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Natural Selection: A Distinction Between Two Forms of Ecological Suffering

Ramon Isaac Duran III

Santa Clara University, rduran@scu.edu

NATURAL SELECTION: A DISTINCTION BETWEEN TWO FORMS OF ECOLOGICAL SUFFERING

RAMON ISAAC DURAN III *

Abstract: Provided that theology and biology agree evolution is good for God's creation, this article argues that humanity must acknowledge that ecological suffering ought to be viewed in two distinct forms. The first form of suffering allows human and non-human creation to experience suffering that promotes biological, spiritual, and intellectual progress. In contrast, the second form of suffering not only manifests itself through human sin, but also perverts the progression of nature that would exist in the absence of immoral action. This paper examines humans' and non-human animals' relationship with suffering in an effort to reconcile environmentalist attempts to mitigate environmental degradation caused by humans with the apparent necessity of suffering for natural progress. Elizabeth A. Johnson's interpretation of the crucifixion of Jesus in *Ask the Beasts: Darwin and the God of Love* serves as the primary basis for the method proposed to determine the necessity and ethicality of human intervention in ecological suffering.

The Bible offers many examples of how those faced with challenges gain, as a result of attempts to ameliorate their plight, a greater sense of self-awareness and an improved understanding of their social, ecological, and even cosmological position. One of the most notable examples occurs when Adam and Eve are cast out of the Garden of Eden: without the comforts of the garden, Adam and Eve must contend with the forces of nature for their survival. Much like Adam and Eve, non-human creation fights against predation, disaster, and limited resources for survival by means of competition, adaptation, and evolution. Holy Scripture makes it clear that God intends for nature to challenge creation through suffering as a means of spurring spiritual, intellectual, physical, and biological progress. This challenge poses a problem for humans as we must evaluate the suffering experienced by humans and members of non-human creation to determine whether (and/or how) suffering should be ameliorated by human action. This paper will argue that while suffering affords an understanding of the non-human natural world and of our relationship with God, the

* Ramon Duran is an undergraduate student in the Department of Religious Studies at Santa Clara University. He would like to thank Professors David B. Gray and Paul J. Schutz for their advice and comments on this essay.

inevitability and universality of natural suffering are not sufficient reasons to render human-made suffering permissible.

Comparing Charles Darwin's theory of evolution with the Christian concept of creation by an omniscient, omnibenevolent, and omnipotent God has often led to the conclusion that the two are entirely incompatible. The processes of evolution, after all, entails an incredible amount of pain and suffering for both humans and non-human animals. While humans are moral agents who may be held responsible for their wrongdoings against non-human animals, other humans, or the environment, non-human animals are not subject to this same scrutiny as they lack moral agency. Though predatory actions by animals do cause the target to experience pain and ultimately death, this is only the result of a natural process, rather than of a malign sentiment on the part of the predator.² It would seem that the predator is the only one that benefits from predation; the prey is merely the recipient of a painful death. If these interactions between predators and prey occur at virtually every moment throughout the animal kingdom, a concern arises regarding the congruity between such predation and the belief that nature is the creation of a loving God.

Catholic theologian Elizabeth A. Johnson notes that the pain and suffering undergone by prey is an inherent part of the natural processes that are essential to the Darwinian theory of evolution.³ Without death and reproduction, there would be no mechanism for replacing existing creatures with those that have adapted and evolved more appropriately and effectively than their ancestors. Natural selection, one of the main tenets of Darwin's theory, is the chief mechanism through which the evolutionary process takes place.

A component of this theory is that predators typically prey on more vulnerable targets such as those that suffer from physical defects or other disadvantages. Johnson gives the specific example of a lioness on the hunt for wildebeests.⁴ In almost every instance, the lioness will bite onto the throat of the slowest wildebeest in the herd. The faster wildebeests, including the second slowest wildebeest, escape the jaws of the lioness. Natural selection, in that case, showcases nature's predisposition to not only create suffering in general terms but also to ensure that suffering is most likely faced by the most vulnerable member of any given

² Elizabeth A. Johnson, *Ask the Beasts: Darwin and the God of Love*. (London: Bloomsbury, 2014), 185.

³ Johnson, *Ask the Beasts*, 184.

⁴ Johnson, *Ask the Beasts*, 185.

group. That is, the ultimate form of suffering—a gruesome death and removal from the reproductive gene pool—is faced by the members already suffering from a preexisting disadvantaged state.

Darwin posits that hunting benefits the wildebeests and other species by removing the weakest members from the reproductive gene pool. Whatever merit this assertion might hold, Darwin's theory does not address the question of how bloody and painful predation can exist within the creation of an omnibenevolent God. The question might be answered by exploring how God can both love His creation and desire it to undergo a transformation that allows each species to achieve its maximum potential. Eco-theologian Denis Edwards writes that the evolutionary processes taking place on Earth are "grounded in the dynamic fruitfulness of the Trinity, the divine fountain, endlessly pouring forth the river of living water, from which all creation drinks in the Spirit."⁵ Considering the incredible number of natural changes that animal and plant species have undergone over billions of years of evolution makes Edwards' position clear. The development of adaptations necessitated countless minute changes in the biological make-up of these creatures. As can be seen in the case of the wildebeest and the lioness, this evolutionary process continues today. To fully understand evolution as one of the ultimate consequences of God's generative love, it is also necessary to identify the sensory mechanisms through which the evolutionary process takes place.

Johnson reaches the conclusion that this relationship between God's desire for nature to achieve its potential and the suffering this progress entails makes pain necessary to encourage further exploration of possible improvements to life.⁶ For this same reason, she notes that developing the ability to determine if an external stimulus is harmful, neutral, or helpful makes animals and plants better prepared to adapt and ultimately survive.⁷ Even the most elementary theological or biological perspective suggests that the ability to feel pain is directly linked to the capacity to avoid whatever causes that pain. God, then, provides to animals the sensation of pain as a defense against extinction. Take for example the predator-prey relationship between cats and mice. If a mouse did not feel pain when it was swatted

⁵ Denis Edwards, "The Attractor and the Energy of Love: Trinity in Evolutionary and Ecological Context," *The Ecumenical Review* 65, no. 1 (March 2013): 129-144.

⁶ Johnson, *Ask the Beasts*, 185.

⁷ Johnson, *Ask the Beasts*, 182

by the claw of a cat, then the mouse would not suspect that the cat poses a danger. Similarly, it would not be beneficial to the mouse if it only began to feel pain when already ensnared in the cat's jaws. For both humans and animals, immediate recognition of pain and suffering deters one from danger. The main difference between humans and non-human animals pertaining to this discussion is that humans are capable of relaying detailed information regarding first- and second-hand experiences with pain and suffering in a more reliable way. First-hand pain experiences, in this case, are those in which an individual physically feels pain through the body's sensory nervous system or as a result of psychological trauma. This contrasts with second-hand pain experiences that evoke feelings of empathy for another who retells the details of their first-hand pain experiences. The Bible, for example, is a medium used to relay experiences of pain and suffering that teach morals and acceptable social behaviors. Though rarely considered an example of a divine blessing, framing the knowledge and sensation of pain as the best defense against life-threatening interactions might justify describing it as a gift from God to His creation.

For humans, the role of evolution in this relationship lies within knowledge that is developed rather than within mere survivability that results as a function of physical adaptations. Allowing predation or disease to remove the weakest genes while the strongest persist advances any given species through a variety of possible adaptations. This way of species progress seems to be associated with physical defects already existing at birth or hatch. Knowledge, conversely, is collectively developed by the many members of a species over the lifetime of an individual within a species. An example of collectively developed knowledge can be seen in the case of humanity.

While this paper focuses on ecological and environmental suffering, I will include here the role of human knowledge so that it may be better understood how knowledge relates to the domain of humanity's influence over the various trajectories of environmental change. Humans, like any other animal, physically evolve and adapt to their environment over time. However, humans are unique in that adaptation is only one means through which the human experience is improved or changed. The transmission of objective knowledge and morals via formal education and child-rearing is the other means through which the human experience and, by extension, human survivability are changed. Given that developed knowledge has at least some bearing on humanity's domain of influence over certain parts

of the environment, it is worth investigating one way in which our knowledge might fall short of a complete representation of the environment and of the delicate interdependencies that constitute its present state.

Human knowledge employs language to record our understanding of humanity and of non-human nature. Language is significant because it is a primary tool used to understand and articulate humans' experiences of the world. However, language can be problematic because it often fails to wholly encapsulate the meaning and substance of the tangible objects and intangible ideas that are described by it. This becomes especially apparent in natural sciences such as ecology. Our theoretical knowledge about nature was created inside the bounds of our language and has acquired anthropocentric elements (e.g., human culture) that are difficult, if not impossible, to remove. This observation shows that insofar as our language exhibits anthropocentric semantics, the ability and inclination to reach beyond pure anthropocentrism is more complex. The main difficulty here is identifying the balance between a pure anthropocentrism that outsizes and overwhelms the capacity of the environment to support all human life and a version of environmentalism that enthrones non-human creation so much that it borders on misanthropy.

The evidence thus far, in light of human-caused global warming and the overuse of natural resources, is that a pure anthropocentrism has historically been preferred by politically and economically dominant human societies. If it is the case that anthropocentric semantics lend themselves to human-caused environmental degradation, then a concern arises in that our very language can obstruct or obscure environmentalist efforts. Our attempts to continue to improve as a species locates the human race in a circular loop of knowledge that is driven by the natural biological drive to gain knowledge; that is, at least some portion of human knowledge is endogenous as it relies on a foundation of semantics formed prior to the discovery of new information or knowledge. To extend this idea further, language itself is likely endogenous to some degree as it relies on a basic set of physical and biological adaptations. As Paul Schutz writes, humanity "... is always and already bound up with the mysteries we observe."⁸ Even amidst the rigorous empirical analyses of natural science, humanity might ultimately be one collection of stardust observing another.⁹ This

⁸ Schutz, "Cultivating a 'Cosmic Perspective'," 809.

⁹ Schutz, "Cultivating a 'Cosmic Perspective'," 809.

alternate perspective does not intend to undercut the advancements and discoveries of natural science, but it does raise the possibility that there exists a horizon of our knowledge at which we may never arrive. The socio-ecological implication of our knowledge is that our knowledge is also a component of our power to make changes to the evolutionary trajectory of other species. Combining this power with the theoretical limits of our knowledge raises the possibility that we could do more harm than good when selecting one course of action over another.¹⁰

While our knowledge is limited, humans can understand more deeply the interconnectedness of humanity and non-human creation than can our non-human counterparts. The third chapter of the Book of Genesis demonstrates the direct effect of the ecological development of the Earth on humans' ability to farm. After God curses the ground, "thorns and thistles" begin to grow on the plants along with weeds and roots. While this interaction between divine and natural seems at first entirely negative, the ecological implication of this new vegetation is actually that the natural environment is given a self-sustaining foundation. One additional consequence of this reality is that Adam can cultivate crops because the soil is now fertilizable. As a result, Adam is motivated to reconcile his banishment from the Garden with the newfound impetus to undertake good agricultural practices—a component of human life that has proven necessary to sustain civilization as we know it.

Global warming serves as a contemporary example of an instance where a reconciliation may be made between purely anthropocentric engagement with the environment and the physical constraints of the Earth's atmosphere. Extreme weather-related disasters have gained increased national attention in the United States, forcing the public to notice humanity's disproportionate dependence on non-human creation. As our understanding of the interconnectedness between humans and non-human creation advances, so can our ethical reflection on the socio-ecological networks in which we coexist with other species.¹¹ The increase in extreme weather conditions has triggered the pain-knowledge-survival tool discussed earlier. The pain that we experience from droughts is not unlike the

¹⁰ Carolyn Albert, "Made for Self-Giving Love of Creation: Implications of Kenosis and Imago Dei for Natural Theodicy and Christian Ecological Ethics," *Currents in Theology and Mission* 39, no. 2 (2012): 131-138.

¹¹ Schutz, "Cultivating a 'Cosmic Perspective'," 805-806.

initial pain that Adam felt when he first learned to farm. Harnessing our knowledge to improve our planet's ecological future is an essential step in recognizing the suffering that humans induce by causing climate change. Poor treatment of the environment has brought the foci of our imaginations to our biological dependency on other-than-human creation.¹²

Coming to terms with the state of humanity's relationship with the natural world is a reckoning welcomed by God. Just as Adam's and Eve's decision to eat the forbidden fruit from the Tree of Knowledge of Good and Evil led to the pair's consciousness of their disobedience of God, the human abuse and exploitation of the environment must lead to a realization of the need to take better care of the planet. In this vein, William P. Brown writes that "[c]onscience, and thus human identity itself, is homegrown, a product of evolutionary and narrative development."¹³ Our evident need to learn by taking risks and ultimately by disobeying ourselves or God seems to be unique to the human experience. This form of *akrasia* is demonstrated by the fact that only through extremely negative circumstances such as climate change do we become fully cognizant of the consequences of our actions. This need, however, provides a logical basis for the existence of another need. This other need is for suffering itself; that is, insofar as suffering is ultimately inevitable and forces the sufferer to progress physically and psychologically. As Johnson explains, "...the pathway to consciousness runs through flesh that can 'feel' its way through the world. In that regard, suffering is irreplaceable..."¹⁴ In other words, the acquisition of genuine understanding is facilitated by a practical experience of facing difficult choices and ultimately learning how to transform oneself in conjunction with God.

The way in which God allows humans to change themselves is comparable to a loving parent permitting a young child to learn from his or her mistakes by giving that child the mental tools and opportunities to think through the issues at stake. If the young child was disciplined immediately or was merely given a basic explanation of why they were wrong to do what they did, the child would focus either on the form of the discipline itself or on the end of the parent's reprimand. In either of these situations, the child undertakes no authentic learning. Instead of resorting to punishment or scolding, the best option for the parent would

¹² Johnson, *Ask the Beasts*, 195.

¹³ Brown, *The Seven Pillars of Creation*, 111.

¹⁴ Johnson, *Ask the Beasts*, 195.

be to allow the child to come to her understanding of the wrongdoing or misjudgment. This method gives the child time to reflect and earnestly consider how her actions impacted another or herself. God uses this latter method to teach humanity so that we may gain integrity through autonomous self-reflection upon our actions.¹⁵ With this integrity, we may learn and thrive.

Now that we have a better understanding of how God uses the relationship between pain, knowledge, and survival to encourage humans and non-human creation to promote evolutionary progress for both their own species and for all creation, we may now return to one of the concerns noted at the outset of this paper. Reconciling the existence of a *loving* God with a world abounding with suffering requires a distinction between predator-like human behavior and the non-human animal predation of natural selection. Here I begin to clarify this distinction by discussing one of the key ways in which God has demonstrated His love for all creation.

Primo Levi was a prisoner at the Nazi concentration camp at Auschwitz during World War II. In *The Drowned and the Saved*, he wrote the following:

Such an opinion seemed monstrous to me. It painted me as when one touches an exposed nerve, and kindled the doubt I spoke of before: I might be alive in the place of another, at the expense of another; I might have usurped, that is, in fact, killed. The 'saved' of the Lager were not the best, those predestined to do good, the bearers of a message: what I had seen and lived through proved the exact contrary. Preferably the worst survived, the selfish, the violent, the insensitive, the collaborators of the 'gray zone,' the spies. It was not a certain rule (there were none, nor are there certain rules in human matters), but it was nevertheless a rule. I felt innocent, yes, but enrolled among the saved and therefore in permanent search of a justification in my own eyes and those of others. The worst survived, that is, the fittest; the best all died.¹⁶

Levi's comparison between the struggle to survive in the camp and Darwin's concept of the survival of the fittest highlights how the Nazi's horribly dehumanizing treatment of the prisoners reveals something about the negative potential of human survival. As a result of the subhuman treatment and of the strong desire to make it out of the camp alive, some prisoners engaged in intra-prison social Darwinism by speaking out against their fellow prisoners so that they might survive. However, Levi recognized something beyond natural

¹⁵ Edwards, "The Attractor and the Energy of Love," 144.

¹⁶ Primo Levi, *The Drowned and the Saved* (New York: Vintage International, 1989), 82.

selection that truly revealed who the best and the worst were among those imprisoned at the camp.

According to Edwards, God is “... not clearly revealed in all the processes of natural selection, God is not revealed in a concentration camp, but God is present in natural selection and in the horror of a concentration camp.”¹⁷ As previously discussed, it is evident that natural selection and evolution consist of steps that appear quite gruesome when viewed in isolation from the whole ecological schema. This comparison between natural selection and social Darwinism within concentration camps not only reveals that God is present in both situations but also highlights a key distinction between suffering created by the evolutionary processes and suffering created by human sin. Understanding why God is present in the concentration camp, yet not revealed, is needed to fully distinguish suffering caused by human sin from evolution-caused suffering.

For Johnson, natural processes like predation and natural selection are part of the inevitable suffering that allows evolution to take place, and that do not necessarily contradict God’s intention for the progress of creation.¹⁸ The concentration camp, however, is a unique example in that it is not at all a natural cycle that is fundamental to evolution. Comparing the camp to Jesus’ crucifixion may be helpful to understand this phenomenon in the context of God’s plan for creation. The crucifixion of Jesus was ordered by political authorities in a way that was grossly “unpredictable, unjust, [and] the result of human sin.”¹⁹ Similarly, Levi’s experience at Auschwitz was no doubt unpredictable, unjust, and an event that took place as a result of the human sin committed by the leaders and enablers of Nazi Germany. The main insight provided by Levi is that there may be events that take place in human society that superficially appear to exhibit elements of natural selection and competition. In spite of the appearance of a survival-of-the-fittest human society, there is an additional moral lens through which humans are subjected to scrutiny. Levi’s account demonstrates that this moral lens is ever-present and that, even in the hell of a concentration camp, the understanding of rectitude offered by this lens is unsurpassed by the will to survive by any means necessary.

¹⁷ Denis Edwards, *Deep Incarnation: God's Redemptive Suffering with Creatures* (Maryknoll, NY: Orbis Books, 2019), 123.

¹⁸ Johnson, *Ask the Beasts*, 202.

¹⁹ Johnson, *Ask the Beasts*, 202.

By using Johnson's criteria for the crucifixion of Jesus as an unpredictable, unjust result of human sin it is possible to see how these same criteria may be used to demonstrate why the exploitation of non-human creation is distinct from the kind of natural suffering that promotes creation's progress. For example, imagine a scenario in which a textile factory dumps its waste product (e.g., unusable ink) into a nearby river. In such a situation, it is hardly plausible to suggest that this ink spillage will cause the kind of suffering that will catalyze positive physical adaptations in the creatures that inhabit or drink the water. It would be absurd to conclude that this suffering would ensure that only the strongest creatures survive—in reality, the toxic ink would probably kill any creature that consumed the river water before any became 'stronger' or appropriately adapted.

In terms of Johnson's criteria of Jesus's crucifixion and of the injustice that accompanied it, the dumping of ink into the river is an occurrence that is unpredictable and unforeseeable in nature. At no point would nature itself have produced a toxic liquid and then released that liquid into a river. While these first elements of unpredictability and foreseeability determine whether an event is natural or unnatural, the second criterion of the cause of an event serves to determine if the human action is unjust. Even if there were no laws to forbid dumping waste into rivers, the damage the waste poses to the common good is reason enough to consider this a moral wrong. Destroying the river's natural integrity, after all, is harmful to virtually all who live downstream. Lastly, this act of dumping ink into a river may be classified as a specifically human sin because it would only be performed by humans. It is important to note, however, that an objective action or set of actions would need to fail to meet one of the criteria in order to fail the entire test. This test, which asks whether a particular instance of suffering is unpredictable, unjust, or the result of human sin, is first meant to determine the justifiability of the action or set of actions and, second, to determine whether anything should be done to mitigate the resultant suffering.

Aside from the criteria that Johnson applies to the crucifixion of Jesus, the crucifixion and Resurrection of Jesus as individual events are significant within the socio-ecological outlook spurred by the relationship between pain, knowledge, and suffering. When Jesus is crucified, He experiences the suffering of all creation while nailed to the cross, including that of the prey in predation and in natural selection.²⁰ The crucifixion of Jesus is the joining

²⁰ Edwards, "The Attractor and the Energy of Love," 135.

of creation with God as Jesus experiences the immense suffering associated with the “godforsaken moment.”²¹ The reality of this bond is further explained by Jesus’s unique position as both fully divine and a part of creation that allows him to bridge this gap between human suffering and God’s love. From an ecological perspective, the incarnation of Jesus also carries significant meaning. When God the Son joins humanity in the flesh, He also joins with the Earth and all the creatures that make up the natural world. In addition to becoming a man in the incarnation of Jesus, God also became the tiniest biological forms of human and non-human creatures alike. Johnson writes that Jesus is the “... self-expressing Wisdom of God, [he] conjoined the material conditions of all biological life forms (grasses and trees) and experienced the pain common to sensitive creatures (sparrows and seals). The flesh assumed in Jesus Christ connects with all humanity, all biological life, all soil, the whole matrix of the material universe down to its very roots.”²² In attempting to answer the question of the possibility of a *loving* God, God’s decision to merge with His creation and take part in its suffering in human form certainly seems to be evidence of His unlimited love for creation.

Provided that God is omnipotent, the tempering of power He shows by choosing to become the same flesh as His creation shows a level of care and of love that is difficult to articulate. Edwards offers the important insight that by suffering with all of creation, the Word approaches us and enters into our pain with a new level of understanding and intimacy.²³ This idea aligns naturally with the concept of empathy: the ability to understand others in a way that is rooted in love and care for fellow members of creation. Jesus’s crucifixion serves as a symbol that reveals profound truth and deepens our understanding of suffering. Even if God’s omniscience would allow him to know what it feels like to be human without becoming flesh, the incarnation of the Word communicates to Christians that God loves creation so much that He is willing to live by human biological and political rules. In this way, we might know for certain that God suffered for creation. This understanding also gives new meaning to the suffering of creation in that it can be understood to continue the cosmic progress willed by God.

²¹ Johnson, *Ask the Beasts*, 191.

²² Johnson, *Ask the Beasts*, 196.

²³ Edwards, “The Attractor and the Energy of Love,” 140.

Evidence of God's love elucidates the distinction between natural evolutionary suffering and suffering induced by human sin. The suffering that serves as the byproduct of the natural evolutionary processes is more accurately described as a pain response to external stimuli that pose a threat to God's creation. It is not difficult to recognize the necessity of pain; the absence of pain would complicate life by increasing its proximity to danger. At least part of this unfamiliarity would stem from a growth in the complicatedness and dangerousness of living in a world without pain. Injury and death, after all, are still possible without pain. In a world lacking pain, creation would have to devise an artificial means of determining the relative danger posed by any given interaction. God's demonstrated love for creation implies that the ability of non-human and human creation to recognize threats is by design. Further, this pain benefits humans by facilitating the development of another form of knowledge about the environment and about other sentient forms of creation.

Through this simultaneously theological and ecological lens, each aspect of evolutionary suffering can be understood as part of God's loving plan for His creation. For example, Darwin observes that predation is the mechanism by which species adapt to biologically improve over generations. God's love for creation means that He intends this physical progress for each species so that creation might reach its full potential. In a predator-prey relationship, the predator typically inflicts suffering by hunting and eating the prey. This process aligns with God's intentions because the preyed-upon species improve when the predators remove the weakest members from the gene pool. Therefore, this form of suffering actually benefits the prey species; it is a form of suffering that ultimately proves necessary to achieve God's will of progress for His creation.

In contrast, ecological suffering through exploitative processes caused by human sin cannot be reconciled with God's will for species' evolution. Humanity poses a threat to the balance of nature by exerting power to pollute the environment or to overuse scarce natural resources. As humans attempt to become increasingly dominant over the natural world, the interconnectedness of nature, non-human animals, and humanity becomes ever more apparent. When longstanding environmental patterns begin to change drastically, so will our perception of these issues. The evolution and the inherent mutability of nature is not an excuse to exploit nature; to disrupt delicate natural forces is to commit human sin. The ecological interconnectedness of creation requires humanity to cease the destruction of the

environment and, rather, to uphold the intrinsic processes of nature that benefit God's creation.

Bibliography

- Albert, Carolyn. "Made for Self-Giving Love of Creation: Implications of Kenosis and Imago Dei for Natural Theodicy and Christian Ecological Ethics." *Currents in Theology and Mission* 39, no. 2 (2012): 131-138.
- Brown, William P. *The Seven Pillars of Creation: The Bible, Science, and the Ecology of Wonder*. New York: Oxford University Press, 2010.
- Edwards, Denis. *Deep Incarnation: God's Redemptive Suffering with Creatures*. Maryknoll, NY: Orbis Books, 2019.
- Edwards, Denis. "The Attractor and the Energy of Love: Trinity in Evolutionary and Ecological Context." *The Ecumenical Review* 65, no. 1 (March 2013): 129-144.
- Johnson, Elizabeth A. *Ask the Beasts: Darwin and the God of Love*. London: Bloomsbury, 2014.
- Levi, Primo. *The Drowned and the Saved*. New York: Vintage International, 1989.
- Schutz, Paul J. "Cultivating a 'Cosmic Perspective' in Theology: Reading William R. Stoeger with Laudato Si'." *Theological Studies* 80, no. 4 (2019): 798-821.