Beth Stovell

Matthew Morris

Article

DOI: https://doi.org/10.56315/PSCF12-22Stovell

Taxonomic Theology: An Interdisciplinary Approach to a Bibiblical and Biological Theology of Naming

Beth Stovell and Matthew Morris

Taxonomic theology couples a biblical theology of naming with the science of taxonomy to highlight resonances between these disciplines while encouraging fruitful avenues of ethical and theological exploration around the naming of living things. Categories of discussion include the creative, relational, and protective aspects of taxonomy, embedded in a biblical theology of image, stewardship, worship, and blessing. Taxonomic theology offers insights for the taxonomist, the theologian, and the Church as a way to move from theory to practice.

Keywords: Genesis, creator, creation care, Adam, hermeneutics, taxonomy, folk taxonomy, evolution, conservation

In Genesis 2, God creates all "living creatures," brings them to Adam, and asks him to name them. Thus begins the story of taxonomy grounded in the biblical narrative. This article brings together a biblical scholar and an evolutionary biologist to draw an interdisciplinary picture of naming—what we have termed "taxonomic theology." The term "taxonomic theology" indicates that our exploration concerns both questions of taxonomy from a scientific perspective and questions of theology around naming from a biblical perspective. By combining these terms "taxonomy" and "theology" into one, our goal is to show that these two topics associated with naming are mutually informing. In doing so, this interdisciplinary work offers insights into potential theological and ethical responses arising from a deeper examination of naming in biblical and biological disciplines.

The first section of this article will draw on Genesis 2 and the broader frameworks of naming and care for "living creatures" to form a biblical theology of naming. The second section will then delve into the scientific implications of naming as a Christian mandate, exploring the relational, creative, and protective implications of naming from the perspective of evolutionary biology. The article will conclude with a dialogical section in which biology engages theology and theology responds to biology toward a taxonomic theology for Christians today.

A Biblical Theology of Naming

Genesis 2:19–20 describes how God brings the animals ("living creatures") before Adam and Adam names them.

Beth M. Stovell *is Professor of Old Testament and Chair of General Theological Studies at Ambrose University in Calgary, AB, Canada. Her books include* Mapping Metaphorical Discourse in the Fourth Gospel *(2012),* The Book of the Twelve *(co-written with David Fuller, 2022), and* Biblical Hermeneutics: Five Views *(co-edited with Stanley E. Porter, 2012).*

Matthew R. J. Morris *is Associate Professor and Cochair of Biology at Ambrose University in Calgary, AB, Canada. He has most recently authored field guides on the freshwater fishes of Montana, Minnesota, and Texas.*

When we read this depiction of Adam naming the animals in the broader context of Genesis 1–2 and the rest of scripture, it provides several key biblical insights about the value of naming in the Bible that have implications for a taxonomy today.

Naming Is a God-Given Human Affinity

While historically a common way of approaching Genesis 2:19–20 has been to focus on Adam's authority in naming or on the inadequacy of animals for Adam's mate, this approach has led to many questions among recent biblical scholars about whether the context actually warrants such a reading.[1] Others have argued that it is better to read the Hebrew word *adam* in this passage in light of the universal use of the term rather than the specific use. The universal use of *adam* focuses on *adam* as "humanity" rather than the specific use of the figure "Adam," a male person.[2] When one reads this verse with all of humanity in mind, it points to God's call to all humanity to name the living creatures that surround them. This would depict naming as a human capacity given by God that we could expect to see across all cultures around the world. As David Clough explains,

> Adam's action has often been interpreted as an indication of power over other creatures, but the giving of a name to each animal rather suggests attention to its particularity. Adam's attempt to comprehend the fellow creatures he found about him has echoed through human history by attempts to order creaturely diversity.[3]

This reading aligns well with scientific research that shows the universal quality of human naming of nature. As Carol Kaesuk Yoon explains in her *Naming Nature,* folk taxonomy shows us that the desire to name the created world is cross-cultural, lying in the deep recesses of a shared human need. This human need is further evidenced in the research on damage done to the organizational parts of human brains, showing a specific part of the brain where the categorization of living things resides.[4]

Biblical scholars have also emphasized not only the care associated with *adam's* naming of the animals, but also *adam*'s knowledge. For example, Tremper Longman III focuses on the unique relationship between human speech in the act of naming in comparison to the lack of speech in animals. Longman states:

> Naming is a unique ability of humanity among all of God's creatures, indicating language and the ability to categorize. As Alter puts it, "Man is superior to all other living creatures because only he can invent language, only he has the level of consciousness that makes him capable of linguistic ordering."[5]

From a biblical perspective, this reading of Genesis 2:20 fits with the broader context of Genesis 1–2. Genesis 1 pictures God's creation of humanity, male and female (Gen. 1:27), and then God commands them to care for the world God created (Gen. 1:28). Both humans and nonhuman life are called to be fruitful, multiply, and fill God's creation (a blessing to marine and bird life in Gen. 1:22 and to humans in Gen. 1:28). Yet in Genesis 1:28, 2:15, and 2:20, God calls upon humanity to do more. As Moo and Moo tell us,

> The command for human beings to "rule" over other creatures (Gen. 1:26, 28), the charge to "work … and take care of" the garden (Gen. 2:15), and Adam's naming of the animals (Gen. 2:19–20) all serve to challenge us to undertake study of the world and to come to know it as well as we can so that we might appropriately rule in it and serve our Creator well.[6]

If humans are called by God to study the world and name the elements of creation, then the call described by Moo and Moo includes both the scientific forms of naming that we find in taxonomy and the broader forms of common naming found in the natural world. If this desire to name is God given, then the naming processes we use should be God directed and shaped by Christian ethical principles that are consistent with God's vision for care for God's good creation.

Naming Is Part of Stewardship of God's Good Creation

Recently scholars of Genesis have focused on the call to steward God's creation throughout Genesis 1–2.[7] This view of stewardship gives the actions of naming in Genesis 2:19–20 a wider context that helps inform how we read the implications of *adam's* act of naming the animals (living creatures). First, Genesis 1–2 provides us with a picture of both animals and humans as "living creatures" (in Hebrew *nephesh khayyah*). The creation of animals as "living creatures" is mirrored in the creation of *adam* as a "living creature."

The same Hebrew phrase *nephesh khayyah* meaning "living creature(s)" in Genesis 1:20, 24, 30 and 2:19 is the phrase used of *adam* in 2:7. Similarly, the wild animals are "made from the ground" (2:19) and *adam* is "made from the ground" (2:7) (again the Hebrew phrase is identical). There is much that suggests that Genesis 2:7 and 2:19 should be read in close relationship to one another. This universal figure *adam,* as a human made from the ground (like the wild animals), is a "living creature," and is then asked to name the other "living creatures." Our translations tend to obscure this by calling Adam a "living being" rather than a "living creature" (Gen. 2:7) when God's breath fills him. But the phrase in Hebrew is the same. This has implications for the goals of creation care that seeks good not only for human and animal life, but even more broadly for all "living creatures."

Humanity (*adam*) is not only described like the animals around them, but they are then called to name those "living creatures" as part of the larger call to "work … and take care of the garden" (Gen. 2:15). Moo and Moo state,

> It is unsurprising that the very first thing Adam does in Genesis 2:19–20 is to name the animals. To name is to begin to know; if Adam is to serve and protect the garden and rule over other creatures, he needs first to be able to name them.[8]

Thus, Moo and Moo read the call to name not as primarily about authority and domination, but instead as a sign of knowing for the purpose of caring and protecting the created world.

Whether our naming of the created world comes in the form of common naming practices or scientific taxonomy, the biblical picture in Genesis 1–2 shows us that such naming is guided by a desire to serve and protect the goodness of God's creation.

Naming Should Reflect God's Glory Rather Than Function as a Quest for Human Fame

The same language used to describe the naming of the animals in Genesis 2:19–20 is found in other parts of Genesis. These other uses of this naming formula help us better understand the role of naming in scripture more broadly. This approach examines instances of similar linguistic structures of naming as a guide for thinking not only about naming of animals, but also about broader conceptions of naming in Genesis and in other parts of the Old (and New) Testament.

First, Genesis 5:2 describes how God created male and female and named them "human." This verse repeats the same language of naming found in Genesis 2:19–20, which uses the phrase "call" (*qara*) + "name" (*shem*). In other parts of Genesis, first the people (Gen. 4:26), then Abram (12:8, 13:4) "call on the name of the Lord" (NIV). In Hebrew, the language in Genesis 2:19–20 of *adam* calling animals by name (*qara* + *shem*) is the same phrase as calling on the name of the Lord, but now the word "Lord" (*YHWH*) is included in this phrase (*qara* + *shem* + *YHWH*). Moo and Moo have noted that this connection between Genesis 2:19–20 and these other parts of Genesis suggests that the act of naming is associated with the act of worshiping God.[9] This view of naming would be consistent with the larger themes of the Name of the Lord found throughout the Old Testament, where the Name of the Lord aligns someone or something as a form of memory of the Lord and a form of ownership. The Lord's Name claims this person, place, or thing as God's own and as a testament to God.[10] Thus, naming reflects God's glory in his creation of the name bearer.

Another use of a naming formula can be found in Genesis 11. However, this example of naming shows a stark alternative vision from that of Genesis 5. Instead of using naming for God's glory, humans use naming for their own fame. In Genesis 11:4, the people of Babel say, "Come let us build ourselves a city … so that we may *make a name for ourselves*." The Hebrew indicates something important about the use of naming. Rather than being name bearers or naming animals for the purpose of care and protection, the people of Babel have chosen to make a name for themselves. Here a reflexive form of the Hebrew verb *asah* (to make for themselves) is used with *shem* (name). This reflexive form flips the order of naming: instead of God making creatures and asking humans to name them as we find in Genesis 1–2, humans are trying to *make* a name for *themselves*.[11] The result of this action is that human communication is dissolved as languages multiply. While Acts 2 will overturn the cursing aspect of Genesis 11, as the Holy Spirit speaks to the people present in their multitude of languages,[12] nonetheless, the removal of human communication in Genesis 11 acts as punishment for the inverted ways of naming practiced by the people of Babel.

In response to the people trying to make a name for themselves, God scatters the languages and instead

"calls a name" of Babel (again using *qara* + *shem*) (Gen. 11:9). While the Hebrew does not specifically include the subject who names the city here, at least one interpretation of this verse is that God retakes the role of naming of this city.[13] Rather than the city and its tower making a name for the people that gives them fame, God calls the city by a name to remember the problems created by the people because of their lust for their own glory. This leads to another biblical insight valuable for taxonomy: if the goal of taxonomy becomes the praise of the scientist rather than the honoring and protecting of God's creation, then a Christian approach to taxonomy has lost its way.

Naming Emphasizes the Importance of What Is Named and Stamps the Name Bearer as God's Whereas Removing a Name Represents a Curse

Throughout the Old and New Testament, the act of naming has significance for the name bearer and for those who hear of the name bearer and their name. Isaiah 40:26 tells the story of God making the starry host and naming them. A similar theme of creation and naming is in Isaiah 43:1, describing the creation and formation of Jacob/Israel and the summoning by their name, to show that they belong to God. Isaiah 43:7 continues this theme of creation and naming. Now all whom God "created for [his] glory" and "formed and made" are "called by [his] name." In prophetic literature and in the Gospels, naming can be associated with God's activity in a person's life and/or in the lives of God's people.[14] Thus, naming is more than an objective process that is separated from the name bearer: naming marks a person or creature or place as God's and thereby points to their importance and value.

In contrast, throughout the Old and New Testament, the removal of names functions as a curse. In Deuteronomy, a common curse is the removal of a name, often described as "blotting out their name" or "wiping out their name" (Deut. 7:24; 9:14; 12:3; 29:20). Joshua 7:9 continues this notion of blotting out names with the Canaanites.[15] Revelation 3:5 describes the hope for God's people in terms of a reversal of this curse: "The one who is victorious will, like them, be dressed in white. I will never blot out the name of that person from the book of life, but will acknowledge that name before my Father and his angels" (NIV). Here, in Revelation 3, we see the opposite of the curses in Deuteronomy and Joshua: the victorious one (in Christ) will never have their name blotted out from the book of life; instead, Christ will acknowledge their name before his Father and his angels. Thus, Revelation 3 emphasizes the themes we have pointed to above: giving a name and acknowledging that name point to the value and importance of the name bearer, while removal of that name is a path toward death.[16] This has important implications for modern taxonomy when naming or removing names can mean the difference between life and death for a species.

Thus, throughout the Old and New Testaments, naming matters. Naming in scripture points to naming as a God-given human affinity. This human affinity comes with blessings as well as responsibilities. Humans are called by God through naming to be stewards of God's good creation, serving and protecting it. Humans must avoid the tendency to use naming to try to make their own names great and instead give glory to God's name through their actions. In scripture, naming emphasizes the importance of what is named as it stamps the name bearer as God's. In contrast, removing a name represents a curse that has the potential for death. Each of these aspects of a biblical theology of naming has implications for scientific naming, as we will further explore below.

Taxonomy and the Biology of Naming

The science of taxonomy and its allied systems of nomenclature, the pursuit of naming and categorizing living things, is one of the earliest fields of modern biology.[17] Although Linnaeus, sometimes referred to as the "second Adam,"[18] was not the first to categorize the natural world, his method had several advantages over previous attempts, including brevity and coherence. The scientific enterprise of naming that he pioneered is distinct from, but has important resonances with, a biblical theology of naming. In this section, a biologist will describe the enterprise and significance of the science of naming. The focus on taxonomy is not to suggest that Adam was a taxonomist, nor is it to suggest that nonexperts cannot develop their own names for things; rather, it is to highlight parallels between biblical naming and the systematic methodology for naming employed by scientists. Other systems for naming creatures likely follow similar principles, such as indigenous names for species, names given to foods,[19] labels such as "native," "alien," and "weed."

The Rules of Naming

Living things can receive an assortment of geographically or culturally specific names. Consider, for instance, the sockeye salmon. It can be called alevin, fry, parr, smolt, or jack depending on the lifestage or sex of the fish; Kokanee or little redfish, if it inhabits lakes; red or blueback salmon, depending on cultural norms; and lox, when its flesh is cured in brine—and these are just the English names.[20] Before Linnaeus systematized naming, if one naturalist wished to write about a species with a broad geographic range, there was no guarantee that other naturalists would recognize the common name that the former had used, potentially resulting in the "discovery" of the same species multiple times, under different names.[21] Indeed, pre-Linnaean documents can include species names that are difficult to reconcile with known species. What was the *dag gadol* that swallowed Jonah?

Early attempts at providing a scientific, normalized name did not help matters, with a single species name being a Latin description of its salient features: a single name could involve several dense lines of Latin.[22] Linnaeus's gift to taxonomy was to formalize an organizational system that could cut through both the diversity of vernacular names and the stultifying length of scientific names. The system of binomial[23] nomenclature was developed, wherein a species would receive a genus name, positioning it within the scheme of life, and a specific epithet.[24] In much the same way that Western human names tend to identify someone based on a family name (e.g., Edwards), and further identify the individual within the family (e.g., Jonathan Edwards),[25] so the wolf could be called *Canis lupus*, identifying it as something distinct (*lupus*) within a larger grouping (*Canis*). This simple rule brought order to a world of biological diversity that was becoming increasingly chaotic as explorers returned with exotic species that did not easily fit known categories.[26]

Linnaeus's system quickly became the dominant means of naming living things, but it was not without its difficulties. What should be done if two people named the same creature with different Latin binomials? What should happen if closer inspection of a species demonstrated there were, in fact, two species under one name? What if the species had been placed in the wrong genus? Taxonomy proved to be unlike other biological disciplines, in that it required the creation of firm rules of conduct in order to prevent slipping back into pre-Linnaean confusion.[27]

Today, rules for animal naming are governed by the International Commission on Zoological Nomenclature (ICZN), while plant, fungal, and algal naming are governed by the International Botanical Congress.[28] Each organization has its own code with distinct rules. Nomenclatural codes read like legalese, but their general purposes are to maintain order in the world of naming.

In brief, the rules of taxonomy include the following:

1. the use of binomial nomenclature;
2. the exclusive use of the English alphabet in species names, typically free of accents, punctuations, or other symbols;
3. valid species names must be published, with the date of publication set as the date of naming (and there are rules about what constitutes a publication);
4. those who name species are recognized for their work within the full species name;[29]
5. priority is given to those who published first, with limits set on how far back in time one may go to seek the "first" publication;
6. the process to follow if species names are changed;
7. what constitutes a valid species name, and what to do with names no longer in use;
8. the connection of a name to a physical specimen of the thing named, what is referred to as a type specimen.[30]

What is missing from the above list are rules regarding the semantic content of the name itself. Taxonomists utilize a philosophy of naming wherein species are considered individuals,[31] such that names are for referential purposes and are otherwise devoid of semantic content.[32] Thus the specific epithet of *Chaeropus ecaudatus* means "without tail"; no matter that the bandicoot does indeed have a tail.[33] Absurd names are also possible, such as the wasp *Aha ha* and the fish genus (appropriately now discarded to the realm of synonymy) *Sayonara*.[34] By ensuring that semantic content does not matter, order in naming is maintained; names do not need to be constantly updated to match our understanding of the natural history of a species.

Of paramount importance is the notion of the type specimen,[35] the original individual organism that was described in the first publication. This individual

becomes the name bearer for the species,[36] such that if the species is divided into two separate species, all individuals grouped with the type specimen retain the original species designation, while a new type specimen is determined for the new species.[37]

Also missing are rules defining what a species is, which gives taxonomists freedom to name things in the absence of evolutionary data. Collectively, the rules of taxonomy ensure consistency in naming practices, while allowing names to be testable hypotheses that can be revised as knowledge of evolutionary relationships change. Although the rules themselves are quite dry, the act of naming, as described by taxonomists, is creative, relational, and protective.

Naming Is a Creative Act

Despite what one might find in a natural history museum, creatures do not come nicely labeled. On the coast of British Columbia, one could be excused for believing that there is only one species of crow, the American crow (*Corvus brachyrhynchos*, literally "short-beaked crow"). Yet, ornithologists told us, at least until 2020, that there was a second species, identical in all appearances to the first: the northwestern crow (*Corvus caurinus*, literally "crow of the northwest wind"). What distinguished these species was their call;[38] molecular research determined that these species were genetically distinct, having split around 381,000 years ago.[39] When naming species, taxonomists are constantly faced with making decisions about what features are worthy of consideration. Was song, in the absence of other differences, enough to name a new species of crow? When making such judgments, taxonomists become creators of the natural world. Naming is a mix of philosophy (what is a species?), the uncovering of evolutionary relationships (systematics), and creative intuition about what is worthy of naming. Even when true evolutionary relationships are determined, creative decisions need to be made about which clusters of shared ancestry require unique names, and which do not.

It might seem odd to think of naming as an act of creation. Isn't God, through the evolutionary process, the species-creator, and aren't we simply the observers of species differences? Yet there are several practical reasons for considering the human participant as creator during the act of naming: naming brings order out of chaos; it brings species into existence to the human mind; and it is an act of intuitive creativity that seeks to stabilize a shifting world.

We have already discussed the rules of naming. These rules became increasingly important as Western naturalists encountered creatures on other continents that defied local naming customs. Different languages, different naming practices, and new species with strange physical features all conspired to subvert what had seemed like an organized natural world. The chaos of biodiversity threatened to overwhelm naturalists, as there became more species within each group than any one person could know in their lifetime. Scientific names for the same creature were published in different journals, in different regions, and under different languages. The rules were a creative act of organization, ordering the scientific enterprise of naming so that the denizens of this world could be properly organized, named, and known.

Naming not only organizes the natural world, it also brings beings into existence for the human observer. Any two individuals within a species differ phenotypically from one another. It is therefore not always immediately apparent which phenotypic differences are relevant for demarcating species; it takes careful observation and training to learn how to see relevant differences. For the lay person, these relevant differences are missed—until pointed out. In botany, this is termed "plant blindness," an inability by the general public, who lack training in botanical names, to see the diversity that surrounds them,[40] and it almost certainly applies to the world of insects, fish, fungi, and other noncharismatic animals.

Taxonomy helps overcome biodiversity blindness. Experts, through extensive training, see more clearly the relevant demarcators of a species, and help guide us to see the world as they do. Biodiversity that we missed suddenly becomes real to us, and this has real implications for our behaviors, including proper management of commercially important species. In a very real way, the taxonomist, when naming a new species, has brought it into existence to the human mind. The key here is that the creature need not, in reality, exist. So long as it has a name, it is real to *us*, and can be protected, studied, and loved.[41] The northwestern crow, we now know, is not a real species,[42] but its lack of reality now does not change the fact that it was very real to birders who for decades listened closely for the song that demarcated it from

its presumed relatives. Taxonomists giveth, and taxonomists taketh away; this is truly a creative act. Taxonomists change species names not only to update evolutionary relationships, but also because they disagree with the creative decisions employed by previous taxonomists.

Although the history of taxonomy has involved an increase in quantitative rigor, there is no replacement for the gut-level intuition that taxonomists develop over decades of observing individual organisms.[43] Evolution throws a curve ball in that the very thing we seek to name––the species––does not have a single robust definition.[44] The reason for this is that speciation is a process that can be muddied by convergent evolution,[45] hybridization, raceme models of evolution,[46] incomplete speciation, and horizontal gene flow.[47] Furthermore, speciation may involve physiological or cryptic phenotypes that we are unable to directly observe. Taxonomists therefore have to choose whether reproduction, morphology, ecological niche, evolutionary ancestry, or some other criterion should apply in any given case as justification for naming new species.[48] A recent book on taxonomy was entitled *The Art of Naming* precisely because the ability to identify those differences that biologically matter versus those differences that are tangential, involves creativity.[49] Thus taxa are constantly being revised and renamed, not simply because our understanding of evolution changes, but also because any two researchers may take a different creative approach to naming.

Disagreements on species boundaries can lead to the need for authoritative bodies to democratically vote on and maintain local species lists. The American Ornithological Society, for instance, maintains bird names in the United States, and recently voted, citing genetic and hybridization data, to strip the northwestern crow of its species status.[50] Intuition leads different researchers to different conclusions; democracy is required to ensure some degree of consistency so that research can continue. When there is no consensus, fierce debates arise between the "lumpers," who see one species with many populations, and the "splitters," who view each population as its own distinct species.[51] This lack of agreement reflects differences in human temperament, but has significant implications, particularly when a splitter wrote your field guide to poisonous snakes of the region but a lumper labeled the hospital's antivenom.[52] Incredibly, the rules of taxonomy are not designed to arbitrate between such differences of opinion.

Naming Is a Relational Act

We name what we love; this works well for charismatic species that are generally of interest to the public. J.B.S Haldane is famously believed to have said, "God has an inordinate fondness for beetles," remarking on the tremendous diversity of beetles that exists.[53] One could more accurately say that taxonomists have an inordinate fondness for beetles, and so have given more names to beetles than to any other taxa; estimates suggest there are actually more species of microwasps than beetles on this planet,[54] but substantially fewer people to love them. We need experts who can devote their lives to describing, naming, and generally being in relationship with those organisms the public pays less attention to. Unfortunately, these taxonomists are themselves becoming an endangered species.

Prior to DNA barcoding, naming required being in close proximity to the organism being named. It required careful observation, noticing the slightest variation in the minutest organs, casting aside those variations deemed uninformative and tallying up those that truly mattered. A taxonomist could devote their life to one group of organisms. Darwin famously began a year of work on barnacle taxonomy that ended up devouring a better part of a decade;[55] many taxonomists will spend their lives on one genus of rove beetle or one family of flowering plant.[56] They come to know these creatures better than anyone else ever has or likely ever will; from this relationship flows the name. We should resist, however, from overly romanticizing this endeavor; taxonomists can be just as overworked and overwhelmed as anyone else. Those that choose particularly difficult or obscure groups have been known to produce names that express a relationship, but not always one of love. The ground beetle *Agra vation* comes to mind.[57]

DNA barcoding, which relies on sequencing particular regions of DNA and delineating new species based on the extent to which DNA sequences differ among populations,[58] has threatened to overturn the relational aspect of naming. The focus on molecular work has resulted in the discovery of many cryptic species. These cryptic species are often given informal lineage names constituting letters and numbers—little more than gobbledygook to the

layperson—and then little more is done. It is even worse when environmental samples have their DNA sequenced and completely unknown genetic lineages are discovered, but the specimens themselves are then destroyed or lost and the creature connected with the DNA remains unseen.[59] Such newly discovered lineages are piling up at alarming rates, while the taxonomic expertise to observe and name the bearers of this DNA ages into retirement.[60] Zoology is finding itself now with zoologists trained in molecular genetics but not in taxonomy, and the knowledge gap is starting to be felt. There are creatures awaiting names and no skilled personnel to love them. Without names, there is little that governments can do to protect these unnamed creatures.

Naming Is a Protective Act

Naming is not only creative and relational; it is also protective. Although the discipline of taxonomy itself is not explicitly protective, the consequence of taxonomy is management and protection of the thing that was named; for many taxonomists, protection is one of their goals.[61] We can protect only what we know exists; we know that something exists only when experts have signaled that it is worthy of a name. Although this is true of common names—we could identify some particular individual plant in the field, give it a name, and feel a sense of responsibility for the thing we have named—scientific names have special legislative status that gives such naming practical significance.

When the peoples of Lake Sammamish in the state of Washington appealed to have their local population of Kokanee salmon recognized as a unique species, they did so knowing that any local name they gave to the fish had no legislative teeth.[62] Scientists needed to give the fish a name in order to apply the Endangered Species Act. Without a special dispensation from the scientists, there would be no federal protection for a declining fish stock with local significance. Applying these protections is another thing: many species are on the verge of extinction despite being named, and yet they thrived under their own folk taxonomies.[63]

The relationship between protection and naming is so powerful that exceptions are made to the otherwise inviolate rules of naming. If a species is on the cusp of extinction, there are grounds to protect that species name even if the science of taxonomy suggests the species belongs to a different genus than it is currently in, or the rule of priority has uncovered an earlier name to which it actually belongs. The problem is that legislation is slow to catch up with changes to species names, and it is the names, not the individual creatures, that are legally protected.[64] A valid name change could remove a species from legal protection if the former name is what is listed.

In exceptional cases, species can retain their name even after evolving to something new. The Florida panther (*Panthera concolor cougar*), after suffering population collapse followed by excessive inbreeding, was intentionally hybridized with a nearby subspecies (*Panthera concolor concolor*), altering the genetic constitution of the population such that it was no longer the Florida panther subspecies. This should have stripped the Florida panther of its legal protections, but conservationists worked with the government to ensure that these hybrids retained their subspecies status and therefore their legal protections.[65]

Must naming always be protective? After all, we certainly name creatures that are not typically loved, such as human parasites. In such cases, naming would seem to be a destructive act; once named, we can better study something in order to eliminate it. In the opinion of this author, however, such exceptions prove the rule. Indeed, naming of parasites, viruses, and other members of nature's "rogue gallery" can be a protective act in multiple ways which include the following:

(1) Naming parasites, pests, and viruses is still often an act of love by those who do the naming. Speak to a tapeworm researcher and you will find profound awe and respect for the creature being named, and a real sense of loss if tapeworms were to go extinct.[66] The adaptations that parasites demonstrate can be breathtaking, but would not be discovered if they were not first named.[67]

(2) Even if a pest were to be named for the purposes of destruction, this can have the effect of protecting other species, by developing targeted destructive techniques that reduce incidental mortality.[68]

(3) Scientists have had the opportunity to eliminate one named pathogen, the smallpox virus, but they have controversially refused to do so.[69] We have certainly unintentionally driven species to extinction, but the scientific community does not appear to have the will to intentionally direct

extinctions, so even naming the undesirable is an act of protection.

Where naming may be destructive, and even chaotic, is in the unnecessary lumping or splitting of species conducted by researchers more interested in publications than in reality.

One could argue that recent pushes for ecosystem conservation, rather than species conservation, will reduce the protective consequences of naming. We are doubtful that this will be true. To understand if ecosystem conservation is working, the desired outcome of biodiversity conservation will need to be assessed, which, in turn, will require having names for the creatures contained therein. Naming, then, is the first step in providing the data to justify continued ecosystem management.

A Dialogical Response: Scientist to Theologian and Theologian to Scientist

Identifying the biblical and biological aspects of naming is an important start to greater understanding of the value of naming. Yet, in order to take this exploration a step further, it is helpful to create a dialogue between biology and theology. In this section, we explore how biology responds to theology and how theology responds to biology around the concept of naming. Our biologist explores how the biblical theology of naming creates pathways for a scientific approach to naming and our theologian explores how a scientific approach to naming results in new directions in theology.

Biology Responds to Theology

A theology of naming has clear resonances with the aspects of taxonomy described above:

Naming is a God-given human affinity.

A biblical hermeneutic that understands Adam as the everyperson has profound implications for taxonomy as a Christian—indeed, human—vocation. Too often Christian biology professors encounter budding ecology students who have been warned against entering biology by well-intended members of the church, for fear that they will be wasting their time on trivial pursuits, or will lose their faith as they undergo secular training. To communicate that naming is a God-given responsibility, and that being made in the image of God includes the vocation of naming in order to better love and protect that which God loves and protects, helps to bridge the too-often contentious divide between science and faith.

However, this also raises some interesting questions about the relationship between adamic naming and the science of taxonomy. It is not obvious that Adam's naming is equivalent to scientific naming. Those culturally rooted names that were the source of confusion for the biologist embody God's calling; the Christian taxonomist should be inclined to respect local naming practices while recognizing the legislative need for scientific names.

Given that the affinity for naming nature is a part of what makes us human,[70] one must ask how such an affinity first evolved. There is, perhaps, a difference between capacity and responsibility; other living things have the capacity to categorize the natural world without being given the responsibility to care for it. Although it is difficult to study this adequately, research on various vertebrates has shown that animals can use vocal cues to communicate about other species they have encountered. Chickadees, for instance, use different calls to identify and communicate about different types of predators, and these communications can lead to action even in unrelated eavesdroppers such as nuthatches.[71] Whether such sounds constitute *names* is less clear. Although only humans are called to steward, it would appear the faculty for naming has a fitness-related component that permitted its first appearance in nonhuman animals.

Naming is part of stewardship of God's good creation.

The rules of scientific naming do not explicitly include protection as an outcome of naming. Instead, protection is an outcome of legislation that recognizes scientific names over vernacular names. If naming itself is a part of caring for creation, then perhaps the Christian taxonomist will want to think carefully about the relationship between the content of a name and the ability to protect the creature so-named. The Slovenian blind cave beetle *Anophthalmus hitleri* has no connection to Hitler. It has no mustache-like markings on its side; it was not discovered by Hitler nor did he own one as a pet. Rather, an amateur entomologist discovered this creature in 1933 and named it after his Führer. No rule forbids this; the content of the name does not matter. Unfortunately, this name has spelled disaster for the beetle, with an extensive black market trade in this species, driven by Nazi

enthusiasts.[72] The Christian taxonomist needs to give careful consideration to the semantic content of the name.

Naming should reflect God's glory rather than function as a quest for human fame.

The theology of naming shows that taxonomy has some work to do to atone for past, and ongoing, mistakes. Although the semantic content of a name is not supposed to matter, a biblical theology of naming indicates that to some extent it does, since naming is an act of worship. It is not clear how far one should take this principle. Taxonomists have been in the habit of giving creatures flippant or bawdy names; they have named creatures after other gods and goddesses; they have named less desirable creatures after people they had grievances with;[73] they have used naming as a means to elevate their own status—whether naming organisms after their patrons, people they wanted to be in good relationship with, or even themselves (this last, an acknowledged cardinal sin in taxonomy); and they have used naming to make money, selling naming rights to the highest bidder and turning species names into product placements.[74] The specific epithet of the monkey *Callicebus aureipalatii* means "golden palace," a name chosen by the online casino GoldenPalace.com after they successfully won a bid for naming rights.[75] Is this best practice in taxonomy? There are no rules preventing any of these things. We do not want to suggest that all such practices are wrong (surely God appreciates the wasp name *Aha ha*), and surely there is a place to name organisms after culturally significant stories and people. The religious taxonomist, however, might wish to think seriously about which naming practices best bring glory to God.

The temptation for fame is a real one in taxonomy. Besides naming species with the hope of being noticed, certain taxonomists have taken splitting to a new level. These rogue scientists search the literature for descriptions of populations with some morphological or genetic distinctions, and then give these populations new species names in their self-published journals. They abide by all of the rules, yet sow confusion while growing their list of publications.[76] Such unregulated misbehavior has been termed "taxonomic vandalism"; it is a real threat to conservation.[77]

Similarly, there is a growing call to recognize that taxonomy has perpetrated a form of colonial violence against indigenous peoples by "discovering" species already bearing names, and renaming them in the image of the colonial power. A recent paper has suggested that 95% of recently named birds came from the global South, yet were named by and after individuals from the global North.[78] Species with vernacular names that bear colonial overtones are being renamed, while newly discovered species are receiving scientific names that honor or are in the language of the surrounding culture.[79] It is likely that there will be resistance to altering time-honored scientific names that have colonialist overtones; but even if the semantic content of a name has no bearing on the organism, it can surely affect the people we are called to love. The religious taxonomist may wish to think carefully about rectifying past names that were made for the glory of the discoverer.

Naming stamps the name bearer as God's whereas removing names represents a curse.

The relationship between naming and removing names, or even refusing to name, has implications for taxonomy. It is not clear if we are to interpret Adam's naming of the animals as Adam giving names to each species, or to each individual organism, or to neither; God names both groups and individuals. Conservation efforts typically revolve around saving populations, not individuals, but there are voices in environmental ethics who would argue that the individual creature, regardless of conservation status, has value and should be protected.[80] Does God have names for individual creatures in the same way he does for individual humans?

What about those creatures that lack scientific names, and so do not warrant protection? Many naturally occurring animal hybrids inhabit the strange no-man's land of naming and protection.[81] Hybrids are the result of reproduction between two species. Sometimes these hybrids are fertile and can persist indefinitely in the wild. They may even be better adapted to their local environments than the native species. Some hybrids are deemed worthy of protection because they provide some advantage, such as hybrid food crops or recreational fishes such as splake (hybrid between lake and brook trout). In other cases, hybrids are destroyed as genetically impure members of a protected species.[82] Hybridization is an important evolutionary occurrence, yet hybrids of protected species apparently have no right to live; losing a species name through hybridization appears to be a curse to the individual.

Domestic organisms, like hybrids, straddle unusual areas within naming.[83] Many creatures, which in the wild would be considered separate species, are grouped together because of the speed at which they evolved, resulting in biologists often ignoring the significance of domestic animals. Indeed, the popular citizen science app *iNaturalist* requires that photographs of cultivated or domestic species be specially flagged so that they do not interfere with "research-grade" identifications, the result being a diminishment in the significance of such creatures as components of urban biodiversity. Laboratory strains can similarly be genetically distinct from their wild counterparts; are they worthy of naming? Do modern naming conventions of laboratory animals (for example, FVB/NTac) devalue them as beings of worth? Advanced techniques have now permitted the "synthetic speciation" of genetically modified organisms,[84] with some beings, such as the frog-derived xenobots,[85] having no natural counterparts. How names are bestowed on such beings, and our responsibilities toward them, is a pressing concern that warrants further attention.

Thus, science has much to learn from a theology of naming, while at the same time raising important issues for theological reflection. The lines between the two disciplines are not always without additional questions, but together they mutually encourage new approaches to our thought and responses to naming.

Theology Responds to Biology

In recent years, a growing number of theologians have explored the influence of science on theology, but few have explored how a scientific approach to naming affects theology specifically. Here are a few ways in which the scientific approach provided above can affect new avenues of theological research and Christian response.

Naming is a creative act.

The creative nature of naming in taxonomy has theological significance. First, theological discussions of creativity begin with God's act of creation as foundational for our own creativity. God the creator makes his creatures creative beings.[86] Throughout the Old and New Testament, God's Spirit fills or falls upon those who create and those who speak and write, reflecting aspects of God's work in the world. Modern theologians have argued that this connection, between God as creator and human creation, continues today.[87] As biblical scholar Richard Hess explains, the figures of Bezalel and Oholiab in Exodus 31 not only receive God's Spirit in order to build the tabernacle and epitomize the spirit of creativity, their names also capture the creative work that God has asked them to undertake. By comparing these two names to ancient Near Eastern naming practices, Hess highlights how Bezalel means "in the shadow of God," which points to God's protection and care over Bezalel's life and actions; Oholiab means "the tabernacle of the Father," which equally points to God's fatherly protection over Ohaliab's life and Ohaliab's specific role as tabernacle maker.[88]

Recent research in theology has focused on the way that creativity connects to what it means for human beings to be human.[89] While much of this research has focused on how theology relates to creativity in the arts, this is a space where scientists are like artists as they exercise their creativity in naming. In this way, scientists and artists alike partake in God's goals of new creation, a theme and purpose we find throughout the Old Testament and the New Testament.[90]

This creative act of naming in taxonomy gives human beings the opportunity to experience and see God's created world in new ways. As noted above, the blindness humans experience without naming is remedied by the creative act of naming. In naming, humans are then able to better know and care for the creation that God gave them. As taxonomists seek to make static that which is evolving, they also seek to find order in what would otherwise be chaos. Many theologians have noted a theological motif throughout scripture of how God seeks to bring order out of chaos as an act of new creation.[91] Meanwhile, scholars who sit at the crossroads of science and theology have demonstrated how thoughtful explorations of chaos within creation can help us better understand both science and faith.[92] In this way, acknowledging the creative nature of naming in taxonomy builds toward new theological trajectories.

Naming is a relational act.

Genesis 1–2 demonstrates that God's work in creation intended human beings to not only have relationships with one another, but also to form a relationship with the living beings in the world around them. As we noted above, creation care is built on the idea of this relationship as one of responsibility and care for the earth that God created. In

this way, naming is an act of worshiping God. Thus, when we speak about naming what we love, we are also being called by God to love the world that we have been given.

One way that we can respond to God's call is through naming. We may then see this as a recursive spiral: God created us to be in relationship to our world; as we grow in this relationship, we can expand how we care for the world through naming; this naming, in turn, develops a deeper sense of care and protection for the beings that are named; the more we care about the world, the more we are inclined to name it and name it well. In contrast, when we do not care about the world or specifically dislike aspects of the created world, we may be tempted to leave it unnamed or name it based on our preferences. But theological responses to naming ask us to follow Jesus's command to "love your enemies" (Matt. 5:44) and to learn from Jesus's own Incarnation.

Theologians often point to how relationships with one another are founded on the relational nature of the Triune God himself.[93] Recently, theologians such as Denis Edwards have explored how both Trinitarian doctrine and the doctrine of the Incarnation shape how we understand our relationship with the rest of God's created world. Edwards argues for Christians to experience an "ecological conversion." As Edwards explains,

> The conviction that God is the Creator of the universe as well as the Earth and all its creatures is certainly central to Christian Faith. It is, however, part of a much larger picture––one of a God who creates, who gives God's very self to the creation in the incarnation of the Word, and who brings healing and fulfillment to creation.[94]

Thus, God's act of naming as relational is linked to the relational nature of God's act of creation and to God's very relational self and to God's act of Incarnation, which permanently joined divinity to the created world.

Naming is a protective act.

As mentioned in our discussion of naming as relational, the relationships that God has designed for human beings to have with God's creation are both relational and protective. From the start of scripture, God calls us toward care for his creation and the ethical treatment of all life. In this way, theology and ethics are benefited by the taxonomic principles of naming as a protective act. While many theologians and ethicists have explored the relationship between theology, ethics, and ecology in the field of ecotheology, exploring naming as a protective act provides new ways of exploring this topic.

A developing hermeneutical approach to biblical studies is Earth Bible hermeneutics. This hermeneutical approach has developed alongside the wider field of ecotheology. It explores how the physical world and its creatures are represented in scripture and how this reading influences how we understand God's purposes of care and protection for the creation God made.[95] The naming of plant and animal life in scripture has played a role in this form of biblical interpretation. One recent example of how this work has developed is the interdisciplinary project *Dictionary of Nature Imagery of the Bible*. This project brings together scientists who study ancient flora and fauna (archaeo-biologists, -ecologists, -zoologists, -ornithologists, and other scientists) with biblical scholars in order to better understand the biblical imagery within the Bible.[96] This, in turn, has affected how modern Israeli animals are protected. Thus, seeing naming as a protective act in a broader scientific framework has a point of integration with the work of ecotheology, the Earth Bible, and other interdisciplinary hermeneutics already underway.

Conclusion

What does a taxonomic theology of naming add to both the taxonomy and the theology that has come before? This article offers several crucial insights, but it is only a starting point to a broader discussion. There are implications for the practice of taxonomy, theological investigation, and the mission of the church. A few highlights from this article could be summarized as follows:

Taxonomic Theology for Taxonomists

1. Taxonomists who write and reflect on their practice invariably discuss the creative, relational, and protective aspects of their discipline. These categories coincide well with a biblical theology of naming in which God names things into being, in which naming is a sign of intimate knowledge of the thing being named, and in which naming is a prerequisite for proper stewardship. Taxonomic theology can therefore offer a metaphysical rationale for something perceived, but not explained, by the taxonomist.

2. Taxonomic theology suggests that the taxonomist should think beyond the rules of taxonomy to best practice regarding love of God and love of neighbor. Rather than seeking their own glory, they should seek the glory of God, by considering the semantic content of the name of the creature, by resisting the temptation to magnify their own glory through a proliferation of unnecessary species names, and by considering the effect of names on others, including our indigenous neighbors.

3. If naming is truly protective, taxonomists must think deeply about whether folk taxonomies or Western scientific taxonomies are better for protection. Yoon argues that the public has handed naming over to the experts to the detriment of the co-flourishing of humans and nonhuman species.[97] How can we rely on both the expertise of taxonomists and the folk taxonomies of local cultures to better conserve species?

Taxonomic Theology for Theologians

1. Taxonomic theology suggests that theologians need to think more broadly about what is included in the divine callings of God and how this relates to being made in the image of God, moving to a place of inclusion on the naming of living things as part of this divine calling.

2. The naming of less desirable organisms has implications for creativity, relationship, and protection that theologians have not, perhaps, taken as seriously as they should. What does it mean to love both human neighbor and mosquito?

3. More broadly, thinking about taxonomy as a creative act has theological implications for what it means to be creative beings within creation.

4. Taxonomic theology raises questions that span theological and scientific categories: for example, does God love and value the individual organism, or the higher biological taxa? If the former, this has significant implications for creatures on the taxonomic fringes, such as hybrids, domestic organisms, laboratory strains, and synthetic species, that do not receive the same sort of taxonomic considerations and therefore do not receive the same sorts of protection. Theologically, how are we to think about the place of these organisms in God's creation?

Taxonomic Theology for the Church

1. Naming living things is not just a calling for Adam, nor is it restricted to scientific professionals—it is a calling for every person. There is a responsibility for the church to learn the names of the things that surround them in order to better steward those creatures that are directly within their sphere of responsibility. Citizen science apps (for example, eBird, iNaturalist) abound that could help guide church leaders in this direction.

2. Further, seminaries that train future church leaders would benefit from learning more about the value of taxonomic and biological sciences to help church leaders grow in their appreciation of God's creation. In this way, taxonomic theology offers a bridge from the academy to the church that could be helpful for the next generation of church leaders.

3. Evangelicals are underrepresented in the sciences.[98] Taxonomic theology suggests that barriers placed on Christian students entering biology need to be removed so that more Christians can enter taxonomy feeling empowered by the church—that this vocation is, indeed, part of the Christian calling.

In short, taxonomic theology integrates a biblical theology of naming with the scientific discipline of naming, but it resonates beyond both spheres to the practice of the church itself. Such implications of taxonomic theology are only a starting place for such an interdisciplinary idea, as we consider the next steps.

Taxonomic theology shows us that God calls humanity to name the living creatures around them in Genesis 2, and that this desire to name is built into humanity. Naming is a creative act that brings order out of chaos, brings species into existence to the human mind, and is an act of intuition. In naming, humans take part in stewarding God's good creation. Naming creates a relationship between humans and the created world. Naming has ethical implications. Naming should reflect God's glory rather than function as a quest for human fame. Naming should function protectively. Naming emphasizes the importance of what is named, and it stamps the name bearer as God's. Removing a name represents a curse. In this way, naming holds the key to life and death. Thus, we are called to name thoughtfully and carefully and we are called to care for the world and the "living creatures" God has created. ►

Acknowledgments

The writing of this article was funded by the AAAS/DoSER Science for Seminaries grant. We thank our colleagues at Ambrose University who were part of our grant team in providing feedback on the ideas in the article, as well as those who attended our talk at the ASA conference for an extended and fruitful question period. Thanks also to two anonymous reviewers who provided insightful critiques and pushed this article to go further and deeper. We would finally like to thank our respective families who have encouraged our integration of theology and science.

Notes

[1]Scholars such as Wayne Grudem and John Piper and other contributing scholars to recent works on "biblical manhood and womanhood" tend to build much of their arguments of male authority on reading Adam's naming of Eve in Genesis 2 as an act of authority. See Wayne Grudem and John Piper, eds. *Recovering Biblical Manhood and Womanhood: A Response to Evangelical Feminism* (Wheaton, IL: Crossway, 2021). In contrast, scholars such as Tammi Schneider have questioned these assumptions and instead highlighted other implications around Eve's naming and how Eve names her children in *Mothers of Promise: Women in the Book of Genesis* (Grand Rapids, MI: Baker Academic, 2008), 170–74.

[2]Sandra Richter, *Stewards of Eden* explains this notion of adam well. See Sandra Richter, *Stewards of Eden: What the Bible Says about the Environment and Why It Matters* (Downers Grove, IL: IVP Academic, 2020). For more on Adam and naming across interpretive traditions, see Michael E. Stone, "Adam's Naming of the Animals: Naming or Creation?," in *The Poetics of Grammar and the Metaphysics of Sound and Sign, Jerusalem Studies in Religion and Culture 6*, ed. Sergio La Porta and David Shulman (Leiden, Netherlands: Brill, 2007), 69–80.

[3]See David L. Clough, On Animals: Volume 1: Systematic Theology (New York: Bloomsbury, 2014), 51.

[4]See Carol Kaesuk Yoon, *Naming Nature: The Clash Between Instinct and Science* (New York: W.W. Norton, 2009).

5Longman cites Robert Alter, *Art of Biblical Narrative* (New York: Basic, 1981), 44. See Tremper Longman III, *Genesis*, Story of God Bible Commentary (Grand Rapids, MI: Zondervan, 2016), 50.

[6]Douglas Moo and Jonathan Moo, *Creation Care: A Biblical Theology of the Natural World, Biblical Theology for Life* (Grand Rapids, MI: Zondervan, 2018), 50.

[7]Such scholarship may take the form of "creation care" or "environmental" or "ecological" readings of Genesis. Examples of these kinds of readings of Genesis (and scripture more widely) include Moo and Moo, *Creation Care*; Sandra L. Richter, *Epic of Eden: A Christian Entry into the Old Testament* (Downers Grove, IL: IVP Academic, 2008); Richter, *Stewards of Eden*; Nicola Hoggard Creegan and Andrew Shepherd, *Creation and Hope: Reflections on Ecological Anticipation and Action from Aotearoa New Zealand* (Eugene, OR: Wipf and Stock, 2018); and David G. Horrell, Cherryl Hunt, Christopher Southgate, and Francesca Stavrakopoulou, eds., *Ecological Hermeneutics: Biblical, Historical and Theological Perspectives* (New York: T&T Clark, 2010).

[8]Moo and Moo, *Creation Care*, 80.

[9]Moo and Moo, *Creation Care*, 50–51.

[10]See Sandra L. Richter, *The Deuteronomistic History and the Name Theology: Lešakkēn* Šemô Šām *in the Bible and the Ancient Near East*, Beihefte zur Zeitschrift für die alttestamentliche Wissenschaft (Berlin, Germany: Walter de Gruyter, 2002); and Daniel I. Block, "'A Place for My Name': Horeb and Zion in the Mosaic Vision of Israelite Worship," *Journal of the Evangelical Theological Society* 58, no. 2 (2015): 221–47, https://www.galaxie.com//article/jets58-2-01.

[11]Here the verb is not *qara* (to call) + *shem*, but instead *asah* (to make) + *shem*. *Asah* functions in a cohortative best, translated "let us make/do this for ourselves." The reflexive nature of this act of naming is important. Rather than receiving the names that God has given and responding by naming out of a desire to know and care for others, they are trying to "make a name" for themselves.

[12]On Acts 2 and Genesis 11, see John G. Davies, "Pentecost and Glossalia," *Journal of Theological Studies* 3 (1952): 228–31, https://www.jstor.org/stable/23952857; James Scott, "Acts 2:9–11 as an Anticipation of the Mission to the Nations," in *The Mission of the Early Church to Jews and Gentiles,* ed. Jostein Ådna and Hans Kvalbein (Tübingen, Germany: Mohr Siebeck, 2000), 87–124, at 105.

[13]While many translators interpret the lack of subject for *qara* in Genesis 11:9 with a passive English translation as in NIV and NRSV, the verb itself is not in a passive form. Instead, it is a Qal perfect 3rd m sing, which is typically an active verbal form. This same verbal form (Qal perf 3ms) is used in the very next phrase with God as its subject in v. 9 ("God confused" *YHWH balal*). Even scholars who translate *qara* in passive ways see the purpose of this phrase as pointing to a linguistic link between God's actions of confusing the languages (*balal)* with the name of the city *Babel*. Andrew E. Steinmann points out the irony of this connection, particularly in comparison to the later Babylonian claim that the name Babel meant "gate of God." See Andrew E. Steinmann, *Genesis: An Introduction and Commentary*, TOTC 1 (Downers Grove, IL: IVP Academic, 2019), 132.

[14]Finlay explains the role of naming in Isaiah and its relationship to God's activity. See Timothy D. Finlay, *The Birth Report Genre in the Hebrew Bible*, FAT 2, R12 (Tübingen, Germany: Mohr Siebeck, 2005), 194–95.

[15]See Arie Versluis, *The Command to Exterminate the Canaanites: Deuteronomy 7* (Leiden, Netherlands: Brill, 2017), 119, 137, 166, 184.

[16]Ian Paul points to the association between the removal of names of criminals and this description in Revelation 3. See Ian Paul, *Revelation: An Introduction and Commentary*, TNTC 20 (Downers Grove, IL: IVP Academic, 2018), 103–9.

[17]Taxonomy and nomenclature are interrelated. Nomenclature refers specifically to the process of naming, while taxonomy involves the act of describing, classifying, and naming living things. A related term, systematics, involves the study of the relationships between living things. All three activities are interrelated but have their subtle distinctions. For instance, taxonomy existed before the field of evolutionary systematics. See Kevin de Queiroz, "The PhyloCode and the Distinction between Taxonomy and Nomenclature," *Systematic Biology* 55, no. 1 (2006): 160–62,

https://www.jstor.org/stable/20142908. For a brief, and thoroughly enjoyable, history of taxonomy, see Yoon, *Naming Nature*.

[18]Peter Harrison, "Linnaeus as a Second Adam? Taxonomy and the Religious Vocation," *Zygon* 44, no. 4 (2009): 879–93, https://doi.org/10.1111/j.1467-9744.2009.01039.x. As Harrison points out, Linnaeus did not call himself a second Adam. This designation came from a particular critic of Linnaeus. However, the name stuck.

[19]See discussion on this in Matthew Morris, "Naming as a Form of Stewardship: A Case Study on Fraudulent Fishes Sold in Calgary, Alberta, Canada," *Perspectives on Science and Christian Faith* 72, no. 3 (2020): 151–66, https://www.asa3.org/ASA/PSCF/2020/PSCF9-20Morris.pdf.

[20]For a discussion on Central Salish names for sockeye, see Ethan Pincott, "Contact and Change in Central Salish Words for Salmon," *International Conference on Salish and Neighbouring Languages* 53 (2018): 182–95, https://lingpapers.sites.olt.ubc.ca/files/2018/07/10_Central-Salish-words-for-salmon.pdf.

[21]This goal of taxonomic stability––producing one species name that can be recognized by all and that will not change over time––is often cited as a justification for the enterprise of taxonomy. See, for instance, Julia D. Sigwart, *What Species Mean: A User's Guide to the Units of Biodiversity* (Boca Raton, FL: CRC Press, 2018); and Michael Ohl, *The Art of Naming*, trans. Elisabeth Lauffer (Cambridge, MA: The MIT Press, 2018). For an overview of the problem in botany, see Lorraine Daston, "Type Specimens and Scientific Memory," *Critical Inquiry* 31, no. 1 (2004): 153–82, https://doi.org/10.1086/427306.

[22]Karen Magnuson Beil, *What Linnaeus Saw* (New York: W. W. Norton & Company, 2019); Judith E. Winston, *Describing Species: Practical Taxonomic Procedure for Biologists* (New York: Columbia University Press, 1999).

[23]The International Commission on Zoological Nomenclature now prefers the term "binominal," although binomial is still in common use and will be used here. Sigwart, *What Species Mean*.

[24]Typically, the genus on its own, and the genus + specific epithet combination are written in *italics* or are underlined**.** The genus is capitalized. The specific epithet is never capitalized. This is to demonstrate that the genus name is a proper noun, while the specific epithet is an adjective. No rule governs this, but it follows standard procedure of italicizing non-English words and permits species names to stand out in the text. Other taxonomic ranks are capitalized but not italicized. See Sigwart, *What Species Mean*.

[25]The metaphor of binomial nomenclature being akin to first name, last name is adapted from Yoon, *Naming Nature*. Of course, the genus positions the creature within a broader organizational framework––the genus belongs to a family, the family to an order, the order to a class, the class to a phylum, the phylum to a kingdom, and the kingdom to a domain (with subcategories and unranked taxa also possible).

[26]Harrison, "Linnaeus as a Second Adam?"; Beil, *What Linnaeus Saw*; and Richard Conniff, *The Species Seekers* (New York: W. W. Norton & Company, 2011).

[27]Ohl, *The Art of Naming*. It could be argued that other scientific disciplines also have rules and can also rely on democratic voting principles—for instance, there are governing bodies to formalize the names of geologic layers and periods in Earth's history. However, this author is hard-pressed to find a document that governs an entire scientific discipline akin to that produced by the International Commission on Zoological Nomenclature and its botanical equivalent.

[28]International Commission on Zoological Nomenclature can be found at https://www.iczn.org/. Prokaryotes and archaea, viruses, and protists also have organizations that oversee naming conventions in their respective fields. Botanical and animal codes differ in important ways; for instance, the botanical code does not permit tautonyms (the genus and specific epithet being the same), while the animal code does (e.g., *Gorilla gorilla*). There are differences in rules of attribution, etc. Neither code allows for the same genus name to be applied to unrelated organisms (*Gorilla* could not also be used to name a gorilla-esque fish), but nothing forbids this between codes (a plant and animal can share a genus name). See Sigwart, *What Species Mean*, and Winston, *Describing Species*.

[29]For animals, the full species name includes not only the specific epithet, but also the attribution for the person(s) who published that name, followed by the year of publication: for example, *Homo sapiens* Linnaeus, 1758 is the full name for humans, indicating the name was first proposed by Linnaeus and published in 1758. Brackets are sometimes present around the person's name and date of publication, which tells us the species was originally published under a different genus. For instance, *Oncorhynchus mykiss* (Walbaum, 1792) indicates that the rainbow trout was first named by Walbaum, but if you went to his 1792 publication you would find a different genus name associated with *mykiss*.

[30]There are many other rules as well, but the salient ones for this article have been identified. ICZN, *International Code of Zoological Nomenclature. Fourth Edition* (London, UK: International Trust for Zoological Nomenclature, 1999), https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature/the-code-online/. For those interested in how modern places and people are converted into binomial nomenclature, see L. W. Grensted and J. Chester Bradley, "Transliteration and Latinization of Greek Words," reprinted and updated from *The Bulletin of Zoological Nomenclature* 15, no. 34/36 (1958): 1111–13. https://www.iczn.org/assets/92273ee2d1/Formation_of_names.pdf.

[31]Ohl, *The Art of Naming*.

[32]Sigwart, *What Species Mean*; see also a robust discussion on the philosophy of species as individuals, and the implications this has for the semantic content of species names, in Ohl, *The Art of Naming*.

[33]John Wright, *The Naming of the Shrew* (London, UK: Bloomsbury, 2014).

[34]For *Aha ha* and other similarly humorous names, see Ohl, *The Art of Naming;* and Wright, *The Naming of the Shrew*. *Sayonara* has not, to our knowledge, been mentioned by other authors; it was found while reviewing fish genera in *Eschmeyer's Catalog of Fishes*, assessed May 13, 2021, https://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp.

[35]Technically, a type is simply a term that is used to "denote a particular kind of specimen or taxon." In previous iterations of the ICZN Code, it was used as shorthand for the different name-bearing types (holotypes—the single individual organism which acts as the name bearer for the species; neotypes—individuals that become the name bearer when the original type is no longer believed to be extant; lectotype—an individual selected from a type

series to be the name bearer (often occurs in older publications when several individuals were used to describe the species, not one of which is given the name-bearing status); and syntype—a type series wherein all individuals are collectively the name bearer). This shorthand will be adopted in this article. See Glossary in ICZN, *International Code of Zoological Nomenclature. Fourth Edition*. Types that do not have name bearing status also exist (e.g., paratypes, paralectotypes, allotypes, etc.).

[36]Ohl, *The Art of Naming*, discusses the role of the type as name bearer in great detail. Some interesting recent changes to the type specimen have permitted the use of non-organismal types (e.g., photographs). For some recent discussion, see Thomas M. Donegan, "New Species and Subspecies Descriptions Do Not and Should Not Always Require a Dead Type Specimen," *Zootaxa* 1761 (2008): 37–48, http://dx.doi.org/10.11646/zootaxa.1761.1.4; Anatoly I. Shatalkin and Tatiana V. Galinskaya, "A Commentary on the Practice of Using the So-Called Typeless Species," *ZooKeys* 693 (2017): 129–39, https://doi.org/10.3897%2Fzookeys.693.10945; Sinang Hongsanan et al., "Can We Use Environmental DNA as Holotypes?," *Fungal Diversity* 92 (2018): 1–30, https://doi.org/10.1007/s13225-018-0404-x ; and Ronald H. Pine and Eliécer E. Gutiérrez, "What is an 'Extant' Type Specimen? Problems Arising from Naming Mammalian Species-Group Taxa without Preserved Types," *Mammal Review* 48, no. 1 (2018): 12–23, https://doi.org/10.1111/mam.12108.

[37]For details, see ICZN, *International Code of Zoological Nomenclature. Fourth Edition*.

[38]The northwest crow is also marginally smaller. "All About Birds: Northwestern Crow," Cornell Lab of Ornithology, Ithaca, NY, accessed May 5, 2021, https://www.allaboutbirds.org/guide/Northwestern_Crow/overview#.

[39]David L. Slager et al., "Cryptic and Extensive Hybridization between Ancient Lineages of American Crows," *Molecular Ecology* 29, no. 5 (2020): 956–69, https://doi.org/10.1111/mec.15377.

[40]James H. Wandersee and Elisabeth E. Schussler, "Preventing Plant Blindness," *The American Biology Teacher* 61, no. 2 (1999): 82–86, https://doi.org/10.2307/4450624.

[41]Christopher Kemp describes the naming of the olinguito thus: "He named it, and he made it real." Christopher Kemp, *The Lost Species: Great Expeditions in the Collections of Natural History Museums* (Chicago, IL: University of Chicago Press, 2017), 4.

[42]Kaeli Swift, "Why the Northwestern Crow Vanished Overnight," *Audubon* (September 4, 2020), accessed May 5, 2021, https://www.audubon.org/news/why-northwestern-crow-vanished-overnight.

[43]An insightful history of taxonomy documents the increased appearance of objectivity in taxonomy. See Yoon, *Naming Nature*. Just because there is disagreement does not mean species are not *real*, but should be expected given the fuzziness of evolutionary processes. Sigwart in *What Species Mean* argues that species names are hypotheses that are constantly being revised with new information; this seems overly idealized. Species names are also the product of creative decision making.

[44]Darwin famously wrote, in a letter to Joseph Hooker, in 1856: "It is really laughable to see what different ideas are prominent in various naturalists' minds, when they speak of 'species'…It all comes, I believe, from trying to define the undefinable." *Darwin Correspondence Project*, University of Cambridge, accessed May 13, 2021, https://www.darwinproject.ac.uk/letter/DCP-LETT-2022.xml.

[45]D. Graham Burnett recounts the 1818 trial in New York centering on the identity of the whale (fish or mammal) and the implications this had for the sale of fish oil. Of particular note was the public mockery of a biologist who testified that a whale was no more a fish than a man; the convergent evolution of fins and body shape had confused people as to which features were most salient for classification. See D. Graham Burnett, *Trying Leviathan* (Princeton, NJ: Princeton University Press, 2010).

[46]Such an evolutionary model, wherein an ancestral population produces multiple sister taxa while itself persisting, is not unusual. It produces what has been referred to as a star phylogeny; when time is incorporated into the phylogeny it takes on the appearance of a raceme––a single stem persisting through time but throwing off multiple sister taxa. For instance, see Michael A. Bell and Windsor E. Aguirre, "Contemporary Evolution, Allelic Recycling, and Adaptive Radiation of the Threespine Stickleback," *Evolutionary Ecology Research* 15 (2013): 377–411, https://condor.depaul.edu/~waguirre/bell_aguirre_2013.pdf. Such models of evolution make species naming difficult; the threespine stickleback described in this article has gone through multiple rounds of splitting and lumping, and is currently considered a "species complex" to get around the need for multiple names. For example, see Jeffrey S. McKinnon and Howard D. Rundle, "Speciation in Nature: The Threespine Stickleback Model Systems," *Trends in Ecology and Evolution* 17, no. 10 (2002): 480–88, http://dx.doi.org/10.1016/S0169-5347(02)02579-X.

[47]For an enlightening introduction to this topic, see David Quammen, *The Tangled Tree: A Radical New History of Life* (New York: Simon & Schuster, 2018). It should also be pointed out that knowledge of evolutionary relationships is not a prerequisite for naming, and in many cases, morphology or ecological niche are more important than evolutionary relationships in naming species (e.g., in paleontology evolution can often be inferred only through fossils, giving the morphological species concept greater significance than the phylogenetic species concept). Many members of the Burgess Shale or Ediacaran fauna have no known evolutionary relationships with other things, but that does not prevent them from being named.

[48]There is too much literature on the species problem to do it justice. As a simple introduction, see John Wilkins, "How Many Species Concepts Are There?," *The Guardian* (October 20, 2010), accessed May 6, 2021, https://www.theguardian.com/science/punctuated-equilibrium/2010/oct/20/3. Wilkins has authored several books on this topic, including John Wilkins, *Species: A History of the Idea* (Berkeley, CA: University of California Press, 2009).

[49]Ohl, *The Art of Naming*.

[50]Swift, "Why the Northwestern Crow Vanished Overnight."

[51]Yoon, *Naming Nature*.

[52]Benjamin Jones, "A Few Bad Scientists are Threatening to Topple Taxonomy," *Smithsonian Magazine* (September 7, 2017), accessed May 6, 2021, https://www.smithsonianmag.com/science-nature/the-big-ugly-problem-heart-of-taxonomy-180964629/.

[53]As recounted in G. E. Hutchinson, "Homage to Santa Rosalia, or Why Are There So Many Kinds of Animals?" *The American Naturalist* 93, no. 870 (1959): 145–59, https://www.jstor.org/stable/2458768.

[54]Andrew A. Forbes et al., "Quantifying the Unquantifiable: Why Hymenoptera, not Coleoptera, is the Most Speciose Animal Order," *BMC Ecology* 18, no. 21 (2018), https://doi.org/10.1186/s12898-018-0176-x.

[55]Rebecca Stott, *Darwin and the Barnacle* (London, UK: Faber and Faber, 2003).

[56]Kemp, *The Lost Species*.

[57]Wright, *The Naming of the Shrew*.

[58]Paul D. N. Hebert et al., "Biological Identification through DNA Barcodes," *Proceedings of the Royal Society B* 270, no. 1512 (2003): 313–21, https://doi.org/10.1098/rspb.2002.2218.

[59]Hongsanan et al., "Can We Use Environmental DNA as Holotypes?"

[60]This loss of expertise is occurring at the same time that funding to museum collections—the heart of taxonomy—is being cut. See Kemp, *The Lost Species*.

[61]For taxonomists describing their conservation motivations, see Ohl, *The Art of Naming* and Kemp, *The Lost Species*. There is significant debate about the actual relationship between conservation and taxonomy/nomenclature. See Georgina M. Mace, "The Role of Taxonomy in Species Conservation," *Philosophical Transactions of the Royal Society B* 359, no. 1444 (2004): 711–19, https://doi.org/10.1098/rstb.2003.1454; Stephen T. Garnett and Les Christidis, "Taxonomy Anarchy Hampers Conservation," *Nature* 546, no. 7656 (2017): 25–27, https://doi.org/10.1038/546025a; Scott A. Thomson et al., "Taxonomy Based on Science Is Necessary for Global Conservation," *PLoS Biology* 16, no. 3 (2018): e2005075, https://doi.org/10.1371%2Fjournal.pbio.2005075; and Stijn Conix, "Taxonomy and Conservation Science: Interdependent and Value-Laden," *History and Philosophy of the Life Sciences* 41, no. 2 (2019): 15, https://doi.org/10.1007/s40656-019-0252-3.

[62]Trout Unlimited et al., "Petition to List the Lake Sammamish Kokanee (*Oncorhynchus nerka*) as Threatened or Endangered under the Federal Endangered Species Act (2007)," July 9, 2007, 35 pages, accessed May 6, 2021, https://your.kingcounty.gov/dnrp/library/water-and-land/salmon/kokanee/esa-process/final-kokanee-listing-petition-070907.pdf. Legislation does recognize the possibility of protecting locally adapted populations within a species.

[63]This is a really important criticism of Western taxonomy and conservation, and was pointed out by an anonymous reviewer.

[64]From the ICZN: "International conventions and national or regional legislation concerning threatened or endangered animals specify the species or subspecies name of the animals that the law intends to protect. Thereafter, protection goes with the name rather than the endangered species itself. Any subsequent change in name could therefore affect conservation measures. The Commission often acts to protect the names of endangered species." ICZN, "Conservation," n.d., accessed May 6, 2021, https://www.iczn.org/about-the-iczn/why-is-the-iczn-important/conservation/.

[65]Andrew Moseman, "Out-of-State Mates Bring Florida Panthers Back from the Brink," *Discover Magazine* (September 24, 2010), accessed May 6, 2021, https://www.discovermagazine.com/planet-earth/out-of-state-mates-bring-florida-panthers-back-from-the-brink.

[66]See, for instance, Carl Zimmer's interviews with parasite researchers in Carl Zimmer, *Parasite Rex: Inside the Bizarre World of Nature's Most Dangerous Creatures* (New York: Free Press, 2000).

[67]Indeed, in the world of natural theology, parasites were sometimes used as exemplars of intelligent design; their adaptations were so breathtakingly complex that they were seen as reasons to praise God! See, for example, the discussion of James McCosh's writings in Matthew Morris, "We Know in Part: James McCosh on Evolution and Christian Faith," *Journal of the History of Biology* 47, no. 3 (2014): 363–410, https://www.jstor.org/stable/43863384.

[68]For instance, the American military recruited entomologists to help identify the vectors of illnesses plaguing troops in remote countries, the net result being targeted elimination rather than widespread release of insecticides. See H. B. Hungerford, "The Relation of Entomology to the War Effort," *Transactions of the Kentucky Academy of Science* 46 (1943): 303–8, https://doi.org/10.2307/3624970.

[69]Arthur L. Caplan, "Is Disease Eradication Ethical?," *The Lancet*, 373, no. 9682 (2009): 2192–93, https://doi.org/10.1016/S0140-6736(09)61179-X; Susannah Locke, "Why the World Can't Bring Itself to Destroy Smallpox Once and for All," *Vox* (May 27, 2014), https://www.vox.com/2014/5/27/5754548/why-the-world-cant-bring-itself-to-destroy-smallpox-once-and-for-all; and Gareth Williams, "Let's Finally Condemn the Smallpox Virus to Extinction," *New Scientist* (May 14, 2014), accessed January 26, 2022, https://www.newscientist.com/article/mg22229694-800-lets-finally-condemn-the-smallpox-virus-to-extinction/.

[70]Yoon, *Naming Nature*.

[71]Christopher N. Templeton and Erick Greene, "Nuthatches Eavesdrop on Variations in Heterospecific Chickadee Mobbing Alarm Calls," *Proceedings of the National Academy of Sciences* 104, no. 13 (2007): 5479–82, https://doi.org/10.1073/pnas.0605183104. For other examples, see Yoon, *Naming Nature*.

[72]Ruth Elkins, "Fans Exterminate 'Hitler' Beetle," *Independent* (August 20, 2006), accessed May 6, 2021, https://www.independent.co.uk/news/world/europe/fans-exterminate-hitler-beetle-6232054.html.

[73]Indeed, Linnaeus did this very thing; Sigwart, *What Species Mean*.

[74]See Ohl, *The Art of Naming*; and Wright, *The Naming of the Shrew*.

[75]Wright, *The Naming of the Shrew*.

[76]Jones, "A Few Bad Scientists are Threatening to Topple Taxonomy."

[77]Matthew Moore, Mary E. Jameson, and Aura Paucar-Cabrera, "Taxonomic Vandalism is an Emerging Problem for Biodiversity Science: A Case Study in the Rutelini (Coleoptera: Scarabaeidae: Rutelinae)," Entomological Society of America Annual Meeting, Oregon Convention Center, Portland, OR (November 17, 2014).

[78]Shane G. DuBay, Daniela H. Palmer Droguett, and Natalia Piland, "Global Inequity in Scientific Names and Who They Honor," *BioR$_x$iv* preprint (2020), accessed May 6, 2021, https://www.biorxiv.org/content/10.1101/2020.08.09.243238v1.full.pdf, https://doi.org/10.1101/2020.08.09.243238.

[79]There is an ongoing discussion about changing the common names of birds to remove racist overtones or honorifics of people with questionable pasts. For example, see the recent change of McCown's longspur, named after John P. McCown, Confederate soldier, to the thick-billed longspur discussed in Jessica Leber, "The McCown's

Longspur Is No More, but the Debate over Bird Names Continues," *Audubon* (September 3, 2020), accessed May 6, 2021, https://www.audubon.org/news/the-mccowns-longspur-no-more-debate-over-bird-names-continues. In Alberta, the Facebook group Alberta Native Wildflowers, Plants, Trees has begun to call out racially insensitive common names for plants, and is proposing already-existing alternatives. A bird and a fish native to Alberta have a common name, part of which is used as a pejorative to indigenous women; this name was still used by the government in publications as recently as 2015. Some recently discovered species have had indigenous names reflected in their species name: Len Norman Gillman and Shane Donald Wright, "Restoring Indigenous Names in Taxonomy," *Communications Biology* 3 (2020): 609, https://doi.org/10.1038/s42003-020-01344-y. These authors call for substantive changes to naming practices going forward. Changing already established but racially charged scientific names is seemingly more complicated and has not, to our knowledge, been done, although graduate students have begun compiling a list of such names. See Eli Caha, "Amid Protests against Racism, Scientists Move to Strip Offensive Names from Journals, Prizes, and More," *Science* (July 2, 2020; updated July 6, 2020), accessed May 6, 2021, https://www.sciencemag.org/news/2020/07/amid-protests-against-racism-scientists-move-strip-offensive-names-journals-prizes-and. Joe Cain has a good introduction to why changing existing species names will prove difficult. See Joe Cain, "Changing Offensive Names in Taxonomy Will Be a Hard Ask," Professor Joe Cain Blog (2020), accessed May 6, 2021, https://profjoecain.net/changing-offensive-names-taxonomy/.

[80]For a good introduction, see Ronald Sandler, "Intrinsic Value, Ecology, and Conservation," *Nature Education Knowledge* 3, no. 10 (2012): 4, https://www.nature.com/scitable/knowledge/library/intrinsic-value-ecology-and-conservation-25815400/.

[81]Harriet Ritvo, *The Platypus and the Mermaid and Other Figments of the Classifying Imagination* (Cambridge, MA: Harvard University Press, 1997).

[82]In Alberta, only "pure" populations of westslope cutthroat trout are considered eligible for conservation, where "pure" was defined as a population wherein the average genome of all tested fish was >99% westslope cutthroat trout. Plans to mitigate hybridization included "clearing" an area of hybrids before introducing pure trout. See DFO, *Recovery Potential Assessment of Pure Native Westslope Cutthroat Trout, Alberta Population*. DFO Canadian Science Advisory Secretariat Science Advisory Report 2009/050 (2010): 19, https://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2009/2009_050-eng.htm.

[83]Katrina van Grouw, *Unnatural Selection* (Princeton, NJ: Princeton University Press, 2018).

[84]Maciej Maselko et al., "Engineering Multiple Species-Like Genetic Incompatibilities in Insects," *Nature Communications* 11 (2020): 4468, https://www.nature.com/articles/s41467-020-18348-1.

[85]Sam Kriegman et al., "A Scalable Pipeline for Designing Reconfigurable Organisms," *Proceedings of the National Academy of Sciences* 117, no. 4 (2020): 1853–59, https://doi.org/10.1073/pnas.1910837117.

[86]Trevor A. Hart connects God's actions in creation to human creativity. See Trevor A. Hart, *Making Good: Creation, Creativity, and Artistry* (Waco, TX: Baylor University Press, 2014).

[87]Many scholars working at the intersection of faith and art have pointed to this theme of God as maker/creator inspiring making and creation in theology. See, for example, Makoto Fujimura, *Art and Faith: A Theology of Making* (New Haven, CT: Yale University Press, 2021).

[88]Richard S. Hess, "Bezalel and Oholiab: Spirit and Creativity" in *Presence, Power and Promise: The Role of the Spirit of God in the Old Testamen*t, ed. David G. Firth and Paul D. Wegner (Downers Grove, IL: IVP Academic, 2011), 161–72.

[89]David Brown, *Divine Generosity and Human Creativity: Theology through Symbol, Painting and Architecture* (New York: Routledge, 2017).

[90]For more on these themes, see Sean M. McDonough, *Creation and New Creation: Understanding God's Creation Project* (Peabody, MA: Hendrickson Publishers, 2017).

[91]This theme is explored in J. Richard Middleton, *A New Heaven and a New Earth: Reclaiming Biblical Eschatology* (Grand Rapids, MI: Baker Academic, 2014).

[92]See for example, Eric M. Vail, *Creation and Chaos Talk: Charting a Way Forward,* Princeton Theological Monograph Series (Eugene, OR: Wipf and Stock, 2012).

[93]In systematic theology, theologians such as Stanley Grenz have argued for a relational nature to the Trinity in works such as Stanley Grenz, *Theology for the Community of God* (Grand Rapids, MI: Eerdmans, 2000). Meanwhile biblical scholars have pointed to this theology of community in John's Gospel; see Mary L. Coloe, *Dwelling in the Household of God: Johannine Ecclesiology and Spirituality* (Collegeville, MN: Liturgical Press, 2017).

[94]Denis Edwards, *Partaking of God: Trinity, Evolution, and Ecology* (Collegeville, MN: Liturgical Press, 2014), 2.

[95]Works in this field include Diane Bergant, *The Earth Is the Lord's: The Bible, Ecology and Worship* (Collegeville, MN: Liturgical Press, 1998); Denis Edwards, ed., *Earth Revealing – Earth Healing: Ecology and Christian Theology* (Collegeville, MN: Liturgical Press, 2001); W. Granberg-Michaelson, ed., *Tending the Garden: Essays on the Gospel and the Earth* (Grand Rapids, MI: Eerdmans, 1987); Norman Habel, chief ed., *The Earth Bible Series*, volumes 1–5 (New York: Sheffield Academic Press, 2000–2002); and Norman Habel, Vicky Balabanski, and Gerald West, series eds., *The Earth Bible Commentary* (New York: Bloomsbury Publishing, 2011–present).

[96]This project includes an online dictionary (https://dni.tau.ac.il), a research unit at the Society of Biblical Literature's annual meetings, and a developing book series called the DNI (Dictionary of Nature Imagery) Bible Supplement series published by T&T Clark.

[97]Yoon, *Naming Nature*.

[98]M. Elizabeth Barnes et al., "Are Scientists Biased Against Christians? Exploring Real and Perceived Bias Against Christians in Academic Biology," *PLOS One* 15, no. 1 (2020): e0226826, https://doi.org/10.1371%2Fjournal.pone.0226826.