



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

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



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

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

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

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

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

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

Temporality: Being-in-the-World

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

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

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

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

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

Biological-Event Temporality

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

Genetics (DNA)

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

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

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

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

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

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

Epigenetics

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

When looking at Earth care, epigenetics reveals that the environment can cause changes in organisms, including humans, that can be passed down to future

generations. The environment, food, pollutants, and social interactions can all cause epigenetic changes that affect phenotype, bodily processes, metabolism, and health (Francis 2011; Gregg 2018). These changes affect the individual and their progeny and echo the need for “a softening up in our relations toward each other and toward nature” (Bartholomew 2017).

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

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

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

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

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

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

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

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

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

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

Claud Romano’s Phenomenology

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

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

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

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

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

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

Fourth, significant events are not dateable; instead, they open time or temporalize it because they overflow the present of its actualization and touch the person’s past, present, and future (Romano 2009, 46). The lightning strike

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

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

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

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

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

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

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

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

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

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

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

Bringing Together Biology and Phenomenology

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

Call to Action

Where Do We Begin?

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

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

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

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

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

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

What Can We Do?

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

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

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

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

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

How?

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

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

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

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

Feedback loops within the aforementioned categories feed the change process until a tipping point is reached where change becomes the norm (Via 2024). Environmental scientist Frances C. Moore et al. (2022, 103–4) analyze the feedback process within the climate-social system to understand individual, communal, national, and global human behavior dynamics to assess potential tipping points. Their findings suggest that behavior can significantly lower global CO₂ emissions (Moore et al. 2022, 109). Behavior includes opinion (social conformity) and morals but requires credibility. “Changing behaviour to better align one’s consumption or practices with how one believes society ought to function can strengthen this moral identity and send a normative signal to other community members about desired collective outcomes” (Moore et al. 2022, 104). Credibility affects how the solar panel advocates’ and climate scientists’ message is received. If they have solar panels or drive an EV car, their message

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

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

Will It Work?

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

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

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

Conclusion

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

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

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