major target for attempted therapies. These disorders are debilitating and heartbreaking for those involved. Schizophrenia, for example, is a disabling psychological disorder that is associated with at least 108 different genes (Trifu et al. 2020). Like schizophrenia, most neurocognitive disorders in general are complicated and involve the interaction of many genes, in some cases with environmental factors. Efforts made to identify their underlying pathology have been confusing and complicated. In my opinion, this type of tampering brings science dangerously close to altering the human personality if not the human person, since many of these genes appear to play roles in personality development. One could imagine how tampering with the schizophrenia-related genes in an effort to eliminate psychological diseases might have a dubious effect on the human population, since most of these genes are multifunctional and have broad-ranging impacts. How would humanity know where to stop once this has begun, since effects on the human population as a whole may not be realized for several generations?

Concluding Thoughts

Applications of gene therapy from the genome of somatic cells into germ cells come with a new set of considerations that have implications for the future of humanity. Changes made in germ line cells can lead to irreversible changes in the human gene pool with implications for the future of humanity. Current methods of ethical review do not examine long-term effects and scientific approaches for the consideration of future consequences. These changes cannot be tested in a research system that tests for years instead of generations.

There are also concerns about how genes would be selected for germ line editing. For diseases that have a one-gene cause, this could be determined in a straightforward way. For multigenic diseases like diabetes or coronary artery disease, the genetic modifications could be quite complicated and could have effects other than those predicted by the modification itself. These effects might limit the use of the technology for germ line cells. Pushing this issue even further, the treatment of neurocognitive conditions could lead to even more complicated problems, such as changes in genes that affect personality and awareness.

For both reasons, the potential risks associated with this work may be significant, and a renewed discussion on the ethics is required from alternate perspectives to gain insights into approaches for the future. Decisions about moving technology require wisdom, not just “knowledge,” and discernment, not only “awareness.”

Some of this dialogue is ongoing in the Christian community already, with commentaries on both sides of the gene editing debate. What can the Orthodox offer to this dialogue? The Orthodox have a unique understanding of personhood and what it means to be a human person. Reflections on gene editing in light of the human person would be important, especially considering the possibilities of it affecting psyche and personality. Orthodox are also capable of having a balanced view toward science that examines it not only as a tool to be used for human purposes but also as a gift from God and a means of asking questions that challenge humanity. For Orthodox, it is not always about getting to an answer but also how the journey is made to get to that point. For gene editing, answers alone are important but perhaps not sufficient for a deep understanding; how we get to those answers will help to drive questions in the future.

As Metropolitan Anthony Bloom has written: “Our task is not merely to imitate what was done by the saints of previous eras, but somehow to appropriate at a much deeper level the way in which they engage their own historical environment, seeking to respond as they would have responded had they lived in our day.”

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Note

- ¹ Some studies on Japanese A-bomb survivors have examined the parents, children, and grandchildren of those affected by the bombs at Hiroshima and Nagasaki. These studies are complicated by the fact that people move around and are hard to trace (see Okubo 2012).

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Dependency as Ontology: Eastern Orthodox Reflections on Disability, Dependency, and Care

Katherine Karam McCray, Research Fellow, Trinity College, University of Toronto, Toronto, Canada, kate.mccray@mail.utoronto.ca

One of the fundamental hurdles for both Christian theology and medical ethics is characterizing disability as an aspect of human experience rather than a deviation from it. Anthropologies that anticipate a fixed subject articulate disability through the lens of pathology, alienating disabled experiences from what it means to be human. Pulling from the social theory of disability, I argue that wellbeing in Eastern Orthodox theology is characterized not by independent performative attainment but through mediated dependency. Eastern Orthodox theological anthropology organizes human dependency around passibility, an innate vulnerability that includes the ability to be acted upon as well as to suffer. Human nature comes packaged with material and social contingency. Christ's passibility provides a moral framework through which extended states of dependency do not derive from sin or failure but rather serve as an example of quintessential human nature. Ontological dependency reframes persistent need, inviting persons who have been underserved and undervalued into a more inclusive model of human nature.



Representing variable bodies and variable needs in care contexts can be a challenge for scholars and clinicians alike. Where ability-centric definitions of the body tend to represent wellness as aligned with ability, the healthy body is assumed to contain certain requisite capacities and capabilities. In such definitions, disability is correspondingly represented as a deficit of those requisite abilities, not as an example of human variety. However, disability scholars emphasize that such assumptions push people with disabilities to the margins, handling variable bodies as afterthoughts rather than as integrated members of a diverse population. In contexts where the goal of care is to enable independence, people who experience extended states of dependency may be represented as experiencing diminished quality of life stemming from their material impairments rather than as a result of a system that marginalizes their lived experiences and chronically underserves disability communities.

Drawing from both critical disability studies and disability theology, I discuss the development of ontological dependency in disability studies and the ethics of care, arguing that support for universal human dependency can be found in Eastern Orthodox¹ theological anthropology such that human beings are expected to depend upon social and material supports at every stage of life. Dependency as a core trait is not related to sin or a degraded way to be human, but instead represents a central aspect of human relationality. I argue that dependency is not a provisional human state but instead an ontological feature of human nature common to all human beings. Furthermore, I argue that recognizing universal ontological dependency provides the basis for reconsidering how models of medical and spiritual care support the wellbeing of persons with variable or extended needs, especially persons with disabilities.²

In Eastern Orthodox theology, dependency upon one another figures dependency upon God and is thusly related to the transformative capacities of the human being in relationship with the divine. By amplifying Eastern Orthodox approaches to human dependency, I intend to bolster arguments for dependency-centered Christian bioethics by pointing to the ancient traditions of the Christian movement. Dependency as human ontology provides an alternative to individual autonomy models in health care and law, which may compromise the vision of the person who requires extended supports. However, by regarding variable dependencies as expected features of human embodiment, we may better anticipate the diverse needs of changing bodies and consider those needs as elements of common human variety across the lifecycle.

How we imagine health parameters directly impacts communities' access to health supports. Cultural competency and cultural literacy are increasingly recognized as factors of care in clinical contexts and impact a patient's overall wellbeing. Physicians who understand the lived experiences of patients and their cultural contexts give more attention to nuance and variability in patient narratives than those who misidentify cultural markers as signs of resistance to treatment

or as predictive of poor health outcomes (Whitley 2012). For example, during the height of the COVID-19 crisis, disability advocates reported concern that disability communities were being unfairly triaged, disproportionately assessed to be in poor health as a result of non-progressing, static disabilities. Haben Girma, a Deaf-Blind human rights advocate and legal theorist, explains how unfamiliarity with the Deaf-Blind community results in people being separated from their communication devices while in hospital and silenced in their own medical decision-making. Lack of disability cultural competency on the part of physicians meant members of the Deaf-Blind community were denied potentially life-saving treatment because their disabilities were identified as comorbidities rather than as elements of material diversity, like race or gender (Wright 2020).

Disability scholars have long highlighted that medicine functions as a conceptual window into the social imagination of the body. How a society imagines medicine to function reveals what that society believes about good and proper bodies—for example, that a healthy body comes with certain requisite abilities as the baseline for human nature, and that the goal of medicine in this social imaginary is to restore the body to its natural, abled state (Garland-Thomson 2009, 31). Tobin Siebers (2008, 9) examines this social “preference for able-bodiedness” as a function of what he terms “the ideology of ability,” an ideological belief of ability as a natural good that underwrites and pervades the construction of material and social systems. The preference for ability influences the way a society constructs material realities and the degree to which it prepares for variability in the population. Privileging ability as a natural good correspondingly shapes disability as unnatural, harmful, and anomalous. The association between disability and deficit or disease invites what disability social theory calls “the medical model of disability,” or the definitional category that handles disability as a pathology to be treated and cured rather than as a feature common to human life (Siebers 2008, 25).

Framing definitions of disability, Mike Oliver describes two models, functioning as the lay definitions of disability. The medical model of disability defines disability as deficit, as a lack of ability to be remediated curatively. The “social model of disability,” which Oliver (1990, 13) pioneered in the context of the British disability rights movement, instead detaches impairment from disablement, examining how bodily impairments are meaningfully separate from the social and moral meanings assigned to them. The social model of disability is intended to answer for the disablement created by the medical model by orienting societies toward the ways social beliefs manufacture gaps in accessibility and facilitation. In Oliver’s (1990, 35) work, disablement has “nothing at all to do with the body” but rather everything to do with the society’s devaluing of disabled lives.

In the first edition of *The Politics of Disablement*, Oliver (1990, 78) originally termed his medical model of disability the “individual model of disability.” The individual model for disability, he explains, treats impairments as the cause of social isolation, pain, suffering, and poor quality of life, as if the individual’s body itself is the cause of negative life experiences. The medical model “locates the problem of disability within the individual and secondly it sees the cause of this problem as stemming from functional limitations or psychological losses which are assumed to arise from disability. These two points are underpinned by what might be called ‘a personal tragedy theory of disability’ which suggests that disability is some chance event which occurs at random to unfortunate individuals” (Oliver 1990, 3). This model associates impairment with negative wellbeing and suffering without examining how disabling social structures and lack of access create structural isolation for people with disabilities. Siebers (2008, 26) explains the individuality of the medical model as relating “disability as a property of the individual body that requires medical intervention.” Although disability advocates contend that disability ought to be regarded as a group to which civil rights are afforded—and indeed the Americans with Disabilities Act is structured using other civil rights legislation as its precedent—“this analogy almost always fails because racism and sexism lead easily to political action based on the recognition of a particular advocacy group, while discrimination against a person with a disability seeks the same kind of solution used in healthcare and rehabilitation” (Siebers 2008, 46).

Those solutions are individual, targeted toward the body, aimed at curative measures and isolated actions instead of regarding the needs of people with disabilities collectively and systemically. Siebers relates the medical model of disability to the individualized and isolated approach to accessibility. Rather than handling accessibility concerns as a systemic problem, the medical model “designs an individual remedy that addresses one person’s particular problem or a small subclass of problems” (Siebers 2008, 45–46). Solutions trend toward a case-by-case basis: “If a wheelchair user cannot enter a restaurant, the restaurant need not be made accessible; two waiters can lift the chair through the door, providing individual attention and an individual solution. A local street sign may designate the presence of a deaf child in the neighborhood, supposedly protecting the child but also eliminating the need to develop universal forms of accessibility” (Siebers 2008, 46).

The medical model of disability does not describe medicine as it ought to be, but instead demarcates a space of medical bias where the bodies of people with disabilities are viewed mechanistically and disability is considered a flaw of the body rather than a mode of variable embodiment experienced by roughly a quarter of the human population (Centers for Disease Control and Prevention, n.d.). Siebers (2008, 6) describes the ideology of ability operating in the practice of medicine and its social imaginary: “The pathologization of other identities by

disability is referential: it summons the historical and representational structures by which disability, sickness, and injury come to signify inferior human status.” However, while other minoritized groups have gained significant civil rights in the last century, disability “marks the last frontier of unquestioned inferiority because the preference for able-bodiedness makes it extremely difficult to embrace disabled people and to recognize their unnecessary and violent exclusion from society” (Siebers 2008, 5–6).

At the heart of the medical model of disability is a laudatory regard for independency and individuality, that the partial goal of medical intervention would be restoring individual autonomy and thereby improving individual quality of life. The ideology of ability is supported by conceptual associations between ability, individual autonomy, and wellness, such that a significant portion of the Western philosophical tradition represents human nature by nesting those qualities inside one another. Martha Fineman describes what she calls “the autonomy myth” by defining the mutually dependent terms involved in describing autonomy. She lists the dictionary definitions for several nested terms to show the ways they require one another—for example, the definition of autonomy is “independence or freedom, as of the will or one’s actions . . . the condition of being autonomous; self-government or the right of self-government: independence” (Fineman 2005, 8). Accordingly, Fineman (2005, 8) glosses independence, which is defined as “not influenced or controlled by others; thinking or acting of oneself . . . not depending or contingent upon something else . . . not relying on another for aid or support.” In this way, autonomy is defined by independence, independence by lack of support or aid. By defining terms, Fineman highlights that what is described as natural to the human being via autonomy and independent moral decision-making is conventionally regarded as the antithesis of dependency.

If the good human life is one that is autonomous, self-securing, and independent, then quality of life is assumed to be attached to these descriptors as well, meaning that the goals of social supports ought to be support toward greater independence rather than dependency upon welfare aid or other supports (Fineman 2005, 53–54). Applied to disability, the centrality of individual autonomy means that even systemic solutions that account for accessibility and enhanced quality of life ought to facilitate non-reliance upon those solutions over time. In this way, even systems that might display interdependency like the inner workings of a family or community, when seen through the autonomy myth, mark locations of concealed dependency rather than reconsideration. Fineman (2005, 54) describes how social welfare aid often weaves together the appearance of support with moralistic judgments against those who display protracted dependencies. In a system where independency is a moral good, dependency must only be provisional. When it becomes chronic or endemic, then dependency marks a degraded way to be human.

The alternative to the individual or medical model of disability is the social model of disability: “The social model opposes the medical model by defining disability relative to the social and built environment, arguing that disabling environments produce disability in bodies and require interventions at the level of social justice” (Siebers 2008, 25). Describing the early concept of the social model, Oliver (1990, 47) argues that disability is a socially dependent category in which a person with an impairment meets an inhospitable material and social environment that does not support the person’s wellbeing (Oliver 1990, 47). The social model of disability articulates how physical impairments are meaningfully separate experiences from the disablement inequitable environments manifest and the moral language used to associate positive attributes to ability and negative worth to disability (Oliver 1990, 25).

However, latent in Oliver’s descriptions is a castigation of dependency. His goal is that through advocacy and reform social and material environments will dismantle barriers, and through this social transformation persons with disabilities will come to enjoy the independence and range of motion available to persons without disabilities (Oliver 1990, 99). When describing people with disabilities, Oliver (1990, 85) states that “dependency is not an intrinsic feature of their impairments but is socially created by a disabling and disablist society.” For Oliver (1990, 49), dependency either on social welfare systems or individualist modes of access, like being lifted into a building where there is no ramp, is the primary harm of the medical model. Where disability cannot be curatively removed, people with disabilities are forced to become dependent on secondary segregationist systems that only provide limited access to education or employment, not equity of experience when compared to non-disabled persons.³ Dependency marks the space of forced secondary status and suboptimal quality of life such that persons with disabilities become dependent upon systems of access that consider their capacity for wellbeing to be limited by impairment rather than by systemic barriers. For Oliver, dependency is a harm to be acted upon, not a universal experience. Dependency describes infantilization, a loss of human dignity, and disablement rather than a universal quality common to all human beings.

Like Oliver, Bill Hughes states categorically that shared vulnerability cannot provide a common basis for human rights and is particularly inadequate to provide for the needs of disabled people. In Hughes’s assessment, ontological dependency is a problem for people with disabilities because it underwrites negative assessments of disability essentialism, as if people with disabilities have a different nature and substance than non-disabled people. Hughes (2019, 831–32) amplifies this dual ontology where persons with disabilities represent a dependent population by grouping the historically ontological characteristics of ability versus vulnerability or abjection. Hughes describes “moral social

ontology” (Hughes 2019, 848) inside “the ableist moral economy” (Hughes 2019, 830–32) or the system of discursive practices that support ability as morally virtuous and upright, while disability is downcast and undesirable. Historically, disability is handled as an entirely different human nature, invalidated by its very essence: “Disability is positioned as the antithesis of embodied value as diminished agency and polluted embodiment, both good to be good to and good to mistreat. Non-disability is, by contrast, ontologically pristine and self-sufficient, the touchstone of propriety and cleanliness, the wellspring of agency, and the legitimate source of dignity and moral action” (Hughes 2019, 831).

Hughes (2019, 834) describes how universal vulnerability “is embedded in the discourse of human rights” such that sociologist “Bryan Turner argues that our common human frailties and limitations legitimate a theory of universal human rights.” Hughes (2019, 834) describes Turner’s stance as one where humanity is “part of a community of suffering by virtue of our common ontological vulnerability. Self and other see a reflection of one another in the mutual gaze, from which compassion arises.” Universal vulnerability and interdependency serve as the basis for many large-scale health agencies that aim to account for social discrimination. For example, the World Health Organization uses universal factors of health in its mandate to provide equitable access to vaccines, respirators, and other infrastructural needs, recognizing that shared dependency means health care access is a universal human right (Iozzio 2023, 6). Different global populations share the same health care needs because being dependent upon structural supports is common to all human beings. Yet, when it comes to the human rights of people with disabilities, Hughes argues that this stance falls short. Vulnerability passes “into abjection and pity . . . displaced by disgust,” which Hughes (2019, 836) relates to the high rate of abuse, which he classifies as hate crimes, experienced by people with disabilities. Ontological vulnerability does not, in Hughes’s estimation, operate as a unifying universal when it comes to disability civil rights historically, but in contradiction, seems to amplify the precarity of people with disabilities who are seen as essentially weak, dependent, and abject in comparison to stable, independent, and virtuous ability.

Describing the category of embodied ontology, which Tom Shakespeare and Nicholas Watson offer as a solution to some of the deficits of a materialist social model, Hughes (2007, 676) states categorically that he sees little value in ontologies when phenomenological accounts better describe the particularities of disability experiences: “Why would one want or need to make a case for disability rights based on an argument from the universality of impairment when an equally if not more compelling case can be made from the vast amount of empirical evidence that indicates, with unquestionable clarity, that disabled people live lives marred by discrimination and exclusion.” However, what

Hughes criticizes in ontological vulnerability is not the universal expression of vulnerable human nature, but the inequitable application of its pervasiveness. That a binary persists that syphons persons into the ontological categories of abled and disabled supports historical eugenics policies and the harms that continue from that legacy. Accordingly, despite Hughes's descriptions of harmful historic ontologizing against persons with disabilities, it is a failure to recognize universal vulnerability that creates and sustains such a binary.

In contrast to Oliver and Hughes's negative regard for dependency, feminist ethicists who focus on care describe both vulnerability and dependency at the heart of human relationality. Relationality comes packaged with vulnerability, contingency, and dependency upon others for a host of goods and services that are beyond one's individual access. However, when we are in relationships of care, being available to intimate connection correspondingly makes one susceptible to harms stemming from lack, including neglect or abuse. A relationship built upon a need makes us susceptible to the unfulfillment of that need, but relational bonds are forged through vulnerable connections. We need one another and forge deep relational bonds through the meeting of one another's vital needs. This means that the same features that open one up to vulnerability and precarity also make the person available for relations of care. In this way, dependency is woven into experiences of precarity because reliance upon others is a tenuous space. Depending on others for aspects of one's personal wellbeing means that there are opportunities for direct interpersonal harms as well as systemic harms related to large-scale discrimination.

Catriona Mackenzie, Wendy Rogers, and Susan Dodds examine how vulnerability, dependency, and precarity fluctuate, expanding upon Fineman's sense of universal vulnerability to explain how intrinsic and extrinsic forms of vulnerability operate. They identify different types of vulnerability, focusing on how ontological and situational vulnerability are layered in a host of applied situations. Ontological vulnerability is an innate contingency or "embodied vulnerability to others that makes human life precarious. Vulnerability and dependency are thus intertwined" (Mackenzie, Rogers, and Dodds 2014, 4). Recognizing the precarity of human life, how we need support in manifold ways, does not preclude situational vulnerabilities related to injustice. The common vulnerability and dependency of the human being opens the person up to specific situational dependencies, which can, through exterior harms and abuses of power, form "the contingent susceptibility of particular persons or groups to specific kinds of harm or threat by others" (Mackenzie, Rogers, and Dodds 2014, 6).

In this way, Mackenzie, Rogers, and Dodds (2014, 5) explain that shared vulnerability "provides a powerful theoretical lens for reconfiguring legal and political approaches to inequality and disadvantage." Dependency as an ontology, then, introduces a dynamic lens through which to critique power and

injustice because it upends the binary between able and disabled, independent and dependent, self-sufficient and facilitated. The human being is ontologically and situationally vulnerable, innately and environmentally dependent, and the question of specificity then revolves around the ways in which such a dependent ontology shows diversity of need, not whether or not human beings are contingent or self-securing. Universal vulnerability and ontological dependency provide the framework for particularizing specific harms, not for relativizing them under some sort of generic experience of vulnerability. It is precisely because dependency is a common human state that the individual stigmatization of disability forms a harm—because such negative judgment is an imbalanced recognition of vulnerability and dependency.

If all bodies are ontologically dependent, then harms against persons with disabilities for specific dependencies constitute unequal and inequitable judgment against some dependencies over others. Mackenzie, Rogers, and Dodds position vulnerability and dependency upon care as experiences across the lifecycle, meaning that we do not age out of vulnerability and social dependency but rather move across different ways of being dependent and relationally vulnerable. Furthermore, it is this ontological dependency that forms the basis for naming the abuses of vulnerability, like lack of access to education or employment for minoritized populations. Because human beings are universally vulnerable and dependent upon social and material systems outside of their direct control, the ways in which certain persons are overlooked becomes a facet of discrimination, not dependency.

Significant contributions to Christian ethics on the topic of dependency and disability include Mary Jo Iozzio's work on dependency-centered bioethics. Iozzio (2023, 66) argues that just as Catholic social teaching, through the work of liberation theologians, has come to regard God's love as preferencing those who have been marginalized, so too God's preferential option includes people with disabilities who historically have not been included in their full personhood. Iozzio additionally argues that to fully understand and embody divine preference is to see the preferential option for marginalized groups as preferential justice, not only love. Iozzio (2023, 67) states, "Justice demands that persons with disability and others who are marginalized receive their due preferentially, especially since what's due is what has been denied them in spite of their personhood as *imago Dei*. That denial is sinful."

Grounded in the recognition of human rights, justice for persons with disabilities is at the heart of Iozzio's work on dependency. Iozzio weaves the mutuality and interdependency found in the Trinitarian relationship into human–divine relations, emphasizing that injustice toward people with disabilities is a denial of human nature, human rights, and the goodness of divine interdependency. Iozzio (2023, 67) names that denial sin, as the denial of God's own priorities: "In order to reverse the sin, justice demands that they

have access to all the conditions necessary for their flourishing in the fullness of life with all due haste. This way of conceptualizing the preferential option—as a preferential justice—returns to the subject matter, insights, and demands of natural law and the common good and reminds us of the dangers that come with a just and subversive love.”

One of the key aspects in reversing injustice in Iozzio’s work is learning to perceive the hidden mechanisms of privilege. “Regardless of where our lives began, since our conceptions and births each of us is relationally dependent on others: mothers, fathers, siblings, extended family members, and friends as well as church, school, work, play, commerce, social services, infrastructure, and so on” (Iozzio 2023, 71). In this construction of dependency, those who experience social precarity also experience God’s preference, and therefore correcting injustice against people with disabilities ought to constitute a preferential model for the church modeled after other modes of preferential justice for people experiencing economic or political insecurity in Catholic social teaching. Applied to disability, this means that a preferential model that centers dependency as a core attribute of human nature ought to prioritize variable bodies, questioning biased assumptions about health, wholeness, and ability.

If all human beings are variably dependent in diverse ways, as Iozzio details, then this should call into question how people with disabilities are singled out for their reliance upon certain social or material systems that facilitate access. Disability does not create a separate human ontology such that persons with disabilities are dependent while persons without disabilities are independent. Instead, the entire human population is reliant upon social and material supports that facilitate access. The difference in experience within these supports relates to the social ideologies of disablement that provide accessibility to some bodies while denying access to others. With this approach in mind, I turn to arguing for an alternative grounding for dependency as human ontology within Eastern Orthodox theological anthropology, arguing that dependency and vulnerability are features that ground human nature in Eastern Christian moral theology and could provide an alternative articulation of the good life for Christian ethics. Iozzio’s work on disability and dependency lays the foundation for further retrieval from traditional Christianities, especially where such retrieval might integrate dependent subjectivity and variable embodiment into perceptions of human diversity.

Just as Iozzio details, when examining access, it is important to emphasize how layered human dependency is in action, because for those people who do not experience friction between their bodies and their environments on a regular basis, dependency may seem like an isolated event. However, all bodies are variable and dependent. Every aspect of human wellbeing relies upon food, clean water, and safe environments. Each of these are mediated spaces, where goods and services are secured to the individual by the efforts of others.

St. Basil the Great, well known for early hospital care, describes how every human being depends on the labor of unseen others in a variety of industries and arts to secure one's daily wellbeing. Though an individual may believe herself to act independently, the ease of motion she experiences in routine activities directly relates to the facilitation of others. Basil explains that we depend on the farmer for healthy foods, the textile worker for clothing, the lawmaker for safety, and the physician for physical health (St. Basil of Caesarea 2010, 330–36). Each of these arts, as Basil calls them, present layers of mediated contribution across generations. The farmer depends on acquired knowledge and industry standards, as does the lawmaker and physician. Each industry requires specialized education and training, making the contribution of others to each field even more intercommunal and unseen. Generations of knowledge go into the production of food services. Generations of knowledge train the competent physician, and in their daily contributions to wellbeing, these arts present icons of human dependency.

St. Basil (2010, 331) explains, “In as much as our body is susceptible to various hurts, some attacking from without and some from within by reason of the food we eat, and since the body suffers affliction from both excess and deficiency, the medical art has been vouchsafed us by God, who directs our whole life.” When the human community depends on these layered industries, in Basil's assessment, though we may not be aware of the labor of others, our reliance upon them is an icon of our dependency on Christ as the one who feeds the sparrows, who clothes the lilies, and cares for our physical and material needs as the Great Physician. The human being relies upon the mediated care of others, all collectively reflecting an iconographic relationship between situations of human need and the divine mediation revealed behind the industries that secure personal wellbeing. As we are contingent, susceptible to unmet needs, and reliant upon goods that we cannot individually secure, the manifold ways in which the human being is intercommunal and interdependent provide a layered iconographic representation of human nature as ontologically dependent.

The early church councils described this dependent human nature as “passible,” from the Greek *pathatos* or the Latin *passibilis*, denoting the capacity to suffer or feel emotions (Gavrilyuk 2006, 98–100). Passibility is not the state of suffering itself but rather the quality that opens the human being up to contingency. Because human beings are passible, we are acted upon by outside forces, open to suffering, but also open to the transformative impact of trusted relationships and the facilitation of others. Passibility is the quality that opens the human being to emotion, to the full range of human joys and sorrows that derive from dependency. Early in the Christological debates, the question of God's inability to suffer functioned as a way to speak about divine permanence, God's non-contingency when compared with creaturely and derivative needs (Gavrilyuk 2006, 48). Because God is derived from nothing but God's self,

God cannot be contingent or subject to the fluctuations of precarity (Gavrilyuk 2006, 5–8).

Yet, when considering whether or not God can suffer, Chalcedon did not maintain that the divine was entirely outside of human emotion. Paul Gavrilyuk explains that the doctrine of divine *apatheia* should not be understood as representing an apathetic God who is not involved in human experiences, but rather that expressions of susceptibility do not apply to the first person of the Trinity (Gavrilyuk 2006, 61). Gavrilyuk contends that impassibility ought to be recognized as an apophatic expression designed to connote God's permanency and uncreated stability, not apathy toward humanity. Accordingly, while Nicaea and Chalcedon affirm God's impassibility, they also affirm Christ's passibility. Christ as the second person of the Trinity, being fully human, experienced every way to be human, assuming all aspects of human lived experience (Gavrilyuk 2006, 48).

Gregory the Theologian expresses the salvation and restoration of humanity through Christ's assumption of human experience, stating "that which was not assumed was not healed" (Gregory of Nazianzus 1894, 32–35). This expression has become a cornerstone of Chalcedonian thought, affirming that Christ was fully human and therefore assumed every aspect of human diversity. A central aspect to Christ's humanity includes Christ's full passibility, the quality that renders him contingent upon food, water, safety, parenting, and friendship. These aspects of human dependency, because they are seen in Christ's own passibility, are not the result of sin or fallen human nature. That Christ relied upon external supports proves that dependency is packaged with human nature outside of sin. Christ relies throughout his life upon social and material supports, exhibiting both contingency upon those supports to meet his needs and loss when trusted others fail to meet those needs.

Athanasius comments on Christ's passibility in his exposition *On Incarnation*, formulating his examination of human nature around Christ's human nature. Athanasius positions Christ as the archetype of humanity, entering the world of the icon or derivative image to restore human nature as an iconographer would restore a painted icon. When Christ becomes human, it is the original image of God taking on the shape of the icon, the original form assuming the likeness of that which images it:

For as when a figure painted on wood has been soiled by dirt from outside, it is necessary for him whose figure it is to come again, so that the image can be renewed on the same material—because of his portrait even the material on which it is painted is not cast aside, but the portrait is reinscribed on it. In the same way the all-holy Son of the Father, being the image of the Father, came to our place to renew the human being according to himself. (Athanasius 2011, 79)

When Christ becomes human, Athanasius (2011, 87) surmises that nothing substantial changes, prefiguring Chalcedon's later affirmation that Christ is fully divine and fully human without confusion and without change. Because Christ is the original image of the invisible God, when Christ inhabits human history, the archetype comes into the space of the type. The image of God comes into the space of the icons that figure him, and in so doing restores, or literally rewrites, those icons crafted in his image. Athanasius (2011, 51) describes at the outset of his treatise that the incarnation of Christ is what the Gentiles mock but the Church adores, that Christ became human and was "apparently degraded" even to the point of death. Human nature appears degraded in reference to the divine, so when the second person of the Trinity takes on humanity, it appears as if he takes on worthlessness. Yet, Athanasius states that what others mock Christianity glorifies, that Christ has come into the space of the human icon to rewrite and restore the "in the image" original to human nature—because "it was not for another to turn what was corruptible into incorruptibility except for the Savior himself . . . it was not for another to recreate again the 'in the image' for human beings except the Image of the Father" (Athanasius 2011, 93).

Christ's human nature proves, for Athanasius, that humanity is meant to commune with the divine because human nature is entirely compatible with divine action. Because of this compatibility, Christ takes on human nature without change. Human nature is meant to participate with God. Because Christ's humanity is what iconographically provides the basis for human nature, then the ways in which Christ displays human activity defines human capacities outside of sin. If we want to know the fullness of human completion, outside of any degradation or corruption, Athanasius points to Christ's humanity. Therefore, when the councils affirm Christ's passibility—that Christ is subject to outside forces, to human emotion and dependency upon social and material supports, and to the losses related to unmet needs—then the Church affirms that such dependencies result from human nature itself and not from the corruption of sin. That Christ's human nature is passible means he is subject to contingency and dependent upon others. Athanasius maintains that Christ is the only full human being, and because Christ exhibits innate dependency, that passibility that creates social and material need cannot constitute a lesser way to be human. Dependency, then, is not related to fallenness or corruption but instead forms a core human attribute because it is exhibited through Christ's human perfection.

In the description of Christ's passibility, we find nested commentary on human dependency. Christ exhibits dependency, and human beings derive our very nature from Christ, depending on Christ's human nature to inform our definitions of human ontology. In this way, human ontology itself depends on Christ's dependency to define our operational integrity outside of sin, corruption,

or injustice. Because Christ's human nature is contingent, requiring both social and material supports across his life, then as the image of God, the firstborn of all creation, Christ's passibility forms the archetype for human icons. Made in the image of God, figuring Christ, human contingency is a part of human ontology, packaged with human nature and not merely an aspect of living in a precarious environment. Therefore, if both Iozzio and Mackenzie inform the way we might view this universal passibility, human dependency as ontology ought to meaningfully distinguish between the experiences of vulnerability that derive from innate need and those that derive from secondary injustice.

That all human beings are passible means humanity is vulnerable by nature, and as such the variable dependencies exhibited by diverse populations must be acknowledged as aspects of the human experience. Experiences of precarity that arise from unmet needs constitute a secondary category of vulnerability, meaning that where disabled people are not facilitated in their social and material wellbeing, that is not an instance of innate dependency but rather a violation of dependency. Denying the structural needs of persons with disabilities constitutes a failure to recognize universal vulnerability. When facilitative supports are provided for non-disabled persons and yet not provided for people with disabilities, this is a failure to recognize the equal deservingness of an ontologically dependent community. Recognizing shared dependency as an attribute of human nature correspondingly calls a society into a relationship of care because we are all socially responsible for creating structures that produce access. This provides the platform for reimagining the goals of a just society.

Dependent ontology reframes the anthropological starting point, inspiring new questions for social and material care. Instead of searching for displays of independent autonomy, dependent ontology enables a different question entirely: what dependencies describe the individual, and are those met in such a way that facilitates decision-making, access, and achievable patient-centered standards for wellness? When the human being is defined through passibility, then extended states of dependency do not represent deviation from human nature because they are located in an variably dependent framework. When situational vulnerabilities are positioned inside a dependent ontology, then local and specific needs deriving from a variable body fit into a conception of human nature that expects material and social contingency.

Long-term dispositional vulnerabilities, like those experienced by wheelchair users in a city system that does not accommodate their needs for mediated access, do not render the person more dependent than bipedal walkers navigating the same city. Both people with disabilities and people without disabilities rely upon structural facilitation for their range of motion. However, city planners plan millions of details over many generations to provide for the needs of bipedal walkers, creating structures that support some bodies while

creating barriers for others. Furthermore, regarding derivative dependencies, child caregiving that ends after a certain developmental milestone is not less dependent than caregiving that lasts a lifetime insofar as both relationships model variable human nature and the care responsibilities of others in those variabilities. In both cases, vulnerable subjects relate in a layered social model. Material and social needs introduce precarity but also relationality, illuminating that the human being is not more or less dependent ontologically, but instead variably dependent, entering into a variety of relational dependencies across the lifecycle.

Passibility provides the space within Eastern Orthodox theological anthropology to reconsider expectations of the body, especially the limitations of human embodiment. Passibility describes how the human body is acted upon by social and material factors and corresponding fluctuations in need over time. This ontological descriptor, if integrated into considerations of human nature, could reorient the expectations of physical, psychological, and intellectual capacities from a fixed or stable set of descriptors toward a variable, ever-changing series of socially mediated relationships. This is what Oliver's social model of disability initiates, that the socially mediated nature of access might become definitional and thereby upend the medical model of disability that represents capacities as deriving only from the body. Furthermore, if the human being is passible by nature, then the mediated relationships that provide for human needs ought to be the central organizational aspects of any good society.

An equitable society can be assessed based on the degree to which that society recognizes the variability and contingency that comes packaged with human embodiment and creates structures that anticipate variable bodies. By describing vulnerability and contingency as core traits of all human beings, passibility in Eastern Orthodox theological anthropology emphasizes universal human dependency as an ethical foundation for anticipating need. The human being needs social and material supports to facilitate range of motion. For Eastern Orthodox theological anthropology, dependency upon one another figures humanity's ultimate dependency upon divine facilitation. Christ's human nature provides the archetype for human agency, and Christ's own reliance upon social and material goods provides the basis for considering dependency as central to human nature itself. Such representation in Eastern Christian theology positions dependency as a moral feature rather than a flaw. Associating dependency with human nature could provide a disability-positive foundation for reconsidering layered dependencies within the human community, wherein the goal of social systems, then, might become greater social and material facilitation.

Notes

- ¹ I use the terms “Eastern Orthodoxy” and “Eastern Christian” throughout the article to describe the texts and practices of Christians in the Levant, North Africa, Greece, and across Eastern Europe as well as the communities they historically fostered worldwide. Although it is conventional for scholars to speak only of “Orthodox Christianity” and its epistemologies regardless of geographic knowledge production, I maintain that using the terms “Eastern Christian” and “Eastern Orthodox” is vital to representing descendant communities from non-Western Christian spaces who created the knowledge systems which are historic to these global practices. Eastern Christianity/Eastern Orthodoxy as terms are also mutually intelligible to scholars of Christianity and Judaism, where otherwise “Orthodox” might denote either separatist strains of Protestant Christianity or the Orthodox Jewish community and its distinctive histories, practices, and beliefs.
- ² To indicate the linguistic and theoretical diversity amongst disability communities, I use both person-first and identity-first language in this article to discuss disability. It should, however, be stated that various communities prefer either person-first or identity-first language, related to their historical development as a community, experiences with social representation, and personal identity formation.
- ³ Segregationist systems would include residential schools and hospitals which historically removed persons with disabilities from the general population following nineteenth and twentieth century eugenics policies aimed at regulating racialized and disability communities. See Oliver and Barnes (2012, 22).

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An Orthodox Christian Theological Ethic of Childbearing: An Analysis of Continuity and Change

Carrie Frederick Frost, Western Washington University, Bellingham, WA, USA,
frostc8@wwu.edu

Does the Orthodox Church have a normative and coherent theological ethic of childbearing that addresses the realities of the twenty-first century and is responsive to scientific and technological developments? This article attempts to answer this question in light of recent Orthodox Church statements that illuminate both the allegiance the Orthodox Church maintains to certain theological and ethical concerns when it comes to childbearing and—to some degree—its changing teachings on issues of childbearing in response to advancements in technology. Abortion, contraception, and reproductive technologies are addressed. The lacunae in the Orthodox Church's treatment of these matters are also considered, as well as the life-giving vision of humanity found in its theological ethic of childbearing.



Introduction

Advances in understanding and technology have shaped the ways childbearing is generally understood and enacted in most places around the world today. Contraception that prevents pregnancy and reproductive technologies that aid conception and successful pregnancies are just two examples. At the same time, childbearing itself is not an advance of contemporary technology; childbearing is a fundamental reality, perhaps *the* fundamental reality for the existence and continuation of humanity.

Because of its perennial primacy in human experience, childbearing is a focus of theological and ethical concerns in all manner of religious traditions across time, even today, when ethics having to do with childbearing are often largely situated outside the sphere of these traditions in more political and social domains. Religious traditions that bring their long-standing perspectives to their encounter with technological advances related to childbearing include the Orthodox Church, which exhibits an allegiance to both certain theological and ethical principles when it comes to childbearing and—to some degree—new teachings on issues of childbearing that are responsive to advancements in technology. Here, I am making a distinction between *principles* and *teachings* to disambiguate doctrinal teachings of theological anthropology (principles) that are understood to be changed by era and locale in comparison to contemporary interpretations of those principles based on era and local (teachings). A comparison of church prayers alongside two contemporary official church statements will allow for consideration of the Orthodox Church's thinking on theological and ethical concerns around childbearing today. The two contemporary church statements under review are the 2020 document from the Ecumenical Patriarchate *For the Life of the World: Toward a Social Ethos of the Orthodox Church* and the 2000 document from the Russian Orthodox Church *Basis of the Social Concept*. Though other local churches have occasionally produced statements addressing matters of childbearing, those from the Ecumenical Patriarchate and the Russian Orthodox Church are the only ones from Orthodox communities that address matters of childbearing with any depth or breadth and thus will be the focus of this article.

Orthodox Church's Core Teachings on Childbearing

Over the course of two millennia, the Orthodox Church has valued the human person as created, unique, precious, and called to communion and eternity. This is evident in the importance the Orthodox Church places on childbearing in the context of marriage and on human life from its very beginnings.

Childbearing in Marriage

The Orthodox Church's esteem for childbearing is publicly declared in the Orthodox marriage service, which includes multiple petitions for the fruitfulness of a couple's union, such as: "That He will grant unto them the enjoyment of the

blessing of children . . . let us pray to the Lord” (Greek Orthodox Archdiocese of America, n.d.). Childbearing is indeed understood to be a great blessing of marriage and therefore is quite naturally hoped and prayed for within the marriage ceremony.

At the same time, the primary purpose of marriage in the Orthodox understanding is not procreation—instead, it is the sacramental union of the couple who work to secure each other’s mutual deification, a theme also evident in the marriage service. Furthermore, marriages in the Orthodox Church are sacramentally valid whether they include children or not, as affirmed by Saint John Chrysostom (2003, 76): “But suppose there is no child; do they remain two and not one? No; their intercourse effects the joining of their bodies, and they are made one, just as when perfume is mixed with ointment.” Childbearing is considered a beautiful and good possibility within a marriage, but it is not definitive of marriage.

Also found in the marriage service is the conviction that new human beings are good, that the arrival of a new person in the world is cause for rejoicing, such as in this line: “That He will make them [the married couple] glad with the sight of sons and daughters, let us pray to the Lord” (Greek Orthodox Archdiocese of America, n.d.). Encapsulated here is a bit of theological anthropology, a reminder of how Orthodox Christians fundamentally understand what it means to be human. When we encounter a new human being who has come into the world, we are ideally “glad” at the sight of him or her. Humans are the pinnacle of God’s creation, created in the image and likeness, created to grow in communion with God, called to eternity. Because of this, each time a new human being comes into the world, an event of cosmic proportions takes place, and awe, thanksgiving, and—as it says here—gladness are the proper reactions.

Another aspect we see at work in this petition from the marriage service is the broadly held expectation within Orthodoxy that marriages will be—at least at some point in their history—open to children. We even pray for grandchildren, as it says in the marriage prayer: “That they [the married couple] may live to see their children’s children” (Greek Orthodox Archdiocese of America, n.d.).

Children do not define marriage, yet marriage is ideally open to children because childbearing is a godly act, a special participation in the act of bringing another new unique, precious human person into the world. In childbearing, we imitate and participate in God’s creative powers. Procreation involves creative capacities that ought not be squandered or ignored. Human life is good and meant to be generated and shared.

Our caregiving powers are also creative and profound, and they may be exercised by welcoming non-biological children into a marriage. A recent document from the Orthodox Church, the statement commissioned and released by the Ecumenical Patriarchate in 2020, *For the Life of the World: Toward a Social Ethos of the Orthodox Church* (FLOW), presents adoption and fostering as parental vocations alongside biological parenthood: “Some of the children who enrich the new household created by a marriage may be the fruit of the couple’s sexual

union, while others may be adopted, and still others may be fostered; but all are equally welcome within the sanctuary of the family and the body of the Church” (Hart and Chryssavgis 2020, §23). Welcoming adopted or fostered children into a family is not a new social phenomenon, but often adoption is presented as an afterthought, as a last option after a couple is not able to conceive, in both Orthodox and other contexts. So, the inclusion of these situations in *FLOW* may be an example of the Orthodox Church affirming these paths to parenthood in light of today’s questions and pressures around abortion and reproductive technologies. (I reference *FLOW* several times in this article, and I wish to disclose I was a member of the commission that composed the document.)

Whether biological or adoptive, the Orthodox ideal is that children are part of married life. They do not define marriage, but they are a natural reflection of the plentitude of the divine nature (Breck 1999; Guroian 2004; Meyendorff 1975).

Abortion

Childbearing is still held as an ideal within marriage, and human life is understood to be innately good and precious. Therefore, the Orthodox Church continues to condemn abortion as the taking of human life. This conviction is perhaps the most unchanging, most unwavering conviction of the Orthodox Church regarding childbearing and can be traced from the earliest days of Christianity to contemporary times (see ancient documents such as the fourth-century Didache, as well as the writings of early Christian thinkers such as Clement of Alexandria, Tertullian, and Basil). This is also an area of noticeable overlap across the autocephalous churches today; for example, both the Russian Orthodox Church and the Ecumenical Patriarchate—though at odds in other ways—continue to condemn the practice of abortion.

The Russian Orthodox Church’s 2000 statement *Basis of the Social Concept* states: “Since the ancient time the Church has viewed deliberate abortion as a grave sin. The canons equate abortion with murder” (Russian Orthodox Church 2000, XII.2). The Ecumenical Patriarchate’s *FLOW* states: “From the first generations of Christians, therefore, the Church has abhorred the practice of elective abortion as infanticide” (Hart and Chryssavgis 2020, §25). Both documents also contain a noteworthy level of compassion for women who have experienced abortion, acknowledging the variety of circumstances and pressures that often lead to an abortion. From *Basis of the Social Concept*: “Without rejecting the women who had an abortion, the Church calls upon them to repent and to overcome the destructive consequences of the sin through prayer and penance followed by participation in the salvific Sacraments . . . The struggle with abortion, to which women sometimes have to resort because of abject poverty and helplessness, demands that the Church and society work out effective measures to protect motherhood and to create conditions for the adoption of the children whose mothers cannot raise them on their own for some reason” (Russian Orthodox Church 2000, XII.2).

From *FLOW*: “The Church recognizes, of course, that pregnancies are often terminated as a result of poverty, despair, coercion, or abuse, and it seeks to provide a way of reconciliation for those who have succumbed to these terrible pressures. Inasmuch, however, as the act of abortion is always objectively a tragedy, one that takes an innocent human life, reconciliation must involve the acknowledgment of this truth before complete repentance, reconciliation, and healing are possible” (Hart and Chryssavgis 2020, §25).

The one perceived change in Orthodox teachings is to address with leniency and compassion extreme situations in which a woman’s life is at risk. For example, the Russian Orthodox Church (2000, XII.2) states: “In case of a direct threat to the life of a mother if her pregnancy continues, especially if she has other children, it is recommended to be lenient in the pastoral practice. The woman who interrupted pregnancy in this situation shall not be excluded from the Eucharistic communion with the Church provided that she has fulfilled the canon of Penance assigned by the priest who takes her confession.” This sentiment is echoed in *FLOW*:

The Church does recognize, however, that in the course of some pregnancies there arise tragic and insoluble medical situations in which the life of the unborn child cannot be preserved or prolonged without grave danger to the life of the mother, and that the only medical remedy may result in or hasten the death of the unborn child, contrary to all that the parents had desired. In such situations, the Church cannot pretend to be competent to know the best way of proceeding in every instance, and must commend the matter to the prayerful deliberations of parents and their physicians. It can, however, offer counsel, as well as prayers for the healing and salvation of all the lives involved. (Hart and Chryssavgis 2020, §26)

Even though overall remarkably consistent across time and space, some questioning of the received position on abortion in the Orthodox Church is beginning. One Orthodox thinker tentatively proposes an alteration to the Orthodox Church’s understanding of abortion, using scientific developments in our understanding of fertilization to potentially “provide a basis for the question of the beginning of human life” (Woloschak 2017, 15). The Greek Orthodox Archbishop Elpidophorous of North America recently made remarks about women and their “choice” that left many Orthodox wondering if he was proposing a revision to Orthodox teaching on abortion:

We affirm the gift and sanctity of life—all life, born and unborn. As Christians we confess that every human being is made in the image and likeness of God. Every life is worthy of our prayer and our protection, whether in the womb, or in the world. We are all responsible for the well-being of children. We are their ‘keepers,’ and cannot shirk from our accountability for their welfare.

At the same time, we also affirm our respect for the autonomy of women. It is they who bring forth life into the world. By His incarnation, our Lord, God, and Savior Jesus Christ assumed human nature, through His conception in the womb of the Virgin Mary. She freely chose to bring Him into the world, and God respected her freedom. We can and must make the case for life, both born and unborn, by our own example of unconditional love. (Greek Orthodox Archdiocese of America 2022)

Other than these exceptions and the recent nuance to such extreme situations, the Orthodox Church has deemed unnecessary and inapplicable any change to its position based on technological advances that have allowed us a better understanding of the process of conception and the development of life in utero or based on technological advances that allow for abortions to be safer for the woman involved. Instead, the ancient conviction of the goodness of human life and its beginnings in the womb continue to determine the Orthodox Church's stance on abortion.

Orthodox Church's Responsiveness to Childbearing Technology

The Orthodox Church's encounter with childbearing technologies, specifically those that prevent and those that foster pregnancy, is changing as these technologies develop.

Contraception

Most of the Orthodox world, perhaps to varying degrees, has had ready access to contraception for sixty odd years since oral contraceptives became widely available in the 1960s. At the same time, contraception itself is not something new. Contraception was present in the ancient world, though an understanding of the mechanics of conception and contraception was lacking. Today, the fact that contraception is so ubiquitous, is relatively safe, and gives couples a high degree of control over conception has prompted the Orthodox Church to refine and expand its encounter with contraception, while maintaining that an openness to children within marriage is ideal.

A provisional acceptance of contraception is present in church statements today. Generally, the judicious, prayerful, provisional, and exceptional use of safe, non-abortive contraceptive methods is condoned. For example, in 1992, the Orthodox Church in America Synod released the following statement as part of a larger document of affirmations on marriage, family, sexuality, and the sanctity of life: "Married couples may express their love in sexual union without always intending the conception of a child, but only those means of controlling conception within marriage are acceptable which do not harm a fetus already conceived" (Orthodox Church in America 1992). We hear the appreciation for the sacramental union of the couple and the unitive quality of marriage in the affirmation that marital sexual union is not exclusively concerned with

procreation. We also hear the normative principle that human life is innately good and a source of gladness or joy in the rejection of forms of conception that would harm or abort a fetus. The Orthodox Church in America synod has, therefore, accepted the use of contraception within these parameters and within a larger vision of a marriage ideally being open to children at some point.

FLOW states: “The Orthodox Church has no dogmatic objection to the use of safe and non-abortifacient contraceptives within the context of married life, not as an ideal or as a permanent arrangement, but as a provisional concession to necessity” (Hart and Chryssavgis 2020, §24). The condoning of the provisional use of contraception in marriage is often expressed as an acknowledgment that physical health problems may preclude childbearing for some couples, and in recent statements the Orthodox Church acknowledges there may be other problems such as psychological or spiritual health that would warrant use of contraception. *FLOW* continues: “The Church anticipates, of course, that most marriages will be open to conception; but she also understands that there are situations in which spiritual, physical, psychological, or financial impediments arise that make it wise—at least, for a time—to delay or forego the bearing of children” (Hart and Chryssavgis 2020, §24).

The Russian Orthodox Church’s *Basis of the Social Concept* also clearly distinguishes between non-abortive and abortive contraception methods and affirms the couple’s discernment when it comes to contraception: “But other means, which do not involve interrupting an already conceived life, cannot be equated with abortion in the least. In defining their attitude to the non-abortive contraceptives, Christian spouses should remember that human reproduction is one of the principal purposes of the divinely established marital union [see Russian Orthodox Church 2000, X. 4]. The deliberate refusal of childbirth on egoistic grounds devalues marriage and is a definite sin” (Russian Orthodox Church 2000, X.II.3).

One of the great benefits of this approach, in which most marriages are expected to be open to childbearing at some point and the judicious use of contraception is condoned, is that it helps Orthodox Christians avoid one of the biggest psychological and spiritual pitfalls of widespread contraception: a false sense of control of one’s fertility and one’s body. The persistent openness to children in the Orthodox context means we will ideally welcome them even when contraception fails, as it sometimes does!

Interestingly, the Orthodox Church’s stances on contraception are typically general; there is no specific stance on individual types of contraception beyond the ban on abortifacients. Convictions and practices are largely left to the discernment of clergy and laity, sometimes in conjunction with each other, sometimes not. This is possibly a source of confusion for some Orthodox Christians—both pastors looking to guide their flocks and couples choosing a type of contraception—because some widely available forms of contraceptives are abortive or have an abortive back-up function, such as the copper IUD, which may not always be apparent to consumers (U.S. Department of Health

and Human Services 2017). While it may be challenging for both those in the position of advising couples on these matters and for the couples themselves to wade through the technicalities of different contraceptive methods, it seems the Orthodox Church generally prefers to leave the specifics to the faithful.

Reproductive Technologies

As with contraception, the Orthodox Church has no dogma about particular reproductive technologies, but it has begun to address the larger issues around reproductive technologies to some extent.

The Orthodox understandings of marriage and the value of human life are the touchstones of assessing whether a given reproductive technology is licit. The central assessment of reproductive technology in Orthodox statements centers around two questions. First, is human life being sacrificed in efforts to help conceive human life? *FLOW* addresses this concern:

The Church has no objection to the use of certain modern and still-evolving reproductive technologies for couples who earnestly desire children, but who are unable to conceive without aid. But the Church cannot approve of methods that result in the destruction of “supernumerary” fertilized ova. The necessary touchstone for assessing whether any given reproductive technology is licit must be the inalienable dignity and incomparable value of every human life. As medical science in this area continues to advance, Orthodox Christians—lay believers and clergy alike—must consult this touchstone in every instance in which a new method appears for helping couples to conceive and bear children, and must also consider whether that method honors the sacred relationship between the two spouses. (Hart and Chryssavgis 2020, 24)

The second question for evaluating reproductive technologies is: Does the technology honor married life, as referred to in the last line of the quotation from *FLOW*? Just as in the case of types of contraception, the specifics of reproductive technologies are not always addressed in Orthodox statements, but there appears to be a growing consensus that the relationship between spouses is violated by the introduction of any third-party reproductive material. This understanding appears to be broadly held by Orthodox sources, as heard in this statement from the Synod of the Orthodox Church in America (1992): “Married couples may use medical means to enhance conception of their common children, but the use of semen or ova other than that of the married couple who both take responsibility for their offspring is forbidden.”

Conclusion

To close, I offer several observations on the implications and possibilities of the Orthodox Church’s continuity and change regarding matters of childbearing.

First, as we have seen in several examples, there is a great deal in common when it comes to matters of childbearing between the Russian Orthodox Church and the Ecumenical Patriarchate. This is notable and important because, at the time of this writing, these Orthodox churches are not in communion with each other, and the Russian Orthodox Church is complicit in the war against its Orthodox brothers and sisters in Ukraine. Especially during this time of demoralizing division, it is important to remember what is shared so that we may find paths to reconciliation.

Second, we live in an era in which the meta-ethics of inevitability are pervasive. We breathe the idea that technological change is unstoppable and progressive. The tenacious Orthodox understanding of the preciousness of human life at all stages, even in the womb, resists the mistake of inevitability. The Orthodox Church holds that some things are always true, always good, and cannot be compromised by progress, which may uniquely position it to resist change in favor of its own principles.

Third, many Orthodox thinkers today see a misalignment between Orthodox practices and teachings when it comes to childbearing. Mentioned earlier was the example of the esteem for childbearing and children in the marriage service. That esteem appears not to be carried into other Orthodox services. For example, the “Churching” prayers, prayed when the mother and child return to church after a post-childbirth absence, characterize childbirth as polluting and defiling, qualities typically associated with sin rather than circumstance in the Orthodox context (see Frost 2019; Larin 2008). Several thinkers and churches wish to bring the esteem for childbearing and the creation of a new human person into its postpartum prayers and the pastoral handling of pregnancy loss and stillbirth. Some local churches or jurisdictions are beginning to change these rites (see Ukrainian Orthodox Church of the USA, forthcoming; Orthodox Church in America, n.d.).

Fourth, an issue missing from contemporary Orthodox statements on childbearing is an acknowledgment of how many babies today are born outside the (ideal) context of marriage. Even while holding up the ideal of marriage, the Orthodox Church rarely comments on human life that arrives outside of wedlock. *FLOW* begins to approach this concern: “Moreover, the Church should extend the sacramental gift of baptism to all children, irrespective of the manner in which they were conceived or adopted” (Hart and Chryssavgis 2020, §23).

In conclusion, the Orthodox Church largely has a normative and coherent theological ethic of childbearing that addresses the realities of the twenty-first century and is responsive to scientific and technological developments, with much overlap between the two autocephalous Orthodox churches that have written social statements that address matters of childbearing, the Ecumenical Patriarchate and the Russian Orthodox Church. At the same time, discrepancies between principles about human life and practices regarding childbearing exist.

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Theological Implications of the Existence of "Offensive" Animals and the Ascetical Opportunities They Provide

Andrew P. Nosal, Associate Professor of Biology, Point Loma Nazarene University, San Diego, CA, USA, anosal@pointloma.edu

Charles Darwin was unimpressed by the natural theology of his time, owing to his observations of suffering in nature and, famously, the particularly elegant viciousness of parasitoid wasps (Ichneumonidae). Presented here is a theological reflection, from a largely Eastern Orthodox perspective, about these wasps and other hard-to-love animals that exhibit behaviors so disturbing or "offensive" that their mere existence may seem incompatible with the existence of an all-knowing, all-loving, and all-powerful Creator-God. These include infanticide in lions, siblicide in boobies, intrauterine cannibalism in sharks, and brood parasitism in cuckoos. These behaviors are obligate, intrinsic to these species— intrinsic to their design. I consider how these animals became so "offensive," including alteristic (Creation being drastically altered, namely, corrupted, by the human Fall into sin) and non-alteristic explanations. I conclude by reflecting on what should be the Christian response to these creatures, including how they present unique ascetical opportunities for Christians to cultivate an all-embracing cosmic love for Creation.



Introduction

What follows is a theological reflection about hard-to-love animals that exhibit behaviors so disturbing or “offensive” that their mere existence may seem incompatible with the existence of an all-knowing, all-loving, and all-powerful Creator-God. By “offensive” behaviors, I do not mean ordinary predation, as in wolves, sharks, or “lions [roaring] for their prey, seeking their food from God” (Psalms 104:21 New Revised Standard Version Updated Edition), but rather behaviors that seem to be gratuitously cruel. For example, on May 22, 1860, six months after the publication of *On the Origin of Species*, English naturalist Charles Darwin (1860a) wrote a letter to his friend and advocate, American botanist Asa Gray:

I had no intention to write atheistically. But I own that I cannot see, as plainly as others do, and as I should wish to do, evidence of design and beneficence on all sides of us. There seems to me too much misery in the world. I cannot persuade myself that a beneficent and omnipotent God would have designedly created the Ichneumonidae with the express intention of their feeding within the living bodies of caterpillars.

Gray, a devout Christian, eagerly promoted Darwin’s theory of evolution in the United States, defending *Origin* from the mounting religious opposition led by fellow Harvard professor Louis Agassiz. In the nineteenth century, religious opposition to Darwin’s theories did not stem from a literal reading of Genesis but rather the natural theology popularized by William Paley ([1802] 1818, 22) with his rendition of the watchmaker analogy: “Every indication of contrivance, every manifestation of design, which existed in the watch, exists in the works of nature; with the difference, on the side of nature, of being greater or more, and that in a degree which exceeds all computation.” Paley argued that the natural world, in all its complexity and apparent design, revealed the Creator, an intelligent designer. At issue was the fortuitous randomness implied by Darwinism, including the appearance of new species by chance, thereby undercutting popular notions of divine purpose and design. Nevertheless, Gray maintained that natural selection was not inconsistent with natural theology, owing to the apparent perfection in the design and adaptations of organisms. However, it was this teleological argument that Darwin refused to accept, owing to his observations of incessant suffering in nature and the particularly elegant viciousness of the parasitoid wasps of the taxonomic family Ichneumonidae.

I shall return to the biology of the ichneumonid wasps shortly, but, contrary to Darwin’s objection, I argue that the existence of these wasps and other “offensive” creatures is perfectly compatible with said God. I do not, however, intend to wade into the murky water of theodicy and formulate a defense for why God created such animals, or even why God created a world that could

give rise to them. Rather, I will only consider how these animals became so “offensive” and what the response to them should be. There may indeed be much to learn about God’s love and how God creates from these hardest-to-love, most “offensive” creatures.

Darwin’s May 22 letter captures two apparent conflicts. The first is the general problem of natural evil, that is, reconciling the overall “misery” or suffering endemic to the natural world with an all-knowing, all-loving, and all-powerful Creator-God. As David Bentley Hart (2005, 50) observes, “all the splendid loveliness of the natural world is everywhere attended—and, indeed, preserved—by death. All life feeds on life, each creature must yield its place in time to another, and at the heart of nature is a perpetual struggle to survive and increase at the expense of other beings.” The second conflict is more specific: reconciling the “offensive” creatures themselves with said God. While many authors have wrestled with the problem of natural evil, the latter conflict has been largely overlooked and is the focus of this article.

Inspired by the Eastern Christian ascetic tradition of contemplating nature (*theoria physike*), I am interested in what these “offensive” animals reveal about the Creator. As Bishop Kallistos of Diokleia (Ware [1979] 1986, 156–61) explains, when contemplating nature, the Christian is to discover the Creator in all things, that all things are essentially sacred, and how each thing points to the Creator. This practice has strong biblical roots, with the Psalmist proclaiming, “O Lord, our Sovereign, how majestic is your name in all the earth” (Psalms 8:1 NRSVUE), “[t]he heavens are telling the glory of God; and the firmament proclaims his handiwork” (Psalms 19:1 NRSVUE), and “O Lord, how manifold are your works! In wisdom you have made them all; the earth is full of your creatures” (Psalms 104:24 NRSVUE). Moreover, the Apostle Paul stated, “Ever since the creation of the world God’s eternal power and divine nature, invisible though they are, have been seen and understood through the things he has made” (Romans 1:20 NRSVUE). Thus, what can be understood about the Creator in and through these “offensive” creatures?

First, let us explore the biology of the parasitoid wasps to understand why they so troubled Darwin. These wasps, belonging to various taxonomic families, including Ichneumonidae, lay eggs on or in their hosts, which are often other insects, including caterpillars. Then, the eggs hatch and the larvae slowly eat their host alive, eventually killing it, which is why these wasps are parasitoids and not parasites, which do not usually kill their host. One example is the emerald cockroach wasp (*Ampulex compressa*), whose reproductive behavior was first described in detail by Francis Williams (1942). The female wasp first finds and stings its cockroach host in the brain, injecting a paralyzing venom that disables its escape response. Next, she chews off half of each antenna from the incapacitated cockroach’s head and sips the exuding blood. The wasp then walks its victim to an underground burrow she excavated earlier, using

what remains of one of the cockroach's antennae as a leash; the cockroach, unable to resist, marches along willingly. The wasp then lays a single egg on the cockroach's cuticle, carefully oviposited so as to not be dislodged by the host's leg movement, and seals the cockroach and her offspring inside the burrow with pebbles. After three days, the egg hatches and the larvae spend five days feeding on the cockroach's external anatomy while it is still alive. The larvae then chew into the cockroach's abdomen and spend another week consuming its internal organs, which eventually kills the host. Finally, the larvae pupate inside the host and at last emerge from the cockroach as fully developed wasps. What troubled Darwin was the sophisticated viciousness of this process, which seemed utterly gratuitous, given that most insects do not reproduce in this way.

It must be noted that parasitoid wasps are hardly alone among "offensive" animals that are seemingly irreconcilable with a beneficent Creator. For example, male lions (*Panthera leo*) routinely engage in hostile takeovers of other prides, ousting the alpha males and systematically killing all the nursing cubs in the pride. This infanticide brings the nursing mothers back into estrous, so they become receptive to mating with and bearing the offspring of the new males (Packer 2000). Infanticide of this sort is a widespread phenomenon in animals (Hrdy 1979) and can function as a means of sexual coercion. Other forms of sexual coercion in animals include forced copulation (mating), sexual harassment, intimidation, and punishment, which are almost invariably inflicted by males on females and occasionally result in serious female injury or death (Clutton-Brock and Parker 1995).

Next, Nazca boobies (*Sula granti*) exhibit obligate siblicide, which begins with a clutch of two eggs laid four days apart. As soon as the younger chick has hatched, the older sibling begins pecking it to death while the mother watches and does nothing. The younger sibling is always killed and serves only as an insurance policy to the mother if the older chick is somehow defective (Anderson 1990). Another form of siblicide takes the form of intrauterine cannibalism within the bifurcated uterus of the sand tiger shark (*Carcharias taurus*). Dozens of embryos are reduced to two, as the largest and most aggressive individuals eat their brothers and sisters in utero until only one shark remains in each horn of the uterus (Gilmore, Putz, and Dodrill 2005). Lastly, the common cuckoo (*Cuculus canorus*) is an obligate brood parasite. The mother cuckoo will sneakily lay an egg in a host species' nest that is a convincing mimic of the host's egg color and spotting pattern. The cuckoo chick hatches first and pushes the host's other eggs out of the nest. The host parents feed the cuckoo chick as if it were their own, motivated by the cuckoo's incessant cheeps that mimic a nest full of host chicks. Even once the cuckoo chick has reached adult size, much larger than the host parents, they continue to feed it (Payne 1977).

Central to the arguments that follow is that these "offensive" behaviors are not merely facultative, performed only by desperate individuals struggling to

survive in the throes of unusually intense competition and resource limitation. Nor do these behaviors result from non-adaptive psychopathologies. Rather, these behaviors are adaptive and obligate, intrinsic to these species—intrinsic to their *design*. Yet, these behaviors are not necessary; most insect species are not parasitoids, most shark species do not exhibit intrauterine cannibalism, and most bird species are not brood parasites. These behaviors appear to exhibit a form of extreme selfishness that is downright cruel. For the materialist scientist, these selfish behaviors are exactly what should be expected in a world of merciless competition and resource limitation that, through differential survival and reproductive success, selects for increasingly adaptive and self-interested qualities. However, for the Christian, scientist or otherwise, this seemingly cruel world, driven by competition for limited resources, is hardly recognizable as the harmonious world proclaimed by the Psalmist, in which the Creator makes “springs gush forth in the valleys,” “giving drink to every wild animal” and “their food in due season” (Psalms 104:10–11, 27 NRSVUE).

The bottom line is that when contemplating nature, one must also contemplate these “offensive” animals. Their “offensive” behaviors cannot simply be shrugged off with platitudes like “wow, that’s nature.” But how, then, are Christians to make sense of these creatures? What do they reveal about the Creator? Are they “good,” or indeed “very good,” as proclaimed in the *Hexaemeron* Creation narrative (Genesis 1:4, 10, 12, 18, 21, 25, 31 NRSVUE)? Lastly, what should the response to them be? To answer these questions, it is helpful to understand how these animals became so “offensive.” Explanatory models can be broadly classified as alteristic, meaning Creation was drastically altered by the Fall of humankind, and non-alteristic, which Alexander Khramov (2017, 84) calls “perseveristic.”

Alteristic Models

Many Christians attribute the general suffering and death in the world, and by extension the “offensive” behaviors of humans and nonhuman animals, to Creation being somehow broken, corrupted, or fallen. “We live in a fallen world” is a common refrain. In the Genesis account of the Fall, the first humans, Adam and Eve, disobey God’s commandment not to eat from the tree of knowledge of good and evil. The consequences for this sinful, selfish exercising of human freedom include hostility between humans and nature, increased childbearing pangs, and a curse on the ground thereafter requiring hard labor to work it. To Adam, God says, “Cursed is the ground because of you; in toil you shall eat of it all the days of your life” (Genesis 3:17 NRSVUE). Thus, many Christians have interpreted human sin to have cursed the entire cosmos (a so-called “cosmic Fall”), thereby introducing decay and death into the primordial “very good” (Genesis 1:31 NRSVUE) and paradisiacal Creation. This generally follows the assertion of the Apostle Paul that “the creation was subjected to futility, not

of its own will, but by the will of the one who subjected it, in hope that the creation itself will be set free from its enslavement to decay and will obtain the freedom of the glory of the children of God. We know that the whole creation has been groaning together as it suffers together the pains of labor” (Romans 8:20–22 NRSVUE).

Many Christians also believe the Fall of humankind was a historical (temporal) event, before which Creation existed in a paradisiacal state free of suffering and death. For example, John Wesley (1872) preached that before the Fall, all creatures were “perfectly happy,” “endued with a degree of understanding,” and universally beautiful. They showed only “benevolence to each other” and even a “loving obedience to man.” They experienced “pleasure unmixed with pain” and were immortal. However, after the Fall, according to Wesley, these creatures became “utterly enslaved to irrational appetites,” “savage fierceness,” and “unrelenting cruelty.” Now, they “tear the flesh, suck the blood, and crush the bones of their helpless fellow creatures.” Their “primeval beauty” was overcome by “terrible and grisly” dispositions. They lost much of their “understanding” and became subject to pain and death.

Similarly, various articles published by *Answers in Genesis*, an apologetics organization that advocates young-Earth creationism and a literal-historical interpretation of Genesis, affirm that all animals were vegetarians before the Fall. For example, Liberty University professor Marcus Ross (2011) wrote of *Tyrannosaurus rex* that “when first created, all the land animals, including dinosaurs, ate only plants. The Bible does not spell out the specifics of *T. rex*’s transformation, but this once-peaceful king became a terror to all who dared to venture into his domain.” In the same vein, Saint Basil the Great (1888, 43–46) believed predators and scavengers were herbivorous before the Fall and subsequently turned carnivorous. Paul Ladouceur (2013) also summarizes many Orthodox Christian liturgical passages concerning the Fall that interpret this as a historical event. So, within the alteristic framework, in which the Fall is understood as a historical event with cosmic import, “offensive” behaviors such as predation, parasitoidism, infanticide, sexual coercion, siblicide, brood parasitism, and the like would have transpired in their respective creatures after and as a direct consequence of the human Fall.

There are of course serious scientific conflicts with this model, namely that pain, death, and “offensive” behaviors existed long before humans appeared on Earth. Recognizing this, other theologians have developed a more nuanced view of the timing and historicity of the Fall, such as C. S. Lewis ([1940] 2016, 87), who suggested that an angelic Fall may have occurred even before the material universe existed. Similarly, Hart (2005, 102) writes that “the fall of rational creation and the subjection of the cosmos to death is something that appears to us nowhere within the unbroken time of nature or history; we cannot search it out within the closed continuum of the wounded world; it belongs to another



frame of time, another *kind* of time, one more real than the time of death.” This follows Sergius Bulgakov’s ([1945] 2002, 170–71) assertion that the Fall was not a temporal event in empirical history but rather a supratemporal (atemporal) event in “meta-history,” “beyond the limits of this world.” Alexander Khramov (2017) expands on this idea to construct an alteristic framework of evolution, affirming that “the basic properties of matter that made evolution possible are in fact no other than corruption brought by sin to the ‘very good’ world which preceded our observable universe.” For Khramov (2017), it is as if the Fall caused the prelapsarian world to implode, in a sense, resulting in the Big Bang (the “first cognizable manifestation of the human Fall”) and all the subsequent chaos, randomness, and selfishness of the empirical or postlapsarian world. Philip Sherrard (1976, 26) puts it similarly, saying the Fall was a lapse “into a materialized space-time universe.” Thus, aside from the speculative meta-historical Fall, these narratives embrace virtually all mainstream aspects of modern cosmology and evolutionary biology.

Although Khramov’s alterism is an admirable, compelling attempt to reconcile evolution with traditional Christian Fall and Redemption theologies, it and other alteristic models are not entirely satisfactory and leave many questions unanswered. First, alterism is often touted as an effective solution to the problem of natural evil because it blames the suffering and death in the world on human sin, not God. However, by saying God is not responsible for or did not intend (directly or indirectly) for the competition, predation, pain, suffering, death, disease, and resource limitation creatures experience, which are of course the very selection pressures that drive evolution and speciation, can it be said that any of the species arising from natural selection were God’s intention? What exactly then is God’s current role in Creation? Khramov’s alterism would seem to suggest that the “offensive” animals evolved from a sort of runaway selfishness that pervades the postlapsarian world, but what of the beautiful and wonderful animals that resulted from the very same selection pressures? Do we not admire the agility of cheetahs, the basketry of weaverbirds, the camouflage of octopuses, the dedicated parental care of emperor penguins, and the delightful courtship dances and plumage of birds of paradise? It seems we cannot praise God for the good bits of nature but write off the nasty bits as symptoms of a fallen world. They are a package deal.

Another concern about adopting an alteristic model of Creation is that, if the Creation we see today is not as God intended, basically amounting to damaged goods that will eventually be redeemed, why should anyone care about, love, or want to protect Creation? For example, Khramov (2017) repeatedly uses catastrophic language to characterize the empirical (postlapsarian) Creation, calling it “ruined,” “destroyed,” and “reduced to chaos,” compared to the “original,” “perfect,” and “very good” primordial (prelapsarian) Creation. He suggests the “very good” of Genesis 1:31 (NRSVUE) applies only to

prelapsarian Creation and not the empirical world we experience now. Such pessimism about the empirical world, which Christopher Knight (2007) observes is particularly common in the Eastern Christian tradition, reminds me of the hymn popularized by Jim Reeves in 1962: “This world is not my home, I’m just passing through.” There seems to be little motivation to cultivate any serious environmental ethic that is faithfully Christian if we are “just passing through” a sort of plan b of Creation. On the other hand, if the Creation we see today *is* as God intended, including all the particular creatures that have and continue to arise by Darwinian evolution, then Creation truly is a theophany worth contemplating and loving, including, and perhaps even especially, the “offensive” animals like the parasitoid wasps. Of course, such non-alteristic models of Creation necessarily require a deemphasis of the Fall’s cosmic import, which may not exactly be patristic but is nonetheless supported by various Christian theologians, including Eastern Orthodox (Bimson 2006; Fretheim 2010; Ladouceur 2013, 2018). Such interpretations of the Fall imply that biological death, for instance, is not evil but rather, being endemic to creation, a force underlying the ongoing creative process. Let us now explore in more detail these non-alteristic models.

Non-Alteristic Models

In non-alteristic models of Creation, the “offensive” animals and behaviors we have discussed *are* as God intended; they have not been altered by human sin. In one version of non-alterism, all of Creation as we experience it, including the “offensive” creatures and general misery in nature, is exactly or expressly as God intended, here and now. In this model, God controls every single eventuality (in a sort of micromanaging way) via direct divine sovereignty and total determinism; thus, there is universal teleology in Creation. Proponents of this model would affirm God has a purpose or plan in creating all creatures as they are, “offensive” behaviors and all, even though that purpose may not be plain to us. However, this is precisely what Charles Darwin refused to embrace. In a follow-up letter to Asa Gray on July 3, 1860, he asked, “Do you believe that when a swallow snaps up a gnat that God designed that that particular swallow should snap up that particular gnat at that particular instant?” (Darwin 1860b). Hart (2005, 29) also takes issue with this model, writing it seems to imply that “there is a divine plan in all the seeming randomness of nature’s violence that accounts for *every* instance of suffering, privation, and loss in a sort of total sum. This is an understandable impulse . . . but providence is not simply a ‘total sum’ or ‘infinite equation’ that leaves nothing behind . . . [and] to assert that every finite contingency is solely and unambiguously the effect of a single will working all things—without any deeper mystery of created freedom—is to assert nothing but that the world is what it is.”



Interestingly, if this deterministic “exactly-as-God-intended” model incorporates the effects of the Fall, it might actually be alteristic. For example, in his *Hexaemeron* homilies, Saint Basil the Great (1895) says “thus in nature all has been foreseen, all is the object of continual care. If you examine the members even of animals, you will find that the Creator has given them nothing superfluous, that He has omitted nothing that is necessary. To carnivorous animals He has given pointed teeth . . . all bear the marks of the wisdom of the Creator.” The phrase “all has been foreseen” seems to channel the theology of Basil the Great’s younger brother, Saint Gregory of Nyssa (1892, 467), who believed that because the Creator foresaw the Fall, God implanted in animals, including humans, the adaptations and bodily functions needed for survival in the corrupted world, which are the “garments of skin” (Genesis 3:21 NRSVUE): “sexual intercourse, conception, parturition, impurities, suckling, feeding, evacuation, gradual growth to full size.” So, although this sounds like the non-alterist narrative insofar as God intended the creatures to be as they are, because these intentions were altered to accommodate the anticipated corruption of the world due to the Fall, this ultimately reduces to alterism. However, this flavor of alterism tends to be less pessimistic about the empirical world, a point I shall return to shortly.

There is, however, another version of non-alterism that shows more promise because it can be reconciled with the mainstream scientific understanding of evolution by natural selection. This version is that Creation, including the “offensive” animals and selection pressures, is as God intended, insofar as God voluntarily created the universe in all its potential *ex nihilo* and empowered Creation to unfold (i.e., actualize the potentialities) according to natural laws (see Knight 2007; Southgate 2008; Peters 2021). However, the current (unfinished) state of Creation, a “divine work in progress” (Theokritoff 2017), does not reflect God’s ultimate intentions, which will only be revealed in the eschaton. In the empirical world, this model would be indistinguishable from Khramov’s alteristic model, however the hardships (selection pressures) would not be a consequence of the human Fall, meta-historical or otherwise, but rather a product of the freedom God gave to Creation. Hart (2005, 91) wrote the following in support of alterism, but it also applies here: “Unless the world is truly set apart from God and possesses a dependent but real liberty of its own analogous to the freedom of God, everything is merely a fragment of divine volition, and God is simply the totality of all that is and all that happens; there is no creation, but only an oddly pantheistic expression of God’s unadulterated power.”

This model might very well have been agreeable to Darwin (1860a), who, in his May 22 letter to Asa Gray wrote, “On the other hand, I cannot anyhow be contented to view this wonderful universe and especially the nature of man, and

to conclude that everything is the result of brute force. I am inclined to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance.” After all, God says, “Let the waters bring forth swarms of living creatures” and “[l]et the Earth bring forth creatures of every kind” (Genesis 1:20; 24 NRSVUE), but God does not dictate when, how, or all the exact forms that will come into existence.

Of course, this model must also not devolve into vapid deism. God must not be misunderstood to have withdrawn Himself from Creation but rather to be immanently present and actively engaged, permeating and sustaining the unfolding Creation. Such immanence may not be incompatible with creaturely freedom if we consider the *logos* (plural: *logoi*) cosmology of Saint Maximus the Confessor (Blowers 2016; Theokritoff 2017, Jackson 2023). Briefly, all created things are implanted with pre-existing *logoi* (divine ideas, principles, wills, or intentions), derived (phylogenetically, in a sense) from the archetype Christ the Logos (“In the beginning was the Word [Logos], and the Word [Logos] was with God, and the Word [Logos] was God” (John 1:1 NRSVUE)), orienting and drawing created things toward their eschatological consummation in the uncreated *logos*, when God will be “all in all” (1 Corinthians 15:28 NSRVUE). However, Paul Blowers (2016) explains that “[Maximus] strictly distinguishes an individual creature’s *logos*, its ontological predisposition to fulfil its divinely intended end, and its *tropos* [*hyparxeos*] or ‘mode of existence,’ whereby it exercises its own freedom, its own proclivities and aversions.” Thus, we might say the *logos* describes *what* a creature is, whereas the *tropos* describes *how* a creature is. It seems Maximus only applied this *logos-tropos* distinction to rational creatures (i.e., humans), whose *tropos* could be aligned with their *logos*, or not. The extent to which this distinction should be extended to nonhuman creatures requires further study, however Andrew Jackson (2023) suggests that the *tropos* of nonhuman creatures is “fixed” in alignment with their *logos*. If true, this would indeed support the notion that even the “offensive” animals as we know them are how God intended.

Although Maximus was an alterist, expressing ideas similar (but perhaps more nuanced) to those of Gregory of Nyssa *vis-à-vis* “garments of skin” and a foreseen Fall, he does not dwell on prelapsarian Creation (“teleology trumps protology,” as Blowers (2016) puts it) and his vision of the empirical world is overwhelmingly positive. Elizabeth Theokritoff (2017) explains how his cosmic vision affirms the fundamental goodness of material Creation, that nothing created by God is intrinsically evil, that “the multiplicity and diversity of creatures is both intentional and real,” and that “we inhabit a meaning-filled world intended to serve as our teacher and guide.” Furthermore, according to Theokritoff (2017), Maximus emphasizes the “coherence of the whole” and a profound sense of “humanity *with* the rest of Creation,” with all creatures participating in the proverbial cosmic liturgy and ultimately intended for deification in their



eschatological union with Christ. Unlike other alterists, Maximus does not view the postlapsarian history of Creation, nor even the incarnation and cross, as some sort of plan b. For Maximus, “the history of Creation is providentially pointed, not simply toward recovering a lost prelapsarian paradise, as if the beginning point of creation is to be reduplicated, but instead toward attaining an *unprecedented* transformation and deification” (Blowers 2016). To that end, Maximus sees the vocation of humans as mediators and microcosms of Creation, cooperating with God to transform Creation. This vision of human vocation forms the basis of the last part of this article on what might be the proper Christian response to “offensive” animals.

Responses to and Opportunities Provided by “Offensive” Animals

What should be our response to “offensive” animals, like the parasitoid wasps? In a word, *love* should be our response as Christians, especially the kind of all-embracing cosmic love that seems to permeate Eastern Christian theology. Andrew Louth (2021) describes how, unlike the stark dualism of Anders Nygren (1953), the church fathers assimilated both *eros* (desire, longing) and *agape* (selfless, sacrificial love) into their understanding of God’s love for Creation and, by extension, humankind’s proper love for Creation. The patristic understanding of love, often described as burning and ecstatic (self-transcending) in its fullness, clearly has metaphysical and cosmic dimensions. Such cosmic love is synergistic, aligning with God’s love to transfigure creation; eucharistic, embodying a sense of universal gratitude for and communion with Creation; and, ascetic (from *askesis*, meaning to exercise), embracing the ancient traditions of prayer, fasting, and acts of selflessness. However, Theokritoff (2013) explains that “the aim of the ascetic way is not to eat lower on the food chain, but to cut off our self-will and conquer our ‘self-love,’ our self-indulgence.” This process of self-denial “forms persons who are not hostage to their own desires but are capable of acting out of self-giving love” (Theokritoff 2013). Maximus the Confessor envisaged even the capacity to love in this way as an ascetic struggle (Louth (2021) translates *askesis* in this context as “disciplined training”). Thus, we might think of the capacity for cosmic love as a muscle needing exercise; disciplined training is required to build and strengthen this muscle. With that in mind, let us now examine why we should love the “offensive” animals, what that love might entail, and how “offensive” animals can be the heavyweights in our ascetic struggle to build our capacity for cosmic love.

Simply put, we should love the “offensive” animals because God loves them (“For God so loved (*apagao*) the world (*kosmos*) that he gave his only Son” (John 3:16 NRSVUE)) and intends to redeem them (“in hope that the creation (*ktisis*) itself will be set free from its enslavement to decay and obtain the freedom of the glory of the children of God” [Romans 8:20–21 NRSVUE]). Furthermore, as Hart (2005, 55) explains, because “God is not only good but goodness

itself,” everything that comes from God must be good and true and beautiful: “Everything that is, insofar as it is, is entirely worthy of love. And it is this love and goodness of God that the Christian is bidden to find in the entirety of the created order.” Even John Wesley (1872), believing the “offensive” animals to have been corrupted by the Fall, nevertheless encouraged his listeners to “imitate Him whose mercy is over all His works,” “soften our hearts towards the meaner creatures, knowing that the Lord careth for them,” and “enlarge our hearts towards those poor creatures, to reflect that, as vile as they appear in our eyes, not one of them is forgotten in the sight of our Father which is in heaven.” The synergistic nature of cosmic love means that human beings, as mediators and microcosms of Creation, have a role to play in cooperating with God to transfigure Creation, uniting Creation in love, and uniting Creation with God (Theokritoff 2017). In short, we humans are icons of God and should reflect God’s love for Creation, even the “offensive” animals.

Next, how might loving “offensive” animals manifest itself? For one, it means not casting moral judgments on them, or any creature. It is a wise and holy impulse to feel compassion for and even revere the sacrificial victimhood (see Rolston (2018) on “cruciform creation”) in the killed lion cubs, the gobbled shark embryos, the younger booby siblings, and the cuckoo chick’s overworked foster parents and evicted foster siblings, and even to feel bewildered by the actors’ “offensive” behaviors. However, remembering the log in our own eyes (Matthew 7:3–5 NRSVUE), and that only humans have eaten from the tree of knowledge of good and evil and now having the capacity to rebel against our intrinsic selfishness, we must refrain from judging and condemning these animals, who cannot rebel against theirs. Therefore, I have consistently used the word “offensive” in quotes; these behaviors are only “offensive” when viewed through an anthropocentric lens. Casting away the anthropocentric lens through which humans view nature is an ascetic act that cultivates a cosmic love for Creation.

These ideas are developed rather richly by Fyodor Dostoyevsky ([1880] 2009) in *The Brothers Karamazov* through his characters Ivan Karamazov and the Elder Zosima. Ivan, in a conversation with his brother Alyosha, observes that “people speak sometimes about the ‘animal’ cruelty of man, but that is terribly unjust and offensive to animals, no animal could ever be so cruel as a man, so artfully, so artistically cruel” (Dostoyevsky [1880] 2009, 298). Elsewhere, Zosima, speaking before Alyosha and other visitors just before his death, cautions, “[M]an, do not pride yourself on superiority to the animals; they are without sin, and you, with your greatness, defile the Earth by your appearance on it, and leave the traces of your foulness after you—alas, it is true of almost every one of us!” (Dostoyevsky [1880] 2009, 406). Earlier, Zosima tells his visitors that “in the forest wanders the dreadful bear, fierce and menacing, and yet innocent in it,” and, speaking of animals more generally, that “there’s no sin in them, for all, all



except man, is sinless, and Christ has been with them before us" (Dostoyevsky [1880] 2009, 372).

Once we resolve not to judge or condemn any creature, we are better prepared to engage in the contemplation of nature (*theoria physike*), which, I would argue, is another way to exercise cosmic love for Creation. Bishop Kallistos of Diokleia (Ware [1979] 1986, 156–61) describes the contemplation of nature as recognizing the "thisness" of creatures and explains that we are to see each creature "for what it truly is, in all the distinctness and intensity of its specific being" and that "no existing thing is paltry or despicable, for as God's handiwork each has its unique place in the created order." He also explains that in and through each creature we are to discern the Creator because "all things are permeated and maintained in being by the uncreated energies of God, so all things are a theophany that mediates His presence. At the heart of each thing is its inner principle or *logos*, implanted within it by the Creator Logos." Thus, we are to acknowledge that each creature exists only in itself and for its Creator, praising God by its very being.

However, do the "offensive" animals "praise the Lord" (Psalms 150:6 NRSVUE) by their very being alone or also by their "offensive" behaviors? Christina Gschwandtner (2013) explains that the "praise of creation suffuses the [Eastern Orthodox] liturgical texts," which affirm "creation as sacred . . . and as a full participant in the worship of God." In her examination of these texts, Gschwandtner (2013) finds that "creation is portrayed as praising, singing, leaping with joy, clapping hands, rejoicing exceedingly and raising its voice, keeping feast, blessing the Lord, being amazed, rejoicing greatly, [and] even dancing." In response to those who might dismiss this language as purely metaphorical, Gschwandtner (2013) makes clear that "the participation of all of creation in praise of God is explicit" and should be taken more literally. She goes on to quote some specific examples of creaturely praise from a homily by Jacob of Serug: "new sounds were heard from all the birds," "all the flowers . . . sent forth perfume like sweet spices sending forth fragrance," and "all creatures silent or eloquent, according to their natures rendered praise which was due" (Gschwandtner 2013). Again, I ask, do the "offensive" animals offer praise also by their parasitoidism, infanticide, siblicide, and brood parasitism, which, intrinsic to these species, would indeed be "according to their natures"? At least with a non-alteristic premise, the answer must be a resounding yes. I realize some may construe this as bold and perhaps unnecessary speculation; however, it seems a logical necessity of my argument. Any hesitancy to affirm that even these "offensive" behaviors offer praise, just like the "nice" behaviors mentioned, would stem from anthropocentric prejudice. It is through asceticism that we come to the joyful and cosmic realization that Gschwandtner's (2013) thesis that "all creatures join together in the liturgical chorus" is truly universal, with no exceptions.

Another example of cosmic love is praying for the wellbeing of the “offensive” animals and even asking for their forgiveness. Dostoyevsky’s ([1880] 2009, 407) Zosima recounts how his dying brother, Markel, asked the birds for forgiveness: “My brother asked the birds to forgive him; that sounds senseless, but it is right; for all is like an ocean, all is flowing and blending; a touch in one place sets up movement at the other end of the Earth.” Recalling his brother’s words, Markel says, “Birds of heaven, happy birds, forgive me, for I have sinned against you too” (Dostoyevsky [1880] 2009, 364). Asking forgiveness of fellow humans is already a humbling, ascetic act, but to bring oneself to ask forgiveness of animals is truly strange and especially humbling. Nevertheless, Bishop Kallistos (Ware 2019) explains that praying for and blessing animals is perfectly acceptable: “They are to be approached with gentleness and tenderness; and, more than that, with respect and reverence, for they are precious in God’s sight.” He also writes that we “need to kneel down before the animals and to ask for their forgiveness for the evils that we inflict upon them” (Ware 2019). Although most of his cited prayers concern desirable and useful animals, such as domesticated animals, bees, silkworms, and beasts of burden, Bishop Kallistos (Ware 2019) writes that “even rats, hornets, and spiders have their appointed place in God’s dispensation.” I imagine he would agree that the “offensive” animals discussed in this article should not be left off the prayer list.

Moving on, what unique ascetical opportunities might “offensive” animals provide us to soften our hearts and exercise cosmic love for Creation? We begin with Saint Isaac the Syrian (1923, 341), who, when asked, “What is a merciful heart?” answered the following in his *Ascetical Homilies*:

The burning of the heart unto the whole creation, man, fowls and beasts, demons and whatever exists; so that by the recollection and the sight of them the eyes shed tears on account of the force of mercy which moves the heart by great compassion. Then the heart becomes weak, and it is not able to bear hearing or examining injury or any insignificant suffering of anything in the creation. And therefore, even on behalf of the irrational beings and the enemies of truth and even on behalf of those who do harm to it, at all times he offers prayers with tears that they may be guarded and strengthened; even on behalf of the kinds of reptiles, on account of his great compassion, which is poured out in his heart without measure, after the example of God.

It is interesting that Saint Isaac does not encourage prayer “even” for demons (notice that demons are merely listed among the “whole creation, man, fowls and beasts, demons and whatever exists”) but rather “even” for reptiles, of all things. This is because reptiles, especially snakes, were among the most “offensive” creatures of that era, recalling the serpent who tempted Eve in



Genesis (3:1 NRSVUE): “More crafty than any other wild animal that the Lord God had made.” Earlier in his *Ascetical Homilies*, Saint Isaac (1923, 248) calls out reptiles specifically among fears and anxieties plaguing humans: “Pusillanimity, grief, despondency, fear of demons, fear of men, rumors of robbers, tales about epidemics, anxiety before sicknesses, fear of scarcity of food, fear of death, reptiles and beasts and other things of this kind.” Later, when praising the virtues of humility, he says, “And when the humble approaches the deadly reptiles, as soon as the touch of his hands attains to their bodies, the virulence of their deadly poison is cooled and with his hands he crushes them as if they were locusts” (Saint Isaac 1923, 386). And yet, he calls on his followers to pray “even” for reptiles.

Reptiles being vilified was nothing new. Three centuries earlier, Saint Basil the Great (1895) also spoke ill of reptiles in his *Hexaemeron* homilies. At the beginning of Homily IX, he claims to “know the laws of allegory” and criticizes those who “change the nature of reptiles and of wild beasts to suit their allegories. For me grass is grass; plant, fish, wild beast, domestic animal, I take all in the literal sense” (Saint Basil the Great 1895). Then, in pondering what lessons animals can teach humans, Saint Basil (1895) shuns certain creatures, especially vipers, as the “cruellest of reptiles,” which he believes were “born by gnawing through the womb, inflicting a proper punishment on their mother” and mating with lampreys in an “adulterous violation of nature.” Although we know that vipers do not mate with lampreys or “gnaw through the womb” (although most members of the taxonomic family Viperidae do indeed give live birth, as opposed to laying eggs, which could have been mistaken for matricide or matrophagy), Saint Basil’s understanding certainly would have landed vipers on the list of “offensive” animals. And yet, Saint Isaac in his *Ascetical Homilies* singles out “even” reptiles as objects for prayer. Once again, I ask what unique ascetical opportunities might “offensive” animals provide us to exercise cosmic love for Creation? The answer requires just a bit more setup.

At the beginning of this article, I referred to the “offensive” animals as “hard to love.” By this I meant their “offensive” nature makes them undesirable to most humans; they have little to offer most humans (at least at first glance) in terms of instrumental, aesthetic, or cultural value. Creatures may be similarly hard to love due to their banality, fearful appearance, cultural vilification, or potential to be dangerous or pestilent. Such creatures might include spiders, mosquitos, cockroaches, snakes, sharks, poisonous or thorny plants, weeds, parasites, and pathogenic bacteria and fungi. On the other hand, research shows that humans’ most favored animals tend to be phylogenetically similar (i.e., other mammals), aesthetically pleasing (e.g., cute, furry, colorful, delicate, intricate), emotionally reciprocal (e.g., dogs), intelligent (e.g., dolphins), innocuous (i.e., not likely to bite, sting, poison, or pass disease), useful to humans or essential

to the environment (e.g., livestock, honeybees, “keystone” species), culturally valuable (e.g., national emblems), or relatively large in size (e.g., elephants, whales, and other “charismatic megafauna”) (Batt 2009). Of course, there is nothing inherently wrong with loving animals for these reasons, but these desirable qualities render such animals rather easy to love. Returning to our earlier analogy, their light weight may not be particularly helpful in our ascetic strength training to build our capacity for cosmic love.

Therefore, if we are striving to cultivate an all-embracing cosmic love for Creation, we might focus on the “offensive” creatures precisely because they are hard to love, undesirable to most, and yet are entirely worthy of our love. After all, Jesus went out of his way to love and minister to the outcasts of society, the least desirable, the overlooked, the hardest to love: the poor and downtrodden, prostitutes, tax collectors, the Samaritan woman, lepers. Through his love, Jesus created value in these people who had “offensive” appearances, professions, behaviors, and afflictions. Are the “offensive” animals not similarly outcasts? By giving attention to the “offensive” animals, by finding desirable qualities and creating value in them, we engage in that ascetic struggle to build our capacity to love Creation with an all-embracing cosmic love.

Conclusions

In summary, the lessons to be learned from the “offensive” animals as follows. First, they reveal God’s mysterious love and patience in creating and God’s empowering of the cosmos with a kind of freedom to unfold. This of course implies that Creation is not yet finished (a “divine work in progress,” as Theokritoff (2017) puts it) and therefore does not, in its current form, reflect God’s ultimate intentions. Next, the “offensive” animals challenge us to love all of Creation unconditionally and enthusiastically and recognize that these creatures present unique ascetical opportunities for us to exercise this kind of cosmic love. This is exemplified by Dostoyevsky’s character Zosima, who encourages his followers to throw themselves onto the Earth and kiss it and love it in ecstasy, to treat all creatures with measureless tenderness, and even to ask forgiveness of the birds. Zosima says not to be ashamed of this ecstasy but rather to treasure it as a gift from God:

Love all God’s creation, the whole and every grain of sand in it. Love every leaf, every ray of God’s light. Love the animals, love the plants, love everything. If you love everything, you will perceive the divine mystery in things. Once you perceive it, you will begin to comprehend it better every day. And you will come at last to love the whole world with an all-embracing love. Love the animals: God has given them the rudiments of thought and joy untroubled. Do not trouble it, don’t harass them, don’t deprive them of their happiness, don’t work against God’s intent. (Dostoyevsky [1880] 2009, 406)



Lastly, as a way forward, cosmic love for Creation could transform relatively recent constructions of environmental stewardship into an ascetic environmental ethic that is perhaps more faithfully Christian. The stewardship construct was developed primarily as a response to charges by Lynn White (1967) and others of exploitation and despotism associated with God telling humans in Genesis (1:28 NRSVUE) to “be fruitful and multiply and fill the earth and subdue it and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the Earth.” However, stewardship seems to have been largely ineffective at reducing demand for natural resources and quelling environmental destruction. As Christopher Vena (2009) sees it, the failure of most formulations of the stewardship paradigm is that they are fundamentally anthropocentric, affirming the supremacy of humans as separate from and above the rest of Creation. Stewardship generally implies that nature needs to be managed, tended, cared for, and protected by humans, thereby reinforcing our already largely instrumental engagement with nature and the notion that nature exists primarily for human usage, albeit sustainable usage with proper stewardship. Ironically, the tending and managing is necessary only because of humans’ destructive practices. Stewardship mostly ignores the interconnectedness between humans and the rest of Creation. An ascetic environmental ethic might mean not living above or even in nature, but perhaps with nature, as part of nature. We are animals. Besides our shared evolutionary kinship, we are united in fragility, dependence on God, and having been brought into being from nothing. Humans are, however, distinct in our capacity to rebel against our selfish animal instincts, which gives us a moral responsibility to live ascetically, make sacrifices, and be for and with Creation. We should perceive Creation in terms of and reflecting God’s love for it. We must become less concerned with how a creature is and simply focus on that it is. The humility that comes from asceticism should challenge us to discover the Godwardness in all creatures and to allow them to exist in relation to their Creator, praising God by their very being, regardless of any cultural value or service they may provide. This of course must include the “offensive” animals like the parasitoid wasps.

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Cell Mysteries and the Paradigm of Sexual Reproduction

Tatjana Paunesku, PhD, Research Associate Professor, Feinberg School of Medicine, Radiation Oncology Department, Northwestern University, Chicago, IL, USA,
tpaunesku@northwestern.edu

Biological evolution is an indisputable reality of life, regardless of our ability to conceptualize it. Life of a species cannot exist without death of individuals and birth of new ones. As long as this cycle exists, biological evolution is inevitable, with new speciation as its eventual outcome. The theory of evolution was formulated by Charles Darwin, but understanding of what life is and how it functions owes equally as much to Matthias Jakob Schleiden's and Theodore Schwann's cell theory. These three naturalists from the nineteenth century gave us the basis for biology as it is today, and yet cells and evolution are still only partially understood. Life remains mysterious. Death remains a focus of most world religions. This article gives a tremendously abbreviated current understanding of the history of life until this moment in an effort to motivate us to think about life on Earth as it really is—with all extant and lost living beings of Earth related through a common ancestor and made of water and dust.



For that which befalleth the sons of men befalleth beasts; even one thing befalleth them: as the one dieth, so dieth the other; yea, they have all one breath; so that a man hath no preeminence above a beast: for all is vanity. All go unto one place; all are of the dust, and all turn to dust again.

Ecclesiastes 3:19–20

No honest human is free of self-doubt about the validity his or her convictions, and the manner in which one deals with self-doubt expresses a degree of personal integrity. Fortunately for the theory of evolution, Charles Darwin (1859) was no exception from this rule, and it is not surprising that he started to doubt the universal applicability of natural selection—a concept he defined—a mere year after publishing *The Origin of Species*. In a letter to a friend, he stated, “[T]he sight of a peacock’s train whenever I gaze at it makes me sick” (Darwin [1882] 1993). What was making him sick was the doubt and not the sight itself, because he found peacocks’ tails to be pretty. In *The Origin of Species*, Darwin developed the concept of speciation of living organisms, describing it as a gradually emerging outcome of natural selection over many generations as separated groups of individuals of an ancestor species get exposed to a sustained environmental pressure. In such a situation, individual animals that manage to produce descendants before they die show themselves to be a good fit to their environment. Moreover, with the environment being relatively static and heredity working as it does, this also meant these descendants would probably meet the demands of their environment—that is, be suited to the environment that “selected” their ancestors. The concept of selection was well known to Darwin from looking at manipulations farmers did with domestic animals. It was, and still is, a custom for the breeders of horses, dogs, cows, etc. to carefully select specific pairs of animals for mating because they have desirable traits their progeny will likely show as well. The workings of human-enforced selection and natural selection are both efficient in changing the distribution of hereditary traits in a species. The major difference between the two is that humans select traits they want in animals within a relatively short time, while nature applies its pressure over many millions of years. Extrapolating from this, Darwin concluded that the average appearance and behavior of any specific species at any specific moment are an outcome of a lengthy selection process; this also meant that each species living in nineteenth century existed because it was (still) in harmony with its surroundings. And yet, there were peacocks. A peacock’s train is blatantly inconsistent with the concept of natural selection, for what natural advantage can there be for a male peacock to be burdened with a heavy and clumsy tail in a world full of predators? This irksome fact stimulated Darwin to think about all possible forces of selection and helped him discover the principle of sexual selection. Consequently, in 1871, he published his second book, *The Descent of Man, and Selection in Relation to Sex*. In it, he postulated that mating success is itself a

source of selection pressure and explained the male peacocks' tails as a key feature that attracts female peacocks. Thus, for a male peacock, the risk of falling prey to a fox before procreation is offset by a much increased likelihood of fathering peacock chicks before the fox snatches him. Darwin still could not guess what may be going through a female peacock's mind when she sees several eligible males, and he bungled things a bit by talking about beauty as humans see it as one of the bases of sexual selection. Even among the naturalists of the time, it was not uncommon to anthropomorphize animals, so Darwin had relatively few conflicts with other biologist about this issue. Subsequent generations of biologists thought differently, and this reliance on aesthetics made many suspicious about sexual selection as a concept. Few humans find beauty in either sex of cockroaches, yet they clearly mate with each other and leave abundant offspring. Likewise, we fail to appreciate the beauty of placozoa, the simplest multicellular organisms that occasionally reproduce sexually (Signorovitch, Dellaporta, and Buss 2005). Nevertheless, regardless of the "beauty principle," the notion of sexual selection survived, and the appeal of male peacocks' tails was revisited in the twentieth century. In a series of experiments, different aspects of the male peacock's tail were obscured and others left untouched to find out what exactly is attractive to female peacocks. It turned out to be the number of "eyespot" on tail feathers and not the size of the tail (Petrie 2021). Why exactly the female peacocks value the "eyespot" is still not known, but Marion Petrie explains that the existence of variance in mating success opens possibilities for rapid evolutionary changes that benefit species as a whole.

Even though biologists from the 1800s did not do peacock experiments, they observed the nature around them avidly and made numerous exciting and wide-sweeping discoveries. Biology of that time was exceedingly popular because of easy access to a new gadget, the microscope, and things to look at under it such as pond water. This situation was so rife with opportunities for discovery that many talented amateurs made their names in this field of science. Darwin was the great pioneer of biology at that time, but some of the other enthusiasts found fault with him and his theories. For example, a book review of *The Descent of Man, and Selection in Relation to Sex* published by biologist St George Jackson Mivart (1871) concluded with the following:

Without a sound philosophical basis, however, no satisfactory scientific superstructure can ever be reared; and if Mr. Darwin's failure should lead to an increase of philosophic culture on the part of physicists, we may therein find some consolation for the injurious effects which his work is likely to produce on too many of our half-educated classes. We sincerely trust Mr. Darwin may yet live to furnish us with another work, which, while enriching physical science, shall not, with needless opposition, set at naught the first principles of both philosophy and religion.

In a nutshell, even though all the most important biological discoveries of the nineteenth century showed, in some form or another, that all life on Earth functions under the same principles, Darwin's explicit statement that humans are part of the animal kingdom found disfavor with many of his religious contemporaries. Interestingly, even though he hoped to protect "the first principles of religion" and thus distance himself from Darwin, Mivart eventually got excommunicated from the Catholic Church for some unusual ideas about hell and ended up buried in a dissenter's cemetery for four years after his death. Meanwhile, Darwin was buried in Westminster Abbey, one of the most important Anglican churches, with pomp and circumstance.

Despite differences of opinion, both Darwin and Mivart viewed themselves as philosophers as much as biologists. Engaging oneself in a philosophical way of thinking was something most scientists in the 1800s did as a matter of course, and the philosophy of biology was not seen as remote from other philosophies, including the philosophy of religion. It is therefore perhaps surprising that Darwin's contemporaries focused on the philosophy of religion did not attempt to reach after new vistas of thought opened by biological philosophy. Fortunately, that is no longer the case. Today, many of those who study the philosophy of religion are eager to consider philosophies of "natural sciences" when developing new positions. One of the intentions of this article is to provide something like a table of contents of biology and encourage non-biologists to pick biological concepts worthy of contemplation that would appeal to them.

Darwin's understanding of biological evolution opened human minds to thinking about the outcomes of survival under the pressures of the natural world, but our understanding of life owes as much to two other nineteenth century biologists: Matthias Jakob Schleiden and Theodore Schwann—originators of cell theory. In fact, there are some who argue the cell theory enabled Darwin to think about heredity in a way that helped him conceptualize evolution (Müller-Wille 2010). These two German scientists were passionate microscopists and friends who realized cellularity is universal for plants and animals alike (Hajdu 2002; Charpa 2003). It is true that the microscope was discovered before their time and that others coined the word "cells" and discovered cell nuclei, but nobody before them dared to say that every living creature is made of cells. In 1838, Schleiden published his understanding focused on plant cells, while Schwann formulated a universal cell theory in 1839. Their book, translated into English in 1847, states succinctly and accurately: "All living things are composed of cells and cell products" (Schwann and Schleyden 1847). Interestingly, as a devout Catholic, Schwann asked the Archbishop of Malines for a blessing for his book on cellularity, and received it. Whether the archbishop, or even Schwann himself, understood the full implications of cell theory is uncertain. The fact is that while the theory

of evolution links humans with primates, the universal cell theory connects humans with every other living creature on the planet. Despite the differences in the size and shape of their cells, all living organisms manage their existence using the same approaches to synthesize proteins and nucleic acids; all engage in some type of cell-to-cell fusion. We are everyone's distant cousins and related to peacocks and plants as well as placozoa and bacteria.

Because a cell is an incredibly complex structure and includes the same key components and parts that function in the same way in all living organisms, an undisputed consensus in biology is that all living organisms have a single common ancestor. This would be a primordial species of single cell organisms that lived billions of years ago, having its entire hereditary material—deoxyribonucleic acid (DNA)—organized into a single piece, a single chromosome. Importantly, single cells that were the individual members of this species were not too fastidious about the separation between self and other cells and often merged with each another and exchanged cellular materials. As a matter of fact, some of the single cell organisms living on Earth today still engage in unions with other single cells even if they are not of the same species. For example, individual cells of two different species of bacteria from *Clostridium* genus have been found to engage in direct cell-to-cell connections. In these interactions, they exchange their intracellular material, which then leads to changes in metabolism. Sometimes, as a result of material exchange, the hybrid cells start to produce non-native metabolites. and it is this unexpected change of metabolic behavior that allowed the discovery of the phenomenon of exchange (Charubin and Papoutsakis 2019). While in this instance material exchange did not lead to hereditary changes, such changes occur easily when there is an exchange of genetic material between cells of the same species. Bacteria *Escherichia coli*, one of the regular inhabitants of human intestines, engages in two different types of “mating.” In these processes, bacterial cells mix their hereditary material and become genetically unstable due to the increased amount of DNA. When the DNA amount gets in balance again, the single bacterial chromosome is often refashioned as a combination of the two initial DNAs (Gratia and Thiry 2003). While temporary genetic instability still affects bacteria that are exchanging genetic material, the descendants of primordial cells developed a new way to handle their DNA that stabilized it and laid the ground for still more frequent mixing of hereditary material. This was the development of the nucleus—a cellular sub-compartment where the hereditary information of a cell, its DNA, is stored. This early nucleated organism gave rise to all organisms with true nucleated cells, the so called eukaryotes, via an ancestral nucleated cell that is referred to as the last eukaryotic common ancestor (LECA) (Goodenough and Heitman 2014). LECA preceded the separation between species that committed to the consumption and metabolism of ingested materials and became fungi or

animals and species that adopted the ability to absorb the energy of the sun and became plants. LECA is also believed to be the organism that first developed sexual reproduction. Subsequently, this type of reproduction developed different specific manifestations in different descending species.

At first glance, considered purely in terms of efficiency, sexual reproduction is a needless complication if the thriving of a species is the only question under consideration. The majority of single cell organisms reproduce asexually, simply by splitting into two daughter cells. While that is not numerous offspring for a single individual, and more offspring can be generated by a multicellular organism, duplications of single cell organisms are, nevertheless, guaranteed duplications. If we look at the entire populations of individuals of single-cell organism species, their populations can double in size in a single generation. This is an efficient process for growth and is responsible for the fact that the calculated current biomass of the simplest and smallest single cell organisms—bacteria—accounts for 10 % of the entire biomass on the planet, while humans account for 0.06%, and all the combined wild animals and birds for less than 0.01 % (Bar-On, Phillips, Milo 2018). This makes sense considering that, unlike bacteria, many individual multicellular organisms do not generate any offspring even when, in theory, they could be a parent to thousands. The difference in reproduction strategy between single cell and multi cell organisms is also interesting to consider from the perspective of death of an individual. While a multicellular organism may or may not reproduce, it is certain that it will eventually die. A single cell organism, on the other hand, literally dies for and lives through its progeny. Each single cell bacteria and its largely identical sister cell are born through cell division of the mother cell; when such a division is done, nothing of the mother cell remains.

Before we go further into the explanation of the sexual life cycle, it is useful to explain that regular cell division—the way in which a cell duplicates itself—is a process through which genetic material first doubles and then gets equally divided, transmitting the identical information to the two daughter cells. This type of cell division, by which a parent cell ceases to exist and two of its daughter cells come to be, is called mitosis. In any multicellular organism, most of the cells that make up its body mass are generated by this process—a cell divides into two daughter cells, which each divide into two more cells, and so on—and a body grows. This form of cell division does not, however, support sexual reproduction. Existence of the sexual life cycle depends on coincidence of two different processes that most likely developed simultaneously, complementing one another for the disadvantages to the organism either process on its own could cause. One of the two processes—cell fusion and material exchange between cells—was briefly mentioned earlier in the context of cell–cell interactions. It should be noted that in the context of bona fide sexual reproduction, accuracy of cell fusion is of paramount importance, and intricate mechanisms have developed for mutual recognition of reproductive cells with

the complementary DNA sets (Goodenough and Heitman 2014). The second process necessary for sexual reproduction is a new type of cell division—division that happens twice in immediate succession but with only one round of duplication of genetic material. This process is called meiosis, and at the end of it, a parent cell has disintegrated into four daughter cells, each with only one half of the genetic material and incapable of further division. Cells called *gametes* that form the basis of sexual reproduction fall into this category. Once generated, they will either participate in merging with a compatible gamete cell or die as they were. The cycle of sexual reproduction depends on the generation of gametes and their fusion. At the end of gamete fusion, a single cell with a full complement of genetic material is created. This newly minted cell—a zygote—can now go through the process of mitosis repeatedly and grow into a new organism. If the zygote belongs to a species of Placozoa, the process is over after two divisions, because Placozoa are organisms made of only four cells. If the zygote is human, it will first split into eight unconnected cells generated through three mitotic divisions. These eight cells will then start to form permanent cell-to-cell connections. These connections are the basis of multicellular organisms functioning as a single organism (separation of cells before this stage can lead to twinning), and they are necessary for subsequent coordinated mitoses that allow for the development of a baby over the period of nine months. It is beyond the scope of this article to talk about embryology, but it is worth mentioning that the correct development of the majority of multicellular organisms includes not only programmed cell divisions but also programmed cell death. The fact that cell death is hardwired into the successful growth of multicellular organisms echoes the fact that both life and death of individuals are necessary for the continuation of life for their species.

The necessity of death for a successful propagation of life is one of the biological concepts that can provide ample room for philosophical reflection and deep religious contemplation. The emotional and psychological turmoil that follows bereavement tears at families and communities, and every world religion has developed approaches for helping the bereaved cope with their loss. A firmly established understanding of death as necessary for the existence of all life that exists and has existed could provide solace in a moment of crisis. For most of us, the greatest moments of anguish derive from an expectation that we should be exempt from what befalls others. Seeing ourselves as members of a species and temporary representatives of all life on Earth is not emotionally or psychologically impossible. Biology provides us with daily confirmations of this fact, and religions focused on the emotional stability of their flock could capitalize on it much more than they do.

Sexual reproduction is, amusingly enough, often referred to as a problem, by which it is meant that it is difficult to justify its existence. The essence of this “problem” is sometimes expressed as follows: If a species is comprised of asexual females (in this case meaning simply an individual capable of

delivering offspring), every living individual of that species will be equally capable to produce offspring. But, if a specific species is sexual, then only the female half of the individuals will be capable of delivering offspring. Because of that, the length of survival of the sexual females must be double that of her asexual peers to produce the same number of offspring (Petrie 2021). In short, the reproductive success of sexually reproducing species versus that of an asexual species identical in every other respect requires two times greater fitness of females. Regardless of whether this is a real-life paradox or a mathematical one, like those developed by Zeno, researchers of the twentieth and twenty-first centuries who tried to uncover the universal benefits of sexual reproduction did not meet definitive success (de Visser and Elena 2007; Otto 2008; Goodenough and Heitman 2014). It appears the fitness benefits of sexual reproduction may be many, but they are all relatively subtle. Regardless, the facts remain that almost all multicellular organisms reproduce sexually and that mutations that lead to asexuality get adopted by very few species (Otto 2008). Even though we are still unable to express it by a single and simple mathematical model, sexual reproduction increases the fitness of the living species and their likelihood of survival.

Clearly, once sexual reproduction came into being, the possibility of sexual selection also arose. Summarizing the available knowledge about sexual selection, a researcher who has worked with peacock tails said, “[S]exual selection is profoundly different from natural selection because, uniquely, it can simultaneously promote and maintain the genetic variation which fuels evolutionary change” (Petrie 2021).

In other words, sexual reproduction coupled with sexual selection may ensure a species has a latent capacity to face the pressure of natural selection, even when such pressure changes intensity or direction. In essence, sexual reproduction and selection come with genetic baggage that ensures a wide genetic variability among the newborns. If the environment has not changed since the parents were born, progeny similar to the parents will thrive the best. If the environment has changed, however, some of the genetic outliers from the next generation may be better suited to the changed environment. Importantly, these individuals will still also retain the genetic material that was better suited to the previous natural circumstances. Therefore, should the environmental changes go through reversals, sexually reproducing organisms will have a good chance to cope with them. Unidirectional changes of the environment, on the other hand, are more likely to overwhelm the genetic adaptability of a species, regardless of its type of reproduction, as can be seen from fossil records.

Reflections

The nature of cells and the intricacies of the process of sexual reproduction have been considered by countless articles and books that this article has barely touched on. Even more importantly, the majority of the concepts described

here were simplified almost to the point of inaccuracy. So, it would be logical for the reader to ask why this was written, and my answer would be that I wished to provide information that could encourage contemplation. Today, any interested high school student can know much more about biology than any of the naturalists from the nineteenth century, and yet we hardly ever try to direct that knowledge to any other purpose than to try to increase it. Research in psychology has formulated that the knowledge not experienced in practice cannot mature into wisdom (Zhang et al. 2022) and so has little impact on one's actions. It is true that the knowledge about an issue as vast and abstract as biological evolution cannot be experienced directly, but there are other ways to become connected with what we know. The most readily available is contemplation, and I propose that we try to think through some of the big biological concepts we assume we know and take for granted. I will reflect here on several of my favorites and talk about what I think of when I allow myself to sink into them.

While all living organisms on Earth exist, most of the matter that exists on Earth is not living. We all know that living and nonliving things are different, but we rarely think about the exact differences between them. Nonliving entities get formed through forces exerted by Earth and the cosmos. Matter that comprises a nonliving thing then remains present where it is through physical forces and chemical bonds. With the passage of time, molecules and atoms encounter forces that are greater than the forces keeping them together as a part of the nonliving object. So, the nonliving thing falls apart and while the process may be very slow, it is inevitable. Some nonliving entities have the capacity for the replenishment of their components—rivers are like that. Only the physical forces keep a river as an entity—its component water molecules travel from the spring to the ocean, but they get replaced over and over, and a river continues to be where it is for a long while. The proto-living entities were also formed through forces exerted by the Earth and the cosmos at some long-ago moment in time. They too just existed and were slowly falling apart until here and there chemical reactions happened that slowed down the falling apart by allowing for the replacement of the complex molecules that got lost due to degradation with the new ones. With time, over billions of years, one of the proto-living entities happened to encompass molecular machinery for all of the key chemical reactions that allowed it to thrive and even grow, so that one day, possibly after additional billions of years, it split itself into two. That instance—the first case when a living thing did not fall apart but segregated into two living things—was the establishing of life and the beginning of biochemistry. That chemistry hoarding protocell became the first cell and the great grandmother of all that is now living on the planet. The myriad of biochemical means used by living creatures today to secure their existence are variations and extrapolations of the chemistry solutions developed by that great grandmother of life.

What does the existence of a living organism mean? Mostly, it means constant renewal, with or without growth, of the existing components that make up the organism. In a human being, complete turnover of every atom that makes the human body occurs every five to seven years. Our bodies work similarly to well-kept homes—roofs and walls and furniture all get changed over time, but the house is still a house. Such turnover happens to cells as well. Humans have a cellular mass turnover of about eighty grams per day, and the cells that die and get replaced are mostly blood cells and cells lining the intestine (Sender and Milo 2021). While individual organisms manage to live and maintain this exchange of materials for a long while, life never continues through single individuals but through successive generations. For any specific species, it is the life of its populations—groups of individuals living near one another—that is actually life supporting. Natural selection acts on populations because the thriving progeny of a population of a specific species is that species’ “adaptation” to its environmental pressures. So, the evolution of life is a never-ending cycle of discovering solutions for the problem of replenishment of life through the support of self and next generations. It is the same problem the great grandmother first cell solved, the best it knew, billions of years ago. Nothing living stays the same, and yet life continues as a variation on the theme of existence. Our bodies and those of all other creatures are like a river that is constantly replenishing both the water and all other components.

While we know that hereditary material is what makes next generations similar to their parents, we rarely take the time to consider the complete implications of the existence of DNA. As I just discussed, living organisms are adept at changing their old molecules for new ones, and the ability to withstand this persistent turnover is necessary for the living organisms to remain alive. But how is it that the living organisms “stay the same” throughout their life with all this material replacement? Where is the source of instruction that ensures the part of a cell being replaced is replaced by a fresh version of the same part? How is it ensured that a new cell replacing a dying cell at a specific location in a multicellular organism will do the same job? The instructions come from the DNA—the hereditary material. While next generations depend on the DNA in the gametes, maintenance of the remainder of the body relies on the DNA of other cells. An oak tree stays an oak tree all of its life and so does a Placozoa, irrespective of how long or how short they each live. Humans remain functional and even preserve memories most of their lives because all the cellular rebuilding happens on the basis of the already existing information. We think of DNA as hereditary material our progeny, if we have it, receives from us, and as the material we received from our parents, but we almost never think of our DNA as the basis for our own individual persistence in the form we currently have. We tend to forget how material and changeable we are, and yet, that is the only type of existence possible in the world as it is.

I could go on with more examples for contemplation, but even the few I raised make it clear that the way in which humans think of the world would benefit from a clearer sense of who we are biologically and what the biosphere is. I propose that we should consider the philosophy of biology while incorporating in it the current science. We should do so fearlessly, admitting all the embarrassing little details about our existence. Ultimately, because no philosophy is remote from other philosophies, a meeting between the philosophy of biology and the philosophy of religion could open a fertile ground for deepening our self-understanding.

Conclusion

The current volume of biological information at our disposal far surpasses what was accessible in the nineteenth century, when all the key concepts discussed in this manuscript were formulated. Nevertheless, our knowledge still has many gaps, and the conceptual understanding of human life, its dependence on the existence of cells, and sexual reproduction is still far from polished. While efforts to generate more information about these topics are as valuable as they are likely, integrating the knowledge we have into our vision of existence in the material world is just as important. Hopefully, this article will provide some inspiration for such an effort.

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Can Spirituality Save Centuries-Old Trees and Forests? A Study from the Mountains of Northwest Greece

Kalliopi Stara, Post-doctoral researcher and lecturer, Laboratory of Ecology, Department of Biological Applications and Technology, University of Ioannina, Ioannina, Greece, kstara@uoi.gr

Rigas Tsiakiris, Head of the Department of Forests Works, Forestry Service of Ioannina, Ioannina, Greece, rigastsiakiris@gmail.com

Jennifer L. G. Wong, Director, Wild Resources Limited, Bangor, UK, jenny.wong@wildresources1.plus.com

John R. Healey, Professor of Forest Sciences, School of Environmental and Natural Sciences, Bangor University, Bangor, UK, j.healey@bangor.ac.uk

Valentino Marini Govigli, Assistant professor, Department of Agri-Food Science and Technology, University of Bologna, Bologna, Italy, valentino.marinigovigli@unibo.it

John M. Halley, Professor of Ecology, Laboratory of Ecology, Department of Biological Applications and Technology, University of Ioannina, Ioannina, Greece, jhalley@uoi.gr

The Sacred Natural Sites (SNS) of the Epirus region of Greece are either solitary trees or groups of trees adjacent to churches or old-growth forests associated with villages. SNS contain naturally shaped, centuries-old trees of various species. Rules enforced by fear of supernatural punishment mean local people did not cut the trees of SNS for timber or fodder. Church trees are associated with rituals and aesthetic values, while sacred forests are multifunctional socio-ecological systems linked to important ecosystem services: they protect settlements from natural disasters, contribute to the conservation of important natural resources such as scarce water supplies, serve as emergency or crisis reserves, and indirectly mitigate internal community conflicts. Protection of sacred forests continues to evolve with those in Zagori and Konitsa added to the national inventory of Intangible Cultural Heritage (UNESCO) in 2015. Further recognition of the value of SNS could provide opportunities for nature protection through a deeper appreciation of the role of spirituality in conservation.



Introduction

Trees and forests are natural resources that make an incalculable contribution to the life of the planet. They absorb large amounts of carbon dioxide from the atmosphere; regulate local and global climate; are the basis of many natural and anthropogenic ecosystems; create specific habitats and microenvironments; hold, create, and enrich the topsoil; limit erosion; act as water pumps and carbon stores; and host more than three-quarters of the planet's terrestrial biodiversity. They provide raw materials for sustaining human life such as fuelwood, timber, food, medicines, fibers, cosmetics, and fodder for livestock, and they are especially valuable for human physical and mental health (FAO 2018, x–xiv; FOREST EUROPE 2015, 26–33).

Forests and trees also have a powerful symbolic value in human culture. The development of small seeds into long-lived trees of enormous dimensions and their ability to survive hardship render some individual trees as numinous, conceptualized as nearly immortal, serving as ciphers for the amazing power of nature. As trees get older, their cultural value increases, and they become inextricably bound by symbolism, stories, and legends. Some trees become sanctified and treated as sacred through association with religious leaders, ceremonial practices, and rituals. Similarly, woodland can be conceptualized as a primordial forest serving as an entrance to a dark and dangerous world that holds secrets, exudes awe, and is symbolically related to the search for spirituality (Cooper [1978] 1979, 71). This is the sublime forest the pioneers of American transcendentalism praised and others demonized in their attempt to tame its wildness (Botetzagias 2010, 186–89). Stories such as that of the mythical Gilgamesh in Mesopotamia, who desired the trees of a legendary cedar forest guarded by a dragon, or of Erisychthon in ancient Greece, who cut the sacred oak tree of Demeter for timber to build a symposium hall, speak of humans' attempt to tame nature by civilizing it through acquisition and use. The association of sacred trees and forests with supernatural guardians, taboos, and the feeling of fear is a common element of all the places termed today as Sacred Natural Sites (SNS), which are defined as “areas of land or water having special spiritual significance for peoples and communities” (Verschuuren et al. 2010, 1).

In this article, SNS refers in particular to the centuries-old sacred trees and forests that have been preserved in the municipalities of Zagori and Konitsa (Epirus region, northwest Greece) using the practices and rituals of the Orthodox Christian Church. We found these forests are kept from utilitarian using people's fear that cutting the trees down could attract a supernatural punishment as a consequence of the intention to grab something belonging to God (Stara 2009, 329). Our work has revealed that SNS, especially sacred forests, embody a very sophisticated management system that has successfully created and preserved extremely valuable local forest resources, maintaining ecosystem services and protecting villages from extreme weather events in a rough mountainous landscape.

Methods

The Study Area

Our research took place in the Epirus region of northwest Greece in the municipalities of Zagori and Konitsa, where we have located and studied SNS, especially sacred forests, over the past twenty years. Zagori—“the land behind the mountain,” as it is defined by the etymology of its Slavic name (Oikonomou 1991, 489)—is a complex of forty-five villages located in the Pindos mountain range, particularly around the Tymfi massif (its highest peak is Gamila at 2,497 meters). Konitsa municipality includes the town of Konitsa, forty-four villages, and most of the area of two mountains: Smolikas, the second highest mountain in Greece (highest peak 2,637 meters) and Grammos (highest peak 2,520 meters). The landscape of the area is characterized by dramatic geological formations, in particular the Vikos and Aoos gorges. Emblematic rivers, such as the Aoos and its tributaries Voidomatis and Sarantaporos, together with Vjosa in Albania, form one of Europe’s last free-flowing wild rivers (Kati et al. 2019, 5), while the most extensive natural oak and black pine forests of Greece characterize the area. A large altitudinal range (400 to 2,637 meters) within a small area combined with mountainous terrain and geological complexity create a high diversity of biotopes of great ecological value and conservational importance. The natural heritage of the area has been recognized with the designation of the Northern Pindos National Park (2005), the largest montane national park of Greece, incorporating the older National Forests of Pindos (1966) and Vikos–Aoos (1973), the Vikos–Aoos UNESCO Geopark (2010), and eleven Natura 2000 sites (Bendermacher-Gerousi et al. 2022, 39–42).

Human presence in the area is evident from the Upper Paleolithic (16,000 years ago). Throughout history, the inhabitants appropriated and domesticated the landscape and even used the steep slopes of the mountains and the Vikos gorge as places of residence. However, most cultural remains are of post-Byzantine origin, including private and public buildings and entire villages protected via national laws and presidential or ministerial edicts as traditional stone-built settlements. In addition, the area is characterized by a remarkable preindustrial infrastructure and transportation network that reflect its prosperity during the period of the Ottoman occupation (1430–1913) (Bendermacher-Gerousi et al. 2022, 52–57, 183). During this period, the villages of Zagori and some of Konitsa enjoyed a kind of “autonomy” and associated privileges (Nitsiakos, Arapoglou, and Karanatsis 1998, 479–80; Nitsiakos 2008, 31). This conferred status and wealth, coupled with high levels of prosperity resulting from remittances based on male emigration, mainly during the eighteenth century, to Europe, Africa, and later the United States (Dalkavoukis 1999, 19–28), as was typical for many agro-pastoral communities in the Balkans (Mazower 2002, 21, 14). Similarly, the inhabitants of the Sarantaporos valley in Konitsa turned to technical specialization (eighteenth to nineteenth centuries) and traveled within and beyond the boundaries of the Ottoman

Empire. Likewise, the town of Konitsa served as a commercial center, with its well-known bazaar functioning as a channel for exchange between different people and cultures (Nitsiakos, Arapoglou, and Karanatsis 1998, 71, 164–65). In addition, the area has long been used by Vlach and Sarakatsani transhumant pastoralists, who still use the extensive alpine meadows as summer pastures, debunking the myth of the isolation of the mountains. Since the Second World War, population decline and rural exodus have resulted in the abandonment of traditional agricultural activities, demographic aging, and some villages engaging almost exclusively in tourism-based activities. These profound changes characterize both Zagori and Konitsa municipalities, as well as most communities in rural Greece. Nonetheless, the long coexistence of people and nature has created a unique cultural landscape. In September 2023, the cultural landscape of Zagori was inscribed in the list of UNESCO World Heritage Sites (UNESCO 2023).

The Research

The idea of studying SNS in Epirus originated in 2000 during an ethnographic survey in Mikro Papingo village (West Zagori), where we discovered that some forest areas were never cut for wood or timber because of the fear of supernatural punishments (Stara 2000, 76). This was in accordance, as we later discovered, with a rich bibliography on the relationship between trees and the world of spirits (e.g., Imellos 1999, 75–81; Milingou-Markantoni 2006, 104–61; Nitsiakos, Arapoglou, and Karanatsis 1998, 477–78; Politis [1904] 2015, 218–21; Roussounidis 1988, 177–81).

Then, during the work for her PhD thesis, Kalliopi Stara (2009) studied twenty-three villages in central and west Zagori and found that centuries-old solitary trees or groves in the vicinity of churches or more extensive sacred forests were a common element of the cultural landscape of the area. From 2012–15, an interdisciplinary project named THALIS–SAGE: “Conservation through Religion: The Sacred Forests of Epirus,” which involved thirty-eight scientists from different universities and institutions worldwide, expanded the research to eastern Zagori and Konitsa, aiming to find the history, ethnography, and importance to biodiversity conservation of the sacred forests of the area. Archival sources were investigated in the local communities, the Forestry Services of Ioannina, Metsovo, and Konitsa, the Metropolis of Ioannina, and the Ecumenical Patriarchate of Constantinople in order to enrich and verify the results of the ethnographic survey.

This article is an account of the findings of the growing body of evidence on sacred forests in Epirus.

Results and Discussion

To provide context for the discussion of our results, we include here a brief account of three exemplar sacred forests from our study that illustrate the

different contexts for the establishment and continuation of SNS. Further details on each of these is contained within Stara et al. (2016), Marini-Govigli et al. (2020), Stara (2023), Marini-Govigli et al. (2024), and Tsiakiris et al. (2024), with an account of the merging of church and commons management systems for Greveniti presented in Marini-Govigli, Efthymiou, and Stara (2021).

Vovoussa: A Forest Dedicated to a Saint

Physical setting: The sacred forest of Vovoussa in eastern Zagori hosts the church of the village's miraculous patron Agia Paraskevi (Stavineri in Vlach) and is named after her. It covers an area of 6.9 hectares at 1,000 meters altitude. It consists mainly of tall black pines (*Pinus nigra*), some of which are more than 350 years old, and a few deciduous oaks of the same age around the church.

Foundation: "It is said that once, many years ago, after a terrible storm, Aoos, the river that crosses Vovoussa, had brought down a lot of water and carried away a pine tree, which was moving upright and as soon as it reached the vaulted bridge, it bent and passed underneath and was carried away by the water, until it stood upright at one end of the river, at the foot of a hill. The people of the village, seeing this strange and wonderful thing, that the pine tree should drift upright, pass under the bridge while they waited for it to drift away, and finally stand upright again, ran to the pine tree. There they saw with awe that, on the branches of the pine tree, was the icon of Agia Paraskevi. Then they built this chapel of Agia Paraskevi. Since then, the residents consider Agia Paraskevi as the protector of the village and often invoke her for protection" (Manuscript of Georgios Papapetrou, 1967–68, mentioning information narrated by Sotirios Hatzis, age 35, carpenter, archive of students' works on ethnography, Faculty of Folklore, Department of History and Archeology, University of Ioannina, 703–4).

Function: According to the local inhabitants, there are no reasons other than worship that explain the strictly protected character of the forest. In the 1970s, a management study was approved by the Forestry Service for its logging, however this plan was eventually canceled after strong local opposition and protests.

Present situation: Agia Paraskevi is the only sacred forest in the area for which protection is absolute. A continuing folk cult associates attempts to cut down trees or interfere with the forest with accidents and deaths. There are even stories of harm that are linked to attempts to obtain honey and wax from bees that sheltering in the centuries-old trees of the forest. The many dead standing or deciduous trees highlight the very good conservation status of the forest. Local people visit the forest frequently to pray and hold an annual service and celebrations *in situ* on July 26 (Figure A).



Figure A: Annual service and celebrations in Vovoussa sacred forest, July 26, 2020. © Kalliopi Stara.

Greveniti: Excommunicated Protection Forest

Physical setting: The sacred forest of Greveniti in eastern Zagori stabilizes the slope above the village. It covers an area of 43.3 hectares at 1,030 to 1,505 meters altitude. It is now a relatively homogeneous beech forest (*Fagus sylvatica*), with the oldest trees determined through dendrochronological dating to be about 260 years old (Marini-Govigli et al. 2024) (Figure B).

Foundation: Toponyms inside the forest (e.g., *Asvestariá* (lime kiln), *Toufa* (small clump of bushes or grasses), *Palési* (treeless place)) give us evidence of a past open landscape. Protection from floods or landslides is the reason to prohibit any logging and grazing activity inside the forest, using the threat of excommunication. Local residents call the forest *prostatelytikó* (protective) or *eftapápado* (excommunicated by seven priests).

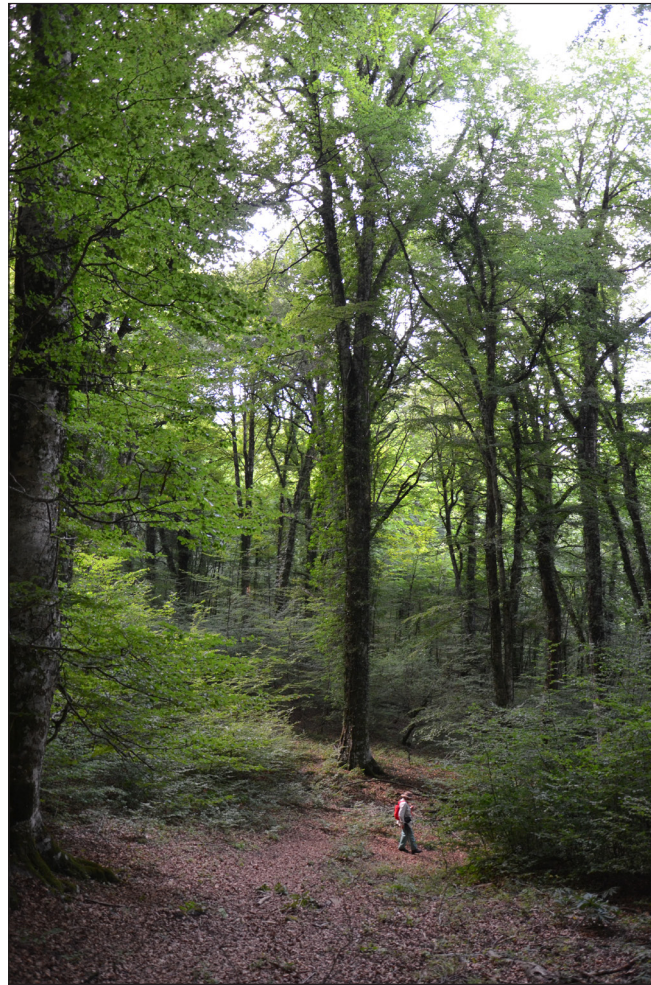


Figure B: Oliver Rackham on August 9, 2014 in the sacred beech forest of Greveniti village, which is said to stabilize the slope above the village. © Kalliopi Stara.

“Seven priests surrounded the forest with a candle from a church, spelling religious words [meaning curses]. It was excommunicated, like cursed. Whoever was going to cut down a tree or do something bad, he was excommunicated too. There was no other protection, people believed in religion back then, and it turned out to be very good, because this forest was protected” (response of a local community member in an interview conducted by Kalliopi Stara and Anthoula Efthymiou inside the sacred forest of Greveniti village in May 2018; Marini-Govigli, Efthymiou, and Stara 2021, 7).

Function: In addition to its role protecting the village itself, the forest preserves aquifers and protects the ancient mule path connecting eastern Zagori to the nearby town of Metsovo and western Macedonia. Older informants remember hiding inside the forest from the German Nazi army who burned their village to the ground during the Second World War. Today, local people are proud of their sacred forest, and this is an important component of their collective memory and local identity.

Present situation: Dramatic changes have happened to Greveniti in the past century. During the seventeenth and eighteenth centuries, it had approximately 1,500 inhabitants, mainly agrosilvopastoralists (producers who combine extensive livestock husbandry on pastures and agriculture in a partially wooded environment, sometimes even on a single site), while the 2011 census recorded only 193 inhabitants, mainly woodcutters. The forest boundaries, as officially formalized by the Forestry Service in 1938, remain almost the same today. The forest is excluded from logging because of its protective function for the village. All local people know about the sacred forest and respect its rules.

“They protect it, and there is a tradition. We don’t intervene in this forest; we don’t touch it. It is a protective forest, it protects us” (response of a local community member in an interview conducted by Kalliopi Stara and Anthoula Efthymiou inside the sacred forest of Greveniti village in May 2018; Marini-Govigli, Efthymiou, and Stara 2021, 7).

Vitsa: Forest of a Former Village

Physical setting: The sacred forest of Vitsa is located one hour’s walking distance southwest of the village’s current location in central Zagori. It is named after Agios Nikolaos at Livadakia (small meadows). It covers an area of 4.9 hectares at 900 meters altitude and consists mainly of deciduous oaks (*Quercus cerris*, *Q. trojana*, *Q. frainetto* and *Q. pubescens*), the oldest of which has been determined to be 350 years old (Marini-Govigli et al. 2024).

Foundation: According to local tradition, Agios Nikolaos used to be the central church of a settlement that was abandoned during the sixteenth or seventeenth century. Its inhabitants then relocated to Vitsa.

Function: The forest has been preserved because of the existence of the church and the continued celebration of Agios Nikolaos every 20th of May. According to the will of the village’s benefactor, Aggeliki Papazoglou, food is paid by her bequest and offered to the celebration participants after the service (Figure C).

Present situation: Timber and fodder harvesting are prohibited, but grazing is allowed after May 20 each year. This date used to regulate the “opening” (*apolyssiá*) of the surrounding wood pasture (an area of grazed pasture with scattered trees) for the village livestock, which were allowed to graze the sacred forest from after the service and celebrations until the end of the season. Recently, a dirt road to access the church and a parking area have been constructed close to the church. People return to the forest every May for the annual celebration and narrate transgression stories related to the forest.

“I remember they used to say that they were going to cut firewood and a swarm of bees appeared, so they got up and left because they were inside



Figure C: Local people during the annual service and celebrations in the forest of Agios Nikolaos, May 20, 2018. © Kalliopi Stara.

the church's forest, where they were not allowed to go. They used to say that the trespasser would pay for it, sooner or later. Another case was when transhumance old women went to cut firewood because they needed it and they could not move, they remained frozen" (response of a local inhabitant in an interview conducted by Kalliopi Stara in Vitsa village, October 2017).

"It was forbidden to cut down the trees. Strictly, it was an unwritten law, but they obey by it, especially the shepherds. They could graze their animals, but to cut down trees was difficult. [Someone] cutting down trees was chased by the forest guardians and the trespasser had also God's curse" (response of a local inhabitant in an interview conducted by Kalliopi Stara inside the sacred forest of Vitsa village, October 2017).

Similar data on seventy-nine additional sacred forests were used to develop a first general model of the types and management regimes of sacred forests in our study area (see Appendix).

Sacred Trees and Forests in the Villages of Epirus

Trees of the Center

In the countryside of Greece, sacred trees are a very distinctive component of the landscape. Churches and their associated trees are generally so closely intertwined that any old maiden tree (a tree of seedling origin that has never been coppiced or pollarded) can be considered an emblem of the sacred (Kyriakidou-Nestoros 1989, 25). Churches and their associated trees inside or on the periphery of the villages are a typical feature of the landscapes of Zagori and Konitsa. Most of these villages were founded in the sixteenth or seventeenth centuries, when former small, scattered settlements were dissolved and clustered into larger ones. According to historic records, fifty-two smaller or larger settlements in Zagori were deserted at this time for unknown reasons or precipitated by population movements throughout the Balkans due to raiding, epidemics, or adverse climatic conditions, which were often demonized in popular imagination (Papageorgiou 1995, 14–21). People migrated individually or in groups and created new villages or added new districts to existing villages in places judged to be welcoming and safe. Through these processes, new villages developed, in many cases around a divinely mandated center, a pre-existing tree, often linked with the epiphany of holy icons that were said to appear in its branches or next to it and, if moved, return to their original positions (Stara, Tsiakiris, and Wong 2015a, 115–17). This was interpreted as a divine intervention and an indication the village location was blessed (Stewart 1991, 84).

Also located in the center of these villages was the main church, which forms the nucleus of the settlement, and around which the central square was later arranged, shaded nowadays by huge oriental plane trees (*Platanus orientalis*) and public buildings. Being in the center of the village, the plane tree serves as the focal point for community life, including festivities, and hosts the public fountain, symbolically providing access to common goods, such as water, for all community members (Nitsiakos 1997, 61). Plane trees, which are native to the area's riparian forests, are intentionally planted in village squares and considered by local people as coeval with the settlement, even if in reality most plane trees were planted during the nineteenth century and often replaced older oaks or maples (Stara and Tsiakiris 2019, 16–17). The impressive appearance of plane trees makes them symbols of community life, while their condition is associated in local peoples' collective imagination with the community's strength and vitality.

Trees of the Periphery

Around the periphery of each village, small *xoklissia* (outlying churches) or *eikonismata* (icon stands) accompanied by centuries-old solitary trees or small groves, define the village's boundary. These *xoklissia* and their impressive trees are conceptualized in the Greek cultural landscape as “liminal” places that create a visual border between the village as a place for community and sanctified

domesticated nature, where the powers of the sacred world dominate, and the dangerous wilderness as a place of supernatural forces in their elemental form, where demons often make their home (Du Boulay 2009, 54–56; Nixon 2006, 8). They thus serve as boundary markers and function as natural portals between village life and the external world. During the Ottoman times, some *xoklissia* also served as *lazarettos* (isolation hospitals) for returning travelers to prevent epidemics entering the village (Stara 2009, 208). These sites also served as the places where villagers said their last farewells to departing migrant sons; thus, occasionally the trees were called *klapsódentra* (literally “cry trees”). Elsewhere in northern Greece, the protective power of boundary trees used to be reinforced every year during the special ceremony of *ipsomós* (the placing of holy bread by the priest in a crevice in their trunks). *Ipsomós* is often accompanied by a litany (a liturgical procession of the holy icons) on a regular basis (i.e., the second day of Easter) or in cases of emergency (Kyriakidou-Nestoros 1989, 33–34). Analogous ceremonies also occur in other Balkan countries, such as Serbia (Đorđević, Dragan, and Dragišić 2023, 37–39) and North Macedonia, where the trees are known as *Panagii* (the Virgin) (Rantasa 2012, 84).

The arrangement of *xoklissia* or *eikonismata* with their attendant trees around the village is also significant and thought to invisibly enforce the natural boundaries of the settlement. They may either mark the main entrances with an outlying church and its trees at the four points of the compass, thus forming the sign of the cross, or be placed to encircle the village in an imaginary protective circle, in both cases creating a sense of security for the inhabitants (see Figure 1; Lagopoulos 2002, 92–102, 135, 145).

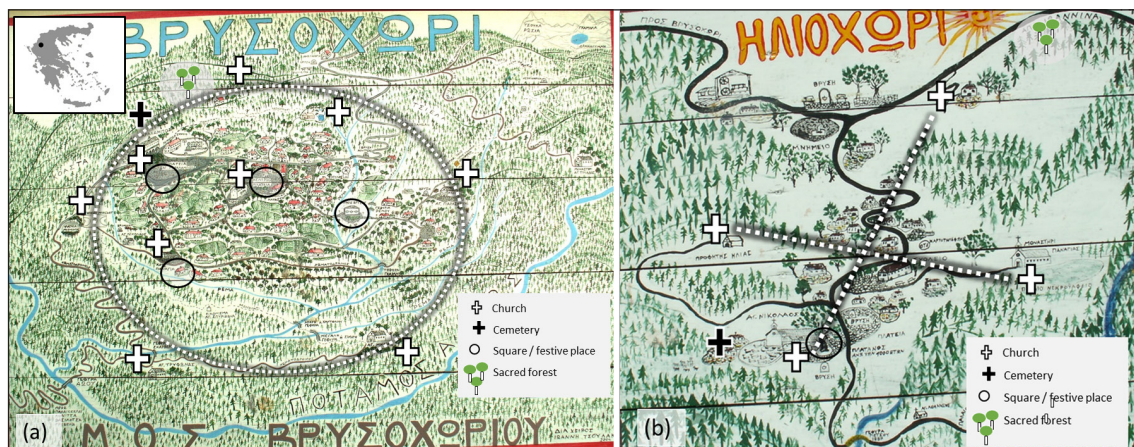


Figure 1: Examples of the circled village Vrysochori (a) and the crossed village Iliohori (b) in East Zagori. Locations marked by crosses are churches accompanied by centuries-old trees. Outlying churches define village boundaries and serve as access routes that cross the village boundary, marking “entrances” to the village. Background cognitive maps were created by Ioannis Tsolakis (2004), funded by the villages’ cultural associations, and placed at villages’ entrances. The area of the village Vrysochori is ~19.3 hectares, while the area of the village Iliohori ~16 hectares.

Different species of oaks (*Quercus pubescens*, *Q. frainetto*, *Q. petraea*, *Q. cerris* and *Q. trojana*), particularly the evergreen prickly or kermes oaks (*Quercus coccifera*), and maples (*Acer monspessulanum*, *A. opalus*, *A. pseudoplatanus* and *A. platanoides*) are the most common trees that accompany the outlying churches of the villages in Epirus. The abundance and variety of oaks and maples in their natural habitat, especially in Zagori, along with their imposing character and enormous value for the local economy (Stara, Tsiakiris, and Wong 2015b, 160), justify their position within the precinct of the house of God, i.e., next to the church. On the contrary, conifers, mainly black pines and firs (*Abies borisii-regis*), are associated with cemeteries. In recent years, funeral cypresses (not indigenous to the area) also tend to be planted in cemeteries, serving as modern mourning symbols (Dafni et al. 2006, 8–9); however, these trees do not always survive the harsh winters of the mountains. Arboreal imagery uses specific tree species as symbols and metaphors of external reality, social life, and spiritual values (Rival 2001, 5–6). Nonetheless, our study revealed it is not the species of tree but rather its age and form (maiden or deliberately shaped for safety or shade reasons) that differentiates sacred from secular trees (or “working,” e.g., coppiced, pollarded, or shredded; Rackham 2006, 2), as taboos against cutting them for wood or fodder and attendant fear of supernatural punishments discourage people from using the timber or foliage of sacred trees.



Figure 2: “Crossed trees” of oak, fir, and black pine in Epirus, photographed between 2007 and 2019. © Kalliopi Stara.

Apart from their old age and natural shape, church trees often have other functions, such as having bells hung in them or being used as support for benches. Of particular significance are those trees on which crosses have been inscribed or embedded in their trunks, termed *stavroména dentra* (literally “crossed trees”). Such trees are reported by local people to be symbols protecting the place from lightning and other calamities, indicate vows to the saint to which the nearby church is dedicated, or serve as memorials to the missionary journeys of St Kosmas the Aetolian (1714–79) (Figure 2).

Sacred Forests

In addition to individual trees associated with church sites, extensive sacred forests also constitute a characteristic element of the cultural landscape of Epirus. These areas arise from a locally adapted system of forest resource management sanctioned by the church. Almost every village in the area has at least one sacred forest. So far, we have identified seventy-nine sacred forests in the villages in Zagori (fifty-four) and Konitsa (twenty-five) (Table 1 in Appendix) through the inspection of archives and rapid ethnographic surveys. Of these seventy-nine sacred forests, sixteen were selected for more detailed ethnographic research and field visits (Stara et al. 2016). Of these, eight were inventoried to determine their value for biodiversity conservation (Avtzis et al. 2018) and five for detailed dendrochronological assessments (Marini-Govigli et al. 2024) (Figure 3).

Sacred Forests as Management Systems

Sacred forests are referred to by local people as areas where specific types of resource utilization are either not permitted or only allowed after a specific decision by the community council and church. Most of these sacred forests are located on steep hillslopes above villages and function as protective woodland buffers against natural hazards such as landslides, torrents, or rare avalanches. The geology of northern Pindos is largely friable flysch and limestone, and the inherent vulnerability of the landscape, in combination with its high precipitation and long harsh winters, makes the physical protection of its settlements and infrastructure essential. In these cases, the sacred forest is more than purely symbolic, and modeling has shown that it serves as effective “green infrastructure,” with its standing and fallen trees functioning as barriers that prevent falling rocks and other material from reaching and damaging the villages (Tsiakiris et al. 2017, 1085).

Sacred forests often host springs and rivulets, regulate the overland flow of precipitation, and replenish village aquifers. In many such cases, these forests are called *livádia* (literally “meadows”) in Greek. However, as they do not have the typical appearance of open grassland, we relate the etymology of their name with the ancient Greek *livás* (literally “water drop”), referring to a forest that regulates water. Other sacred forests, most often called *kouri* (a patch of forest that is protected with the potential to be used as a reserve for

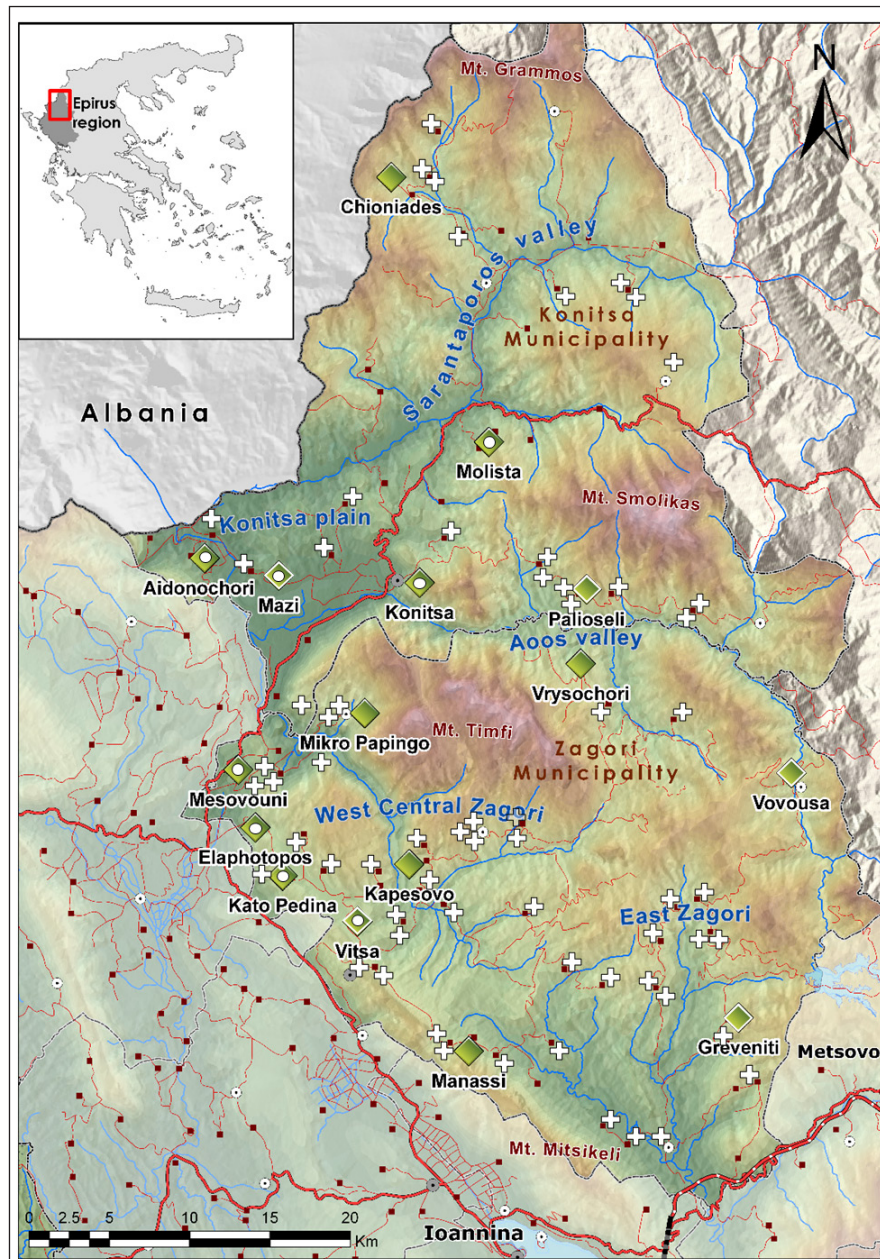


Figure 3: Location of the research area in Konitsa and Zagori municipalities in Epirus, northwest Greece. Green diamonds show the sixteen forests where ethnographic surveys were carried out. Green diamonds with white circles show the eight forests in which biodiversity surveys were carried out, and those with a white outline show the five sites for which detailed dendrochronological assessments were conducted. White crosses indicate the locations of the remaining sixty-three sacred forests. The names of each of the seventy-nine sacred forests shown are given in the Appendix. Adapted from Stara et al. (2016).

community needs or church income; Stara et al. 2016, 290), consist of oaks and have been conserved with the potential to be used as resource reserves for community needs. As an example, forests of evergreen prickly oak species could be shredded *in extremis* to prevent livestock starvation during extremely

long or harsh winters. Exceptionally, they could also serve communities' needs for timber for beneficial public works such as the construction of a church (e.g., Agios Vlasios in Megalo Papingo, 1852) or school (e.g., Pascháleios School in Kapesovo, 1864) (Stara et al. 2016, 299).

Forests in general are known to be multifunctional ecosystems; thus, sacred forests can serve several purposes in parallel: function (e.g., livestock shelter from the sun in the heat of the summer); to meet church secular needs within the Ottoman administration; to shelter displaced people during the Second World War when, during their "clearance operations," Nazi occupiers attacked twenty-nine villages, burning 1,611 houses and killing people, mainly in eastern Zagori, as in the case of Greveniti (Bendermacher-Gerousi et al. 2022, 215); as a venue for cultural festivals; aesthetic (e.g., landscape beauty); and as historical legacies (e.g., abandoned villages' sacred forests, as in the case of Vitsa). Although sacred status means that, in principle, no use of the material resources is permitted, we found a range of rules that vary from strict prohibition to controlled management, which could include the collection of dead wood, grazing, the harvesting of poles or foliage fodder, and more exceptionally, the extraction of fuelwood or timber, all of which were observed to a greater or lesser extent according to need and over time (Stara et al. 2016, 298). Moreover, there were generally exceptions for lower social status community members, who could either use the sacred forests or not according to their personal morality. Tolerance of these norms successfully prevents intracommunity conflicts. Trespassers who dare to use the small dimension wood or foliage of the sacred forest trees for their private needs are expected to beg for God's mercy, the assistance of the church (in accordance with the church's tradition of charity, which relieves poverty and exclusion; Votrin 2005, 20), and the assistance of the community in their time of need. If this is not granted, it is generally believed the trespassers will pay for their failings with misfortune. However, this community tolerance of trespass usually does not extend to the cutting of the sacred forest trees for timber (Stara 2009, 350).

Mechanisms for Conferring Sacred Status to Land

We found two ways in which protection has been conferred to forests via supernatural beliefs: dedication to a saint or the threat of excommunication. In some cases, both could be used in a single forest. Conservation of forests through supernatural beliefs and fears was consolidated during the years of Ottoman rule (1430–1913), a period when belief in invisible spirits was very common in the Balkans. Many local people still hold the belief that malicious and benign spirits coexist with people in everyday life, even if this is rarely expressed publicly for fear of being characterized as superstitious or ignorant (Mazower 2002, 56). These beliefs could come into play in any of the forests established by the church.

From the fourteenth to eighteenth centuries, excommunications performed by Orthodox clergy were often carried out for the resolution of economic or

social issues, such as the theft of objects, pasture claims, boundary disputes, or false testimonies (Michailaris 2004, 74). In the case of sacred forests, excommunication was found to be used specifically to safeguard protective woodland buffers above villages in rough terrain and on steep slopes (as in the case of Greveniti). It constituted a nonspecific threat against potential offenders, meaning anyone who would dare to usurp the sacred forest for personal profit was automatically considered excommunicated. This curse could cause economic ruin, misery, disease, accidents, or even death to the offenders. Moreover, it could damn their souls to eternal hell and stigmatize the trespasser through exclusion from the church, its mysteries, and social events related to religious life (Michailaris 2004, 221; Stara 2009, 293). However, most significant for its role as a deterrent, excommunication could be extended to trespassers' animals and innocent and vulnerable family members such as children, or even future generations. According to oral tradition, excommunication was performed through a ceremony held on the boundary of the forest (which may not have contained many trees at the time), singing certain curse psalms of David, ringing of bells, burning black candles, and generally reversing the regular order of things. The ritual was conducted by a specified number of priests—commonly three, five, or seven—and this is why some excommunication-protected forests are called *eftapápada* (literally “excommunicated by seven priests,” as in the case of Greveniti) (Stara et al. 2016, 292).

A common occurrence connected with religiosity was the dedication of forests to saints or village patrons. Dedication of a forest involved either the building of a church in the forest and the establishment of its saint as the forest's guardian (as in the case of Vovoussa) or its dedication to the central village church (as in the case of Vitsa), so that the village patron saint was also considered the guardian of the forest. In both cases, linking the forest to a saint protected it from trespass. This seemed so efficient that the Austrian forester Alfold Stengel, managing director of the Austrian Forestry Mission in Greece in 1914, stated that “preserving forest patches near churches is such an effective practice, that seems as the only way for the newly established state to protect its forest resources and therefore a denser network of outlying churches should be installed” (Grispos 1973, 144).

Punishments and Punishers

Stories about supernatural punishments for infractions against trees often repeat ancient Greek myths (Polymerou-Kamilaki 2003, 22–23), which were well known as they were included in primary school textbooks. A typical example is the story of the gluttonous Erisychthon, who cut the sacred oak of the ancient goddess Demeter and was punished with eternal hunger that eventually led him to eat his own flesh, which was included in textbooks published in 1906 and 1930. Similarly, the poem “The Curse of the Pine Tree” by Zacharias Papantoniou was included in a textbook of 1918. This poem speaks about a personalized pine tree cut down for fuel wood. Because of this, the “murderer”

(*fonías* in the Greek text) lost consciousness and eventually his life. Analogous themes were also reproduced in Greek literature, with a characteristic example being the novel *Under the Royal Oak* by Alexandros Pappadiamantis (1901), which speaks about a young boy who fell in love with an oak tree haunted by a nymph. Such stories accord with the strong interest in the supernatural by the educated elite and academic folklorists, who, since the establishment of modern Greece (in 1832), interpret tree worship as the survival of pre-Christian beliefs that could be used, among other things, as potential proof of the fledgling nation's ancient pedigree (Stara 2018, 323–24). A relevant example is the term *national park*, which in Greek equates to the archaic *ethnikós drymós* (oak forest). The term has ideological connotations to the oaks dedicated to Zeus in Greek mythology and their dryads (oak nymphs). Similarly, the first national parks established in Greece (in 1938) were Mount Olympus, the home of the gods in mythology, and Mount Parnassos, strongly linked with the western European movements of Romanticism and Parnassism, all in the spirit of the idealized image of Greece held by northern European travelers and literate elites of the seventeenth through nineteenth centuries (Moudopoulos-Athanasίου 2022, 35). How far this influences the local tales of supernatural punishments related to the Zagori SNS is difficult to discern but is undoubtedly a contributing factor.

In records found in literature (e.g., Oikonomidis 1958, 75) and repeated in narratives from Zagori (Stara 2009, 331), saints are presented as friendly and kind but at the same time frightening. They firstly show their caring personalities and warn the wrongdoer by appearing in his dreams or sending him a serpent as a sign of their presence and strength, urging him to return what he cut back to the forest. Some narratives describe small accidents while cutting, such as losing the axe, not being able to carry the forbidden load, or feeling frozen. Ignoring warnings brings down retribution, for example, the forbidden foliage that was cut to be fed to animals could cause their death, or the forbidden firewood might burn down the house. Some even more serious consequences are described in which the wrongdoing is followed by a delayed illness or the sudden death of the perpetrator himself, innocent family members, or in the worst case, the extermination of all his generation. Such stories bring to life the old curse that says “to give them all to the *vakuf*,” which means someone dies without descendants and all his property passes to the church (Stara 2009, 272, 334). Punishments affecting trespassers seem to depend on the motivations and situations of the wrongdoers, as forgiveness through directed devotions (*támata*), or inversion ceremonies in the case of excommunications, are also common in the narratives.

Sacred Forests: The Adaptation of an Old System to Modern Times

With the exception of the terms *kouri* and *livádi*, sacred forests are named locally *eklistiastiká* or *klisiast(i)ká*, literally “those belonging to the church.” Another synonym is *vakoufik’a* or *vakoufia* from the Arabic *waqf*, which signifies a bequest from which the income should be used for public benefit (Moutafchieva 1990,

148). Today, the terms “sacred forests” (*ierá dási* in Greek) and “Sacred Natural Sites” (*Ieroi Fysikoi Topoi* in Greek) have been adopted by the international scientific community, reflecting a modern identity. The term “sacred,” derived from the Latin *sacer* and the Hebrew *sacire* (separate), has been used in Greek folklore to characterize trees that are “haunted” by the supernatural (Stara 2018, 325). The term “forest” (*dásos*) is also new to the cultural history of the area. It was introduced into the vocabulary of local communities with the establishment of the Hellenic State (1832) and Forestry Services. The term *forest* is often associated with reforestation initiatives, mainly dominated by pine species and managed by the Forestry Service for timber production or aesthetic values. Over the years, the term forest replaced previously common terms such as *lóngos* (scrubland), *ormáni* or *roumáni* (a forest area interspersed with fields and vineyards), *kladeró* (a forest used for harvesting tree branches for fodder), or *baltaliki* (a forest used for harvesting fuel wood) (Nitsiakos 2015, 39–48; Oikonomou 1991, 400). The Forestry Service, despite having formal oversight of all forests, does not officially recognize sacred forests as a special category requiring sensitive management. Therefore, our proposal is the formal legal recognition and designation of sacred forests as distinct sociocultural entities.

The combination of ethnographic and ecological studies has shown that sacred forests in Epirus are distinct socio-ecological systems sensitive to social changes (Marini-Govigli, Efthymiou, and Stara 2021, 7–9). In an assessment based on the criteria of the Cultural and Spiritual Values of Protected Areas Specialist Group (World Commission on Protected Areas) of the International Union for Conservation of Nature implemented in 2012 for sixty-five SNS in Zagori, we categorized them all as threatened. This is because even if the majority continue to be respected by local communities, a quarter were either destroyed (11%, seven sites) or in a degraded state (13%, eight sites). Changing patterns of land use and population decline have had a dramatic effect on the region’s social structure, resulting in the collapse of local management systems. Modernization and ignorance of their existence outside local communities has led to SNS being threatened where there is conflict with modern life’s necessities (Sacred Natural Sites 2012). Moreover, without the active protection afforded by their sacred status, many sacred forests would not have survived in the flammable conditions of the Mediterranean landscape. Today, land abandonment and rapid vegetation succession, together with climate change, make sacred forests vulnerable to forest fires, especially if they become surrounded with a matrix of dense evergreen scrubland, as was the case for the protective forest of Agia Paraskevi in the village of Ano Pedina in central Zagori, which accidentally burned in August 2000.

The threatened status of SNS in Epirus, the challenge to preserve this heritage and keep it alive within communities and between generations, and the urgency of action related to global challenges affecting biocultural diversity (Verschuuren et al. 2010, 11–12) motivated us to propose the sacred forests of Epirus for inclusion in the national index of Intangible Cultural Heritage

(UNESCO) (Stara 2022, 120). The proposal was submitted by the University of Ioannina (Department of Biological Applications and Technology, Laboratory of Ecology and Department of History and Archeology, Faculty of Folklore), supported by the municipalities of Zagori and Konitsa and organizations related to the conservation and promotion of natural and cultural heritage of the area (Northern Pindos National Park, Vjosa/Aoos River Ecomuseum, Zagori Ecomuseum, Zagori Development Agency) or active with the SNS (Delos Initiative (World Commission on Protected Areas/International Union for Conservation of Nature), Mediterranean Institute for Nature and Anthropos). The proposal was approved in 2015 (ICH of Greece, 2015) and dedicated to the memory of our beloved colleague Oliver Rackham (1939–2014) with whom we surveyed several sacred forests (Tsiakiris et al. 2024).

In the modern context, the number of people in the villages is dwindling, and the local church institutions do not formally recognize the living components of the sites as having a formal status. Even if their status was better recognized, the local church institutions do not have the resources required for the protection and active conservation management needed to preserve many of the SNS. We therefore suggest the continued protection of the sacred forests requires the acquisition of new identities. This process is occurring even without intervention, as shown in Greveniti (Marini-Govigli, Efthymiou, and Stara 2021) or Vovoussa (Stara 2023), however, we think a modern secular conservation component would strengthen the maintenance of the religious legacy and help it to continue to protect the sacred forests of Epirus. Some of the past values of SNS remain stable, such as their role in providing protection against natural hazards, use as festive places, sense of spirituality, and aesthetic qualities. On the other hand, some of their previous values have lost meaning in modern times, for instance their role as reserves of natural resources (e.g., foliage fodder for use in times of acute shortage of livestock feed), which no longer have value in a context where communities rely on the importation of resources. Simultaneously, new values have developed, such as recognizing the importance of SNS as the oldest form of nature protection worldwide, even if their primary value was different (Zannini et al. 2021, 10), which has led to the present-day recognition of their importance for biodiversity conservation. A good example can be found in the sacred forests of Ethiopia, which are now valued as biodiversity and genetic arks (Aerts et al. 2016; Goodin, Alemayehu, and Lowman 2019, 4) that provide cultural, provisioning, and other services to their communities (Abiyu, Hailu, and Teshome 2015, 127). However, they were initially established to maintain the purity of the holy place based on a cultural logic with the church in its center as an effective portal to the divine, enclosed in a circle of purity (Kent and Orlowska 2018, 117). Like the Ethiopian SNS, the sacred forests of Epirus, despite their small size, have been shown to be important for conservation of different taxonomic groups: fungi, lichens, herbaceous plants, woody plants, nematodes, insects, bats, and passerine birds (Avtzis et al. 2018, 101; Benedetti et al. 2021, 4; Diamandis et al. 2021, 153; Georgiadis et al. 2023, 10).

As well as their conservational importance, there are important similarities between the contexts and statuses of the sacred forests in Greece and the church forests in Ethiopia (Goodin, Alemayehu, and Lowman 2019, 3; Kent and Orlowska 2018, 137). However, in Ethiopia the church has a very active role in the management of these forests, while in Greece sacred forests are mostly cared for by just a few active members of local communities, who number less than fifty inhabitants in most villages, while “modern” church councils in most Greek villages consist only of a few elder members. Usually, church councils do not treat centuries-old trees in church yards and sacred forests as respected, integral elements of the sacred landscape, so their maintenance is not a priority on council agendas. Therefore, while fully respecting the essential role of religion in the development and preservation of the Greek sacred forests up to the present, to protect them in the future, there is a need to add a stronger secular component (i.e., to emphasize the value of these forests for biodiversity and thus the need to integrate them into the modern nature conservation agenda). We note the same trend has also been observed for the Ethiopian church forests over the past fifteen years (e.g., Aerts et al. 2016, 412–13). However, we try to incorporate such secular values (e.g., the importance of biodiversity) as an additional component of the overall value of these forests while continuing to focus on their spiritual or intangible values.

Sacred Natural Sites as an Educational Opportunity

As SNS have been proved to be little known outside their communities (Stara 2022, 132), one of our main concerns has been to preserve and publicize knowledge of them in Epirus and beyond. Thus, we have developed a strategy that includes dissemination events for academia (participation in conferences, publications, networking, lectures, and summer schools), the local communities (participatory fieldwork, participation in local events, articles in local magazines, and other forms of collaboration with the municipality and other local institutions), and the general public (popular publications, environmental education materials, participation in national events on nature conservation and Intangible Cultural Heritage, appearances in press and media events with articles or interviews, frequent posts on social media, filming and creating documentaries, presence in local and national television and radio broadcasting).

In the framework of the THALIS-SAGE project, and to share the results of a scientific project with local communities and the general public, especially teachers and children, we designed an environmental education activities package entitled “Centuries Old Trees, Their Values and Importance for Biodiversity Conservation” (Stara and Vokou 2015, in Greek). The material includes the book *The Magnificent Trees of Zagori and Konitsa: Centuries Old Trees, Sacred Trees, Witnesses of Local History and Guardians of Biodiversity*, which presents in simple form our scientific results and details about impressive, long-lived trees of the area, their characteristics, functions, values, and importance for supporting other

life forms. It also includes literature texts and poems that describes relationships between trees and people, with special attention to material provided by local writers and artists. The book is accompanied by fifteen worksheets for children and corresponding instructions for trainers, a map with information on locating impressive trees and accessible sacred forests in Epirus, and the illustrated fairy tale “The Tree of Our Small World” with graphics designed by Myrto Delivoria (Stara 2015), which, although a work of fiction, was inspired by our ethnographic research. In 2016, these materials received the necessary approval from the Ministry of Education, Research and Religious Affairs, and copies were distributed to all primary schools in the prefecture of Ioannina, local cultural associations, and other relevant institutions locally and nationally. They are also available for free online (<https://www.openbook.gr/ta-aiwnovia-dentra/>).

We chose centuries-old trees and not sacred forests as the protagonists of our educational material. This is mainly because, through all our meetings with teachers and other key stakeholders, we came to realize that people tend to associate the concept of sacred forests with the sacred groves of ancient Greek mythology. Therefore, it was difficult to transform the established image of the ancient sacred forest inhabited by deities and nymphs to the sophisticated management system that evolved during the years of the Ottoman occupation, which is the origin of the protection of sacred forests in Epirus. Moreover, ancient trees are now severely threatened while also being prominent features in the landscape, making them easier for people to identify with. They also constitute a familiar image and common experience for teachers and pupils. Their longevity gives them great historical, aesthetic, and recreational value and makes them both stable features in a changing world and symbols of eternity, solidarity, and strength. This transforms them into characters with personality that belong to “a special class that transcends the normal plane of existence” (Cannon, Piovesan, and Munné-Bosch 2022, 1).

Centuries-old trees are of special value as monuments of natural and cultural heritage, functioning as repositories of local history and the particular identity of each community, as well as witnesses of climate change, reservoirs of genetic diversity and survival in extreme environmental conditions, and arks of biodiversity (Cannon, Piovesan, and Munné-Bosch 2002, 7–8; Rackham 2006, 46–49). While charismatic megafauna are used in environmental awareness actions symbolizing nature conservation, the same is not yet true for megaflore (i.e., trees and forests) (Hall, James, and Baird 2011, 310), even if centuries-old trees are highly visible and charismatic rare organisms being lost globally at an alarming rate (Piovesan et al. 2022, 1025).

Through our educational work, we have disseminated the idea of sacred forests beyond the narrow audience of scientists. The topic of sacred forests and trees has, since 2012, been taught in summer schools (e.g., the Greek Summer School in Conservation Biology entitled Biodiversity: Theory and Practice (2012–19) and the Konitsa Summer School on Anthropology, Ethnography and Folklore of the Balkans (2014–19)). Since 2016, the topic has

also been included in the elective undergraduate courses Cultural Ecology and Field Ecology in the Department of Biological Applications and Technology of the University of Ioannina, which include field visits, as well as in masters-level modules at Bangor University (UK) and the University of Lleida (Spain).

In recent years, more and more local communities, through their cultural associations, have started efforts to promote the importance of sacred forests as part of local history through talks, events, and publications. In 2022, the broadcast of “ERT Green Stories” by the national television channel ERT3, directed by Vangelis Efthymiou (2023), included a program dedicated to the sacred forests of Epirus, while the documentary “The Wild Beauty of the Balkans” for ARTE TV (2023), directed by Jeremy József Pierre Fekete (in German), dedicated an episode to Greece in which the coverage of Epirus focused on its geological history and SNS.

Sacred Natural Sites as a Conservation Opportunity

In Greece, by mid-2021, legislation had recognized sixty-nine “Monuments of Nature to be Preserved,” which are related to forests or other areas of great value, be it ecological, paleontological, geomorphological, or other. This list included fifty individual trees, small clusters of trees, or forests, many associated with religious life. More recently (2022), the sacred trees in Kato Olympos of Saint Cosmas the Aetolean, who visited the area in 1765, as well as the sacred forest of Agioi Theodori in Rapsani, also in Thessaly, are on the tentative list of the national index of Intangible Cultural Heritage, waiting for approval from the Greek Ministry of Culture (Intangible Cultural Heritage of Greece 2022). However, active protection of centuries-old trees has been rare in Greece, and, despite their imposing presence, these trees often seem neglected and vulnerable, usually absent from nature or culture management plans, policies, and nature conservation projects (Blicharska and Mikusiński 2014, 1559). Nevertheless, there is a rapidly growing recognition of the importance of these veteran trees (Parker and Lewington 2012) and the need to create “disturbance refugia” for their survival (Lindenmayer, Laurance, and Franklin 2012, 1306). The UK is the best example, having detailed records of >200,000 ancient trees based on a formal protocol for recording trees (Piovesan et al. 2022, 1027) and involving citizen scientists in the recording of trees of special interest (Nolan et al. 2020, 3105; Woodland Trust 2025).

Reviewing the list of Intangible Cultural Heritage related to nature worldwide, we identified a set of threats that includes natural disasters, globalization, cultural homogenization, and unregulated tourism (Intangible Cultural Heritage, n.d., 6, 8). Concerning tourism, one of the challenges for the elements of Intangible Cultural Heritage is their change from the invisible to the visible, the obscure to the important, and the local to the international. Their exposure to a global audience via the internet creates vulnerability and redefines the relationship between tourism and cultural heritage from one of complementary mutual reinforcement to tourism

(especially “experience tourism”) being a source of risk to cultural heritage (Drinis 2022, 37–38) and even to “extreme spirits” being offered as “spiritual antidotes” to modern life (Johnston 2005, 113–17). Thus, it is a paradox that at the same time as sacred forests are gaining visibility via the mass media and internet, many are losing their visibility in the landscape. As a consequence, while individual sacred forests could serve as “conceptualized cultural codes imprinted in the landscape” (Colding and Folke 2001, 590), today homogenization threatens the diversity of both cultural and natural landscapes. Land abandonment is the driving force that transforms the open mosaics of the cultural landscape of the past to impenetrable scrubland due to natural vegetation succession in several rural areas in the Mediterranean (Grove and Rackham 2001, 235). This natural recovery of forest has obscured the distinct past landscapes, hiding sacred forests within a continuum of forest cover. Nonetheless, they can still be revealed by careful investigation. Reviewing aerial photographs from 1945, we found that at that time, sacred forests were very distinct in the landscape as patches of tree cover within a largely treeless matrix, similar to the situation of the sacred forests of the Ethiopian highlands today (Aerts et al. 2016, 406; Klepeis et al. 2016, 7600) (Figures 4 and 5).

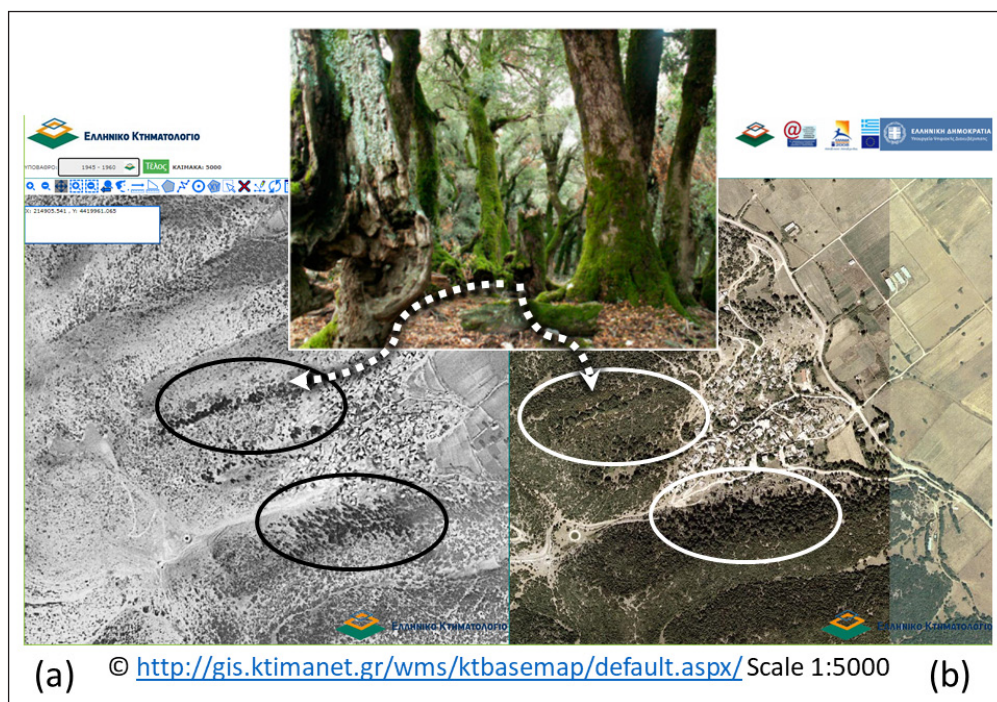


Figure 4: The protective sacred forests Megala Pournária (big prickly oaks) and Anilia (non-sunny) of the village Kato Pedina in Zagori. In the aerial photo from 1945 (a), the forests are distinguished as patches within the matrix of treeless, overgrazed vegetation, while the village is rather invisible. In the aerial photo from 2007 to 2009 (b), the sacred forests can still be distinguished due to the crowns of their large trees, however they are no longer distinct patches and are instead embedded within a continuum of forest cover that has grown up over the past fifty years through vegetation succession.

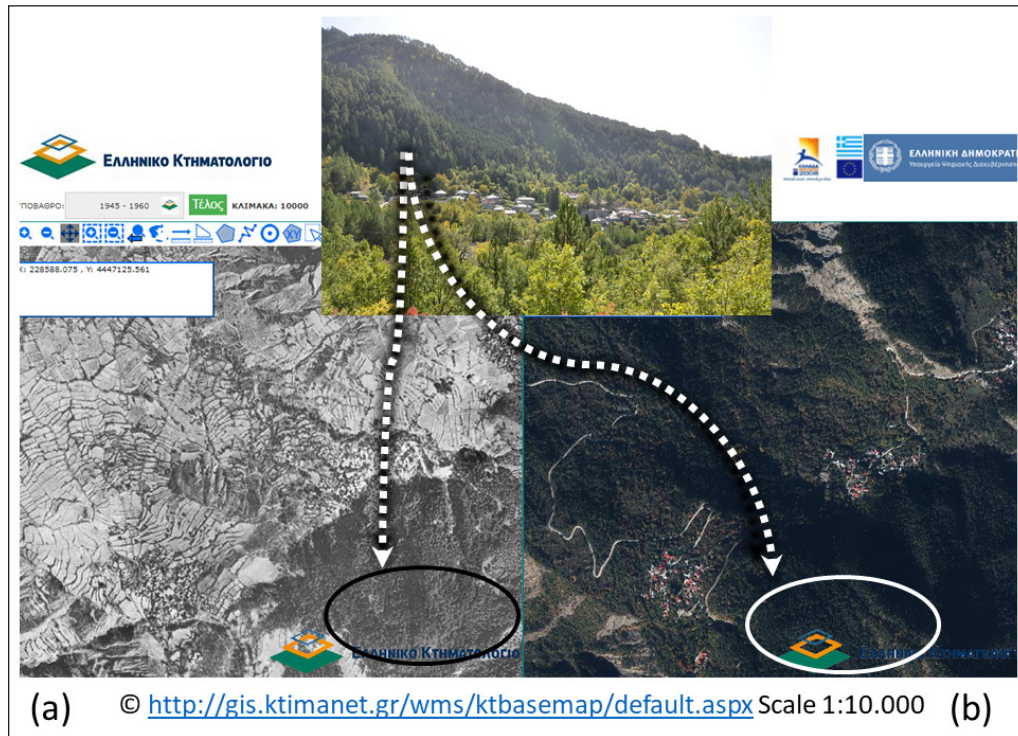


Figure 5: The protective sacred forest Trafos (ditch) of the village Molista in Konitsa. In the aerial photo from 1945 (a), the forest is distinguished as a patch within the matrix of cultivated land. In the aerial photo from 2007 to 2009 (b), the sacred forest is part of a continuum of forest cover that has grown up over the past fifty years through vegetation succession.

In Epirus, as in many other places around the world, SNS constitute the oldest form of nature conservation, hosting distinctive vegetation communities and forest structures (Marini-Govigli et al. 2020, 63) with limited human impacts over the past 400 years and old-growth characteristics (Tsiakiris et al. 2024). This creates an opportunity for sacred forests that host centuries-old trees to be assigned an extra value in conservation prioritization as old-growth forests (defined by European Commission 2023, 6–7). Old-growth forests are among the world’s most biodiverse ecosystems and are especially rare in Europe, where it has been estimated that, along with the small area of truly primary forests, they represent less than 3% of the EU’s forest area (European Commission 2023, 5). Thus, sacred forests could be incorporated into a broader national and European policy context within the framework of the 2020–2030 European Forest Strategy, of which old-growth forest preservation is one of the main pillars (European Parliament 2022, 19).

There are, moreover, opportunities for sacred forests to be designated as a heritage forest conservation network, e.g., as UNESCO “mixed heritage sites” containing elements of both natural and cultural significance or as “other effective area-based conservation measures” (IUCN, n.d). These are synergistic

with the rising appreciation of the wider values of SNS (Roux et al. 2022, 8) while recognizing the potential trade-offs between the materiality of biodiversity conservation and consideration of nature's meaning in an ethical context (Dudley, Higgins-Zogib, and Mansourian 2009, 574). This is a contemporary challenge being addressed through recent trends to include cultural values such as beauty, silence, tranquility, and spirituality in the development of new strategies for natural heritage conservation (Mallarach and Verschuuren 2019, 152–53). This also provides an important rationale for SNS, such as those in Epirus, across Europe, and worldwide, to be safeguarded for both spiritual and natural heritage conservation through new approaches that are fully integrated with existing religious legacy and church institutions.

SNS in Epirus have a special status. Legally, they belong to the state or the municipality, and their protection and management is the responsibility of the local Forestry Service. However, in people's conscience, their management is associated with the church. The Orthodox Church, and especially Ecumenical Patriarch Bartholomew, places ecological issues at the center of ministry, taking initiatives such as the offer of prayers for the preservation of the natural creation (established in 1989 by Patriarch Dimitrios) every first day of the new ecclesiastical calendar (September 1st) and the organization of an international interdisciplinary dialogue on the responsibility and obligation to find tangible ways of healing the natural environment (Chryssavgis 2013, 153). At this level, Orthodox theologians are attempting a new interpretation of biblical texts and a new worldview where "eco despair" is replaced by action (Theokritoff 2010, 155). There is potential for the church to be further involved in discussion of the interrelated spiritual and ecological crises (Votrin 2005, 11), helping to promote a conservation morality based on the human responsibility for the upkeep and management of nature (Bhagwat, Dudley, and Harrop 2011, 237). In this discourse, both clergy and lay members of the church could be involved within Christian institutions, enabling new pathways for communication between the church, local communities, conservationists, and scientists. In the case of the SNS of Epirus, this is something we plan to contribute to in the next stage of our work. The development of a plan to safeguard these SNS that integrates the conservation and religious institutional components to produce a viable management plan for each forest can motivate a community-based and participatory conservation strategy, incorporating the institution and values of the church, respecting the long historical continuity and specific identity of SNS, and focusing not only on environmental conservation but also on the search for a sense of the spiritual that people increasingly associate with the grandeur of nature.

Appendix

No	Geographic Unit	Village name	Forest name
1	Konitsa	Aetopetra	Agia Paraskevi
2		Aidonochori	Panagia sto Kouri
3		Armata	Kriakoura
4		Armata	Panagia
5		Chioniades	Kouri
6		Drosopigi	Kouri (above village)
7		Drosopigi	Kouri
8		Eleuthero	Roumani
9		Eleuthero	Smara/ Bouga
10		Fourka	Panagia Kladormi
11		Gorgopotamos	Kouri
12		Gorgopotamos	Roumani
13		Hliorachi	Agios Vasileios
14		Kalobrysi	Agia Paraskevi
15		Kavasilla	Panagia
16		Konitsa	Kouri
17		Lagkada	Kouri
18		Mazi	Kouri
19		Molista	Trafos
20		Pades	Mereao
21		Palioseli	Agios Sotiras
22		Palioseli	Profitis Ilias
23		Palioseli	Mereao
24		Plikati	Panagia
25		Vourbiani	Kouri
26	Zagori	Ano Pedina	Agia Paraskevi
27		Aristi	Kouri
28		Aristi	Pournaria
29		Aristi	Spasma
30		Aspraggeloi	Sepetura
31		Dikorfo	Agios Ioannis
32		Dikorfo	Agios Nikolaos
33		Dilofo	Kouri
34		Dipotamo	Agios Konstantinos

(Contd.)

No	Geographic Unit	Village name	Forest name
35		Doliani	Kouri
36		Doliani	Livadi
37		Elafotopos	Kouri tis Panagias
38		Elafotopos	Kouri tis Malamos
39		Elati	Kouri/ Ostria Ai Giorgi
40		Elatochori	Livadi
41		Flabourari	Livadi
42		Flabourari	Profitis Elias
43		Fragkades	Livadi
44		Greveniti	Toufa
45		Iliochoi	Livadi
46		Kalota	Livadi
47		Kapesovo	Gradista
48		Karyes	Ag. Nikolaos
49		Kastanonas	Eftapapado
50		Kato Pedina	Anilia
51		Kato Pedina	Megala Pournaria
52		Kavallari	Ag. Dimitrios
53		Kipoi	Aforismos
54		Kipoi	Panagia
55		Kleidonia	Kri
56		Koukouli	Aforismos
57		Laista	Livadi
58		Leptokarya	Nekrelia
59		Makrino	Livadi
60		Manassis	Livadi
61		Megalo Papingo	Dasomeno
62		Megalo Papingo	Kouria
63		Mesovouni	Agios Charalampos
64		Mikro Papingo	Plai
65		Miliotades	Panagia
66		Monodendri	Agia Paraskevi
67		Negades	Livadi
68		Petra	Livadi
69		Skamneli	Selio
70		Skamneli	Agia Paraskevi

(Contd.)

No	Geographic Unit	Village name	Forest name
71		Tristeno	Livadi
72		Tsepelovo	Livadi
73		Tsepelovo	Agia Paraskevi
74		Tsepelovo	Agios Ioannis
75		Vikos	Panagia
76		Vitsa	Agios Nikolaos/Livadakia
77		Vovoussa	Agia Paraskevi
78		Vradeto	Livadi
79		Vrysochori	Livadi

Table 1: The seventy-nine sacred forests that appear in Figure 3 revealed by ethnographic and archival survey.

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When World and Worldview Clash: Orthodox Liturgy, Philosophy, and the Issue of *Phthora*

Christina M. Gschwandtner, Professor of Philosophy, Fordham University, New York City, USA, gschwandtner@fordham.edu

The ancient Greek notion of *phthora* (perishing, ceasing to be, disintegration, corruption, defilement) is absolutely crucial for Orthodox theology and deeply inscribed in its liturgy. Yet, it no longer represents how we generally think about the cosmos and the material world. This article examines the role of this notion in the Orthodox patristic worldview and its contemporary relevance. It first explains the philosophical background to the notion before going on to show how it is appropriated by patristic thinkers for major theological doctrines and deeply shapes the worldview communicated by liturgical practice. It concludes by highlighting the complexity of the issue and pointing to the kinds of challenges contemporary Orthodox theologians would have to address if they wanted to employ this notion for making a substantive theological contribution to contemporary debates.



Rituals communicate worldviews. This is especially true of Eastern Orthodox liturgy, given its complex textual tradition, long services, and elaborate performance. The “imaginary”—in Charles Taylor’s sense—communicated within and by Orthodox liturgy, even today, is a patristic worldview that operates with ancient Greek philosophical conceptions of the cosmos. This does not mean Orthodox theology was “contaminated” by philosophy, as if philosophy were a hostile influence on it from which it needed to be kept pure and separate. Rather, the cultural context within which Christianity emerged and flourished assumed a worldview or imaginary that had been articulated most fully by philosophers like Plato and Aristotle. Aside from aspects that conflicted with central aspects of the Christian faith, the basic presuppositions and view of the cosmos of the philosophical worldview of the time were generally taken for granted.

The notion of *phthora* was central to this cosmological worldview and was adopted by Orthodox patristic thinkers and hymnographers in a variety of ways. In the ancient world, *phthora* was essentially what one would today call a scientific notion; it expressed insights about motion and change, especially the changing and disintegrating of matter or living beings. It operated both at the macro level of cosmology and at the micro level of elements and smallest particles. Patristic thinkers employed the basic convictions of this worldview both for their own views of the cosmos—including its creation—and for major theological doctrines, such as the particular nature of the incarnation, death, and resurrection of Christ. One might say somewhat glibly that Orthodox theology can be summarized as God who cannot undergo *phthora* coming into a world of *phthora* in order to redeem humanity from *phthora*. *Phthora* plays an indispensable role in working out the meaning of the death and birth of Christ (in that order), and the implications of both for human redemption.

These presuppositions about the functioning of the cosmos, the nature of Christ’s humanity, and the process of redemption became deeply inscribed in Orthodox liturgy, which was and often continues to be the primary or even the only place of faith formation for adherents to Orthodox Christianity. Yet, the majority of contemporary believers now subscribe—consciously or unconsciously—to modern scientific presuppositions that no longer match this worldview. This reality results in a disconnect: “Unless we take seriously the different cosmological and anthropological settings within which the Church lives and moves, it is impossible for us to understand Byzantine art or biblical, patristic and liturgical texts, and it is equally impossible for us to understand the rationality and reality underlying the specific manner in which the Church’s life is constructed as an active, decisive, salvific reorganization and refashioning of the limited dimensions and functions of the created world and the created being of” the human (Nellas 1987, 169). Can the patristic worldview communicated by liturgy continue to function today? What aspects of the soteriological

worldview liturgy upholds are still compatible with the realities of contemporary life? Would it be possible to extricate central theological affirmations from the broader scientific and cultural worldview in which they were shaped and formulated? What are the particular challenges the issue of *phthora* poses for such considerations?

The present article seeks to raise this question fully by laying out the particular challenges posed by this notion: its centrality to the ancient cosmological and physical worldview, its importance in Orthodox patristic theology, and its deep embeddedness in Orthodox liturgy. A full proposal for how the notion might either need to be adjusted or could still be made to function today, by taking into account the insights of science, cannot be made within the confines of this article, but the conclusion to the article will lay out some of the difficulties that need to be considered for such a fuller working out of the issue. The argument will proceed in four steps: (1) The first part will briefly review the ancient cosmological presuppositions regarding *phthora*, relying especially on Aristotle, who provides their fullest formulation; (2) the second part will explicate its importance in Orthodox doctrine, drawing especially on the summative discussion by John of Damascus in his *Fount of Knowledge*, often regarded as the definitive formulation of Orthodox faith; (3) the third part will highlight the importance of the notion in Orthodox liturgy, as it is still performed in Orthodox parishes today; (4) the final part will lay out some of the challenges posed by this notion, especially in terms of its clash with contemporary scientific insights.

The Role of *Phthora* in Ancient Greek Cosmology

Phthora is an extremely complex notion, crucial to ancient cosmology, physics, anthropology, and psychology. At its most basic level, *phthora* is the opposite of *genesis*: “going out of being” or “perishing” in contrast to “coming into being.” In this sense, *genesis* designates birth or generation, and *phthora* means death or disintegration. The fullest account of these two opposite motions is given by Aristotle in the text on genesis and *phthora* (variously translated as *On Generation and Corruption* or *On Coming-to-Be and Ceasing-to-Be*), in which Aristotle discusses these two central principles and explains how they work, but he also refers to it extensively in his *Physics*, in the *Metaphysics*, in *On the Heavens*, and elsewhere.¹

Phthora is an issue of substance in the sense that substantial change consists in the perishing of the substance or its transformation into a different substance or entity. Everything that comes into being or is born is therefore subject to *phthora* in the sense of disintegration and perishing, including inanimate objects. *Phthora* in the most proper sense refers to this ultimate dissolution into the elements; the eternal is *aphtharton* (*Physics* II.7; 198a). The material world is governed by the continual movements of becoming and perishing (or ceasing). The basic elements (fire, air, water, earth) cannot be eternal, because

then they would not be subject to *genesis* and *phthora* (*De Caelo* III.6; 304b). Immaterial reality, by contrast, is eternal and not subject to any kind of change; it does not come into being or go out of being: some substances are eternally ungenerated and imperishable and thus do not admit of *genesis* or *phthora*.² These are the “divine” entities to which we do not have much access (*Parts of Animals* I.5; 644b). They are necessarily such and not subject to fate or accident (*Metaphysics* VI.2; 1026b–27a). Aristotle thinks it necessary for there to be an eternal, immovable substance that is not subject to *phthora* but generates all other movement (1071b).

In this regard, *phthora* points to an ontological status that defines everything finite as different from the divine in a fundamental way: the divine does not undergo disintegration or going out of being, but everything else does. (As some patristic thinkers will argue, even angels have their immortality not by nature but as a gift that could potentially be revoked, e.g., Philoponus, *Opificio mundi* I.9, I.15–18.) Only the eternal does not change and hence also does not disintegrate or perish. This is a presupposition taken for granted in the Greek imaginary, as is evident in Galen’s insistence: “The mind readily accepts that everything ungenerated is thereby also indestructible” (*ap.* 600.14). So being subject to *phthora* means to be finite, mortal, and changeable, thus not infinite, immortal, immutable, and incorruptible.

On a more basic level, *genesis* and *phthora* are also employed for the simple case of a state-of-affairs coming to be (*gignetai*) or ceasing to be (*phtheiretai*). In this sense, *phthora* can refer to any change in a basic state of affairs: something comes to be in this way or that and then ceases to be such. To undergo change and motion is to be subject to *phthora*. Coming-to-be and ceasing-to-be are not arbitrary or random: things usually change into their natural opposites. Aristotle gives the example of pale turning into dark and musical into non-musical rather than pale into musical, which makes no sense (*Physics* I.5; 188a). Everything—except substances—comes to be from and returns to its contrary, albeit sometimes via intermediary stages (189a). This overall harmony is preserved even in artistry or manufacturing, which obey the same rules about coming to be and ceasing to be, because they operate with the same natural forces (188b; *Metaphysics* VII.7; 1032a–b).

At the same time, contraries are destructive of one another, that is, work *phthora* on each other (192a). For the Greeks, the two notions always entail each other, as stated in a prominent Aristotelian commentary: “But if perishing is of necessity and in the very nature of everything that has come to be, it will apply of necessity, to everything that comes to be, that it must perish” (*Quaestiones* 1.18, attributed to Alexander of Aphrodisias). Something that has a beginning or is generated always also has an end or a time of falling apart. Several of the Greek thinkers insist that if the universe is generated, then by definition it is impossible for it to be eternal, even the gods cannot overrule this. Philoponus,

a Christian philosopher, draws on these insights in order to argue vigorously (against Aristotle) that the cosmos is created and thus not eternal: it relies on God for its existence and has beginning and end, i.e., *genesis* and *phthora*. (He also shares the broader Greek conceptions about opposites and contraries as they are articulated by Aristotle, e.g., *Opificio mundi* II.6.)

Becoming and perishing can apply either to simple or to compound things (*Physics* I.7; 198b). Aristotle draws a distinction between two kinds of movement from *genesis* to *phthora*, one that constitutes substantial change and one that refers to qualitative change. In the latter case, the entity to which the change happens does not itself perish (199a). Change can either affect the underlying entity or the entity can be changed wholly (199b). Occasionally, he will call one kind a “simple” becoming (*haplē genesis*) and the other a becoming “something” (*gignesthai ti*) (314a). (In most of these contexts, Aristotle discusses “becoming” far more extensively than “perishing”; it is often simply implied as the opposite movement.) That is, things can begin and cease to be in a radical sense (like being born and perishing) or they can change from one kind of element into another (317a–319b). Aristotle also notes that something ceasing to be cannot always mean a complete annihilation, because the universe would have long ceased to be altogether if that were the case (318a). Furthermore, nothing can come out of nothing (*Physics* I.8; *De Generatione* I.1–3; *Metaphysics* VII.8) Thus, *genesis* and *phthora* are linked to each other in a continual cycle. This is obviously closely connected to his discussions of actuality and potentiality, which govern the becoming and undoing of all things, and to his notion of “natural” movement, which governs the directions into which something moves or changes.

Aristotle’s discussion of the four causes relies on these insights about becoming and disintegrating: something comes out of or is generated by the causes (*Physics* II.3). They essentially describe how *genesis* and *phthora* function concretely, how something comes to be something else and therefore ceases to be what it was before. Something coming about or ceasing to be is governed by logical reasons and is not just the result of luck (II.4–6). Furthermore, *phthora* governs the relations between the primary elements of fire, air, water, and earth (*De Generatione* I.3, II.3). (There is some debate over whether aether constitutes a fifth element that is not subject to *phthora*, because it is the element of the heavens or the eternal—at least for those thinkers, like Aristotle, who posit the heavens as eternal.) In this sense, there can be degrees of such exposure to *phthora*: earth is far more “corruptible” than air or fire, which are purer and warmer elements, thus thought to be more stable and closer to the eternal. Aristotle specifically points out that our common perception of this, which judges air for example to be less solid or real than earth, is contradictory to what is actually true: air and fire are more real and less liable to *phthora* than earth (318b). The change of one element into another—often through intermediary stages, especially for those elements least compatible with each other—involves

phthora: fire degenerates into air, air into water, water into earth, which is the lowest of the primary elements. The opposites are thus not absolute but are tempered by degrees and respects.

Aristotle also considers the kind of change that happens when nourishment is changed into blood, that is, when something entering our body ceases to be what it is (food or drink) and becomes something else (the stuff of our physical bodies) (*De Generatione* I.4). (This obviously applies also to other such changes in the natural world.) In this change something persists, although it seems like the original substance is entirely annihilated. Thus, attributes of something can change without a complete perishing of the original substance (319b). More complex change involves more attributes (331b). A change in attributes, including growth and decay, is different from the fundamental beginning or perishing of the substance itself, i.e., *genesis* and *phthora* in the fullest sense (320a). But Aristotle reiterates that the reciprocal coming-to-be and ceasing-to-be of contraries, such as hot to cold, dry to wet, etc. are also a type of *genesis* and *phthora* (331a).

These are the basic presuppositions about how anything material in the cosmos begins and perishes that are assumed by the subsequent tradition for centuries, aside from the Aristotelian argument about the eternity of the world, over which there was significant debate in Christian and non-Christian sources. The commentary tradition through which Platonic and Aristotelian insights are handed down reiterates them, and they are either implicitly assumed or explicitly taught for most of the Byzantine era.³ Eusebius's praise of philosophy as united with Christianity against paganism is perhaps unusually explicit: "When poets therefore, as they say, invent legends concerning the gods, while philosophers give physical explanations, we ought, I suppose, rightly to despise the former, and admire the latter as philosophers [i.e., lovers of wisdom], and to accept the persuasive arguments of this better class rather than the triflings of the poets. ... if the physical explanations of the philosophers are true, the [pagan poets'] testimonies of the gods must be false" (*Preparation for the Gospel* III.XV.125b). Yet, even when the "Greeks" (or "Hellenes") as a whole are condemned as pagan, including the philosophers, their scientific insights are silently assumed (especially evident in Basil's *Hexaemeron* and *On the Orthodox Faith* by John of Damascus).

Phthora is often translated into English as "corruption," capable of taking on moral connotations of corruptibility or defilement. In its fundamental meaning, however, *phthora* is neutral; it is first of all simply a description of how forces operate and how change happens. It describes the natural cycles of life and death, seed and maturation, the flourishing and decaying of all living things. *Phthora* is crucial for life to continue: plants must decompose for the seeds to be released and for other beings to be nourished; animals die when they have

given birth or raised their young; humans make way for the next generation. *Phthora* in this sense is no more vicious than entropy, which is probably its closest contemporary cosmological parallel. Yet the concept can also take on other connotations. In a hierarchically ordered cosmos, what is not subject to *phthora* is clearly superior to what is so governed. Elements especially given to *phthora* are thought to be less valuable than those less subject to it, the ones that are more like the incorruptible eternal or divine. (This is not particularly counterintuitive; we still think of gold, silver, and platinum as more valuable than less stable or solid elements.) Plato's emphasis on eternal, unchanging truths over the transitory and illusory nature of appearances illustrates this most clearly.

The finitude of beings and things that are subject to *phthora* entails not only death but all the other limitations of being finite: being prone to illness, pain, suffering, ignorance, and so forth. The fact that we are finite creatures means that our bodies will give out, that we fall ill, grow old and decrepit, and ultimately die. Our bodies, like all material bodies, will disintegrate and finally return to the elements. The animating principle of our material bodies, their soul, will depart and leave them lifeless and subject to decomposition. Yet, this is not a sinister curse or some fundamental evil; it is the very condition of having material bodies that live on a physical earth within a universe composed of elements. To be anything other than divine is to be finite or bounded and thus to be subject to *phthora*.

The Role of *Phthora* in Patristic Theology

Almost all patristic thinkers operate with these basic presuppositions about *genesis* and *phthora*, although they certainly debate and at times refine them. One key distinction between the patristic theologians and some (albeit not all) ancient thinkers is that they insist on the temporal nature of the cosmos: it is created by God and thus has a beginning and end. Origen (*On First Principles*), Athanasius (*De Incarnatione*), Eusebius (*Preparation for the Gospel*), Basil of Caesarea (*Hexaemeron*), Gregory of Nyssa (*On Human Nature*), Maximus (*Ambigua* and *Mystagogy*), John of Damascus (*On the Orthodox Faith*), and many others insist that because the world is created, it is therefore subject to *phthora*. *Phthora* affects everything in the universe, all the elements, but especially everything on this Earth, including all living beings, their bodies, and the materials of which they are constituted. (Indeed, even those who think that the soul is imperishable—an issue on which there is by no means agreement among patristic authors—usually contend that animal souls are subject to *phthora*.) Many of the texts on creation—from Basil's *Hexaemeron* (e.g., I.3) to Philoponus's *Opificio mundi* (e.g., I.5) and various other commentaries on Genesis—reiterate the basic assumptions about *phthora* as perishability.

This transitory and fragile nature of the human condition is frequently discussed. Basil says that “the shape of the body is perishable” and wonders how this perishable body can serve as an image of the divine when “the imperishable is not depicted in the perishable, nor is the perishable an image of the imperishable” (*Origin of Humanity*, I.6). The divine is eternal, immutable, formless, and imperishable, while the weak human flesh is temporal, changing, perishable, and figured or circumscribed. Athanasius pictures the original human as mortal and subject to *phthora* but potentially able to achieve imperishability (*aphtharsian*), a possibility humans squandered in the fall (*De Incarnatione* 4). He argues that “human beings, turning away from things eternal and by the counsel of the devil turning toward perishable things [*ta tes phthoras*], were themselves the cause of perishing [*phthoras*] in death, being . . . perishable by nature [*kata physin phthartoi*] but escaping their natural fate by the grace of participation in the Word, had they remained good” (*De Inc.* 5). Had they remained steadfast in the Word, they would have been preserved from this natural corruption or perishability, but because of their sin, “corruption [*phthora*] thenceforth prevailed against them” (*De Inc.* 5). In fact, freeing us from *phthora* is cited by Athanasius as the primary (or perhaps sole) reason for Christ’s death. The term and its cognates appear in his treatise in almost every other sentence.⁴

In the patristic appropriation of this notion, *phthora* also comes to refer to the fallenness of the world, to its defilement and corruption in the sense of its being occupied by hostile forces. For John of Damascus, the fall meant that humans were “condemned to death and made subject to *phthora*” (*Orthodox Faith* III.1). These forces are expelled from the waters of baptism and from other elements by various types of blessings. Earth and water are more likely to be contaminated by hostile forces because they are naturally more unstable than fire or air. The possibilities of degrees of *phthora* also imply that one can to some extent become more or less corruptible (*Orthodox Faith* II.30). One increases one’s subjection to the forces of *phthora* by focusing on bodily and material dimensions, being swayed by the senses, and being ruled by passions, which all increase corruptibility. The first lines of Evagrius’s *Eulogios* are representative in this regard: “Those who hold the land of heaven as their own by means of ascetic labours do not fix their gaze on the stomach, nor on concern for perishable goods [*tōn phthartōn*] . . . On the contrary, by means of an intellectual vision they participate in a nourishing light from the highest realities, like the incorporeal beings who are surrounded by the radiance of the light of the divine glory” (Prologue, *Eulogios* 1). This turn away from concern with the perishable to focus on the imperishable is pervasive in the ascetic literature.⁵ One comes closer to the divine and imperishability by focusing on the soul or mind, the immaterial realm, by turning away from sensory dimensions, as far as that is possible, and by controlling one’s passions: all lead to an increase in incorruptibility and a certain measure of freedom from

phthora. Saints—especially the ascetics—seek to separate from the perishable and focus on the imperishable, to become more and more assimilated to it. This obviously recalls Plato’s insistence in the *Phaedo* (and elsewhere) that we should focus on the imperishable soul rather than the desires of our perishable bodies, which will mire us further in perishability. This is why philosophy is “the practice of dying” (64a, 67c–e; reiterated, among others, by John of Damascus in chapter 3 of the *Fount of Knowledge*) and why the ascetic life was often referred to as the philosophical life. (Although Plato does not develop the cosmological and physical dimensions of *genesis* and *phthora* as fully as Aristotle, he certainly has plenty to say about the value of the imperishable over the perishable, which clearly had as much of an impact on Christian thinking as Aristotle’s more “scientific” views.)

Fallenness, in the sense of living in a world subject to *phthora*, can slide into sinfulness, focusing on what is perishable rather than what is eternal. And the most obvious instances of *genesis* and *phthora* at work, as in human pregnancy and childbirth—often closely linked to maternal and/or infant death in the ancient world—can come to be tainted by notions of defilement or corruption, not just in a physical but also a moral sense of pollution—thus the prayers for cleansing after childbirth. At the same time, destruction (such as fires, floods, droughts, or other phenomena that induce famine and death) are sometimes thought to be instructive because such instances of “natural” *phthora* teach us that everything perishes and we should therefore focus on what does not perish. Even our own perishing in death is a bonus in disguise in the sense that it means that thereby evil does not become permanent in our nature. John of Damascus maintains: “He condemned us to the *phthora* of death in order that what was evil might not be immortal” (*Orthodox Faith* IV.9). The line between natural forces of disintegration and the forces of evil is very thin and at times quite ambiguous.⁶

Furthermore, these notions become crucial for working out what it means for Christ to be fully human, to be born as a material being, to die, and to be resurrected. The church spent several centuries struggling to express how Christ can be said to be fully human and fully divine.⁷ Because Christ is God, he cannot undergo *phthora*; that would be a contradiction in terms. The eternal is unchanging (thus the patristic insistence on divine immutability and impassibility that baffles many people today) and cannot disintegrate or undergo perishing. God being immutable (i.e., without change; see Gavriluk 2004) and incorruptible (i.e., not subject to *phthora*) logically entail each other; anything subject to change is ultimately also subject to disintegration. Yet, for Christ to redeem us, he must be fully human and thus material, which means he must have a physical body that undergoes birth, growth, change, and disintegration. Christ’s hair and fingernails grew and thus had to be cut; he ate, digested, and defecated like any human being. So how can Christ’s basic subjection to *phthora* as a full human

being, having a truly human nature, be reconciled with his being and nature as eternal and hence not subject to *phthora*?

One important element of the response became the claim that Christ is born without *phthora*. Mary is said not to have her hymen ruptured by this birth or to have undergone birthpangs, because both of them are clear instances of *phthora*, often associated theologically with the fallen nature of our world. Pain, rupture, breakage, and disintegration are all instances of *phthora* at work. Thus, Christ's divine nature is fully preserved in the virgin birth and at the same time hallows his mother to some extent in the process. Yet, he is fully human and thus subject to *phthora* in terms of his physical body—gestated by Mary's pregnancy—and his human life on Earth is marked by *phthora*. How is this possible?

The patristic theologians work this out by distinguishing between two notions or aspects of *phthora*, essentially following Aristotle's distinction between qualified or partial becoming/ceasing to be and simple or basic becoming/perishing (i.e., complete coming-into or going-out-of being). That is, they distinguish between human suffering and subjection to the forces and processes of this planet on the one hand and complete dissolution (i.e., destruction of substance or nature) and return to the primary elements (of fire, air, water, earth) on the other. Christ suffers the former but not the latter. John of Damascus stresses that if Christ had not undergone *phthora* in the first sense, then the incarnation would be a hoax or "stage trick"—and we would be saved "only in appearance" (*Orthodox Faith* III.28). Two notions of *genesis* come to correspond to this dual sense of *phthora*. Maximus and John of Damascus distinguish between *genesis* in the sense of having a beginning or coming into being and *gennesis* (with two nu) as being generated or born (*Orthodox Faith* IV.7).⁸ As God, Christ does not have *genesis* in the absolute sense, but he is generated (*genneto*) eternally from the Father and has a human birth (i.e., undergoes *gennesis* as a human being).

This applies even more profoundly to Christ's death. The crucial verse here is Psalm 15:10 (in the Septuagint counting), which affirms that "you did not let your holy one see *phthora*," and is cited by many patristic thinkers and liturgical texts to confirm that, as divine, Christ was not subject to *phthora*. Given the fundamental Greek conviction that opposites cannot mix and that the stronger can annihilate the weaker, this means that Christ's nature, which is by definition not subject to *phthora*, can therefore overcome it: "trampling down death by death," as the Paschal hymn proclaims. Thus, while the corruptible or perishable can be assimilated to the incorruptible (in the incarnation), ultimately the incorruptible or imperishable overcomes the corruptible (in Christ's death as God). Christ undoes death and destruction by entering them, allowing them to do their work on him, and showing that they are unable to do so, thereby overturning them and ultimately annihilating them altogether.

This is often portrayed in theological and liturgical texts as a “hook” on which the devil or death is caught like a fish: by taking hold of Christ when he enters Sheol or Hades after the crucifixion, the powers of hell illegitimately appropriate something that is not theirs. As the rulers of *phthora*—and of the realm where all things end up as they disintegrate and perish—they try to grasp a nature that is not subject to *phthora* and to which they thus have no right. By swallowing up the dead Christ into its realm of disintegration, hell did something both illegitimate and logically impossible, inasmuch as the imperishable God cannot undergo absolute perishing or disintegration (the fact that none of Christ’s limbs were broken on the cross is read as further confirmation of this). John summarizes that “death approaches, gulps down the bait of the body, and is pierced by the hook of the divinity” (*Orthodox Faith* III.27). Christ *must* rise; his very nature as divine entails it. Just as light always overcomes darkness, the imperishable must overcome perishability (e.g., *Opificio mundi* II.6, II.16; *Orthodox Faith* III.27). This allows Christ to triumph over *phthora*, to open the gates of death, and to free all those subject to *phthora* and held in the realm of *phthora*, i.e., the realm of death and disintegration. While some of the imagery of trickery, which the patristic hymnographers seem to relish, might today strike us as odd or even inappropriate for God, this clearly is conceived as a logical, indeed cosmological, conclusion, a feat of material, physical “magic” (but eminently logical magic): what is not subject to *phthora*, by undergoing death (*phthora* in the sense of suffering and dying, though not in the sense of ultimate disintegration and perishing), thereby overturns and undoes death and corruptibility, precisely because it cannot succumb to *phthora* in the ultimate sense.

Incarnation and resurrection are thus deeply connected to each other through this very notion of *phthora* and its basic incompatibility with the divine. John of Damascus explains that the two natures of Christ are united without either changing its nature and without their being mixed together in any way, because such a mixing would be impossible; one would simply annihilate the other. That is to say, Christ is not a compound; the incarnation involves no mixing, mingling, or blending (*Orthodox Faith* III.3). The divine nature remains uncreated, immortal, invisible, and incorruptible. The human nature that had sinned, fallen, and become corruptible is made clean and incorruptible by uniting (but not merging) with the divine Word (III.12). This is why the resurrection frees us from corruption or perishing: the imperishable has transformed the perishable (III.12). And this is clearly seen by most of the patristic tradition as the primary and most desired redemptive result of Christ’s death and resurrection: He redeems us from *phthora* by vanquishing it in his own nature, which through his human nature becomes also ours (*De Incarnatione* 7–10; *Orthodox Faith* IV.4, IV.13, IV.27).⁹

The Role of *Phthora* in Orthodox Liturgy

These fundamental convictions are deeply inscribed within Orthodox liturgy and are abundant in the liturgical texts, both ancient and contemporary. On the most basic level, the language of “heaven and earth,” which pervades the liturgy as a shorthand way to refer to the whole cosmos, presupposes this cosmology. This phrase usually functions in the liturgical texts as a reference to the two fundamental realms or realities of being: visible and invisible, temporal and eternal, the realm that undergoes disintegration and the realm that does not (despite a certain slippage in these notions, especially in regard to the heavens). Maximus the Confessor probably works this out the most fully in a liturgical sense in his *Mystagogy*.¹⁰ The superimposition—and final reconciliation—of visible and invisible, heavenly and earthly, intelligible and sensory, body and soul, etc., as all imaged or perhaps even enacted in the liturgy, often baffles the contemporary, more literally-minded reader, and is frequently interpreted only as pretty metaphorical imagery. But Maximus is making fundamental cosmological and ontological claims about the ultimate impact of liturgy on the functioning of the cosmos through Christ’s redemptive actions and about the real physical and metaphysical changes it has wrought and continues to operate in every synaxis. These claims are not to be taken lightly or seen as purely poetic or merely metaphorical. This is how incarnation, crucifixion, the victory of the cross, redemption, and resurrection are actually supposed to work and be made real by the liturgy, especially through the Eucharist.

This is evident throughout the liturgical texts. For example, the affirmation that Christ is born without *phthora* is reiterated multiple times in every Orthodox liturgy, when it is said of the Theotokos: “Without corruption [or defilement] you gave birth to God the Word.” Various translations, it is the central liturgical claim about the birth of Christ. This has profound implications for Mary and not just in regard to Christ’s birth. For example, in the liturgical texts for the Feast of Dormition—her falling asleep in death—she is affirmed to hallow the elements, as her body, which Christ preserves from *phthora* as a firstfruits of our own redemption from its destructive force, ascends to heaven after her death. Again, she suffers *thanatos* but not *phthora* in the ultimate sense: her body is “preserved incorrupt” in the tomb.¹¹

The conviction that Christ does not undergo *phthora* in the final sense, even in his death, is stated over and over again in Orthodox liturgy. Not only is it fundamental to the Paschal troparion—the central liturgical affirmation of redemption that Christ, as the “source of incorruption” (*aphtharsias*) overcomes death by death, which is sung over and over again, multiple times in each service, between the feasts of Pascha and Ascension—but Christ’s conquering of corruption and wielding victory over chaos and disintegration is a theme that pervades the liturgy. Many of the canons read during Matins refer to Christ as imperishable (or incorruptible), entering perishability/corruptibility in order to

save us from it. Similar claims figure importantly in the September and Lenten celebrations of the cross, which is interpreted as a sign of this victory: just as the first tree/wood (of Adam) brought *phthora*, so the tree/wood of the cross triumphs over it. It is reiterated in all feasts of the Theotokos and also in the Christmas/Nativity services as the central achievement of the incarnation (“thy holy nativity [of the Theotokos and of Christ] . . . frees Adam and Eve from the *phthora* of death”). That Mary is preserved from “defilement” and kept “uncorrupt” by Christ’s birth is reiterated over and over again. The prayer to bring us out of or deliver us “from corruption” (*ek phthoras*) is similarly ubiquitous. The theme is also evident in the celebrations of baptism, including the important Feast of Theophany, where Christ is portrayed as expelling the forces of evil and disintegration and to regenerate all the elements, including contraries like water and fire, in order to give humans a share in “incorruption” (*kai tēs aphtharsias*). In various other liturgical feasts, the texts frequently affirm that the human nature, subject to decay and perishing, is refashioned in Christ and thereby freed from *phthora*. God takes on what he was not—human perishable nature—in order to renew it as imperishable.

Furthermore, the tradition insists that liturgical means are required for overcoming *phthora* and its consequences. Imperishability is acquired by degrees through baptism and Eucharist. One is cleansed of the external forces of corruption in the baptismal waters, which weaken the hold of *phthora* upon the person baptized and enable the process of gaining imperishability to begin by clothing the baptized in garments of “incorruptibility” (*Orthodox Faith* IV.13).¹² (This is one reason why permanently perishable things or beings—from icons to animals—are blessed but not baptized.¹³) One appropriates imperishability through the Eucharist, as one assimilates the divine imperishable and incorruptible nature into one’s own perishable and corruptible nature. John of Damascus employs variants of the term *phthora* multiple times in his discussion of the Eucharist (*Orthodox Faith* IV.13), but referring to the Eucharist as food or medicine of immortality is quite common. This transformation from perishability to imperishability is slow, partly because the two principles are so opposed to each other; thus, one must do it over and over again, as well as reinforce it with the rest of one’s life by striving against the corrupting forces of the passions, that is, to become firmly rooted in the unchanging eternal and not swayed by the perishable earthly. Presumably, this is partly why there are stories about ascetic saints who only very rarely participate in the Eucharist; given their progress, they perhaps do not require this *pharmakon* against *phthora* quite so frequently. It is also why the bodies of saints are often claimed not to decompose; their bodies already visibly (and by scent!) participate in imperishability. Maximus affirms that in the “universal consummation,” the human being “will be raised together with the universe, and he will recover the power no longer to be able to be corrupted (*phtheiresthai*)” (*CCSG* 35).

(It is perhaps also worth pointing out that this is one reason why stability and imperviousness to change were so highly valued by the Byzantines. They are reflective of the imperishability and perfection of the eternal and begin to approach them by turning the earthly *oikoumene* into an icon of the heavenly order.)

The Role of *Phthora* in Orthodox Thought Today

What are we to make of this today? One thing emerges clearly: the contemporary Western practice of separating science, politics, and personal faith from each other does not work for the ancients. Orthodox theological doctrine and liturgical practice cannot be thought without the cosmology, physics, and anthropology that undergirded them. (They also had profound political and economic implications, which cannot be discussed here.) To a large extent, redemption for the Eastern patristic tradition means deliverance from *phthora*, that is to say, deliverance from finitude, with all its dimensions of human limitations, being subject to error, pain, suffering, aging, and perishing. Salvation does not designate merely a notion of one's personal spiritual continuation after death, but it is intimately connected to the broader functioning of the cosmos and all its elements. The resurrection of the body affirmed by the creeds is understood as a transformation of the earthly perishable material into something imperishable that is no longer subject to earthly rules of materiality but cannot be thought in isolation from the basic presuppositions about material and immaterial substances. Notions of resurrection or the afterlife thus are not simply disconnected from the cosmological presuppositions but were articulated within their context and congruent with this worldview.

In this regard, it is clear that Orthodox theological convictions cannot be separated from "scientific" ones about the nature of matter, the ordering of the cosmos, or the generation of life. Yet, just as evidently, this is no longer the worldview assumed by contemporary scientific knowledge. While it is on some level congruent with basic notions of entropy and the life cycle of living things—life is only possible because of death, both on the macro scale of the death of the first generation of stars that enable all life on Earth and on the micro scale of bacteria and fungi that break down plant matter so new life can grow—it cannot possibly be maintained in its full complexity.¹⁴ We neither subscribe to ancient Greek notions of motion and change—including the convictions they entailed regarding geocentric cosmology or the stability of species—nor do our biology or chemistry (and the technologies made possible by them) match how the Greeks—both "Hellenes" and "Romanoi"—thought about the interaction of elements with or transformation into each other. The chemical processes that turn oil into plastics, the metals that are required for computers and mobile phones, even the basic physical rules that govern everything from flush toilets to airplanes, are all incompatible with the ancient scientific worldview. Very few

of us are willing to do without these “achievements” of modern science and contemporary technology.

This raises real questions, however, about how we perceive liturgy to function today. Can (or should) it be “updated” to accord with more recent scientific “imaginaries”? Would something essential be lost if the language referring to materiality, motion and change, heaven and earth, corruption and perishing was removed from liturgical texts? What does it mean for them to be ubiquitous but no longer functional? What about the broader soteriological picture? What would it mean for the birth of Christ and veneration of the Theotokos if the logic of *phthora* were excised from it? How would one even begin to reconceive the idea of “trampling down death by death” without the logic of incorruptibility overturning the consequences of *phthora*? All these are far too fundamental to the Orthodox theological imaginary to be able to be removed or altered without complete breakdown in theological coherence. Yet, can the idea that finitude and natural processes of disintegration and perishing are somehow “unnatural”—perhaps linked to sin—and to be abolished by redemption still be maintained today? Conversely, affirming the worldview—impossible to do consistently for anyone who lives in the contemporary world—without actually subscribing to it, either results in serious schizophrenia for believers or empties the theological affirmations of any truly viable content, i.e., content that continues to function as it was intended when it was first formulated.

This clash of worldviews raises questions not only about doctrine but also about concrete liturgical practices. Do contemporary Orthodox still count on baptism and Eucharist to effect actual ontological change by transforming perishable materials into imperishability and literally undoing the effects of *phthora*? Yet, this is what the liturgy they celebrate claims to be doing: to enact the cosmos in miniature, both as a pattern of the divine prototype and as a means for its transformation. Patristic liturgy serves—in Plato’s famous words—as a “moving icon of eternity”: both as its image and as a means for its consummation. One of the reasons—perhaps the very point—of doing liturgy, at least for Maximus and other patristic thinkers, is not only to transform the people who participate in it but to serve the healing and unification of the entire cosmos. It would be hard to envision what this could mean for a Newtonian, much less for an Einsteinian, cosmos. Yet, excising the cosmological and physical dimension of Orthodox liturgy means to dismantle it at its very core, as the centrality of the victory of Pascha and of the practice of the Eucharist highlight. Does the Paschal triumph over *phthora* and the Eucharistic food that heals from *phthora* by making our bodies “imperishable” still have meaning on a planet destined for conflagration and in a universe condemned to the heat death of increasingly rapid expansion?

Especially in light of the environmental crisis, we sorely need a new conversation and collaboration between scientific insights and moral reflection

today.¹⁵ Can the forces of life and flourishing triumph over the forces of death and destruction we have unleashed? Can the redemptive vision of the unification and harmony of all things articulated by the patristic authors provide a blueprint for a different, less destructive, way of dwelling upon the Earth? Can the basic principles underlying this ancient cosmology, as it is theologically worked out and enacted in liturgy, be made productive for our contemporary crises, even if many of its concrete scientific elements are no longer convincing? That is the challenge before any viable Orthodox theology today, at least if it truly wants to take seriously the contemporary intellectual imaginary and the existential plight of all living beings on this planet.

Notes

- ¹ For a summary of ancient Greek cosmology in general, see M. R. Wright (1995). For Stoic cosmology see David E. Hahm (1977).
- ² For a detailed discussion of Aristotle's notion of growth and change in *On Generation and Corruption*, see Inna Kupreeva (2005). For a discussion of his view on corruption vis-à-vis his notion of substance, see Mark Losoncz (2020).
- ³ For broad overviews, see S. Sambursky (1956, 1959, 1962). For the discussion between Aristotle and Averroes on this matter, see Josep Puig Montada (1996). For essays on the role of philosophy in the Byzantine and late antique world, see Lloyd P. Gerson (2010).
- ⁴ Andrew Louth says that "death and corruption, thanatos and phthora, stalk the pages of Athanasios' text like a couple of furies: the world created out of nothing is dissolving back into nothing" (2013, 71). For broader (albeit different) discussions of patristic anthropology, see John Behr (2000) and Panayiotis Nellas (1987, especially 43–104).
- ⁵ Pierre Hadot (2004, 2011) points to some of these parallels in his examination of ancient philosophy as "spiritual exercises" and as a way of life.
- ⁶ The Greek Orthodox thinker Christos Yannaras (2012, especially 55–65) erases them entirely. His book is not focused on *phthora* per se but on the nature of evil. Yannaras draws stark distinctions between a Western view (which he condemns in the strongest terms as distorted, repellent, overly legalistic, rabidly individualistic, etc.) and his own Orthodox position.
- ⁷ As one of the anonymous reviewers rightly pointed out, these issues are also at stake in the monophysite controversy, i.e., the debate over Christ's nature between the Byzantine and Oriental Orthodox traditions.
- ⁸ For a fuller account of this distinction, see Andrew Louth's (1996) introduction to Maximus the Confessor. For the most comprehensive account of the thought of St. John Damascene, see Louth (2002). See also several of the essays collected in Louth (2023).
- ⁹ This is also why animals are generally thought to be incapable of heaven, because they cannot, ontologically speaking, achieve incorruptibility but remain caught in the material and perish in the ultimate sense of final disintegration into the elements.
- ¹⁰ For the most detailed discussion of the philosophical sources of Maximus's liturgical vision, see Pascal Mueller-Jourdain (2005).
- ¹¹ This should perhaps also make certain Orthodox a bit more hesitant to insist on a radical distinction of Orthodox conceptions from Catholic notions of Mary's virginal birth and ascension. The differences are perhaps not as weighty as they sometimes appear to those uninformed of ancient cosmology and physics. While Orthodox theology does not explicitly except Mary from the consequences of death and "original sin"—itself a complicated notion, deeply wrapped up with conceptions of defilement and corruption—it is quite clear that Mary is preserved from the consequences of *phthora* at least in her giving birth to Christ and her death, albeit not in her suffering at seeing her son die, which several thinkers read as a "compensation" for her painless giving birth.
- ¹² Nellas (1987, 44–53) makes much of the "garments of skin" put on after the fall, which he contends shows that the current perishable human nature is deemed "unnatural" by the patristic literature, depicted as "coarse and solid," subject to decay and decomposition. The garments of incorruption counter and heal this condition. Clothing imagery in general is pervasive in the patristic literature, including in the Syriac tradition, and especially prominent in baptismal contexts.
- ¹³ At the same time, the prayer of blessing over an icon includes a reference to *phthora*: "O Lord our God, Who created us after Your own Image and Likeness; Who redeems us from our former corruption of the ancient curse."
- ¹⁴ For a recent discussion of entropy in regard to patristic notions of salvation, see Eugenia Torrance (2020). For fuller discussions of how Christian notions of incarnation and redemption might be compatible with the scientific worldview, see Ernest M. Conradie (2005), Celia E. Deane-Drummond (2009), Elizabeth Johnson (2018), Christopher Southgate (2008), Conradie et al. (2014), Conradie and Hilda Koster (2020), and many other (mostly Western) sources.

- ¹⁵ The original version of the article tried to propose some possible avenues of exploration for the contemporary ecological crisis, but as the anonymous reviewers rightly pointed out, this topic deserves much fuller exploration than is possible in this context and has therefore been reserved for a subsequent discussion. (I am most grateful for the reviewers' careful reading of the earlier draft and for their helpful suggestions, which have almost all been followed. I would also like to acknowledge my graduate assistant Lily Marie Kerhulas who helped with procuring some of the secondary sources and assisted with some of the Greek in liturgical texts, not all of which I was able to incorporate here.) For a more "positive" reading of the tradition and its potential to contribute to the environmental debate in particular, see my forthcoming piece "Creation, Cosmos, and the Earth: Eastern Christian Narratives of Redemption," in *The Saving Gace of the Story*, vol. V of *An Earthed Faith: Telling the Story Amidst the "Anthropocene,"* edited by Ernst M. Conradie and Hilda Koster.

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Soaring on the Wings of the Wind: Prolegomenon to a Symbolic Ontology of Creation

Bruce V. Foltz, Professor Emeritus of Philosophy, Eckerd College, St. Petersburg, FL, USA,
foltzbv@eckerd.edu

Traditionally, the world was itself both understood and experienced as being “a symbol and full of symbols” (Pavel Florensky)—as an “enchanted” cosmos (Max Weber) comprising realms of visible realities, each manifesting invisible orders, each aglow with divine radiance. By valorizing modern science as the only legitimate “theory of the real” (Martin Heidegger), modernity has violently broken with humanity’s shared experience of the world as a deeply meaningful symbolic order, progressively delegitimizing the symbolic world-understanding that had long illumined our living relation to our now-disenchanted world. This article first outlines modes of experience embodying this symbolic ontology from Sts Dionysius, Ephrem, and Maximus to Owen Barfield and Florensky. Second, it traces the erosion of this symbolic realism from Augustine’s psychological theory of the “sign” through the Protestant Reformation, Galileo’s dismissal of extra-scientific knowledge, and postmodern and cybernetic ontologies of “text” and “information.” Third, it distinguishes seven symbolic modalities, lending special attention to the role of beauty in mediating between visible and invisible orders.



In every place, if you look, His symbol is there . . .
 When He created the world,
 He gazed at it and adorned it with His images.
 Streams of His symbols opened, flowed and poured forth. . .
 St. Ephrem the Syrian (1989, 348f)

Preface

What would it mean, in these waning days of modernity, to experience the world through the symbolic mode of consciousness that was once native to all humanity? I recently met with what I regard as such an experience, and I begin this essay with a description of its features, followed by reflections on the kind of symbolic ontology that is indigenous to premodern worldviews, on its dissolution in modernity, on the principal elements of a symbolic ontology, and on the possibility of its retrieval.

The Symbolic Experience of the World

I live within a dense forest of great, ancient oaks on the shores of what once bore the name Bahia del Spiritu Santo but which has now been assigned the prosaic designation of Tampa Bay. Our house is surrounded by an expanse of towering trees, the area's last remnant of old-growth live oaks, some of them growing there since colonial times. They stand grandly and sovereignly.

Extending from the second story of the house is an elevated wooden porch, jutting into the midst of the oak canopy. From there, nothing is visible except the world as it issues from the hand of its creator. I do most of my reading there, and much of my thinking, and when the night sky is clear, all my stargazing, suspended between heaven and earth.

But when the winds come up from the bay, this Bay of the Holy Spirit, it is hard to concentrate on anything other than the wind and what comes with it. For when encountered from within the forest canopy itself, the wind is something exhilarating and overwhelming and sublime. The first time I experienced this was on an evening in late summer, the wind coming up quite suddenly and taking my breath away—literally in-spiring me, filling me with breath from beyond—an event whose proper phenomenology defies prosaic, nonsymbolic description. For the wind was breath itself—Greek, *pneuma*—and re-spiration, breath and spirit and the very current of life, brought forth from across the waters (Hebrew *ruach*, as in Genesis 1:2)—awakening and invigorating the spirit. It was itself spirit at work—Latin, *spiritus*. In an unanticipated experience, I encountered at once the meanings that *ruach-pneuma-spiritus* have, since ancient times, gathered together. My inspired inhalation was part of the exuberant exhalation around me. The spirit within me was roused together with the spiritual presence arriving with the wind—or rather, as the wind. Life within me surged at that moment, when the forest itself came alive and life was breathed into it as on the First Day.

Breath, wind, inhalation, and exhalation: the swirling symbols merge, evoke, and invoke one another, revealing differing aspects of a selfsame reality!

Something very real had taken place, but something that our modern mindset casually relegates to the status of a marginal, “mystical” sideshow. Now thinking back to that evening, poetic words arise from memory: “Wild Spirit, which art moving everywhere . . .” Yes, like Percy Bysshe Shelley, I sensed that an “unseen presence” from beyond my reach, from beyond my thought, had indeed all at once drawn near. The “West Wind” was for the poet a powerful symbol, even if its transcendent referent finally eluded him. As the philosopher Paul Ricoeur (1967, 347–57) famously propounded, “The symbol gives rise to thought.” But at the same time, as Owen Barfield has shown, the symbol in its poetic resonance leads not just to thought but to experience, our own experience as well as the experience of the poet.

During that evening in late summer, thought arose as a response not to remembered texts or to the contemplation of familiar symbolic images, but to a vivid experience of the wind *as itself a symbol*. The thought to which it “gave rise” was this: Could it be true, as Martin Heidegger long insisted, that before it gives itself to thinking, before it reveals itself within thinking, creation is always already poetic—that it is the world, precisely *as itself a symbol*, that gives rise to thought—and that the wind in Shelley’s poem can be a (literary) symbol only because the wind itself already is an (ontological) symbol? But of what was the wind a symbol? Captured by a sense that an invisible order had become accessible, I was struck by a second thought: that before there were patriarchs and prophets, before the coming of Christ, it must have been in experiences like this that people first encountered the very God who “soared upon the wings of the wind” (Psalm 18:10; also 2 Samuel 22:11 and Psalm 104:3). Surely they sensed the presence of their Lord in just such a stirring of the wind, and doubtless too they encountered the wind as an animating power, just as Ezekiel in the Vision of Dry Bones was told to invoke the wind itself, saying: “Come from the four winds and vivify these dead men, and let them live” (Ezekiel 37:9). Encountered the divine spirit in a way analogous (if less momentous) to that remarkable day in Jerusalem, when it is said that something on the order of “a mighty rushing wind” came down from heaven and filled the house where the faithful were gathered, the Holy Spirit animating everyone present (Acts 2:1–4). Encountered God in the way that Jesus explains to Nicodemus: “The wind [*pneuma*] blows where it wishes, and you hear the sound of it, but cannot tell where it comes from or where it goes. So is everyone who is born of the Spirit [*pneumatōs*]” (John 3:8).

Premodern Worldviews as Resting upon a Symbolic Ontology

In the woods alongside our oyster-shell-encrusted Spiritu Santo Bay, I had unexpectedly come up against a symbol—not an element of a poem, not something in my mind, not some trope within a text, but something eminently

real, something that in a very concrete manner drew together (Greek, *sym-bolon*) two orders of reality—earth and heaven, visible and invisible. I had gotten a glimpse, if only for a few moments, into what the Russian philosopher and Soviet martyr Fr Pavel Florensky called a “symbolic world-understanding,” which he argued is essential for a living Christian culture. And, we might add, essential for any culture that is able to sustain its religious roots. “For every entity,” Florensky maintains, together with earlier Eastern Fathers such as St Gregory Palamas, “the *essence* is the side turned toward itself, whereas the *energy* is the side turned outward.” Moreover, every entity can, in turn, have its own energy “illuminated by the energy of another” (Florensky [1921] 2014, 127, 134; emphasis added). “The symbol,” he concluded, is “any reality that contains in its energy the energy of another reality higher in value and hierarchy; the lower reality is a window into the higher reality.” The symbol brings with it higher realities, and only because of this does it evoke the depths of thought. But to see this, Florensky maintains, we must “destroy the hard shell around us, and come to understand that the world is a symbol and full of symbols and that therefore our world-understanding must be symbolic” (Florensky [1921] 2014, 148). Or, to state it even more simply, in the words of St Porphyrios (2005, 107): “Whoever wants to become a Christian must first become a poet.

Of course, St Porphyrios does not mean here that every believer must set out to write some verse, but that they should allow the world to present itself in its own poetic depths, as charged with an expressive core of meaning that draws together visible and invisible realities. And even less does Florensky mean that the symbolic character of the world exists only in our heads. On the contrary, the symbol in this most authentic sense is ontological, a real link between the world and God, a living bridge to the divine that constitutes the very being of creation, and by that same fact it is essential for understanding the world as it truly is. Thus, we could say that Florensky is a “symbolic realist.” For he maintains that far from being unreal, the symbol is the very touchstone of reality, the signature of having made contact with what is most real—with the visible perceptibly infused with the invisible—encountered true being, *tō ontos on*.

But this is not how we understand the symbol today, nor is it how we experience the world. Since the advent of modernity, we have learned to *experience* the world in accord with how we *understand* it, as the object of scientific knowledge. The world is not translucent for us but rather solid and opaque and self-subsistent, an idol projected from modern science and Enlightenment philosophy—with no interior and no other side—possessing a density that repels luminosity, like the dark background of a mirror (Foltz 2004, 330–42). It yields no visage beyond our own projected reflections of ourselves and our conceptual schemata. We approach the world as materialists, or more precisely, as metaphysical naturalists: we believe that the world is ultimately (really) only what the natural sciences say it is, and nothing more.

At the outset, however, it must be emphasized that this is a problem not with science as such but rather with its elevation into a narrow but mandatory worldview that we have unquestioningly, often unknowingly, embraced—a historically exceptional premise we have inherited from a relatively small number of reductionistic philosophers, and above all from Galileo acting not as a scientist but as a metaphysician. The problem, that is, lies not with the positive sciences themselves, but with the scientistic worldview that bases itself upon what Alfred North Whitehead (1966, 132) calls “the grand doctrine of nature as a self-sufficient, meaningless complex of facts,” a dogma that is not itself scientific at all, but meta-scientific, i.e., meta-physical. But this view has now become hegemonic, not merely one perspective among others. As Heidegger (1977, 157ff) noted, for modernity and its peculiar worldview: “Science is the theory of the real.” The depth-dimension of the symbolic, or as Heidegger put it, the poetic, understood ontologically, has been subjectified and thus delegitimized. But before endorsing Heidegger’s claim, we must ask: Is such a flattening of the world in fact unique to modernity? Has it ever been any different? Didn’t people always experience the world in a factual or straightforwardly “empirical” sort of way, adding on values and metaphors and poetic, fanciful, “symbolic” adumbrations only “after the fact”? Isn’t it the experience of unadorned “fact” that delivers the primal datum?

But two centuries’ scholarship on the worldviews of premodern peoples has shown that it is not the “factual” but the poetic experience of the world that has always been held as normative and primary—primary historically, epistemologically, and spiritually as well—and that modernity is itself an outlier, an anomalous modality of consciousness within the collective experience of humanity. And this requires us to ask: What if our primordial experience of the world is *itself* naturally and inherently symbolic and poetic as well? And what if our reductionistic modification of it results only from training and artifice and societally mandated conventionality? Heidegger maintained something along these lines in his later work, where he holds that the world is most truly encountered within its own poetic fullness (Heidegger 1971; Foltz 1995, ch. 8). And so argued his contemporary Owen Barfield, who provided the guiding vision for the Oxford Inklings Circle, which included J. R. R. Tolkien, C. S. Lewis, and Charles Williams—writers who perhaps did more than any other recent figures in the West to retrieve a symbolic world-understanding, and who were bound together by a rejection of modernity’s reductionistic, materialistic mindset that they called “positivism.”

Barfield himself had undergone a remarkable and somewhat mystical experience in his early twenties. After reading certain Romantic poets, probably William Wordsworth and Samuel Taylor Coleridge, he found that nature had become transformed for him, that it was now filled with an intense meaningfulness due to “some magic” that had “enhanced the meanings” of the

words he read. Moreover, it seemed to him likely that “those enhanced meanings may reveal hitherto unapprehended parts or aspects of reality” (Barfield 2012, 18). This led him to ask whether the language of lyric poetry effectively transmitted the very kind of experiences he had just had, and which the poet must have previously undergone. That is, he came to suspect that language itself can convey varying modes of experience and to investigate the evolution of both language and the corresponding changes in our consciousness of the world. In the words he studied, first in English and then in other languages, he always found that they had originally held together the rich, poetic meanings that can be found in such ancient words as *ruach* and *pneuma* and *spiritus* (Barfield 1973, 62–65). Figurative and literal, inner and outer, subjective and objective, poetic and practical meanings had at some earlier time all been aspects of a single, concrete experience. Barfield concluded that language always embodies some cultural mode of experience, and his study of word origins suggests that our experience of the world was originally not bare, stripped down and “factual” but rather poetic and evocative, clothed with meanings and symbolic epiphanies. He presented these insights in a book called *Poetic Diction*, arguing that the modern distinction between physical reality and symbolic meaning was alien to earlier generations: “When the wind blew it was not ‘like’ someone breathing. It *was* [itself] the breath of a divinity” (Wilson 1990, 125). That the wind was not for them allegorical but rather a living symbol connecting them with other world.

This pivotal insight that the Inklings group adopted from Barfield was once expressed compellingly by Tolkien in a famous conversation with C. S. Lewis, a dialogue that led to Lewis’s conversion to Christianity. It unfolded as they walked across the Oxford campus on an early autumn night, reaching its peak just as a sudden breeze rose up to rattle the leaves. Lewis recalled this decisive event vividly: “A rush of wind which came so suddenly on the still, warm evening and set so many leaves pattering down that we thought it was raining. We held our breath” (Carpenter 2004, 43). Tolkien then reflected upon this unexpected breath of breeze that had brought the sky down to earth:

We speak of “stars” and “trees” as though they were entities which we had mastered in our post-Newtonian, materialist fashion. A tree for us is simply a vegetable organism and a star simply a ball of inanimate matter moving along a mathematical course. But for those who formed the words *star* and *tree* they were very different. For them, stars were a living silver, bursting into flame in answer to an eternal music. They saw the sky as a jeweled tent, and the earth as the womb whence all living things have come. (Wilson 127; Carpenter 2004, 43)

Symbols, then, were not initially projections from an essentially subjective sphere but concrete recognitions and articulations of “what [really] is” (*tō ontos*

on) as it has presented itself within the living experience of our premodern ancestors—and as it still offers itself to our experience today, at least prior to our mental operations upon it. By comparison, then, the conventional language of modernity is impoverished, abstract, and barren.

Correspondingly, and as Gerhart Ladner (1995, 134, 7) recounts, the “rich nature symbolism of early Christianity” derived not from some aboriginal, prescientific attempt to explain the world, but from “an experience of a world pervaded by the divine.” What compels us to believe that these early Jewish and Christian perceptions were merely primitive embellishments of otherwise prosaic realities, better grasped in sober, abstract concepts? On the contrary, Psalm 18 counters this modern (revisionist) perspective, reminding us that God “makes darkness His secret place, round about Him His tabernacle: darkness of waters, thick clouds of the skies.” But is this not just a stammering way of stating something more accurately rendered through the more precise lexicon of scientific meteorology? The earliest Christian theologians, themselves erudite and philosophically sophisticated, certainly did not think so. St. Basil the Great, St. Gregory of Nyssa, and St. Ambrose, for example, all wrote symbolically rich *Hexaemeron*s, abounding with poetic depictions of the cosmos during its earliest beginnings. Far from de-mythologizing the language of Genesis, they celebrate and cultivate the symbolic element, showing us how we may learn from what St. Ambrose calls “the mystery of nature” streaming throughout creation” (St. Ambrose 2004, 110). For, as Ambrose (2004, 110) puts it, God creates the world less like an external agent effecting a cause, than like “a philosopher propounding his best thoughts.” And the philosopher invoked here is not a modern analytic philosopher but a man grown wise, initiated into the same wisdom natively embedded throughout the *kosmos*. As the Wisdom Books of the Old Testament continually remind us, nature is itself expressive, and so too is it evocative, drawing us beyond itself into a transcendent order. Thus, we are not invited to project thoughts (or symbols) *onto* nature, as if (in Ambrose’s words) the world indifferently “subsists in itself,” but rather to gather our thoughts *from* nature, which itself embodies the thoughts of God.

Their fourth-century contemporary, St. Ephrem the Syrian, places the symbolism of creation at the center of his cosmology as well as his soteriology. In St. Ephrem’s teaching, itself largely expressed in poetic form, there is an unbridgeable gap, an ontological chasm between God and creation, for God dwells within a profound hiddenness (*kasyuta*). Because of this, it is folly and impiety to seek God through what he calls prying and investigation (*bsa, aqqeh*). For He is cloaked in mystery, forever dwelling in hiddenness. But at the same time, Ephrem designates the hidden God as “the Hidden One who *revealed* Himself,” because happily for us. God at the same time “bends down” to us through three waves of disclosure that in no way diminish his invincible hiddenness. First, God discloses Himself to us in symbols (*raze*: mysteries or

hidden meanings) present everywhere throughout nature, as well as within Holy Scripture, as “hidden powers” within them. Second, He reveals Himself through the Divine Names, such as Creator, Being, Healer, etc. Finally, and most remarkably, God has “put on a body” and become visible in Christ, this One whom Ephrem calls “the Lord of the Symbols”—for it is Christ who fully reveals the meaning of the symbols already present in nature and scripture, as He first did on the road to Emmaus. So overwhelmed is St. Ephrem (1994, 53) at this feast of the symbolic, he declares: “This Jesus has so multiplied His symbols that I have fallen into their many waves.” And only because God reveals Himself are we able to know Him—not through syllogisms but through the grace of wonder (*tebra*) at God’s hidden self-revealing throughout creation. “Lord, your symbols are to be found everywhere, yet You are hidden from everywhere,” St Ephrem exclaims. “Blessed is the Hidden One shining out!” (Brock 1985, 55).

A century later, St. Dionysius developed a symbolic ontology, or philosophy of being, within which all creation is itself a theophany—every being precisely *is* a symbol, revealing the Creator who is Himself beyond being, and who is therefore knowable through these symbols. Like St. Ephrem, Dionysius distinguishes between knowing God in concrete realities and knowing God through the Divine Names; but significantly, he counsels that visible realities are in an important sense better. For the divine theophanies that unfold within perceptible realities (wind, fire, water, and so on) are less readily confused with the transcendent God who is beyond being, while the Divine Names (Goodness, Beauty, Wisdom, Creator, and so on) can be easily misunderstood as identical to God, and thereby they may obscure the divine transcendence itself, their very universality lending itself to idolatrous understandings. Sensible symbols, then, remind us by their spatiotemporal particularity that they are not the God who is made manifest through them. Moreover, the experience of God in the wind must first of all be an experience of the wind itself, in the integrity of its being, not the decoding of some extrinsic cipher or occult sign that serves as its simulacrum; hence, the transcendent God is concealed by the very particularity of the wind as much as He is revealed within it. What is symbolized by the symbol is present in its very hiddenness and indeed as that hiddenness. In the terminology of a contemporary interpreter of Dionysius, Jean-Luc Marion, the experience of God in the wind discovers a *saturated phenomenon*, a phenomenon that contains more than itself, overflowing with an abundance from beyond.

The symbolic ontology of the Areopagite, in turn, underlies the thought of St. Maximus the Confessor, who maintains that every being articulates an inner *logos*, elaborating in its own unrepeatable way the Eternal Logos. Here too creatures are symbols of God; the primary reality of all creation rests in its power to manifest its Creator. As Maximus states in his *Ambigua* (AD 1285), “for our sake [the Logos] ineffably concealed Himself in the *logoi* of beings”

(St. Maximus 2014, 63). Nor was such a symbolic ontology altogether absent in the West. John Scotus Eriugena, who translated both Dionysius and Maximus, maintained in ninth-century Ireland that all creation forms a hierarchy of symbols manifesting the divine reality. All things—natural things, scripture and even artifacts—form a ladder of symbols that, “taking him by the hand,” can lead the individual to the “hidden mysteries” of God.

These thinkers, premodern voices from different times and places, express a world understanding whose profoundly symbolic character was a matter of shared experience. They do not write as if they were innovators introducing new ideas but as if gently reminding their readers of what they already knew, for it was already woven into the depths of their own experience. At a time when the art of rhetoric was taken seriously, none of them betray any sense that their readers might be surprised at what they are stating. Today, in contrast, we have almost entirely lost this symbolic cosmos. The world of modernity is thoroughly de-sacralized, or in the terminology of Max Weber, *disenchanted*. As Florensky observes, the philosophical naturalism of modernity has caused the “sensuous husk” of the symbol to become hardened and impenetrable, so that the interior spiritual reality has become indiscernible and inaccessible. This is for the religious world understanding nothing less than catastrophic. In a closed world hardened against a symbolic depth-dimension and fortified against transcendence altogether—a world sealed shut within Kantian categories—the Ascension of Christ and the Annunciation brought by the angel Gabriel become unintelligible. Florensky asks how we can descend into such blasphemy as to track within Euclidean coordinates either Gabriel’s arrival (The Annunciation) or Christ’s departure (The Ascension) employing the laws of the conservation of energy and indestructibility of matter and applying the differential equation of motion (Florensky [1921] 2014, 138).

Two questions, then, arise from this recognition of our loss. First, how did the demise of the symbolic world take place? Second, how can we best understand the underlying ontology of the symbol as a visible bridge to the invisible? The remainder of this article outlines several of the many developments leading to the decline of the symbol in our experience of the world and ends with a few notes. It is presented here only as a preview or outline of a much larger project that is already underway, not a self-contained work of intellectual history—a beginning and not an end.

The Eclipse of the Symbolic in Modernity

The eclipse of the symbolic already begins in late antiquity. It was Augustine who inaugurated the Western reduction of the symbol to a psychological datum—no longer an ontological bridge connecting visible and invisible realms. As the great Dominican scholar M. D. Chenu (1968) observes, Augustine set in motion “a certain desacralization” that “denied any mystical content to nature and

any native sacredness concealed within it.” He reduced the cosmic symbolism advanced by Dionysius to “the level of his [own] psychology of knowledge,” understanding the symbol as merely a “sign” produced in the mind of the knower and requiring the “intervention” of a human concept. Whereas for Dionysius “it was not the believer who gave signs their meaning; it was objective elements themselves . . . The symbol was the true and proper expression of reality; nay more, it was through such symbolization that reality fulfilled itself [and] it was no more reducible to analysis than the mystery it made present” (Chenu 1968, 125ff). It was this eroded, Augustinian understanding of the symbol as a mental “sign,” mutely awaiting conceptual formation, that ultimately prevailed through scholasticism and into modernity, later to resurface as the “text” beloved of postmodern philosophers.

In the later Middle Ages, and especially in Thomistic expositions, Platonic realism, with its emphasis on the participation of the visible in the invisible realm, recedes behind an Aristotelean emphasis upon individual entities as “what can stand alone,” i.e., as “self-existent beings,” an understanding that both St. Ephrem and St. Ambrose, along with St. Athanasius, saw as the very essence of idolatry (St. Ephrem the Syrian 1994, 67f; Foltz 2014, 215–31). The importance of form still lingers, but eventually the emphasis on self-subsistence gives birth to medieval nominalism, the *via moderna*, which closes the door on the experience of transcendence within creation. Forms at this stage are no more than logical categories, universals—merely names, signifying nothing more transcendent than our own mental acts of generalization. The self-emergent, expressive cosmos is reduced to an order of abstraction. The foundation is now prepared for what Weber (2011, 120) will call the “disenchantment”—or more literally, the *Entzauberung* or “de-magification”—of the world.

Drawing upon this nominalist metaphysic, the Protestant Reformers swung open the doors to modernity by waging war against the symbolic order, not only in theology but in cosmology as well. Ritual and sacrament, sacred art, and symbolism as such are excoriated as magical, superstitious, and idolatrous. Like scripture, creation too must only be read “literally,” disdaining any call from symbolic depths. Historian of science Peter Harrison (1998, 116) states this succinctly: “[I]conoclasm with respect to images directly parallels literalism with respect to texts.” Luther, strongly influenced by Ockham’s nominalism, declares that allegory is only for “weak minds” and “idle men,” and John Calvin excoriates all symbolic readings of scripture. The Anglican Francis Bacon joins with them, deriding the traditional understanding that creation reveals things divine as a “heathen opinion,” calling instead for “a new, nonallegorical way of reading the book of nature” (Harrison 2015, 76). In Italy, Galileo was busy filling this prescription in a strident tone.

Nor was this iconoclastic assault upon the symbolic order confined to the writings of an intellectual elite. In the early months of 1522, rioters broke into

Wittenberg's Church of St. Mary, the "Mother Church of the Reformation," and went about "stripping altars, breaking images and burning the debris" (Koerner 2004). And in the decades that followed, enraged mobs set upon churches throughout Northern Europe, as if declaring war upon the very capacity of the visible world to manifest the invisible. Art historian Joseph Leo Koerner compiles a long list of these degradations, even a small sampling of which is painful to recite: "[I]mages were broken, burned, toppled, beheaded, and hanged. They were spat, pissed and shat upon, tossed into toilets, sewers, fountains, canals, rivers, rubble heaps, garbage dumps, pigsties and charnel houses"—somehow seeking to prove for all time that the material world was, after all, merely base and contemptible and indeed excremental, utterly incapable of serving as a window of transcendence (Koerner 2004, 104f). And as Weber suggested, this turns out to be a most convenient view of nature as well, justifying its unrestricted appropriation for industry and commerce.

Thus, a radical reduction of the highest to the lowest takes shape well before the rise of scientistic ideologies. Koerner summarizes the spirit of these onslaughts: "Protestant iconoclasm sought disenchantment—mere wood and nothing more." (Koerner 2004). Throughout the era, a starkly disenchanted cosmology and a one-dimensional literalism in theology mirror and compete with one another. As Harrison (1998, 115) states: "If the things of nature, created by God, no longer resonate with symbolic potency, then those human artefacts which had once participated in that universe of meaning . . . will be similarly mute."

The last traces of a symbolic cosmos are banished by Galileo, whose metaphysical claims far exceeded the scientific needs and concerns of astronomy and physics. Along with Descartes, he founded modern metaphysics, insisting that the very being of space must be regarded as geometrical—transforming a methodology into an ontology, and initiating the reductionistic scientism that has now become our standard. As the French philosopher Jean Borella puts it: "[Galileo] was convinced that what is revealed beneath the scientific gaze is the world's very reality, *such as it is in itself*. His confidence in the ontological value of his analysis was total, and hence too its demands" (Borella 2016, 65; emphasis added). If physics alone reveals the reality of nature, then only scientific knowledge is legitimate, and other truth claims are nothing more than fantasy and fraud. But is the world really nothing more than what the natural sciences currently say it is? And if we wish to assert this, would this claim itself be scientific?

The fierce epistemic dogmatism of Galileo may be seen in his appropriation of one of the great guiding images of premodern thought, both East and West: the "Book of Nature." Originally and for many centuries, the Book of Nature was seen as standing parallel to, and indeed temporally preceding, the Book of Holy Scripture. It served as a source of divine revelation legible even to

the illiterate and unlearned. This symbol, this particular bridge between visible and invisible orders, was first employed by St. Anthony the Great in the fourth century, and expressly invoked by such diverse figures as St. Athanasius, Evagrius Ponticus, Origen, St. Basil the Great, St. Gregory of Nyssa, St. Augustine, St. John Cassian, St. John Chrysostom, St. Isaac the Syrian, St. Maximus the Confessor, St. Bernard of Clairvaux, St. Bonaventure, St. Thomas Aquinas, Hugh of St. Victor, and Dante Alighieri. In *The Assayer*, however, Galileo appropriates (without acknowledgment) and upends St. Anthony's eloquent understanding of the Book of Nature. In his dialogue with an unnamed "philosopher" who had asked how he could live without "books," St. Anthony explains that he needed no books made of paper, because creation as it surrounds him is itself a book that is "present whenever I wish to read the words of God" (Socrates Scholasticus 1999, 107). But Galileo not only appropriates this once-symbolic understanding, he also inverts it, while subtly ridiculing the desert saint for being delusional in his belief. For although Galileo too points to the "grand book, the universe, which stands continually open to our gaze," he cautions that "the book cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics, and *its characters are triangles, circles, and other geometric figures without which it is humanly impossible to understand a single word of it*; without these, one wanders about in a dark labyrinth" (Galileo 1957, 238).

St. Anthony, then, whose spiritual life unfolded at the foot of a great mountain, bathed in the relentless sunlight and stark beauty of the Egyptian desert, in reality dwelt in invincible darkness, a "dark labyrinth," suffering from the ancient delusion that he could read the book of nature as a great text, one that had been fashioned to everywhere reveal its own author. Rather, insists Galileo, speaking not as a scientist but as a "natural philosopher" and metaphysician, it would have been "humanly impossible" for St. Anthony to have "understand a single word of it." A book it is indeed, proclaims the Renaissance physicist together with the fourth-century saint. However, it is not a book intended to be read by everyone, but one meant to be made intelligible only to a certain elect. That is, it must have been created as it was, so that those mathematically skilled cosmologists whom God in his omniscience surely knew would come along sooner or later, those highly educated few who could successfully decipher this encoded book of nature, could finally understand the workings of the divine intellect. And lest there be any doubt, Galileo (1957, 238) emphasizes that "nature takes no delight in poetry," its "fables and fictions" being themselves "abhorrent to nature. That is, in his act of creation, God was not a poet, intent upon investing his creation with meaning of its own, but no more than a mathematician.

But the problem lies not just with the condescending elitism displayed here, nor even with Galileo's presumption that there is only one legitimate way to read the book of nature, but with his insistence that we must not take seriously

the universe as encountered from within our living experience—the sun on our skin or our delight in rush of wind through the forest. Rather, we must read it only while standing upon our heads, submissively abandoning our own experience of the world as having all along been a great lie—understand the world around us by employing only the most abstract concepts of discursive rationality: the “triangles, circles, and other geometric figures” that for Plato were themselves symbols of higher realities, and thus standing far below them. As put by Michel Henry (2014, 82), “With Galileo . . . the encounter with the world is stripped of its essential subjectivity,” its capacity to reveal itself to us as living subjects and inhabitants.”

But now that we all are students of Galileo, we understand our relationship with the created world—with the world that inconspicuously supports and surrounds us, the world that addresses us and calls us into relation—as if “in fact” it were merely an arc across which some one set of perceptive receptors (e.g., our eyeballs or our ears) and some second, corresponding set of perceptible objects conducted some visual or auditory commerce. Thus, the contemporary Greek philosopher Christos Yannaras (2007, 83) maintains, perhaps echoing the “First” of Rilke’s *Duino Elegies* (“*Das alles war Auftrag*”), that we have shut ourselves off from the possibility of encountering creation as a personal calling, an address or invitation (*klēse*) issued by its Author and meant for us each individually. Galileo initiates this tectonic shift of worldviews by projecting geometry onto the visible order, as if it were the essential ground plan of reality, “a true being of the world, a world in itself” (Henry 2012, 7)—and thereby inaugurating what Husserl (1970, 48f; emphasis added) called “the surreptitious substitution of the mathematically substructured world of idealities for the only real world, the one that is actually given through perception . . . i.e. our everyday life-world [*Lebenswelt*].” By uncritically embracing this one-sided perspective, we succumb to what Whitehead (1967, 51) called The Fallacy of Misplaced Concreteness, a philosophical blunder that takes abstractions to be real and thereby falling into the “error of mistaking the abstract for the concrete. And the angel in Nazareth is trapped within the nets of the infinitesimal calculus. The Ascension of Christ must be measurable at a certain velocity, following upon a specific rate of acceleration. To the reader with modern sympathies—and this includes most of us— not only mystical depth but meaning itself have become otiose and irrelevant, displaced by the hegemony of scientific analysis.

Descartes adds to this geometric objectification of the world a corresponding subjectification of perception, cognition, and creative imagination. With the visible cosmos now defined by extension alone, physical reality becomes “external” to the non-extended realm of consciousness, making consciousness itself exclusively “internal,” withdrawing its vital moorings within the world it inhabits. Not only are we *closed off* from the depths of creation, we are now *closed up* within our own self-consciousness, unsure of whether there really

is an external world at all. We now hover outside the world as metaphysical “outsiders,” as what Gilbert Ryle called a “ghost in the machine.” And visible creation itself? Metaphysically drained of meaning through the amputation of its symbolic depth-dimension, the vastness of this mute universe already appears to Descartes’s contemporary Pascal as a malevolent wasteland both alien and “terrifying.” And Pascal (2004, 57) speaks here for modern humanity as a whole: “When I consider the whole silent universe and man left to himself without light, as though lost in this corner of the universe . . . I become frightened, like someone brought in his sleep to a frightening desert island who wakes up with no knowledge of where he is or means of escape.”

Borella (2016) offers an important insight into how this modern, naturalistic (materialistic) understanding and experience of nature, inaugurated by Galileo and Descartes, has left Western modernity with a “divorce and [an] irreparable breach between the order of being and appearance.” For the physical world we encounter in our everyday experience—and to which the very “meanings and sentiments tied to the most profound rhythms of our psycho-corporeal life are attached”—can no longer be regarded as a manifestation of reality but rather becomes a free-floating façade with no organic roots in the order of the real (Borella 2016). Our spontaneous experience of the world now has no perceptible connection to the “triangles, circles, and other geometric figures” of Galileo or to Descartes’s, the backstage reality of a “complex machinery of pulleys, cords, bellows, pipes, wheels, jointed levers, weights, and other devices which always come back to extension and motion” (Borella 2016). The world of our lived experience thus becomes a “‘an irretrievably ‘faked’ universe,’ a ‘fabulous opera’ that a machinist God has constructed, perhaps for our astonishment, and [which only] this ‘new philosophy’ [of Galileo] enables us to pierce through to its secret” (Borella 2016). Finally, as Borella (2016, 75ff) concludes, “such a divorce of being and appearance ends up destroying all symbolism, insofar as the symbol is rightly a mediator between [the] visible and the invisible orders.”

Together with this altered consciousness of the world, the manner of its presentation in the visual arts changes too. The self-constituting ego disclosed to itself within the Cartesian *cogito* becomes the true *sub-jectum* underlying the real—its own self-certainty now the foundation for truth generally—with the same certainty that the ego finds in geometry now also structuring space. Rather than being addressed by the world in its ontological truth or un-concealment (*a-létheia*), the ego now appoints *itself* to establish the truth of being.

Thus, as Florensky maintains, the reverse perspective characteristic of both sacred art and the drawings of children in all cultures—with the lines of perspective converging dynamically toward the viewer, symbolically addressing the viewer—gets replaced by the geometrical, optical, “objective” perspective, its lines of perspective converging from it not toward the viewer

but into a vanishing point at an infinite distance (Florensky [1920] 2002, 197–271). The abstract grid of Euclidian geometry, which rather than being natural to us must itself be learned, is imposed upon the world, like the planar points of graph paper imposed upon the three-dimensional universe, and then taken to itself be real, as if no forms (from which symbolic modes of address and invitation could arise) *already* inhered in nature itself. “Everything visible and perceptible is [now] only simple material for filling in some general regulatory schema imposed upon it from without” (Florensky [1920] 2002, 216f, 219, 261f). As Heidegger (1977, 167) remarks: “Science sets upon the real. It orders it into place.” Whereas a profoundly evocative symbolic order had once arisen organically from every dappled niche of creation, we now experience only the abstract order that we ourselves project upon it, rendering it less meaningful, less instructive, and less enchanting, but certainly more malleable and more useful.

Eventually, beginning in the late eighteenth century, a series of poets and writers and artists worked to restore to the world its symbolic depth and its capacity to bear the weight of theophany. However, Christianity in Western Europe had by that time become so enervated by assimilating the metaphysics of modernity, that many figures (such as Hölderlin and Goethe, Blake and Yeats) turned instead toward paganism and folk mythology as a viable medium for comprehending the symbolic character of the world. William Blake even resorted to creating his own, visionary, para-Christian mythology. Still others, however—first of all Thomas Traherne, and then Novalis and Coleridge—were able to work productively within a Christian worldview. And toward the end of the nineteenth century, additional figures such as John Ruskin, George MacDonald, and Gerard Manley Hopkins made heroic efforts to retrieve this ever-emerging infusion of nature with transcendence from within a Christian frame of reference. Ruskin, an Evangelical Protestant, showed in detail (with, for example, a lengthy volume devoted solely to the aesthetic theology of clouds) how all the features of nature have at their core an articulation of divine presence and beauty. MacDonald, originally a Calvinist, in his “realistic” novels as well his fantasy novels, explores modes of experiencing the world, and especially nature, which rediscover its depth dimension, encountering far more truth here than in the scientific findings that he had dutifully mastered at the university. And Hopkins, much influenced by Ruskin and appropriating what he understood to be Duns Scotus’s concept of the haecceity or “thisness” creation, anticipated Buber and Yannaras in showing how every epiphany of the holy in nature was unique and unrepeatable, a “calling” or “invitation” (*klēsē*, as Yannaras put it) addressed uniquely to each person who stood as its witness.

The so-called “sophiology” of Solovyov, Bulgakov, and Florensky was in many ways the highpoint of this retrieval of the symbolic realm, while at the same time (at least, in the case of Solovyov and Bulgakov) one that compromised its

own foundations through a tendency to reify the symbolic order into something metaphysically resembling a stratum of Neo-Platonic emanation. Florensky, however, resisted and ultimately marginalized this substantialist undertow, and his work remains a beacon light for understanding and recovering the symbolic ontology of creation.

More recently, the deconstructive, post-structuralist view of the world as “text” fully effaces the very depth-dimension of creation, dissolving the world into nothing more than what we have to say about it. Without roots extending into other realms, the world becomes infinitely malleable, “ours” to do with just as we desire, to deconstruct and reconstruct as we please. In tandem with its postmodern apologists, and as Heidegger saw already in the 1950s, the view of the world deriving from cybernetics and computer technology reduces the cosmos to mere bits of “information,” the latter being only the latest degradation of being itself into what Heidegger calls “stock” or “inventory” (*Bestand*), where “to be” is to be a resource that is stored and transmitted, processed and consumed. Not only physical reality in general but specifically life itself is disclosed in its very being as nothing more than bundles of “information”: cell-embedded DNA and RNA “codes” to be deciphered and manipulated by the science of genetics. In contrast, for the ancient Greeks, *zōē* or life was eminently visible, presenting itself as a striking and arresting intensification of *physis* or self-emergence, i.e., of nature as such (Heidegger 1975, 114).

Meanwhile, the fixation of the contemporary gaze upon the video screens of televisions, smart phones, and computers—surfing nomadically from one hyper-text link to another—passes as a *de facto* confirmation of this worldview, seducing us with uninhibited transhumanist fantasies, as if nature (including our own nature) were not a book of any kind—neither holy writ nor even a textbook of geometry—but a metaphysical *tabula rasa*, submissively offering itself to the capricious inscriptions we might wish to impress upon it. The symbolic, ontological roots of creation, in contrast, once served not only to nourish its inherent depth and transcendent moorings but also to anchor its integral resistance to our facile appropriation of it.

Notes Toward a Symbolic Ontology

A comprehensive investigation of the symbolic ontology of creation would want to distinguish between different symbolic modalities. Most critical (but by no means exhaustive) would be distinctions between (1) *ontological symbolism*, the inherent potential of any entity as such to serve as a symbol in its very being—the ontological power of a being (and of the world as a whole) to serve as an image, making present some other being or order of reality; (2) *figuration or representation as such*, which may or may not consist of a genuine symbol in one of the following senses; (3) *perceptual symbolism*, through which a perceptible reality (for example, a shadow, reflection, or echo) serves as a symbol for another but

more primary, perceptible reality that becomes present through it; (4) *natural symbolism*, through which some particular entity or aspect of creation inherently manifests the energy of higher, imperceptible realities (sun and moon and stars, fire and water); (5) *poetic symbolism*, symbolism that is “made” (*poiēsis*) by drawing upon the natural or empirical symbolism of a given entity, and which always emerges from within some given cultural framework; (6) *visionary symbolism*, such as the Tree of Life in Genesis or the Cherubic Throne of God’s Glory seen by the prophet Ezekiel (Florensky ([1920] 2020, 60ff) describes these as noetic unities that are “transcendent in relation to our world and therefore can only be represented symbolically”; and (7) *revealed symbolism*, in which an existing symbol of one kind or another is anointed and made manifest by the Creator to bear higher energies that are revealed through it. For Christians, the life-giving Cross is the preeminent example of such a revealed symbol, as would also be the abundant typological symbolism throughout scripture and early Christian writing ([1920] 2020, 60f). And of course, these different modes of symbolism often overlap and intersect in a dynamic synergy.

For the retrieval of the symbolic cosmos, a renewed openness to ontological symbolism as such would be critical, i.e., a restored sense for how deeply all creation participates in, and makes manifest, the energies of higher (and lower) realities. The reflection of the moon on the surface of a lake or the tracks of a deer in fallen snow make it evident that the image-original relation is ontologically fundamental to our world, while suggesting that it may be even more deeply essential to being as such. The earliest human drawings found at Altamira and Lescaux show that our species has from the beginning elevated this imaging event into something more, something that reaches out toward the “invisible looks” commended by Plato. But there is still more here. For if we are to learn from the Patristic understanding articulated by Sts Ephrem, Dionysius, and Maximus—and developed more recently by figures such as Fr. Pavel Florensky—we must begin with the premise that the world or *kosmos* serves, and has been created to serve, *in its very being* as a symbolic and phenomenal link (not just a coded, mathematical cipher, legible only to an elite few) between the invisible and the visible, God and the world. In the words of St. Ephrem: “Had God not wanted to disclose Himself to us, there would not have been anything in creation able to elucidate anything at all about Him” (Brock 1985, 41). If this is correct, then everything must harbor, however hiddenly, a real translucency through which the divine light may be discerned by those prepared to see it.

By what means, then, can we understand this symbolic being of things, which would constitute their primary character—preceding and indeed *enabling* their potentiality to be understood by means of scientific induction and discursive rationality? What does it mean for something to be symbolic in its very being? As we have seen with Florensky ([1921] 2014), it means being a “reality that contains in its energy the energy of another reality higher in value and hierarchy;

the lower reality is a window into the higher reality.” It therefore presupposes a certain translucency to creation itself, the persistent glow of a light infused from above, an inherent reference to another order of being that attracts and draws us so powerfully that Plato speculated we must have remembered it from some prior lifetime. And at the same time, this transcendent mooring would secure for creation a profound integrity—revealed in every natural “form” that we encounter within our created world—that resists our willful intrusions upon it, for it is always anchored in depths beyond our powers of comprehension.

It would also mean that beings are not impervious to other orders of being. That is, for warm hearts and open eyes, things present themselves as always already more than themselves, as in each case being a threshold or portal to another, higher order of reality, and in a lesser way to lower orders that point toward them, that invoke and anticipate them. Plato understood that visible things have a certain indicant and evocative aspect to them that reveals higher, invisible realities, which he called their “invisible look,” their *eidos* or “form.” In the Divided Line Analogy of his *Republic* (509d–510a), he uses as preliminary images of this mode of being—the mode of being that binds together ontological orders—what we have distinguished as empirical symbols, things such as shadows and reflections in water and other shiny surfaces, going on to outline a four-tiered metaphysical hierarchy ascending at each level from image to original. We recognize that these passing phenomena are themselves “images” or symbols, in part because they possess a relatively ephemeral quality, a lack of persistent reality when compared to the more stable, less transitory, and more meaningful realities whose energies they bear—the shadow of a tree, for example, referring us back to the tree itself, maintaining its own being *as* an image while serving as a mode of being-seen undergone by the tree. They are perceptible images of more enduring and more full-bodied realities. But how can a solid and stable thing, like a tree or a star, a painting or a temple, itself be a symbol? And how can we know that it is such?

A preeminent way this is possible is by means of its beauty. As Plato (1952, 91) believed, it is only in the case of beauty that transcendent realms become discernible, become visible and perceptible and manifest: “[F]or beauty alone it has been ordained, to be most manifest to sense and most lovely of them all.” Of all the eternal wellsprings—the ontological characters of being *qua* being that medieval philosophers called transcendentals—only beauty “has been ordained” to actually *appear* to us. We may even agree heartily with Plotinus (1969, 57), while stepping back from his speculations concerning *anamnēsis* or “recollection,” that beauty precisely *is* this glow of higher modes of being, a luminosity that it is possible to recognize “at the first glance . . . as from an ancient knowledge.” The beauty that everywhere shines through creation constitutes a metaphysical seal, indelibly attesting that its moorings ultimately lie elsewhere—that its power to attract us and excite us is not a passing pleasure

of the moment but is rooted in an eternal order to which we are intimately related—while at the same time the inherent sanctity of beauty cautions us that it is not ours alone to do with as we please.

This is true, of course, for art as well as nature. Great paintings, whether representational works by Turner, Friedrich and Van Gogh, or more abstract work by artists such as Kandinsky or Klee, resonate with other orders of reality. They draw us in through an evocative quality, a certain attraction or pull beyond the visible—we experience them as reaching toward something beyond shape and color, something transcendent. Florensky ([1922] 1996, 66) maintains that “all symbolic work [has] the basic ontological character of seeking to be that which it symbolizes.” And it succeeds when it “evokes in the viewer the reality of the other world (as the pungent scent of seaweed in the air evokes in us the still faraway ocean)” (Florensky [1922] 1996, 66).

And must we not also say that the song of a mockingbird, arising in the sultry air of a summer night, works in the same way, evoking metaphysically distant orders of being? Borrowing a phrase from C. S. Lewis, one that he himself borrowed from the German Romantics, we may say that through this kind of ontological overflow or *ekstasis*, a particular thing (or a sound, or a smell, or a series of words or notes) evokes in us a certain *Sehnsucht* or yearning, an undefinable desire for something that transcends the boundaries of ordinary experience, that beckons and draws us in its direction. Lewis (1958, 7f) calls this an “intense longing” for something unknown but somehow discerned, adding that “there is a particular mystery about the object of this Desire.” This spiritual longing arises when what we encounter brings with it “that unnamable something, desire for which pierces us like a rapier at the smell of a bonfire, the sound of wild ducks flying overhead . . . the morning cobwebs in late summer, or the noise of falling waves” (Lewis 1958, 9f). Or it may happen less through a sense of longing than a mixture of fascination and apprehension, a sense of the *mysterium tremendum et fascinans* as Rudolf Otto put it, drawing us toward what appears, while at the same time withdrawing the familiar ground from beneath our feet. Or again, using the language of Jean-Luc Marion, we may regard this pull from beyond as the bearer of a “saturated phenomenon,” whose content and meaning so overwhelm our possibilities of intuition that it becomes elusive and in a certain way inconspicuous, and thus a bearer of what St. Dionysius saw as apophatic truth.

Nor would such a symbolic ontology seek to establish a metaphysical monism, such as the Presocratic philosophers are often (mistakenly) understood to assert. Rather, what is outlined here would unfold as a phenomenological ontology, describing how the world is disclosed to us within our very experience of it, and just as much a hermeneutic ontology, more inclined toward discerning and listening than to speaking, zealous to avoid distorting the word of creation *as it is spoken*. And this is to say that creation is not best approached as a substance

at all, i.e., as something whose “essence” we need to identify and explain, but rather as a dialogue in which we need to engage, an encounter or event, a word requiring both speaker and listener to fully unfold and be spoken. Florensky himself elucidates these features of a symbolic worldview nicely, first by contrasting the explanatory character conventionally attributed to the natural sciences with the “symbolic description” he emphasizes, and then in a passage that even compares symbolic knowledge to conjugal union.

First, he argues that since authentic science is an active expression of love for a given subject matter, it is better to understand science as “descriptive,” as “consciousness-deepening,” and ultimately as symbolic, than it is to see it as “explanatory” and reductive:

Neither mathematical formulas nor mechanical models [necessarily seek to] appropriate the reality of the phenomenon itself, but [can instead] stand alongside it, *with it and for its sake*. *Explanation* wants to appropriate the phenomenon itself, to dissolve its reality into those forces and entities that it substitutes for what is being explained. Our spirit’s [activity of] *describing* by means of symbols . . . wants to *deepen our attention* and serve as a *consciousness of the reality before us*. (Florensky [1918] 1993, 21; emphasis added)

Second, symbolic understanding is a mode of real intimacy between knower and known. Florensky even draws here upon the unitive imagery of the *Song of Songs* and of the early church, for which Christ is the Eternal Bridegroom, to describe the union between creation and Creator, knower and known:

The Orthodox worldview sees in the world its permeation with the rays of TRUTH, sees another world in this world, looks at creation as a symbol of the higher being . . . We can and do get out of the complex of our own sensations only when we recognize the conjugal encounter of the objective with us. I can say about the act of knowing: “Here I am, knowing the sun, and here is the sun being known.” Therefore, in me there is a union of two energies and, consequently, two beings. The connection of energies is called *synergeia*, common-energy (the whole process of sanctification is synergistic). The word is a synergy of the knower and the thing known, especially when it comes to knowing GOD. (Florensky [1912] 1993, 294, 300)

But if this theophanic radiance—in the words of Dostoevsky’s Elder Zosima, this “glow of other worlds through the reality that one can perceive, see, smell, taste”—if this is always at work everywhere throughout creation by virtue of its very ontological structure, two further questions arise (Dostoevsky 2002, 211, 217). What about produced objects, whose more proximate origin comes not from the Creator, but from created beings themselves? And above all, why do

we (who are starved for transcendence) not always (or at least, not usually) yield ecstatically to this enchanted draught toward what is inherently beautiful and holy?

First, from our earliest years we have been taught that the world is only what science discerns it to be, that the rainbow is “really” nothing more than “a multicolored circular arc” that has been “caused by refraction, internal reflection and dispersion of light in water droplets resulting in a continuous spectrum of light” (Wikipedia 2023). We have been expected to believe that our spontaneous wonder at its beauty, at the sudden and startling and marvelous appearance of these bright and lovely colors at the edge of dark storm clouds, emerging from some unannounced, mysterious source and leading us to see there a revealing of metaphysical depths, a visible theophany, perhaps even the signature of a promise—that all this is childish “fable” superimposed upon the hard, substantial, and indifferent bedrock of scientific fact. It is sad but unsurprising that we (reluctantly, perhaps nostalgically, but habitually) dismiss the former in favor of the latter, and even regard this very dismissal as itself a modern virtue.

Galileo (1957) boasts in *The Assayer* that those “rare” and “solitary” souls willing to reduce the rainbow to mathematical models of it are like “eagles,” masters of the sky, whose lofty vision replicates and rivals that of the God who in ancient song was Himself said to “soar upon the wings of the wind.” Whereas those many (*hoi polloi*) who are natively inclined to understand such wonders more traditionally, more perceptually and experientially and more symbolically, are like “starlings” who “fly in flocks” and “fill the sky with shrieks and cries wherever they settle, and befoul the earth beneath them” (Galileo 1957, 239). Today championed with far greater unanimity, scientific knowledge is everywhere valorized and elevated over modes of knowledge indigenous to inhabitants, to practical people, to poets, to mystics—to all those who are personally, not just theoretically, engaged with the beautiful, breathtaking world of creation that surrounds us. Unsurprising, indeed, that we should aspire to be noble eagles soaring (at least vicariously) upon the hyperborean winds of theoretical physics rather than contemptible starlings, bound through loyalty to our own experience to the terrestrial miasma here below. (Happily, this condescending triumphalism and intolerance is by no means shared by all, or even most, scientists and theorists of science, while the gifts of modern science to human weal require no documentation.)

Second, while it is argued that all creation is symbolic in its being—the walnut tree no more than the wooden bowl crafted from it, and the hand-crafted bowl no more than the manufactured cardboard container in which it was brought home, which also (if less recognizably) came from a tree—the symbolic dynamism is more powerfully and meaningfully and accessibly manifest in the tree than in the bowl, and more truly in the artisan-highlighted wood-grain of the bowl than in the composite material. That is, if nature’s

symbolic character is itself instituted by its Creator, it follows that the closer we come to experiencing a thing as it issues from the hand of God, the more this symbolic character will be intact and manifest. Today, in our increasingly fabricated world, this most often takes place when we encounter some aspect of natural creation in its original natural setting.

An important exception emerges, however, with those traditional arts that honor the natural contours of their materials, purposefully eliciting them into view, as well as with the sacred arts and their own symbolism that more powerfully elevate the natural symbolism of their elemental materials, not uncommonly making them more manifest than in their natural state. And as René Dubos has shown, entire landscapes may likewise be fondly and faithfully transformed, such as the English countryside, that “green & pleasant Land” of Blake and Wordsworth; the hills of Tuscany loved by Petrarch and Goethe; or the sunstruck “Apollonian” landscapes in the south of France hymned by Hölderlin during his last travels—lands that have been lovingly courted or “wooded” over centuries by many generations of their respective inhabitants, i.e., by those faithful dwellers whose intimacy with their beauty and elusive mystery has allowed them to cultivate and build and (as Hölderlin himself had put it) to “dwell poetically upon the earth” (Dubos 1980; Hölderlin 2009, 213f; Hölderlin 1968, 200).

A corollary of this principle is that in our increasingly artificial environment, where the inherent symbolism of creation, and thus its ontological integrity, is neither respected nor even recognized but heedlessly trampled or suppressed altogether—in the chemically sanitized and fluoride-adjusted water we drink or the highly processed, genetically modified food that we eat—it becomes ever more seductive for us to surrender to an uncanny amnesia, somehow forgetting that the cosmos was not made by human beings and that it does not derive its deepest meanings from their interests and intents.

Third and more generally, we no longer inhabit the Edenic world of our earliest origins, where we could immediately, effortlessly encounter the divine energies always and everywhere. In a fallen world, prayer and asceticism are needed to heal and purify the soul to a point at which this disrupted world’s obscured theophanic character can again reveal itself, allowing us to once again see that creation is only secondarily the indifferent, self-standing substance that a naturalistic, positivistic, materialistic metaphysic takes it to be, but rather is first of all, and most essentially, a translucent, evocative, symbolic order poetic, and theophanous realm within which every bush is burning and every tree is a tree of life, and where every breath of breeze carries a still small voice—whispering to us of the mild and gentle winds of Eden while echoing the ancestral voice of the transcendent and unapproachable God somehow still, implausibly and wondrously, walking nearby in the cool of the day.

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God and the World: Panentheism in Modern Orthodox Christianity

Paul Ladouceur, Adjunct Professor, Orthodox School of Theology at Trinity College, University of Toronto, Toronto, Canada; Professeur associé, Faculté de théologie et de sciences religieuses, Université Laval, Québec, Canada, 123thabor@gmail.com

Panentheism is an unsettling and controversial notion in modern Orthodox Christianity. Some Orthodox theologians explicitly identify themselves as panentheists, while others reject panentheism as incompatible with Orthodox tradition. Sergius Bulgakov presents his theology of Divine Wisdom (sophiology) as panentheist, distinguishing it from pantheism. Orthodox theologians such as Kallistos Ware and Andrew Louth associate with panentheism. Whereas Orthodox critics (notably, Georges Florovsky and Nicolas Lossky) see panentheism as a subspecies of pantheism (hence, unacceptable), Bulgakov and other modern Orthodox theologians regard it as a subspecies of theism (hence, acceptable). The issue revolves around divergent theologies of creation and how God relates to creation. Earlier, the issue was entwined in the controversy over Bulgakov's theology of Divine Wisdom. By the twenty-first century, the focus is on looking for compatibilities in patristic theology, especially the *logoi* of creation in Maximus the Confessor and the divine energies in Gregory Palamas. The transition in Orthodox thought from a mostly aggressive stance towards panentheism to an irenic one is promising, but Orthodox theologians have yet to engage meaningfully in the ongoing dialogues on panentheism.



Introduction to Panentheism

The notion of panentheism stands at the interface between science and religion; it provides a vision of the universe and science that allows for constructive dialogue between scientific agnosticism and religious belief.¹ Panentheism is a philosophical and theological position that asserts simultaneously that God is in the world and that the world is in God. Panentheism is situated between classical theism, its Enlightenment form deism, and pantheism. Christianity, like most world religions, is theistic, affirming the existence of an absolute Being, God. In Christianity, God is both transcendent and immanent in relation to the world (or universe or cosmos): transcendent as beyond the world, both material and noetic; God is the creator of the world, but is infinitely more than the world; and immanent, since God sustains the world at every moment and is thus present in the world as its principle of existence. Theism typically emphasizes divine attributes that distinguish God from the world, such as unicity, simplicity, immutability, impassibility, and eternity, and affirms that God is ontologically different and separate from the world.

Deism admits the existence of divine Being but emphasizes God's otherness from the world and does not recognize any divine action in the world other than the initial act of creation. The classic eighteenth-century image attributed to deism presents God as a cosmic clockmaker who, having made the clock, winds it up and walks away, letting it tick along independently. Pantheism confounds God and creation; it identifies God and creation, denying God's transcendence and retaining only a depersonalized divine immanence. In the absence of a notion of creation *ex nihilo*, the world is seen as an eternal existent.

Panentheism is a modern neologism coined in the early nineteenth century.² It is composed of the Greek words *pan* (all), *en* (in), and *theos* (God). Panentheism understands God and the world to be intimately interrelated, with the world being in God in some fashion and, similarly, God being in the world in some fashion. The fundamental problem of panentheism is the middle term, "*en/in*": How is creation "*in*" God? Or God "*in*" creation? Panentheism seeks to avoid both separating God from the world—as traditional theism, especially in its radical form, deism, tends to do, notably by its emphasis on a fundamental ontological difference between God and the world—and identifying or fusing God with the world as in pantheism. Traditional theistic systems emphasize the difference between God and the world, notably by highlighting the ontological gulf between Creator and created, between infinite and finite, between eternal and temporal, while panentheism stresses a dynamic interrelationship or interpenetration of God and the world. Whereas pantheism identifies or comingles God and the world, panentheism maintains the identity and significance of both the divine and the non-divine, the distinction between the world as created and God as transcendent, uncreated and the Creator. In modern readings of ancient literature, anticipations of panentheist understandings of

God-and-creation occur in philosophical and theological writings throughout history, although overly enthusiastic panentheist readings of ancient Christian authors and in non-Christian religions may be more anachronistic than sound historical theology or interreligious comparative theology.

A rich diversity of panentheist models of God–world relations has developed in the past century, often in response to scientific theories, especially modern cosmology and brain science (see Atmanspacher and von Sass 2017, 1031; Clayton 2004; Clayton 2017; Cooper 2006; and Culp 2017). Panentheism is frequently seen as a philosophy that facilitates the search for compatibility and dialogue between religious and scientific views of the world, including human existence. But for some philosophers, panentheism is not a clearly demarcated philosophical position, since advocates of panentheism cannot adequately distinguish it from “well-established and clearly articulated rival models of God such as classical theism, neo-classical theism, open theism, and pantheism” (Mullins 2019, 204).³ Willem B. Drees (2017) questions whether panentheism has inherent advantages over theism and pantheism in relation with science.

Panentheism is an unsettling and controversial notion in modern Orthodox Christianity. Some Orthodox theologians explicitly place their theologies under the panentheist umbrella, while others reject panentheism as incompatible with Orthodox tradition. This article explores panentheism in modern Orthodox thought. It discusses Orthodox supporters and critics of panentheism, beginning with the Russian religious renaissance, especially Sergius Bulgakov (1871–1944) and his predecessors, and Orthodox critics of panentheism, notably Georges Florovsky (1893–1979) and Nicolas Lossky (1870–1965),⁴ and more recent Orthodox theologians attracted to panentheism, such as Kallistos Ware (1934–2022), Andrew Louth (b. 1944), Christopher C. Knight (b. 1952), and Alexei Nesteruk (b. 1957). The conclusion focuses on how Orthodox theologians envisage panentheism as compatible with the Orthodox tradition and whether the Orthodox critics of panentheism have been answered, and it sketches the contours of an Orthodox panentheism.

Panentheism in Sergius Bulgakov

Sergius Bulgakov’s philosophical–theological thinking revolves around his much-criticized theology of Divine Wisdom (sophiology), with which he also assimilates the patristic notion of the divine energies in a complex (and not entirely coherent) system that seeks to maintain an antinomic balance between God as utterly transcendent and yet radically immanent. He explicitly defines his theology as panentheist, defending it against the accusation of pantheism levied against his philosophical mentor Vladimir Solovyov (1853–1900).⁵ To distance himself from Solovyov’s subtly pantheistic system, Bulgakov emphasizes God’s transcendence to creation and God as Creator, while at the same time

maintaining the prime panentheist affirmation that God is in creation and creation in God—nothing can exist outside God:

As the object of the providence of God, the world is not only a thing or an object in the hands of God; it possesses its own proper being, given by God at its creation, its own nature, its own life. And at the same time this created nature does not remain outside God, because ontologically there can be no extra-divine existence. The world abides in God, although it is not God, and the relationship of God to the world in [divine] Providence is not defined as a unilateral action of God towards a world existing outside of him and alien to him, but rather as an *interaction* of Creator with creation . . . Because of the divinity of its foundation, the world maintains its own existence in the eyes of God, even though it is created *ex nihilo*. As a result of its created nature, it also maintains its own independent existence in the eyes of God. God gave to the world at its creation a genuine *reality*, which he also posits eternally for the Creator himself. It is by the power of this divine reality and as by this unbridgeable difference that the world exists both for itself and for God, and the relationship between them can only be on the basis of interaction, however profound, intimate and multifaceted it may be, even to the extent of the union of the two natures, divine and human, and the deification of humanity in Christ and the church. (Bulgakov 1931b, 102–4)

Bulgakov maintains the traditional Christian doctrine of creation *ex nihilo* but nuances the understanding of this doctrine by affirming that creation exists within God as potential, in effect as an eternal divine “idea,” realized only at the moment of creation:

God creates the world, as it were, out of himself, out of the abundance of his own resources. Nothing new is introduced for God by the life of the world of creatures. That world only receives, according to the mode proper to it, the divine principle of life. Its being is only a reflection and a mirror of the world of God . . . The world, having been created from “nothing,” in this “nothing” finds its “place.” God confers on a principle which originates in himself an existence distinct from his own. This is not pantheism, but panentheism. (Bulgakov 1937, 63–64, 72)

It is statements such as “God creates the world, as it were, out of himself” that, taken out of context, lend themselves to interpretations of Bulgakov’s cosmology as pantheist. Such statements must be seen in relation to Bulgakov’s cosmology as a whole, which includes the unequivocal affirmation of divine transcendence, for example when he writes: “God in the Holy Trinity has all

fullness and all-bliss; he is self-existent, unchanging, eternal, and therefore absolute (God in himself)” (Bulgakov 1931a, 35).

Following his discussion of the presence of the Holy Spirit in the world, Bulgakov (1936, 199–200) writes: “But is this not a pantheism, an impious deification of the world, leading to a kind of religious materialism? Yes, it is a pantheism, but an entirely pious one; or more precisely, as I prefer to call it to avoid ambiguity, it is a *panentheism*.” Bulgakov variously summarizes his panentheism as “the truth that all is in God or of God (panentheism)” (Bulgakov 1925, 27) and “the world is the not-God existent in God; God is the not-world existent in the world. God posits the world outside of himself, but the world possesses its being in God” (Bulgakov 1931a).⁶

For Bulgakov, panentheism is based on the key premise that nothing can exist autonomously apart from God, that God must at every moment create or sustain everything that is not-God: “Nothing can exist outside God, as alien or exterior to him . . . In reality there is but one true existence, the divine. There is only the one God in his divine Wisdom, and outside him nothing whatever. What is not God is *nothing*” (Bulgakov 1937, 72, 148). The last sentence must be understood in the sense that nothing can exist independently of God as Creator; otherwise, God would not be absolute or one, since something else would exist in addition to God. This is the basis of dualistic philosophical systems, which see God and the world as independent eternal existents.

It is on this conception of panentheism that Bulgakov founds his distinction between eternal Divine Sophia (God in himself) and Created Sophia (all that is not-God, which God creates and sustains in time).

Bulgakov’s Philosophical and Spiritual Predecessors

Bulgakov was the last great Russian religious philosopher–theologian. But what about his predecessors in the Russian religious renaissance from the 1880s to the Bolshevik Revolution?

Other leading representatives of the Russian religious renaissance did not refer explicitly to “panentheism,” but they advanced certain ideas that can be assimilated to panentheism. This does, of course, run the risk of an anachronistic interpretation of their thinking. To give two examples, the term “panentheism” does not occur in two major representative works of the religious renaissance, the *Lectures on Godmanhood* (1877–84) by Vladimir Solovyov and *The Pillar and Ground of the Truth* (1914) by Pavel Florensky, nor for that matter in the novels of Fyodor Dostoyevsky.

The search for intimations of panentheism in Bulgakov’s predecessors must instead focus on the notion of all-unity or total-unity (*vseedinstvo*) and the interest of the religious thinkers in spiritual (or mystical) experiences inspired by nature. The idea of a principle of unification of all that exists has its roots in

ancient philosophies; it features prominently, for example, in Plato (“the One”) and in Plotinus (“the First”). All-unity was readily assimilated in the Russian religious renaissance from German idealists, especially Friedrich Schelling (1775–1854), whose philosophy has a decidedly pantheist flavor, and from Schelling’s predecessors, especially the mystic Jakob Boehme (1575–1624). In early Christian thought, God as Creator is the *de facto* principle of unity in creation, but for many thinkers of the Russian religious renaissance, a strict theism that emphasizes a radical distinctiveness between God and the world, reflected in a theistic exposition of the doctrine of creation *ex nihilo*, posits an untenable dualism, an unbridgeable chasm between God and creation. The challenge was to identify a basis of all-unity that encompasses both the Creator and the created, the spiritual and the material, and empirical, intuitive, and abstract knowledge, in a single all-inclusive vision of existence and knowledge without slipping into unwanted dualism or pantheism. The idea of the totality of all beings forming an absolute unity, yet without this being pantheism, occurs as early as Peter Chaadaev (1794–1856): “There is absolute unity in the total aggregation of beings . . . This objective unity . . . has nothing in common with the pantheism professed by a majority of contemporary philosophers” (cited in Zenkovsky 1953, 162). Vladimir Solovyov draws on German idealism to make all-unity and its correlate divine-humanity or Godmanhood (*bogochelovechestvo*), the centerpieces of his thinking. To express the unity of all beings, Solovyov adopts the term *vseedinstvo* (all-unity).

Nicolas Lossky (1870–1965) (father of the theologian Vladimir Lossky) describes the characteristic feature of Russian philosophical thought as “the search for an exhaustive knowledge of reality as a whole and the concreteness of metaphysical conceptions . . . the whole being understood not as a chaotic multiplicity but as a systematic pan-unity” (Lossky 1952, 95). This all-unity is discovered first in contemplation and in prayer. “In dialoguing with God,” summarizes the Catholic theologian Tomáš Špidlík (1919–2010), “we discover the profound sense of the universe and its unity: the Russians call this *vseedinstvo*, ‘all-unity,’ for them a key expression in gnoseology” (Špidlík 1994, 86). From Solovyov onwards, all-unity was a powerful, even hypnotic notion in Russian thought, “bewitching and subjugating men’s minds,” writes Vasily Zenkovsky (1881–1962), becoming an *idée fixe* (Zenkovsky 1953, II:874).

Solovyov (2003, 29–66) set out to unify the three forms of knowledge (empirical, metaphysical, and mystical) and integrate them with beauty. Beauty in this sense is less an aesthetic quality isolated from ethics and truth as it is a manifestation of goodness and truth—a modern revisitation of the classic Platonic triad of higher forms, truth-beauty-goodness. At first, Solovyov referred to the principle of unity in creation as the “world-soul” (*anima mundi*), inherited from Stoic and Neo-Platonist philosophy and the idealist Friedrich Schelling.

Through the notion of the world-soul, Solovyov sought to reconcile divine unity and the multiplicity of creation: “The soul of the world is both *one* and *all*; it occupies a mediating position between the plurality of living entities and the unconditional unity of the Deity . . . The soul of the world is a *dual* entity: it includes both the divine principle and created being; but, since it is determined by neither of them, it remains *free*” (cited in Zenkovsky 1953, II:505–6).

For Solovyov, divine fullness or actuality *includes* multiplicity, the unity of a multiplicity of ideas and potencies, “the primordial unity of the divine Logos,” writes Solovyov (1877–83, 131) in his *Lectures on Godmanhood*. Solovyov’s (1877–83, 130) justification for this “primordial unity” is based on the notion of divine as absolute: “If the divine essence were not all-one, did not contain all, then something existent could, consequently, be outside of God; but in such a case God would be limited by this being, external to himself; God would not be Absolute, i.e. he would not be God.” Bulgakov later expresses this notion—hardly new in Western thought, since Greek philosophers came to the same realization before Christianity—in his somewhat ambiguous statement “What is not God is *nothing*” (Bulgakov 1937, 72, 148).

The cosmic “fall” is thus a fall from divine unity-in-multiplicity to creaturely disunity-in-multiplicity: “Having fallen away from the divine unity, the natural world appears as a chaos of discordant elements” (Solovyov 1877–83, 135). Solovyov (1877–83, 103–4) conceived the principle of all-unity manifested in the world-soul as a mirror of the divine world, which unites the Platonic triad of beauty, truth, and goodness:

The absolute actualizes goodness in beauty, through truth. Since they are only different aspects or positings of a single subject, these three ideas, or universal unities, form, in their interpenetration, a new concrete unity. This unity constitutes the complete actualization of the divine content, the integral totality of the absolute essence, the realization of God as the *all-One*, in whom “dwells all the fullness of the Godhead bodily” [Colossians 2:9].

For Solovyov, love is the over-arching principle of unity of the truth-beauty-goodness triad that brings together the different orders of existence:

Goodness is the unity of the all or of all individuals; it is love as what is willed, or desired; it is the beloved. Consequently, here we have love in a special and preeminent sense as the idea of ideas; its unity is *essential*. Truth is also love; that is, it is the unity of the all, but as objectively represented; its unity is ideal. Finally, beauty is also love (that is, the unity of all individuals). But it is love as manifested or made available to the senses; its unity is real. (Solovyov 1877–83, 103)

Solovyov saw the world as all-unity in the state of becoming, whereas the Absolute is the All-Unity, as Nicolas Lossky (1953, 104) explains:

The world contains the divine element, all-oneness, as a potentiality, an idea; but it also contains the non-divine, natural, material element, the dispersed, the multiplex of the particular which is not all-oneness. However, every particular being tends to become all-oneness and gradually moves toward that goal, uniting oneself with God. The process of establishing all-oneness in the world is the *development* of the world.

Other figures of the Russian religious renaissance who pursued the quest for all-unity, or the closely related concept of integral knowledge, at some stage in their intellectual development include Nicolas Berdyaev (1874–1948), Simeon Frank (1877–1950), Lev Karsavin (1882–1952), Alexei Losev (1893–1988), Sergius Troubetskoy (1862–1905), and Eugene Troubetskoy (1863–1920), as well as Fyodor Dostoyevsky (1821–1891) and the leading poets of the Silver Age of Russian letters prior to World War I, such as Alexander Blok (1880–1921) and Vyacheslav Ivanov (1866–1949).

Another aspect of the Russian religious renaissance that contains intimations of panentheism are spiritual experiences inspired by nature. Cosmism, a sense of unity between humanity and the rest of creation, is reflected in descriptions of nature in writings of major personalities of the Russian religious renaissance. In Dostoyevsky's *The Brothers Karamazov* (1880), starets (elder) Zosima recounts an event from his youth, when he suddenly calls out to his companions, "speaking straight from [his] heart":

Gentlemen . . . look around you at the gifts of God, the clear sky, the pure air, the tender grass, the birds; nature is beautiful and sinless, and we, only we, are sinful and foolish, and we don't understand that life is heaven, for we have only to understand that and it will at once be fulfilled in all its beauty, we shall embrace each other and weep. (Dostoyevsky 1880, II, VI, 2)

Similarly, after the death of Zosima, Alyosha (Alexei), the youngest of the Karamazov brothers, rushes out into the still night, gazes upwards at the starry night and all around him:

[T]he silence of earth seemed to melt into the silence of the heavens. The mystery of earth was one with the mystery of the stars . . . Alyosha stood, gazed, and suddenly threw himself down on the earth. He did not know why he embraced it. He could not have told why he longed so irresistibly to kiss it, to kiss it all. But he kissed it weeping, sobbing, and watering it with his tears, and vowed passionately to love it, to love it for ever and ever. (Dostoyevsky 1880, III, VII, 4)

In his *Autobiographical Notes*, Bulgakov describes several experiences stimulated by nature and by art that nudged him towards his return to Christianity after years of intellectual wandering in the byways of Marxism and idealism. The first experience, in the spirit of nineteenth century romanticism (as indeed the extracts from Dostoyevsky's *The Brothers Karamazov*), took place in 1895:

I was twenty-four years old. For a decade I had lived without faith and, after early stormy doubts, a religious emptiness reigned in my soul. One evening we were driving across the southern steppes of Russia, and the strong-scented spring grass was gilded by the rays of a glorious sunset. Far in the distance I saw the blue outlines of the Caucasus. This was my first sight of the mountains. I looked with ecstatic delight at their rising slopes. I drank in the light and the air of the steppes. I listened to the revelation of nature. My soul was accustomed to the dull pain of seeing nature as a lifeless desert and of treating its surface beauty as a deceptive mask. Yet, contrary to my intellectual convictions, I could not be reconciled to nature without God. Suddenly, in that evening hour, my soul was joyfully stirred. I started to wonder what would happen if the cosmos were not a desert and its beauty not a mask or deception—if nature were not death, but life. If he existed, the merciful and loving Father, if nature was the vesture of his love and glory, and if the pious feelings of my childhood, when I used to live in his presence, when I loved him and trembled because I was weak, were true, then the tears and inspiration of my adolescence, the sweetness of my prayers, my innocence and all those emotions which I had rejected and trodden down would be vindicated, and my present outlook with its emptiness and deadness would appear nothing more than blindness and lies, and what a transformation it would bring to me! (Bulgakov 1946, 10–11)

But Bulgakov was slow to respond to this invitation to recognize a transcendental reality, the existence of a world beyond the sensory; another thirteen years would pass before his definitive return to the faith and the church.

Bulgakov's mentor Pavel Florensky intersperses descriptions of experiences in nature with philosophical and theological reflections in his classic *The Pillar and Ground of the Truth* (1914). Many chapters of the book (in the form of letters to an unnamed friend) begin with an evocation of a natural experience with which he associates a theological reflection developed in the rest of the chapter, as in this introduction to Letter Five, on the Comforter:

Do you remember, my gentle one, our long walks in the forest, the forest of dying August? The silvery trunks of the birches stood like stately palms, and their gold-green tops, as though exuding blood, pressed against the crimson and purple aspens. And above the surface of the earth, the branches of a hazel grove spread like green gauze. There was a holy hush of solemnity beneath the

vaults of this temple. My far and yet eternally near Friend, do you remember our intimate conversations? The Holy Spirit and religious antinomies—that, it appears, is what interested us most. And finding ourselves in this solemn grove, we walked at sunset through the cornfield, became drunk with the flaming west, and rejoiced that the question was becoming clear, that we had come independently to the same answer. Then our thoughts flowed out in streams flaming like the vault of heaven, and we grasped each other's thoughts almost before they were spoken. (Florensky 1914, 80)

Nicolas Berdyaev (1874–1948), Bulgakov's friend and collaborator, also advances a philosophical–theological position assimilated to panentheism. Berdyaev's Trinitarianism and aspects of his cosmology may have been influenced by Bulgakov, even though Berdyaev did not adhere to sophiology, from which he explicitly distances himself (see Berdyaev 1935; 1948, 241). In his history of panentheism, John W. Cooper (2006, 218–20) refers to both Bulgakov and Berdyaev as “trinitarian panentheists.”

In summary, for the Russian religious thinkers, God creates the world in beauty as a manifestation of his love towards creation. The created beauty of the world is not merely aesthetic; more importantly, it is a visible manifestation and seal of divine love and God's intimate connection with the world, which has a correlate in the ideal of beauty as the goal of the human creative process. Humanity is a part of the cosmos, rather than the cosmos being something separate “out there” and humanity as irreconcilably different from the rest of creation. This cosmic, mystical outlook sees the world as a divine creation reflecting divine glory: one has only to open one's eyes to perceive the glory of God. All-unity is thus an unspoken complicity between Creator and created. The sense of wonder experienced in the contemplation of nature becomes prayer; humanity joins and verbalizes the wordless worship of both inanimate and animate creation for its Creator. If God is indeed love, as John the Evangelist unequivocally affirms (1 John 4:8, 16), then this love must and does manifest itself throughout creation as a unifying principle between God and creation, between God and humanity.

Both these aspects of the Russian religious renaissance, the search for all-unity and spiritual–mystical experiences of God, can be interpreted as manifesting an underlying panentheistic view of how God relates to the world or creation, God's presence in the world, and the world's presence in God.

Orthodox Critics of Panentheism

Orthodox thought after the Russian religious philosophers had difficulty comprehending and accepting the notion of all-unity, tinged with Platonism and romantic cosmism, and, it was felt, teetering towards pantheism. Orthodox thought sought to bridge the gap between God and creation by other avenues.

One weakness of all-unity, typically elaborated in isolation from Christ and the Incarnation, is that it becomes a philosophical notion that is not specifically Christian and is not dependent on Revelation, even though it is not inimical to Revelation. For some critics, all-unity is too close to pantheism for comfort. Vasily Zenkovsky (1881–1962) refers to pantheism as the “fatal companion of the metaphysics of total-unity.” He describes Solovyov’s metaphysics of all-unity as “a modernized pantheism, in the tradition of Spinoza and Schelling,” with the world as Absolute Being, even if “an Absolute in process of becoming,” while recognizing Solovyov’s sincere wish “to place Christian principles at the foundation of all of his theoretical constructions” (Zenkovsky 1953, II:847, 530). Nicolas Lossky (1952, 128) also refers to the “pantheistic flavor” of Solovyov’s conception of all-unity as the Absolute. Both Zenkovsky and Lossky link what they perceive as implicit pantheism in Solovyov’s cosmology to his failure to consider God explicitly as *the* Absolute, the Creator (Zenkovsky 1953, II:530; Lossky 1952, 127–28). Yet Solovyov does not emerge as a pantheist in the light of the totality of his writings and of his life. It is true that, unlike his successors Florensky and Bulgakov, Solovyov did not forcefully emphasize the idea of God as Creator and creation *ex nihilo*—the thrust of Solovyov’s intellectual project was to express a unity between God and the world, not to seek out what differentiates them.

After Bulgakov’s death in 1944, the mode of religious thought he incarnated lost its appeal among younger Orthodox theologians, who followed a more scriptural and patristic approach to theology. Georges Florovsky was the strongest Orthodox critic of panentheism. Florovsky considered Bulgakov’s panentheism as little more than Solovyov’s pantheist wolf disguised in a theistic sheepskin. Florovsky affirmed the patristic doctrine of creation as the true Christian theology of relations between God and the world, with a great ontological gulf between God as the Uncreated Creator and creation as contingent.

Florovsky thus advanced a classic and strong theistic position, indirectly attacking Solovyov and Bulgakov. In his foundational essay “Creation and Createdness,” Florovsky (1928, 33–63) argues that creation is an act of the divine will, hence contingent—the world might not have been—not a feature of the divine essence, which would be pantheism: “The world exists, but it also *began to exist*, which means that it *might not have existed*, and so its existence is not a matter of any necessity. Created existence is neither self-sufficient nor self-sustaining” (Florovsky 1928, 36).

But Florovsky (1928, 44) is hard put to explain how the idea of creation originates in God and admits, reluctantly, that creation has some form of pre-existence (“before” creation) in the divine will: “God’s unchanging will first freely produces the idea of creation and then creation itself.” This alone could be considered a legitimate formulation of panentheism. Florovsky tries

to get around this problem by explaining that the idea of creation existed in God's mind from all eternity but its realization occurs in time—a position not dissimilar to that of Bulgakov. Florovsky (1928, 43) postulates that there are two types of eternity, one relating to the divine essence, and hence ontological, the other to the divine will, and hence contingent, with creation falling into the second category:

God's idea of the world, his plan and intention are without any doubt *eternal*, but in some sense they are *not coeternal or co-existent* with him, as they are “separated” from his “essence” *by the exercise of his will*. To put it differently, the eternity of God's idea of the world is of a different type to the eternity of God's being and consciousness . . . The idea of the world originates *in God's will, not his being*.

Florovsky's solution is ingenious but not entirely satisfactory, and it seems to run counter to his own categorical assertion that “[n]othing created can ever be part of God” (Florovsky 1928, 45). It also involves introducing time into eternity—but does God suddenly “have” the “idea of the world,” as happens in human thought?

Florovsky (1928, 45–46) tries to buttress his argument that there are two types of eternity with citations from Gregory of Nazianzus, Athanasius, Augustine, John of Damascus, and Maximus the Confessor to the effect that there was some form of divine eternal pre-contemplation of creation before its actual realization. Unlike Bulgakov and later Orthodox theologians, Florovsky is unwilling to call a spade a spade—to recognize intimations of panentheism in the ancient fathers—but in the end, his solution could be assimilated to panentheism.

Nicolas Lossky, like Florovsky, finds that Bulgakov was unable to prevent his sophiology from slipping into pantheism: “The non-divine aspect of the world proves to be so characterless that his theory must be regarded as a peculiar variety of pantheism” (Lossky 1952, 229, also 230). For Lossky (1952, 228), the basic flaw in Bulgakov's system is that Bulgakov blurs, if not eradicates, the ontological gulf between God and creation:

His contention that in the Divine and in the created world all is “one and identical in content (though not in being),” and all his theories connected therewith contain too great an ontological approximation of the world, and especially of man, to God . . . that is logically incompatible with the teaching about God expounded by the negative theology.

Lossky's specific objections to Bulgakov's panentheism, which overlap with his critique of sophiology, are that the idea that God creates from within himself

minimizes divine creativity; that Bulgakov's argument suggests, untenably, that humanity is consubstantial with God; and that panentheism is unable to give a reasonable explanation for evil, the freedom of created agents, and their capacity for independent creativity (Lossky 1952, 230).

Florovsky's main target in "Creation and Createdness" was sophiology, but panentheism suffers collateral damage for being too closely interwoven with sophiology in Bulgakov and for being ultimately reducible, according to Florovsky, to pantheism. Whereas Florovsky sees panentheism as a subspecies of pantheism (hence, unacceptable), Bulgakov and other modern Orthodox theologians who welcome panentheism regard it as a subspecies of theism (hence, acceptable). Considering the totality of Bulgakov's theology, with the overwhelming evidence that he was a Christian theist, it is not possible to sustain a claim that he was in reality a pantheist, even if his own theological system grounded in sophiology breaks down under close analysis.

Modern Orthodox Endorsements of Panentheism

Four Orthodox theologians, Metropolitan Kallistos Ware, Fr. Andrew Louth, Alexei Nesteruk, and Fr. Christopher Knight, participated in a symposium on panentheism held in 2001 (Ware 2004; Louth 2004; Nesteruk 2004; Knight 2004). Ware's paper focuses on the doctrine of the divine energies of Gregory Palamas (1296–1359) and Louth's on the *logoi* of Maximus the Confessor (580–662). Both papers relate the doctrines of Maximus and Palamas to panentheism. The core of Palamite theology is the distinction between the divine essence, what God is, unknowable to created beings, and the divine energies, by which God acts and makes himself known in creation; the divine energies are not attributes or external features of God but rather God himself. Humans can know and experience God by the divine energies, thus opening the door to a panentheistic interpretation of the divine energies. For Ware (2004, 159), Judaism, Christianity, and Islam are "all fundamentally 'panentheist,' if by 'panentheist' is meant the belief that God, while *above* the world, is at the same time within the world, everywhere present as the heart of its heart, the core of its core." This explanation can be taken as a simple affirmation of divine transcendence and immanence and does not include the notion that the world is somehow in God. Nevertheless, Ware (2004, 166) accepts that panentheism "is a label that may legitimately be applied to Palamism," in the sense of "weak panentheism," since Palamas "believes that the being of God embraces and penetrates the universe, he also believes that the divine being is in no way exhausted by the universe, for God remains utterly transcendent in his imparticipable essence."

As Louth (2004, 188) summarizes, the *logoi* of Maximus the Confessor are the inner principles or reasons of creation that derive from their Creator, the

Logos of God—Christ—entailing a participation in God, compatible with panentheism: “To say that the universe is created by the Logos entails that the universe has a meaning . . . That ‘meaning’ is logos: everything that exists has its own logos, and that logos is derived from God the Logos. To have meaning, logos, is to participate in the Logos of God.”

Nesteruk (2004, 175), proceeding from the ancient Greek and patristic notion of humanity as a microcosm of creation and from *logoi* of things of Maximus, affirms that the universe “is seen as inherent in the person of the Logos of God.” But since the universe is not a personal hypostasis, it cannot relate to God as such, and thus humans, as personal beings capable of participating in the Logos, bring nonhuman creation to its fulfillment in God: “It is only through human apprehension that these objects [non-human creation] are brought to a realization of their function in the divine plan, when the objects receive their meaning in terms of purposes and ends” (Nesteruk 2004, 180). In this sense, humans offer nonhuman creation to God, acting as “priests of creation” (Nesteruk 2004, 182), a notion developed by other Orthodox theologians, such as Fr. Alexander Schmemmann (1921–83) in a liturgical context (Schmemmann 1973) and Metropolitan John Zizioulas (1931–2023) as a grounding for human responsibility for creation (Zizioulas 2013).

In his essay, Knight discusses Philip Sherrard (1922–95), a British Orthodox writer and translator of Greek literature into English. Sherrard (1998, 239), who identifies with panentheism, discussing the concept of creation *ex nihilo*, argues that for some Eastern Christian writers, the term “nothing” “does not denote an absolute black, the privation of every quality,” but beyond its negative connotation, has positive content:

It refers to that in God which is free from all form, material or non-material . . . Insofar as we can envisage it at all, it may be envisaged as the fathomless, incomprehensible ground or depths of God’s uncreated energies and possibilities, the pre-ontological *nihil* from which all things proceed. In this way it refers not to something that is outside or privative of God, or that is void of his presence. It refers to what is within God.

Even though Ware, Louth, Nesteruk, and Knight participated in the 2001 symposium on panentheism, none explicitly identifies himself as “panentheist,” as do Bulgakov and Sherrard. Adherence to panentheism is an inference, not directly proclaimed. Although few Orthodox theologians explicitly identify themselves as panentheist, many, like Ware, Louth, and Nesteruk, draw on the Palamite theology of the divine energies and Maximus’s *logoi* of creation—or both—in their own theologies, thereby adopting theologies seen as fundamentally panentheist.

Have the Critics Been Answered?

Orthodox approaches to a theology of God and the world advanced since the late nineteenth century overlap to some extent. Among the early Russian religious thinkers, the quest for all-unity flowed into sophiology, which, even in its refined Bulgakovian form, turned out to be highly problematic. It was hotly contested during Bulgakov's lifetime and received little attention after his death, except as an exotic episode in historical theology. Alternatively, the Palamite theology of the divine energies and Maximus's *logoi*, derived from and consistent with Orthodox tradition, were more favorably received in the second half of the twentieth century, even though Bulgakov considered that his sophiology was compatible with Palamism and constituted a further development of it.

The theologies of the *logoi* of things and the divine energies waxed into the spirituality of the contemplation of God in creation, human responsibility for the natural world, and support for environmental measures. Despite the defense of panentheism by appeals to the theologies of the divine energies and the *logoi*, panentheism remains on the margins of Orthodox thought, perhaps because it is considered primarily an overly philosophical approach to essentially theological questions, too closely associated with sophiology and hence under a suspicion of covert pantheism, as critics such as Florovsky and Nicolas Lossky maintained.

Despite Orthodox reticence to adopt the term panentheism, have the philosophical and theological objections to panentheism, especially in Bulgakov, raised by Florovsky and Lossky, been adequately answered? Perhaps they have. First, it is impossible to sustain the contention that Bulgakov was a pantheist, however ambiguous some of his formulations may be, especially taken in isolation from the totality of his theology and personal faith, and however much certain interpretations of his theology of creation and his sophiology may argue in this direction. Bulgakov explicitly rejected the accusation of pantheism, affirming divine transcendence to creation and creation *ex nihilo* (defined as the actualization in time of eternal divine ideas) and proclaiming his theology was panentheistic—creation is in some fashion in God, but God is more, infinitely more, than creation.

Second, the interpretation of panentheism by contemporary Orthodox theologians in the light of the *logoi* of creation in Maximus the Confessor and the divine energies of Palamas shows that intimations of panentheism occur among esteemed fathers of the Church, especially Maximus and Palamas, whose theologies are widely received in contemporary Orthodox thought.

Third, the affirmation of divine presence in creation both in the Russian religious renaissance and in modern Orthodox thinkers such as Ware ("through creation to the Creator") (Ware 1996), Dumitru Stăniloae ("the contemplation

of God in creation”) (Stăniloae 2002, 203–33), and Alexander Schmemmann (“the world as sacrament”) (Schmemmann 1979, 217–27) manifests a theological–spiritual vision in the Orthodox mystical–sacramental tradition that could be placed under the panentheist umbrella. Stăniloae, an early exponent of the revival of Palamite theology, develops the notion of “the Contemplation of God in Creation” as an essential aspect of “illumination” in Christian spiritual life, while Schmemmann places the contemplation of God in creation in a pastoral and liturgical context and develops the idea of humans as priests of creation.

Fourth, Florovsky’s solution to the problem of reconciling divine transcendence and divine immanence, the basis of his critique of panentheism—two types of eternity in God, with creation subsisting in the divine will prior to its actualization in time—can be read as panentheistic in all but name and runs counter to his own emphasis on the ontological gulf separating God and creation.

Conclusion: Towards an Orthodox Panentheism

Orthodox thinking on panentheism focuses almost exclusively on its ontological implications for relations between God and creation—Orthodox theologians have metaphysics in their DNA—leaving aside other aspects of panentheist reflection, such as the relations among God, mind, and body (see Atmanspacher and von Sass 2017, 1034–36). Orthodox mindful of the science–theology dialogue have to some extent appealed specifically to panentheism to buttress their theological positions (see Ware 2004; Louth 2004; Nesteruk 2004; Knight 2004).

The transition in contemporary Orthodox thought from an earlier polemical stance regarding panentheism to an irenic one is promising, despite continued reticence in some Orthodox quarters to accept such a modern philosophical notion as panentheism as compatible with Orthodox tradition. Major issues that require further exploration include overcoming Orthodox hesitations concerning panentheism because of its apparent origin in secular philosophy rather than Christian theology, and the relationship and compatibility between panentheism and Maximus’s theology of the *logoi* and the neo-Palamite theology of the divine energies, widely (but not universally) accepted in contemporary Orthodox theology.

Although several modern Orthodox theologians have explicitly or implicitly accepted the notion of panentheism, Orthodox have not engaged in the ongoing dialogues over the nature and varieties of panentheism. By and large, Orthodox have been content to ground their cosmologies in patristic theologies, especially those of Maximus the Confessor and Palamas, with further refinements—even Sergius Bulgakov saw his sophiology as a development of Palamism, for example, in a positive elaboration of the four negative characteristics of Chalcedonian Christology (see Bulgakov 1937, 83–88). Even those Orthodox who seek to

place their theologies under the panentheist umbrella—with Bulgakov the most prominent—do not explicitly elaborate how they understand panentheism.

Even though some Orthodox theologians accept panentheism as a legitimate philosophical–theological position in the Orthodox tradition, they have not truly spelled out with much precision how they understand panentheism or where they situate themselves in the panoply of contemporary panentheisms. Nonetheless, several key elements recur in the reconciliation of panentheism and Orthodox tradition:

- God is the uncreated Creator of all that exists (the cosmos, world, or universe, “heaven and earth” in the Nicene Creed).
- God is both transcendent to and immanent in creation.
- As transcendent to creation, God is entirely self-sufficient to creation and under no necessity to create (Bulgakov is an exception to this principle, since he argues that God’s nature as love inclines or even compels God to create an external object to fulfill his nature as love (Bulgakov 1945, 130). See the discussion of this in “Divine Freedom and the Need of God for Creation” in Gallaher 2016, 95–114).
- As immanent to creation, God sustains the world in a continuous act of creation; this God is in the world, not as exhausting divinity, and the world is in God, not as a “part” of God but as encompassed in God’s love and providence.
- Creation had some form of eternal divine existence—a “divine idea”—before being actualized in the act of creation by the divine will.
- Both the theology of the divine energies of Palamas and the theology of the divine *logoi* of things of Maximus the Confessor are compatible with panentheism.
- Neither panentheism nor the theologies of the divine energies or the *logoi* exhaust the divine mystery, the fullness of which is beyond the comprehension of creatures.
- The ultimate fulfillment of panentheism is eschatological, in the Kingdom of God, when God will be “all in all” (1 Corinthians 15:28) (one of Bulgakov’s preferred biblical references); for humanity, the notion that God will be “all in all” is encapsulated in the Orthodox doctrine of theosis (deification).

It is in this context that Orthodox believe it is possible to accommodate panentheism within the Orthodox tradition. Of the broad approaches to panentheism surveyed in Philip Clayton’s (2017) article in *Zygon: Journal of Religion and Science*, several do not appear on the Orthodox radar: “conservative panentheism” (basically an extension of classical theism, which affirms but

minimizes divine immanence, with implications suggesting the rejection of some scientific theories such as evolution) and “naturalistic panentheism” (too close to, if not affirming, materialism, atheism, and pantheism). Orthodox would be drawn to apophatic panentheism (consistent with the powerful role of apophatic theology in the Orthodox tradition) and metaphysical panentheism (2017, 1057) (which can accommodate the divine energies and the *logoi* of things). Clayton also mentions “mystical panentheism,” which would appeal to Orthodox as an extension of apophatism: the encounter with God in the natural world (see the citations from Dostoyevsky 1880 given earlier).

The schema incorporates an apophatic element, typically one of the strongest aspects of modern Orthodox thought, into the theologies of Florensky, Bulgakov, and Vladimir Lossky (see Ladouceur 2019, 98–105). The insertion of an apophatic component into panentheism suggests there is a limit to our comprehension of the divine–creation relationship; at some point, human rationality, understanding, and language cease to be meaningful, and we must retreat to a humble attitude of awe, worship, and prayer before the divine mystery of creation.

This schema nonetheless leaves important issues dangling, including crucial ones such as how is creation “in” God: How can the idea of creation be eternal in God, since eternity is an ineffable divine quality? And the question of whether and how God is affected by events in his own creation—by human actions. This is a variation of the old philosophical issue of divine unchangeability and impassibility in new clothes (change [including compassion, suffering] involves imperfection; God is perfect, therefore cannot be subject to change etc.). There is a line of thought in Orthodoxy, admittedly not strong, that recognizes divine passibility beyond that of Christ on the Cross: God suffers because of humanity and with humanity (for an overview of the theology of divine suffering in modern Orthodox thought, see Ladouceur 2019, 236–39). Divine passibility or impassibility has downstream implications in spirituality, for example, belief in the efficacy of prayer, especially intercessory prayer for both the living and the deceased. But this mystery has not yet been integrated into Orthodox reflection on panentheism.

On another front, does panentheism resolve the dilemma of what to do about the sophiology of the Russian religious renaissance? Is it an acceptable philosophical–theological position to account for relations between God and the world without having to appeal to the external construct of Divine Wisdom, with all the inherent risks of the personalization of wisdom as some form of divine being? In his masterly study *Wisdom in the Christian Tradition*, Marcus Plested (2022) considers the charge of pantheism levied against the sophiologies of Solovyov, Florensky, and Bulgakov, but he does not refer directly to panentheism, even though Bulgakov himself repeatedly places his theology under the panentheist umbrella.⁷ Plested (2022) offers a “re-oriented

sophiology,” a “sophiology without Sophia.” He jettisons the troublesome notion of an intermediary, somewhere between God and creation, “shifting, imprecise, indefinable, ungraspable, elusive” (Plested 2022), somehow associated with femininity, and which more than any other aspect of sophiology has been the source of unending debates and accusations of heresy. Plested’s (2022) framework for a re-oriented sophiology, is, as he states, “based in the first instance on Palamas”; it is neo-Palamism 2.0, which makes explicit tacit implications in Palamism itself. The framework is inherently panentheistic: “The creation as whole is a manifestation of the divine wisdom, the eternal ideas for the creation corresponding to the uncreated energies sustaining and underpinning the creation . . . God thus creates, indwells, and draws all creation back to himself as wisdom according to energy or operation.” Through the Incarnation, God opens “to all human beings the promise of participation in the deifying energies of God” (Plested 2022, 239–42).

Paraphrasing Vladimir Lossky and Florovsky, the sophiologists asked the right questions about God and the world but offered the wrong answers.⁸ Perhaps panentheism is the right answer—but Orthodox need to do more homework.

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Notes

- ¹ The literature on panentheism and science is abundant. For starters, see the articles contained in the thematic section of *Zygon: Journal of Religion and Science* devoted to “The Many Faces of Panentheism,” *Zygon: Journal of Religion and Science* 52 (4): 1029–45. The Editorial Introduction by Harald Atmanspacher and Hartmut von Sass provides an overview of the five articles included in the section.
- ² The first explicit use of the term panentheism is attributed to the German philosopher Karl Krause (1781–1832), who sought to define a middle ground between the theistic systems of Georg Wilhelm Friedrich Hegel (1770–1831) and Friedrich Wilhelm Joseph von Schelling (1775–1854) and the supposed pantheism of Baruch Spinoza (1632–77).
- ³ R. T. Mullins’s article responds to Ralph Lataster and Purushottama Bilimoria 2018. Benedikt Paul Göcke (2019) offers another response to this article. See also the earlier debate between Göcke and Lataster (Göcke 2013; Lataster 2014, 2015).
- ⁴ In an exchange with Norman Russell, Christos Yannaras remarked that “[t]he modern proposal of ‘panentheism’ has no relationship with the cosmological perspective of Maximus and Gregory Palamas” (Yannaras and Russell 2017, 122). Yannaras does not appear to have elaborated further his thinking on panentheism in readily accessible publications.
- ⁵ For an exploration of the pantheistic undercurrent in Bulgakov’s theology, see Gallaher (2012, 215–18). Gallaher concludes here that Bulgakov falls into the same pantheist difficulties as Solovyov, and that Vladimir Lossky may well be partially right in his critique of Bulgakov’s sophiology. Subsequently, in a 2021 paper, Gallaher absolves Bulgakov of the suspicion of pantheism. Gallaher (2024) states that he has “changed his mind” and refers to Bulgakov’s “panentheistic account of creation” as “the vehicle for a radically Christocentric vision of creation and redemption.”
- ⁶ The last sentence (cited in Gallaher 2012, 217) is missing in the English translation of the book.
- ⁷ For example, in “Hypostasis and Hypostaticity: Scholia to *The Unfading Light*” (1925), *Judas Iscariot, The Perfidious Apostle* (1931), *Icons and the Name of God* (1931), *The Comforter* (1936), *Sophia, the Wisdom of God: An Outline of Sophiology* (1937). See references.
- ⁸ Commenting on the Eurasian philosophy of the 1920s, Florovsky said that the Eurasians “raise the right questions, but offer wrong answers” (quoted in Blane 1993, 38–39). A month before his untimely death in 1958, Vladimir Lossky confided to the Catholic theologian Louis Bouyer (1985, 160) that “[e]ven if we cannot accept Fr. Sergius’s [Bulgakov] conclusions, we must acknowledge that he has posed the right questions.”

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