

“Three Criteria for Environmental Authenticity: A Response to the Simulation Problem”

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Abstract:

Broadly, I endorse the view that biodiverse species and spaces warrant conservation (partially) in virtue of their power to induce epistemic (Paul 2015; Sarkar 2011), relational, and positive, psycho-physiological transformation. However, if we are (in the not-so-distant future) able to construct cross-modally replete *simulations* of biodiverse environments, then what reason would we have to conserve genuine, biodiverse ecosystems? In order to address this “Simulation Problem”, I argue that the authenticity of biodiverse environments matters, both in itself and insofar as authenticity plays an important psychological, cultural, personal, and epistemic role in the lives of human agents.

Keywords:

Environmental philosophy, environmental ethics, transformative power, re-wilding, authenticity, simulations, philosophy of technology

‘Three Criteria for [Environmental] Authenticity: A Response to the Simulation Problem’

I. Introduction

I endorse the claim that the conservation of biodiverse environments is partially justified by reference to the transformative power that they bear, which is explicable in terms of their (i) capacity to facilitate human intellectual achievements, technology, and understanding (Sarkar 2011), and (ii) their capacity to facilitate human psychological functioning and well-being. In order to justify (ii), I refer to a series of empirical studies in environmental psychology, which demonstrate that immersion in these restorative environments decreases stress, facilitates quicker recovery rates after surgery (Ulrich 1991), and alleviates negative symptoms associated with attention- and mood-based disorders (e.g., ADHD and depression) (Kaplan & Kaplan 1989; 1982; 2012).

My task in this paper will be to introduce and address a worry that is particularly problematic for those who endorse a transformative power account of biodiversity conservation. In particular, Roger Ulrich's (1991) studies have demonstrated that showing patients who are recovering from abdominal surgery mere *photographs* or *videos* of natural environments has a similar (albeit lesser) positive, psychophysiological effect to genuine, biodiverse environments. This is worrisome, as we can imagine a case in the not-so-distant future wherein technology has advanced to the point that video game play is a completely immersive, cross-modal experience, replete with simulated sights, sounds, smells, tactile sensations, etc. An objection to my view might go: in this not-so-distant future, we won't need to worry about conserving biodiverse environments, as we will be able to construct *simulations* of biodiverse environments that will induce the same positive effects on human psychophysiological functioning. Call this the ‘Simulation Problem’.

It is worth noting: I am *not* here claiming that simulations of natural regions are inherently problematic (that is, simply insofar as they are inauthentic). I grant that they are a medical boon (insofar as they facilitate quicker recovery rates after surgery) (Ulrich 1991) and educationally informative (when utilized in e.g., classroom settings). Furthermore, they may afford socioeconomically disadvantaged populations and individuals with mobility constraints greater access to psychophysiological restoration. I caution, however, that we should avoid focusing on the widespread dissemination of immersive, simulative technologies as the primary means to combat environmental, access inequity. Instead, I urge, we ought to increase access to immersive, transformational experiences across

populations through proactive initiatives and the bio-diversification of urban and suburban landscapes (by, for example, publicly funding the cultivation of rooftop gardens and street-side food forests).¹

II. *The Aura of Authenticity*²

In order to address the Simulation Problem, I will show that, even if the psychophysiological effects of biodiverse, restorative environments are replicable to some degree, simulations of biodiverse environments are in some important sense *inauthentic*. Furthermore, I claim that the authenticity of artifacts and environments matters, both in itself and insofar as authenticity plays an important psychological, cultural, and personal role in the lives of human agents.³ I will argue, furthermore, that authenticity augments and contributes to the transformative power that e.g., biodiverse environments bear. Transformation, more precisely, occurs along three dimensions: (i) epistemically (Paul 2015; Sarkar 2011), (ii) relationally (i.e., in terms of cultural or self-determination), and (iii) restoratively. Artifacts and environments that are authentic (so far as I define the term) more directly contribute to epistemic, relational, and (positive) psychophysiological transformation. By contrast, simulations of biodiverse spaces that confer these positive affects do so only parasitically. Put simply, the transformational power of simulations ontologically and causally depends on the originals that they represent.

This claim is, admittedly, tentative: as there is an absence of rigorous, empirical inquiry into the phenomenological and psychological effects of exposure to authentic, as opposed to inauthentic,

¹ Furthermore, recreational simulations that are cross-modally replete pose the potential of becoming (negatively) addictive. After all, data indicates that individuals are spending ever more (screen) time on their phones and playing video games. (From 2018 to 2019 alone, the time that individuals spent playing video games increased by 19.3% (*The State of Online Gaming 2019*).) It's reasonable to speculate that this percentage will only grow as virtual platforms (e.g., simulations) become increasingly more immersive. And, as Collingridge (1981) notes, it is far easier to modify technologies during the nascent stages of their development (conversely, they are far more difficult to regulate once they become ubiquitous). This paper is therefore formulated as an attempt to ameliorate the potential, negative impacts associated with the widespread implementation of simulative technologies.

² The phrase 'aura of authenticity' is borrowed from Walter Benjamin's (1939) seminal work, 'Art in the Age of Mechanical Reproduction'.

³ This implies that I am a pluralist about the reasons that justify biodiversity conservation. I argue, for example, that biodiversity ought to be conserved in virtue of its transformative power. I do, however, remain open to the possibility that biodiverse environments ought to be conserved in virtue of e.g., their intrinsic or relational value.

environments (e.g., simulations), I will build my case on the foundation of a series of philosophical thought experiments that test our intuitions about authenticity. Additionally, I will evaluate a selection of anthropological case studies that illuminate folk psychological conceptions of the value of authenticity in a variety of cultural contexts. Though I grant that thought experiments do not, on their own, conclusively justify claims pertaining to the necessity of authenticity, I take it that they nevertheless provide justification for this claim to a rather strong degree. Furthermore, it is useful to note that thought experiments may illuminate potential empirical parameters that could be employed to build experimental frameworks that test claims about authenticity's psychophysiological force (and, by extension, its necessity in restorative contexts).

Before we proceed, it is helpful to note that I grant that *inauthentic* environments, artifacts, and entities can (and often do) bear *other* properties or facilitate *other* effects that we value. Fully immersive simulations are impressive, for they are (say) technologically innovative. Similarly, skilled artistic replicas exhibit great skill and are indicative of a craftsperson's expertise. Furthermore, inauthenticity need not (always) count against the to-be-preservedness of an entity. Artificial limbs—though in some sense serving as replicas of the biological analogs that they mimic—are indisputably worth producing and conserving. More specifically, their value is conferred both by the functional role that they successfully play (e.g., restoring or increasing mobility) and due to that fact that they are technologically marvelous and innovative. From all of this, it is clear that I therefore endorse a *pluralism* about values. If, at times, competing values come into conflict, then we may need to employ external standards of arbitration to mediate between them (e.g., appeals to functionality or social justice).⁴

It is worth distinguishing between inauthenticity as a disvalue, and inauthenticity as failing to confer value. I endorse the latter claim, though not the former. To clarify this point, consider prints of paintings (the kind of case that Benjamin had in mind). One values a print of, say, Van Gogh's *Starry Night* insofar as it is a representation of the original. Its inauthenticity does not detract from its value, though its value is far lesser than the original precisely because it is inauthentic *qua* *Starry Night*. This also neatly explains why we value replicas printed on higher-quality paper, for they more closely mimic the canvas on which the original *Starry Night* was painted.

Finally, I will claim that authenticity is a property that is by necessity indexed and contextual. On this view, a spectacular stage performance is authentic *qua* performance but inauthentic *qua* the

⁴ Indeed, as Caroline Christoff has helpfully suggested, there could be important cultural or sociopolitical considerations that confer value to e.g., artificial limbs *in virtue of their inauthenticity* if they e.g., play an important role in the self-determination or identity of the individuals who employ them.

lived daily life of the actor who expresses it. Likewise, a simulation may be authentic *qua* simulation but inauthentic *qua* biodiverse environment (etc.). When I am discussing authenticity in the context of biodiverse environments and their simulations (that to some degree match the phenomenological experiences that they induce), I am therefore targeting authenticity as indexed to biodiverse environments, their constituents, and the broader context in which they're situated. More specifically, I claim that simulations are inauthentic *in virtue of [not] in fact being* biodiverse, restorative environments.

III. Three Criteria of Authenticity

Now that I have addressed a few considerations, I will outline four case studies in order to check our intuitions about authenticity. The first and second cases involve replicas of artistic artifacts; the third case involves a simulation of a natural environment; and the fourth involves an indistinguishable human clone. Throughout my analysis, I will also evaluate a series of anthropological case studies (in our actual world) that will help to empirically ground these philosophical claims.

Like Elliot (1997), I assume that human artifacts (and their replicas) and natural artifacts (and their simulations) are broadly analogous. The cases that I outline are all negative, for they each contain examples that are paradigmatically inauthentic. Reflecting on their inauthenticity will, I think, illuminate three positive conditions that an artifact or environment must meet in order to count as truly authentic:

- (i) Historical Origin: the artifact, entity, or environment must have the appropriate historical origins.
- (ii) Connection to World: there must be a close match between the way that the artifact, entity, or environment seems and what the artifact, entity, or environment in fact is.
- (iii) Relational Role: the artifact, environment, or entity must be of an appropriate kind to play a **(potential)** role in partially constituting meaningful human and more-than-human relationships.⁵

IV. The First Criterion of Authenticity — Historical Origins

4.1 Case Studies: Goya and the Lascaux Caves

To begin, consider a case wherein an art collector—call him Eduardo—has been gifted a Goya sketch for his birthday.⁶ Upon receiving the sketch, Eduardo is thrilled, as Goya is his favored

⁵ I am borrowing the phrase “more-than-human” from David Abrams.

⁶ This case is a variation on an example originally articulated by Elliot (1997).

artist. Eduardo is then informed that the sketch that he's been given is an exact replica of a Goya that had been destroyed. Upon learning that the sketch is not an original Goya, Eduardo is noticeably disappointed. After all, the replica is missing a property that the original possessed: it was painted, not by Goya, but by a very skilled imitator. For this reason, Eduardo considers the copy inauthentic.

In a second case, consider the Lascaux Caves in southwestern France, which contain a series of Upper Paleolithic paintings of large (mostly mammalian) animals (Bahn 2007).⁷ In 1955, Lascaux was closed to the public, for its many, daily visitors were introducing a series of damaging contaminants into the caves (e.g., carbon dioxide, humidity, heat, and lichen). To preserve the original paintings, in 1983, a replica of Lascaux's Painted Gallery and the Great Hall of the Bulls was opened for visitors to enjoy.

Though visitors may find the replicas of the paintings at Lascaux educational, it would be odd for them to marvel at their craftsmanship (*except* insofar as they indirectly marvel at the original paintings via their educational representations); for though the copies are visually indiscernible from the paintings contained in the Painted Gallery and Great Hall, the replicas are inauthentic in an important sense.

The inauthenticity of the Goya and the Lascaux copies is attributable to the fact that their historical origins differ from the historical origins of their corresponding originals (Benjamin 1936; Elliot 1997; Korsmeyer 2012). In the first case, the original and the copy were sketched by different artists, at different times, and in different places. The value of the original Goya was partially conferred by facts concerning its historical origin (e.g., the original was born of Goya's imagination and was painted by Goya's very hand). The copy's historical origins differ, and either detract from or do not positively contribute to its overall value. In the second case, the inauthenticity of the Lascaux replicas is likewise attributable to the fact that the originals and the replicas differ with respect to their historical origins. Whereas the originals were painted about 17,000 years ago by humans living during the Upper Paleolithic period, the replicas were built in the 1980s (likely out of plaster, acrylic, and wood). This divergence in historical origins explains why it would be odd to marvel at the Lascaux replicas: the value of the originals is, after all, partially conferred by the fact that they are ancient artifacts. Taken together, these two cases suggest that a good account of authenticity ought to make sense of the important role that an entity or environment's historical origins play.

With this in mind, I propose that, in order for an artifact or environment to count as genuinely authentic, it must have:

⁷ Thanks to Kathleen Higgins for suggesting this illuminating example.

(i) Appropriate Historical Origins

4.2 Historical Origins and Age

I would like to elaborate on a particular feature of some entities and environments that is intimately connected to their historical origins and demonstrates one sense in which they are of symbolic, scientific, and cross-cultural import. Drawing on our previous case, it makes good sense to posit that the Caves at Lascaux partially warrant conservation insofar as they are—at 17,000 years—very old. This indicates, to extend Benjamin’s turn of phrase, that there is an *aura of historicity* that confers a distinctive transformative power to the entities, organisms, and environments that bear it. There is, moreover, something distinctive about the experiences induced by entities and environments that have persisted—without any out-of-the-ordinary metaphysical permutations or breaks—over long spans of time.

It is indisputable, for example, that visitors to old growth forests in the U.S. Pacific Northwest experience a wide range of positive emotions and experiences (e.g., wonder, the sublime) that are facilitated partially by the fact that the old-growth sequoias and redwoods that dwell there range upwards of around 800 to 3,000 years old.⁸

Admittedly, the wonder that visitors experience in the shadow of these towering coastal giants is partially explained by their great height and girth. (To take a specific case, the tallest tree in the world—a redwood named ‘Hyperion’—rises to an impressive 379.7 feet tall, while boasting a diameter of 24 feet) (Sederoff et al. 2010). Nevertheless, examining the cousin case of ancient Chinese *Ginkgo bilobas* trees lends further credence to the claim that the authentic historicity and *age* of more-than-human entities is uniquely transformative in nature.

Compared to coastal redwoods, Chinese ginkgos are not overwhelmingly large. They are, nevertheless, biologically unique and historically impressive. The only surviving members of the order Ginkgoales, ginkgo trees grew while dinosaurs still roamed our planet Earth. The fact that they have persisted as a species for over 200 million years has therefore earned them the apt nickname, ‘living fossils’. Like coastal sequoias and redwoods, ginkgo trees invite visitation and incite reverence in those who behold them, as evidenced by a particular specimen located near the Gu Guanyin Buddhist Temple in the Zhongnan Mountains of China. At 1,400 years old, this particular living fos-

⁸ I acknowledge that, strictly speaking, ‘history’ refers to the study of human affairs, events, and developments that have occurred in the past. However, I am here using this term to refer to the study of past events more generally. So, when I use the term ‘history’ or ‘historicity’, I am referring to discoveries (potential or actual) about past geological, biological, cultural, etc. events that have transpired, which are afforded by the study of entities or environments (e.g., very old trees) that have persisted over time.

sil draws a stream of yearly visitors who flock to witness the spectacular autumnal shedding of its golden leaves. The appeal of the Gu Guanyin ginkgo is, of course, partially explained by reference to its aesthetic appeal and great beauty. Yet, as ginkgo trees are rather common throughout China, this particular ginkgo's appeal must also be explained by reference to some other, non-aesthetic feature that it uniquely bears. The aura of historicity that stems from its prominent age (I posit) best explains its fame.

Given these considerations, the awe, reverence, respect, and appeal induced by redwoods, sequoias, and ancient ginkgos indicates that entities of a great age bear a depth of transformative power that e.g., shorter-lived or less mature trees do not possess. This, I think, now calls for further explication. More specifically, why must entities be *authentic* in order for them to acquire the relevant aura of historicity that grants them this unique brand of transformative power?

4.3 Historical Origins and Intellectual Transformative Power

Let us briefly return to the explication of transformative power that I articulated in the first portion of this piece. As previously argued, an entity or environment's transformative power can be spelled out in terms of either the intellectual insights or discoveries that it facilitates, the important cultural role that it plays, or its capacity to induce psychophysiological restoration. I will explicate each of these claims in more depth in short order.

First, ancient and very old organisms bear at least one flavor of transformative power—the capacity to induce intellectual discoveries, insights, and achievements—and they do so if and only if they meet the proposed criteria of authenticity. After all, only authentic entities and environments that in fact bear the appropriate origins can provide us with a means to justifiably acquire novel knowledge about e.g., their early evolutionary history and development (e.g., information pertaining to the environmental and geological conditions in which they were formed, crafted, or grew). Though we certainly can (and often do) acquire information about these organisms and environments via technological developments that illuminate discoveries pertaining to them, the discoveries

that we make are nevertheless parasitic on the existence of the originals.⁹

Authentic, ancient entities are able to facilitate intellectual transformation partially insofar as they provide us with (in a manner of speaking) a causal, evidential link to the past. By, for example, taking a cross-section of a particular old growth tree's trunk, one is able to visually discern the ringed patterns that track its development—and, thereby, its age—over a multiplicity of seasons. Evaluating a tree's rings furthermore provides one with a set of data that justifies claims about the area's annual precipitation and drought cycles. More specifically, large spaces between marked rings indicate increased seasonal growth due to heavy rainfall, while narrow spacings indicate little growth, due to years of drought or sparse precipitation. Novel discoveries and insights can also be induced by non-living environmental entities that bear transformative power in virtue of their deep, historical roots. Consider non-living mountains, the empirical evaluation of which sheds epistemic light on past climatic conditions and Earth's early geological history (Juyal et al. 2011).

Historical authenticity can also be indexed to species, conceived of as wholes. More specifically, species that have remained largely unchanged since their early evolutionary development facilitate unique intellectual discoveries and insights pertaining to their constituent members, the archaic climatic conditions in which they developed, and other organisms that shared their ecological habitats. As we've seen, *Ginkgo biloba*, for example, are the only remaining members of the order Ginkgoales, which were nearly stricken from the fossil record after the Pliocene. Studying living *ginkgo biloba* facilitates a variety of discoveries that illuminate past ecological conditions and evolutionary developments. For example, their evaluation has shed light on a world-changing shift in the evolu-

⁹ Indeed, I grant that there are an array of representational works (reliant on the existence of the originals) that facilitate discovery and are thereby both epistemically beneficial and integral. For example, consider well-arranged and well-filmed nature documentaries that educate a broad array of audiences about e.g., biodiverse species, geological processes, and planetary formation. The way in which these documentaries are edited makes certain features of that which they represent salient. This, by extension, enables subjects to acquire information about the subject matter at hand in a more immediate fashion. Some of the cinematic techniques that are utilized to accomplish this task include framing, musical score, composition, etc—all of which prime the information that's displayed on screen in order to make certain features salient. A scene, for example, containing footage of a frog that lies in wait for a tasty morsel (e.g., a flying invertebrate of some kind) could employ music that signals anticipation, thereby indicating the uncertainty associated with the acquisition of food for many more-than-human species and populations. Additionally, the zoom employed in order to frame e.g., the frog's hind legs signals facts pertaining to the leap that (it is indicated) will soon impressively occur. Finally, music that reaches its apex can be utilized to signal the final acquisition of the tasty morsel, thereby signaling the triumph of success. **Nature documentaries of this sort are importantly distinct from cross-modally replete simulations, for they are framed in a way that presents them as representationally parasitic on their ecological subjects. They furthermore motivate the conservation of these more-than-human entities via e.g., their narrative and its framing.**

tionary history of the kingdom Plantae.¹⁰ An in-depth study of the fossil record, paired with the fact that only *ginkgo biloba* have endured out of their order, indicates (more specifically) that the diversity of ginkgo species declined during the Cretaceous period. As their decline corresponded to the development and flourishing of flowering plants, this provides justification for the hypothesis that flowering plants outmaneuvered *Ginkgoales* due to the advantages conferred by their bright blooms. The alliance, more specifically, that was forged between flowering plants and the pollinators that fed on them led to increases in the reproductive success of both. From within our contemporary context, this finding should worry us very much. After all, it suggests that the current decline in pollinator (e.g., bee) populations that we are experiencing (a result of our overuse of pesticides) will also threaten the flourishing of flowering plants—those beings upon whom we largely depend for our sustenance (Royer et al. 2003).

Studying contemporary ginkgo trees therefore enables us to acquire knowledge about events that are not immediate in our perceptual experience. So though we cannot directly experience e.g., the Jurassic or the Cretaceous periods, we can gain empirical justification for claims about what these periods were like through observations of these living (and other non-living) fossils. The living descendants of ginkgo biloba trees are, after all, causally continuous with their ancestors and have remained biologically consistent over the course of the last 200 million years.

To adequately play their epistemic, justificatory role, ginkgos, redwoods, and (returning to our previous case) the Caves at Lascaux must therefore be authentic. Even their perfect simulations, replicas, or photographs could only provide us with information about e.g., early homo sapiens or the Jurassic period parasitically.¹¹ After all, any information they they contain would ontologically rely on the existence of data gleaned from the originals.

V. The Second Criterion of Authenticity — Connection to World

5.1 Connection to World

In order to illuminate the second criterion of authenticity, consider the following, philosophical thought experiment, wherein an avid naturalist and outdoors-woman—call her Rowan—is

¹⁰ The Kingdom Plantae is one of six Kingdoms used by biologists to classify organisms on our planet Earth (and, potentially, beyond). The Kingdom Plantae includes all of the varying plant groups under its general heading (algae, moss, trees, etc.).

¹¹ Note that the core claim is that authentic entities and environments must meet the three criteria outlined this piece. This is not, however, to imply that, if an entity satisfies one of the criteria, then it is thereby authentic. After all, a replica of a ginkgo is informative (that is, can facilitate discoveries and insights) but is inauthentic *qua* ginkgo.

tricked by a very clever programmer who develops an incredible experience machine (Descartes 1641; Elliot 1997: 86-90; Harman 1973; Nozick 1974: 644). Once plugged in, the experience machine is able to stimulate Rowan's neural and sensory apparatuses so as to produce experiences that are phenomenologically indistinguishable from any set of experiences that she could have in the actual world. Now imagine that Rowan is plugged into the experience machine. The programmer knows that Rowan has a preference for mountain meadows and views. So, he stimulates the relevant neural and sensory regions so that her experiences qualitatively match the experiences that Rowan would have, were she in an actual mountain meadow: she sees wildflowers, hears the sound of the wind rustling the leaves of quaking aspens, feels the sharp chill of (what she takes to be) her high elevation, and enjoys a stunning sunset. Imagine that, beforehand, Rowan was not told that she would be plugged into the machine. She has been tricked by the scientist, who had told her that he would take her to her favored mountain region in the high Rockies. While plugged into the machine, Rowan believes that she is in fact in the high Rockies; she believes, for example, that she is in fact enjoying a majestic mountain view, replete with quaking aspens, high pines, wildflowers, and a golden sunset. However, she is not in fact experiencing these things.

She wants, however, to experience a genuine mountain meadow, for the transformative power that her favored mountain meadow bears is partially conferred in virtue of its being, in fact, the very mountain meadow that it appears to be.¹² More specifically, her machine-induced experiences—though qualitatively indistinguishable—do not hold the same value for her that they would have held, were she immersed in an actual mountain environment.

On an ordinary day, how Rowan conceives of herself is transformed by her immersive engagement with the High Rockies. In other words, her self-conception is molded by the genuine relationship that arises between her psyche, body, and the broader mountain environment in which she's situated. She deems even the difficulties that she encounters (when, say, hiking up a profoundly steep slope) worthy of pursuit and takes them to be partially self-constituting (*qua* resilient outdoors-woman). Altogether, Rowan is positively transformed by striking perceptual experiences (as of grand vistas), the epistemic affordances gifted through immersion (pertaining to e.g., the ecological composition of the region and the survivalist methods by which to successfully navigate it), and the relationally-determined transformations in her own sense of self.

Were Rowan, by contrast, to know that she were in a simulation, her self-conception would radically shift—from avid outdoors-woman to (say) fearless, simulative gamer. With this in mind, the

¹² *Prima facie*, this suggests that authenticity is a necessary condition on an environment's being restorative. I will return to this point shortly.

experiences produced by the experience machine are—as I have been suggesting—in an important sense inauthentic.

In this third case, the inauthenticity of the experiences that the machine induces are partially explained by reference to the fact that the experience machine and a genuine mountain environment differ with respect to their historical origins. The geological, geographical, and biological features of the mountain environment are the products of natural forces that shaped the landscape over millennia. The experience machine's historical origins, by contrast, are attributable to, for instance, the deceptive programmer and their twisted mind. So one way to explain the inauthenticity of the experience machine is by reference to facts concerning its historical origins.

There is an additional explanation of the machine's inauthenticity available. In particular, this third case suggests a second criterion that an artifact or environment must meet in order to count as truly authentic. With an eye toward articulating this second criterion of authenticity, I will now draw an analogy between the experiences induced by the experience machine, on the one hand, and hallucinatory experiences, on the other.

In general, we value veridical (that is, accurate) experiences over hallucinations. One way to explain our preference for veridical experiences is to say that we value our connection to the world. In order for us to be appropriately connected to the world—and, by extension, to truth—there must be a close match between the way that things seem to us in our experiences and the way that things in fact are.¹³ In the case under consideration, there is a mismatch between the way that things seem to Rowan and the way that things in fact are. In particular, it seems to Rowan as though she is in fact experiencing a mountain environment, replete with quaking aspens, a sharp breeze, and a golden sunset. However, any beliefs that she may form about her mountain environment will be false, for her experiences are induced, not by exposure to a mountain environment, but by the mad programmer's experience machine. Of this we can say that: so long as she is plugged into the experience machine, her connection to the world will be severed.

This case suggests that our connection to the world—and truth—matters and is partially constitutive of environmental (and artifactual) authenticity. Therefore, I now propose the second criterion of authenticity:

- (ii) Connection to World

5.2 An Epistemological Pitstop

¹³ This explains the usual, epistemic worries about skeptical (including Brain in Vat—BiV) scenarios.

This second criterion of authenticity—connection to world—highlights an important distinction between three epistemological states that a subject may occupy when embedded in an environment: (i) the subject may know that the environment or entity is authentic; (ii) the subject may know that the entity or environment is inauthentic (i.e., not authentic); (iii) the subject may know neither that the environment or entity is authentic, nor that it is inauthentic.¹⁴

In the above case, Rowan is plugged into the experience machine without prior knowledge. She is unaware of the fact—that is, she does not know—that the mountain environment that she purports to perceive is not a genuine, mountain environment at all, but is in fact an incredible simulation. If Rowan does not know that what she perceives is a fantastic simulation, then how can it be that authenticity—and, in turn, her connection to the world—matters to her?

Rowan, as I have postulated, would be surprised and disappointed if she knew that the apparent mountain environment is in fact a mere simulation. After all, she cares about the unique kind of thing that the mountain environment is: a distinctive peak and valley with a specific set of historical origins that over time yielded a unique ecosystem, etc. Furthermore, it matters to her that the mountain environment is in fact that which it appears to be, for she values her connection to the world insofar as it partially determines her self-identity (i.e., sense of self). And this requires that the way that things seem must in fact correspond to the way that things are. Therefore, I posit that authenticity matters to Rowan even if only *counterfactually*. That is, even if Rowan does not in fact know that the environment that she perceives is inauthentic, *if she did know*, then, as a result, she would rule the simulation of significantly less value.

Furthermore, I now claim that if Rowan did in fact know that the environment that she perceives is inauthentic, then the qualitative nature of her overall experience would change. We can explicate this claim in two ways. First, we can grant that, though the contents of Rowan's visual field remain fixed in both cases, her affective states and the corresponding qualities that they lend to her experience will shift on the basis of her newly acquired knowledge: enjoyment would decline, anxiety would increase, and a frantic search for an escape from the simulation would likely ensue.¹⁵

There is, however, evidence articulated in the literature on the cognitive penetrability of perception

¹⁴ In this third case, I posit that the subject does still implicitly know the disjunction: either this environment or entity is authentic or it is inauthentic. I am here ruling out a fourth case in which subjects fail to know the disjunction, "either this environment is inauthentic or it is authentic." This, it seems to me, is an implausible view. Environments must be either authentic or inauthentic and, I claim, human subjects implicitly know that this disjunction obtains.

¹⁵ Of course, the idea that Rowan would frantically attempt to escape the simulation is contingent on one feature of the thought experiment that I've specified: namely, Rowan is inserted into the simulation without her prior knowledge.

that goes some way toward justifying a stronger claim. Namely, the contents of Rowan's perceptual experience may in fact shift once she becomes aware of the fact that the environment that she perceives is inauthentic.¹⁶

Whether¹⁷ we adopt the weak or the strong version of the claim that knowledge catalyzes changes in the qualitative nature of our experiences, we can at this point conclude that authenticity—understood in terms of historical origins and, now, connection to world—matters to subjects, even if only counterfactually. So even if one is epistemically worse for the wear—that is, even if one fails to know that the environment that one perceives is inauthentic—authenticity nevertheless matters to them. After all, if they did in fact know that the environment that they perceive is not authentic, then the qualitative nature of their corresponding experiences would, as a result, shift. More specifically, the qualitative feel of the resulting experience (and its psychological effects) would be

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¹⁶ One way to spell out this claim is by reference to literature articulated on the cognitive penetrability of perceptual experience, which (in general) states that beliefs, judgments, and other cognitive states may (at least partially) affect the contents of Rowan's perceptual experience. Some data: Cecile Goodman (1947) found that subjects represent metal coins as larger in their perceptual experience than identically-sized cardboard cut-outs. This, Goodman posits, is function of the value that subjects place on the coins as compared to the value that they place on the cardboard cutouts. Edouard Machery does note, however, that attempts to duplicate this experiment have been largely unsuccessful. Fiona MacPherson and Dustin Stokes attempt to resurrect Goodman's thesis by appealing to the perceptual differences that obtain between novices and experts (in e.g., naturalistic and medical contexts). They both provide illuminating insights on the cognitive penetrability thesis.

¹⁷ In addition, note that a subject's knowing neither that the environment is authentic nor that it is inauthentic would also affect the overall quality of their experience. After all, feeling as though one is in a global, epistemically dubious position would be incredibly unsettling. One would feel as though one could not trust the accuracy of one's sensory experiences. This would breed feelings of mistrust in both the accuracy of one's perceptual apparatuses and feeling of mistrust pertaining to one's environment.

deleterious¹⁸, not restorative, in nature.¹⁹

5.3 Clarifying Our Connection to World

So far, I have cashed out condition two—connection to world—in terms of veridicality. In other words, subjects value authentic environments, for the way that these environments appear in one’s perceptual experience corresponds to the way that things in fact are. Condition two can also be understood in a weaker sense: being appropriately connected to the world involves standing in an (appropriate)²⁰ causal relationship to the environmental stimuli that induce one’s perceptual experiences *even if* the way that things seem do not precisely match the way that things in fact are. Interpreting this claim in a weaker way helps to mediate philosophical concerns elicited by a variety of fantastical—though conceptually possible—thought experiments. Consider, for example, a case wherein an individual travels through a forest that contains a fungal species that produces hallucinogenic spores. Grant that, due to the hallucinogenic effects of the fungal spores, the way that things seem to the individual in their visual field does not match the way that things in fact are. With the weaker interpretation of condition two in mind, we might still plausibly claim that this individual is

¹⁸ Here, I am ruling out cases wherein negative (e.g., painful) experiences have positive (e.g., psychological beneficial) value. In fact, I do concede (and endorse the claim that) some negative experiences have a positive value. Consider, for example, the ritualistic use of the toxic, white flower *Datura Wrighti*. Given its terrifying psychophysiological effects, it may seem surprising that anthropologists have documented the use of *Datura Wrighti* in ritualistic and medical settings in a variety of North American indigenous societies—including the Navajo Havasupai, Yuma, Paiute, Apache (Curtin 1983: 85-86), Walapai (Gayton 1928: 25), and Zuni. Boyd and Dering (1996; 267-269) have gathered evidence that indicates the “widespread use of the genus *Datura* by shamans for the purpose of divination, prophecy, ecstatic initiation, ritual intoxication, diagnosis, and curing” (267). Examining the psychological symbolism prevalent in the ritualistic uses of *Datura* is, I think, illuminating. First, we typically conceive of positive experiences as being conducive to our wellbeing, while painful experiences are considered detrimental. However, the hallucinogenic experiences and physical sensations induced by *Datura* are highly unpleasant (if not downright terrifying); ingesting *datura* contributes to frightful visions, extreme nausea, bodily heaviness, headaches, and light sensitivity, amongst many other unpleasant effects. Nevertheless, the indigenous communities previously mentioned conceive of the experiences yielded by *datura* as catalysts for psychological growth, transformation, and (beneficial) change. Therefore, *Datura* teaches us that not all negative experiences are harmful *in the long term*. Instead, that which is experienced as unpleasant in the moment is, at times, conducive to one’s longterm flourishing. The case above, however, is not like this insofar as both its experiential and long-term effects are detrimental in nature.

¹⁹ At this point, one might wonder: is knowing that something is authentic different from knowing nothing at all? In general, I posit that we by default assume—in the absence of countervailing data—that the entities or environments that we perceive are authentic.

²⁰ By ‘appropriate’ I here mean something like: one’s perceptual capacities serve their evolutionary function by providing one with e.g., an accurate visual map of one’s environment. By ‘appropriate’ I also mean to exclude cases wherein, for example, the mad scientist manipulates one’s neural and perceptual networks to such a degree that e.g., the way that things seem to a subject in her experience fail to match the way that things in fact are.

importantly connected to that which they perceive in their visual field, for their experiences are induced by the forest, which are then hallucinogenically modified by the fungal spores.²¹

As in other dream world objections, I grant that hallucinatory experiences may themselves be desirable for reasons other than their authenticity or inauthenticity. Nevertheless, there is a very important sense in which we rely on our veridical experiences in order to carry about daily actions. Moreover, even when immersed in hallucinations, individuals must still refer to veridical experiences as a locus by reference to which to get along in the world. Otherwise, to use the common phrase, by losing one's connection to world, one also thereby loses one's mind. Finally, without a veridical experience as a referent, we cannot even call a particular experience hallucinatory, for the very notion of a hallucination is parasitic on some (perhaps pre-theoretical) conception of that which constitutes experiential veridicality.

5.4 Distinguishing Connection to World and Historical Origins

So far, I have explicated authenticity in terms of historical origins and connection to world. One might at this point worry: conditions one and two, on the surface, seem to collapse into each other. While I admit that connection to world and historical origins are in many ways conceptual bedfellows, they are distinct in the following sense. Connection to world is best understood synchronically—that is, at a time—while historical origins is best understood diachronically—that is, over time. More precisely, when considering the authenticity of an environment in terms of connection to world, our concern pertains to a causal match that obtains (or fails to obtain) *at a time* between the way that things seem immediately in a subject's perceptual experience and the way that things in fact are. By contrast, authenticity understood in terms of historical origins refers to the relationship that obtains between a subject who justifiably infers and acquires knowledge pertaining to an entity's or environment's causal history on the basis of the appropriate perceptual connections that obtain between her and her environment. Here, the inextricable relationship between conditions one and two thus becomes salient: for when one is appropriately connected to the world, one is in a position to justifiably infer the entity or environment's historical origins, which—in some cases—then shifts the affective contents of one's experiences (resulting in e.g., reverence, wonder, or awe).

5.5 Our Evolutionary Connection to the World

So far, I have relied on a rather fantastical, Nozickian thought experiment in order to pump

²¹ And anyhow, we can encourage the person at a distance to wear a mask!

our intuitions about authenticity (and, more specifically, to introduce condition two—connection to world). From this reflection, it is (I think) now clear that connection to world is of epistemic import insofar as this condition must be satisfied for organisms, entities, and environments to directly confer novel intellectual discoveries and insights to perceiving subjects. Now, I further propose that there is an additional way to explicate connection to world. Namely, connection to world is and has been indispensable to our evolutionary history and contemporary survival.

Historically, the evolution of our species *Homo sapiens* depended on there being a veridical match between the way that things seem to us in our experience and the way that things in fact are. Indeed, our perceptual capacities (and those of all biotic species) have been selected for as a result of our ancestors' interactions with a variety of environmental pressures over the course of millennia. Veridicality and the selection of advantageous biological features (e.g., opposable thumbs for the purposes of tool manipulation) therefore contributed to reproductive success and the persistence of individual members of *homo sapiens*. More precisely, in order for our ancestors to successfully acquire food, avoid bodily damage, reproduce, and maximize societal benefits, there must have been a close match between the contents of their perceptual experience and the environment in which they were situated. Failures in perceptual matching could prove fatal, as in the case of a subject who mistakenly confuses a toxic mushroom with a benign varietal, eats it, and perishes as a result.

Likewise, it would be heavily problematic for an individual to interact with a simulacrum of a foodstuff that provides them with no nutritional benefit (as, purportedly, a simulation would) for any prolonged period of time *even if* it felt to the individual as though they were eating the foodstuff. After all, it would then become difficult for the individual to distinguish between simulated and non-simulated foods, as they would not be able to discern the one from the other on the basis of any perceptual cues. In an extreme case, if the individual were to continue to follow the perceptual cues that encourage them to (seemingly) consume the simulacrum, then they would eventually starve.²² Starvation is, clearly, conducive to neither individual health, nor the continuation of one's overarching species. So it would behoove us to avoid extreme severances in connection to world, whenever possible.

VI. The Third Criterion of Authenticity — Relational Role

6.1 Relational Role

To introduce the third criterion of authenticity, I will begin by illustrating a case that consists

²² Real world case study: our addiction to sugar, which is a simulacrum in many ways of nutritious, energy dense food. Our taste for glucose has led us down a dangerous path!

of a couple, Margot and Abdu, who together enjoy a happy marriage, which is sadly subjected to a strange twist of (philosophical) fate. Having illustrated this case, I will then draw an analogy between the irreplaceability of human to human relationships, on the one hand, and the irreplaceability of human to more-than-human relationships, on the other. Before proceeding, I will briefly clarify how I conceive of relationships in general.

I am committed to the claim that relationships²³ are both constituted and individuated by at least two *relata*. It follows from this definition that, if either of a relationship's *relata* changes, then the ontological status of the overarching relationship changes, too. Furthermore, I posit that *relata* and the relationships that they serve to constitute can be individuated either synchronically (again, at a time) or diachronically (that is, over time). This explains how relationships that persist over the course of many years can be justifiably individuated, despite causally-continuous changes in the *relata* that constitute them. Note that relationships can only be individuated in this way *if* there is an appropriate amount of causal continuity that obtains both within each individual (e.g., the inevitable changes that a person undergoes over time) and between *relata* (e.g., the inevitable changes that occur between those in relationship). Any substantive causal breaks within or between *relata* produce changes in the status of overarching relationships.²⁴ With these remarks in mind, let us return to the philosophical thought experiment at hand, which involves the devastating case of Margot and Abdu.

By a strange twist of fate, Abdu is one day replaced by a functionally and phenomenologically analogous replica (i.e., a clone) called Abdu Two. Time passes and marital events between Margot and Abdu (Two) seem to proceed as per usual. Many years pass until, finally, Abdu Two informs Margot of the switch that has occurred. He assures her that Abdu has not (in fact) been harmed. Indeed, Abdu finds himself in an analogous position to Margot, for he is now living in a phenomenologically identical home with an indistinguishable clone, Margot Two. Despite Abdu Two's assurance, Margot is (understandably) distraught. For though Margot is assured that no harm has come to her beloved Abdu, Margot desires and places value on her relationship specifically *with Abdu*.

The best explanation for Margot's distress runs as follows: Margot and Abdu's relationship cannot be preserved *even if* Abdu is replaced by a functionally and phenomenologically identical counterpart. For, though Abdu Two looks, smells, acts, cooks, dances, and enjoys the same works of literature as Abdu, Abdu Two (i) differs in his historical origins (he is, after all, the product of

²³ I remain neutral with respect to whether this is an ontological claim or whether it is an ordinary language claim about how we ought to use the term 'relationship'.

²⁴ A sharp break in an individual's personality, for example, caused by (say) extreme neurological decline may change the status of the relationships in which they find themselves.

cloning, not of sexual reproduction), (ii) is not that which he appears to be (so fails to satisfy condition two, connection to world), and (iii) is not the appropriate being who can serve the role of partial constituent in Margot and Abdu's marital relationship. After all, the relationship that Margot and Abdu share *qua* romantic couple is constituted and individuated by a set of two individuals—Margot and Abdu. If either or both of this set's members is replaced—even if by phenomenologically indistinguishable replicas—then the ontological status of their overarching relationship changes, too.

This fantastical, philosophical thought experiment strongly suggests, I think, a third condition of authenticity. Namely, in order for an entity or environment to count as authentic, it must be of the appropriate sort to serve as a constituent that individuates meaningful relationships. Call this feature of authentic entities and objects their capacity to serve an important:

(iii) Relational Role

6.2 Anishinaabe Relationships with *Manoomin*

I will now discuss the important relationships that human individuals and communities share with more-than-human entities and environments. Nevertheless, one might still wonder: how can a non-human entity play a non-duplicable, relational role? In order to further illuminate an answer to this question, I will now turn to the Great Lakes and the Indigenous Anishinaabe people who call it home.

The Anishinaabe people share an important set of cultural relationships with a variety of wild rice, *manoomin*, that plays just such an important, indispensable, and non-replicable cultural role. First, *manoomin* and its management connects the Anishinaabe people with the local plant life, animal life, and other environmental entities (e.g., waterways) with which they daily interact. Engagement with *manoomin* therefore serves to partially constitute an important set of human - more-than-human ecological relationships. These ecological relationships are formed and cemented through efficient land management practices, which—when successful—produce webs of reciprocity. More specifically, the relationship between *manoomin* and the Anishinaabe people is reciprocal in nature, for—when rice stewards satisfy their care-taking roles—both *manoomin* and human populations flourish.

During seasons of harvest, Anishinaabek families set up rice camps that serve as cultural hubs, which interweave ritual, work, storytelling, dancing, courting, education, and gameplay. Rice camps therefore provide a cultural framework in which relations between members of different Anishinaabek familial groups are built, explored, and maintained. *Manoomin*'s important cultural position is secured year-round, for even when not in harvest, wild rice is used during feasts, ceremonies, weddings, and other celebratory gatherings. Following Whyte (2017), call the wide variety of relation-

ships that are born of this cultural and environmental interweaving *collective food relations*.

As in the case of Margot and Abdu, the sets of collective food relations that manoomin yields are uniquely associated with (and individuated by) these first foods. And, given the important role that foods like manoomin play in Anishinaabek life, they cannot be easily (if at all) replaced by other foods (including, for example, other rice species). This observation led Norman Deschampe, former Minnesota Chippewa Tribal President, to state that:

[Anishinaabek communities] are of the opinion that the wild rice rights assured by treaty accrue not only to individual grains of rice, but to the very essence of the resource. [Anishinaabek communities] were not promised just any wild rice; that promise could be kept by delivering sacks of grain to our members each year. [They] were promised the rice that grew in the waters of [their] people, and all the value that rice holds (Andow et al. 2009: 3)

We can explicate this quote in the following way. Manoomin is imbued with and enmeshed in a set of cultural-ecological relationships, whereas other wild and agricultural rice crop species are (in this particular context) not. It would, for example, be less good for Anishinaabek communities to receive bags of rice from the United States government than it would be for Anishinaabek communities to harvest *manoomin* from the Great Lakes Region. After all, the latter bears and stimulates an important set of cultural-ecological relations that imply communal identity and tribal sovereignty,²⁵ while the other does not. Taking this claim to its conceptual extreme, it would be terrible for Anishinaabek communities to receive mere simulacra (e.g., simulations) of wild rice, which could play no role in either their cultural practices or their collective resilience. After all, simulations of wild rice would lack the appropriate historical origins, are nutritionally deficit, and cannot bind human and more-than-human ecological communities together through effective land management practices and ceremony.

By assessing the relationships that obtain between Anishinaabek communities and *manoomin*, we have gone some way toward further justifying the claim that the authenticity of entities and environments is partially determined by the relational role that at least some of them play in constituting meaningful cultural-ecological relationships. Replacing *manoomin* (with another rice species or mere simulacra) would inherently damage the important relationships that bind these environmental entities to the communities in which they are culturally enmeshed—even if their substitutes were of a phenomenologically identical kind. Furthermore, replacing *manoomin* with mere simulacra would undermine Anishinaabek collective resilience—that which enables them to adapt to the swiftly chang-

²⁵ That is, that the lake is currently under tribal management and control. Management of *manoomin* furthermore contributes to the collective resilience (Whyte 2017; 2018) of the Anishinaabe people, which enables them to adapt to changing ecological traditions through food sovereignty (that is, the capacity to cultivate, manage, and enjoy foods grown by their own land management practices).

ing environmental conditions that threaten to wipe out their Indigenous life-ways and capacity to persist through food sovereignty and the preservation of their cultural inheritance (Whyte 2018).

VII. The Authenticity of Biodiversity

So far, I have established that we as humans value the experiences that are induced in us by particular, authentic constituents of biodiverse systems. We value, for example, *manoomin*, the sight of a graceful heron, the wild energy of upstream-running salmon, the sweet scent of New Mexican white sage, and the fiery bloom of Indian paintbrush along the Texas Highway 1.²⁶ I now take as my task the operationalization of this claim over biodiversity in general. More specifically, I will show that we (that is, members of our species *homo sapiens*) value the authenticity of biodiverse environments (e.g., rivers, forests, deserts, prairies) conceived of as ecological wholes.

First, I posit that biodiverse environments, conceived of as ecological wholes, *just are* composed of the sets of their biotic constituents. I infer that, insofar as we value the experiences induced in us by authentic, ecological constituents, we also value the authenticity of biodiverse ecosystems, conceived of more generally. This helps us to make sense of the intuition that one can be meaningfully connected to an ecological *place*, just as one can share a meaningful relationship with a particular species. I may justifiably feel that I stand, for example, in a kind of irreplaceable relationship with Austin's Bull Creek insofar as I have daily spent time over the course of six years developing a set of relationships with its many ecological and geological constituents (e.g., the trees in the surrounding forest, the redbuds that bloom so beautifully in Spring, the reishi that fruit from the trunks of dead trees after early Autumnal rains, and the many birds that make of it their seasonal home).²⁷ In a more deep-rooted way, the Anishinaabe people share a multi-generational relationship with *manoomin*, for which they exhibit reverence and care. Considered together, these cases show that entities and environments, conceived of as ecological wholes (not merely particular species) can be of relational import to individuals and communities alike.

²⁶ The list goes on: the river Ganges, charismatic animals (e.g., elephants and tigers), the Western fascination with dinosaurs, etc.

²⁷ Similarly, it makes sense to infer that backpackers who spend years immersed in the red rock halls of Southern Utah share an important relationship with it; this relationship is given in virtue of the relationship that they share with its endless stretches of canyons, by sniffing its varieties of desert sage, enjoying its many twisted junipers, and delightedly catching glimpses of mated peregrine falcon pairs as they dove speedily after their prey.

VIII. Objections

8.1 What About Undiscovered Species with which We Currently Share No Relationship?

One might now worry: so far, I have established that biodiverse environments are not perfectly replicable insofar as an attempt at replication would eliminate their capacity to play an important epistemic, cultural, and psychophysiological role in human life. Furthermore, I have shown that they must be authentic in order to facilitate these important effects. However, this objection runs, I have failed to mention organisms, species, and environments with which we have little or have not so far made perceptual contact. There are, nevertheless, many undiscovered species (e.g., some species of deep sea non-vertebrate or hitherto undiscovered lifeforms on exoplanets) that are worthy of conservation and that bear a kind of authenticity that is likewise non-replicable. *Prima facie*, the objection runs, my account—particularly condition (iii)—fails to make sense of the authenticity of undiscovered organisms like these. Therefore, it is uncomfortably limited in its scope.

In order to extend my account of authenticity to hitherto undiscovered biological organisms, I need only make the simple inference that discovering new species will (or, in the counterfactual case, would) clue us into their historical origins, further connect us to our biotic and cosmic world, and could in principle facilitate the generation of new relationships (as between e.g., terrestrial and extraterrestrial lifeforms). Discovering new species indisputably contributes to intellectual discoveries and insights by expanding our epistemic repertoire. This, furthermore, aids in our self-understanding, for (in the case of e.g., extraterrestrial organisms) it illuminates the conditions that must be met for the generation of life in general. (Are all biological organisms carbon-based, or might they be silicon?)

Anticipation plays a relevant psychological role that drives the quest for discovering species with which we have not so far had perceptual contact. Anticipation, more specifically, involves the psychological pleasure or curiosity that predicts with some degree of likelihood the possibility of discovering hitherto unknown species. Here's an analogy that will help to make sense of this claim. I have enjoyed, over the course of my life, many glorious vegan treats. On the basis of a recent experience wherein I enjoyed a shockingly good Vietnamese eggplant bao (bun), my confidence in the probability that I will likely enjoy many more delicious, novel treats in the future (with which I have no current or previous experience) increased. I look forward to enjoying these new treats, which will expand my palate and contribute to the discovery of novel flavor profiles. Likewise, we experience the same kind of anticipatory delight when considering the discovery of new biotic or environmental particulars and wholes. This anticipation lends itself to the cultivation of new relationships and

the possibility of reverence. So the authenticity of undiscovered biotic organisms and environmental features is conferred by the promise of the intellectual insights that they will induce, which will yield possibilities for reverence and the cultivation of further ecological relationships. Both of these are given to us through the possibility that our epistemic horizons will be broadened.

8.2 Artistic, Technological, and Environmental Authenticity

I will now address a second worry for my general account of (environmental) authenticity. Namely, authenticity does not always bolster the value (or to-be-preservedness) of entities and environments. There are, the objection runs, many entities, artifacts, and environments are valuable *precisely because they are inauthentic*. Artificial limbs, as we have briefly seen, are valuable insofar as they are (in ideal cases) perfect—if not superior—replicas of biological limbs, which satisfy the important functional goals for which they are crafted. Likewise, precise pictorial representations (e.g., photorealistic paintings) of environmental entities are excellent *by virtue of being* excellent representations. If inauthenticity serves to *bolster* value in these cases, then inauthenticity may also bolster the value of simulations of biodiverse environments.

This objection is, I think, fundamentally misguided. The inauthenticity of the entities in question does not bolster or contribute value to them. Instead, their value is conferred by features *other than their (in)authenticity*. This implies, and I have previously stated, that there are a plurality of values that may come into play when assessing the status of entities, artifacts, or environments. Authenticity is but one value amongst many, including e.g., technological excellence, impeccable craftsmanship, etc.

With this appeal to value pluralism in mind, I now claim that artificial limbs and representational artworks are worth conserving for reasons *other than* their inauthenticity. For example, the excellence of a hyperrealistic painting is attributable to the great skill of the artist who executed the work. Likewise, the excellence of an artificial limb is attributable to, for example, the fact that it is both functional and technologically innovative. Artificial limbs are worth conserving and producing for they allow subjects to regain partial, full, or superior range of movement; they are innovative insofar as they mark the advent of a new wave of technological advances that are both elegant and spectacular.

8.3 Inauthenticity is Perceived as Conferring Lesser Value

The values that I have outlined serve to override the trouble associated with the inauthenticity of the entities and artifacts under consideration. In other words, the value of these entities and

artifacts is not conferred in virtue of their inauthenticity, but *despite* their inauthenticity. To justify this claim, I will now outline a psychological study conducted by CUNY's Angelika Seidel and Jesse Prinz, which indicates that inauthenticity is perceived by subjects as conferring *reduced value* in many artistic contexts.

Seidel and Prinz requested that their subjects envision a scenario wherein Leonardo da Vinci's Mona Lisa has been destroyed in a fire. They then told the subjects that a phenomenologically indistinguishable replica exists—a copy so perfect that experts could not discern it from its original. They then asked subjects whether, given the choice, they would prefer to see the ashes of the original or the visually indiscernible (that is, perfect) copy. According to Prinz, “[e]ighty per cent of our respondents chose the ashes,” a statistic which led him to conclude that, “apparently, we disvalue copies and attribute almost magical significance to originals” (Prinz 2013).

Though this study seems to indicate that subjects value originals over their replicas, it is not conclusive. To demonstrate this claim, this study will need to be replicated across a variety of cases. In addition, a more precise specification of the variables that best explain the differing values that subjects attribute to each (fictional) work is required. Nevertheless, Prinz and Seidel's study does go some way toward justifying the claim that subjects value authentic entities and environments over their replicas *even when* the originals fail to induce the same (aesthetic, phenomenological) experiences, due to a breakdown in the properties that they once bore.²⁸

IX. Conservation, Restoration, and Generation

9.1 Degrees of Authenticity

I will now draw a distinction between the role that authenticity plays in conservation, restoration, and (what I term) generation cases. This tripartite distinction highlights an important feature of authenticity: namely, it is not an all-or-nothing property but a matter of degree. To put it differently, it is not the case that (strictly speaking) entities and environments either fully bear the property of authenticity, or fully do not. Instead, entities, artifacts, environments, and even people may bear it fully, somewhat, or not at all. In order to illuminate this claim, I will spend the duration of this section drawing out its implications in restoration and generation cases explicitly. Before turning to this task, it is important to note that the weight of the properties that come into play when we engage in deliberative procedures (about, more specifically, how we ought to act) will take

²⁸ Or, in this case, the very composition!

more or less precedence depending on the *context*. In the context of the overarching argument articulated here, I have shown that the authenticity of artifacts and (e.g., biodiverse) environments plays an important role in justifying their conservation. More specifically, their authenticity conditions the transformative power (understood in terms of e.g., intellectual, cultural, and restorative power) that they bear and, ultimately, it is this transformative power that gives us good reason to conserve them.²⁹

In order to more clearly explicate the claim that the property of authenticity is best conceived of as falling along a spectrum, let us first consider the case of ecological restoration. I will focus, more precisely, on the case of Scottish primeval forests, which were historically razed, yet have been (through contemporary efforts) to varying extents restored. Having completed this task, we will then turn to considering authenticity within the context of the marvelous possibility of generating e.g., novel biodiverse species via emerging technologies.

9.2 Authenticity and Ecological Restoration

Scottish primeval forests—including the Caledonian Forest—were originally comprised of Scots pine, oak, aspen, willow, holly, alder, and birch. Sadly, these forests were cleared and overburned in order to stimulate the growth of heather, which provides roving sheep with excellent pastoral grazing. The total history of deforestation in Scotland is long, so I will not recount it in its fullness here. Suffice it for our present purposes to say, grazing pressures in conjunction with an overabundance of logging directly contributed to the decline of the region's woodlands. Furthermore, and as a result of this extensive habitat destruction, Scotland lost a plethora of the biodiverse species that historically occupied its landscapes (Ashmole 2006; Fowler 2002; Smout 1997; 2003).

There have been quite a few contemporary efforts to restore forests and tree cover to the Scottish Highlands. However, most restoration efforts have produced forests that are largely monocultural, replanted with an eye toward fueling commercial forestry:

Most forests were planted and restocked through deliberate programs directed by the Forestry Commission [...] These commercial forestry plantations, whether public or private, are dominated by conifers, especially exotics, such as Douglas fir (*Pseudotsuga menziesii*),

²⁹ There may be other reasons that justify the conservation of artifacts, entities, and environments that go beyond their restorative power (and—thereby—their authenticity). I endorse a pluralism about values and grant that biodiverse environments may be worth conserving insofar as they are aesthetically or intrinsically valuable (that is, valuable in themselves, absent any role that they do or do not play in human life). However, as I am not here articulating an intrinsic value defense of biodiversity conservation, I set these considerations, for the moment, aside.

Norway spruce (*Picea abies*), and Sitka spruce (*Picea istchensis*), a species introduced from Canada in the 19th century and referred to as a “super tree” for its speed of growth and tolerance of rough climate (Forestry Industry Council of Great Britain 1998). All are construction species with high yield per hectare and capital value. [...] Although indigenous Scots pine is evidence in some of these enclosures, overall tree species diversity is relatively low. Likewise, the population and diversity of fauna is limited, due to the density of plantation (Robbins and Fraser 2003: 105).

As this passage indicates, the majority of Scottish forests are “forests of production”—monocultures planted for the purposes of resource extraction.

The authenticity exhibited by monocultural, production forests is significantly lesser than that of the primeval originals. Returning to condition one, their historical origins differ in at least two respects: (i) due to a severance in the original forests’ historical roots (through deforestation and overgrazing) and (ii) due to the fact that the trees planted in their stead are non-native varieties that fail to uphold any degree of (what I term) *biotic continuity* with the forests that were.

I conceive of ‘biotic continuity’ as referring to a process whereby the organisms that populate an ecosystem are dynamically produced through typical ecological processes (e.g., sexual or asexual reproduction) that take place over time. Species exhibit strong biotic continuity if they grow and flourish as a result of (in the case of plant species) successful seed dispersal paired with favorable environmental conditions. Anthropogenic (i.e., human) influences can, at times, yield strong biotic continuity—as is the case when human populations implement fire ecological practices that are integral to the functioning of a biotic landscape (consider, for example, sequoia seed pods, which require fire for dispersal and proper germination). Not all anthropogenic influences, however, yield equal biotic continuity. Consider cultivation cases, wherein human communities create seed banks out of which native plant varieties are later grown. In this cultivation case, biotic continuity (I posit) is upheld, but to a weaker degree. More specifically, biotic continuity is weakened in this second case due to the time that elapses between the dispersal and gathering of seeds, their storage, and their re-introduction into an ecological landscape that is conducive to their growth. More precisely, the causal break due to storage explains the break in biotic continuity. Furthermore, in cases of cultivation it is important to note that the proverbial and literal fruits yielded by the seeds planted must to some extent match the native varieties that grow (or grew) in the ecological region³⁰ in question.³¹

³⁰ Given this definition, Chinaberry trees in Texas—which have gained an ecological foothold by crowding out native species—fail to uphold a high degree of biotic continuity. This is evidenced by the fact that Chinaberries’ speedy growth contributes to declines in biodiversity, due to their propensity to create Chinaberry monocultures.

³¹ Campbell discusses these cases in more depth.

Planting invasive species in an ecological habitat, by contrast, significantly weakens biotic continuity, for the introduction of invasive varieties contributes to sharp declines in local biodiversity (due to a lack of mutualism that obtains between invasive and pre-existing species). Having said all of this, altogether, I propose that a higher degree of biotic continuity confers a higher degree of authenticity to replanted forests.

Returning to the case in question, restored forests are comprised of monocultures of exotic species, planted with a particular purpose in mind—logging—in order to yield production materials that can play the role of constituent parts in e.g., building construction. Additionally, due to the dense manner in which monocultural forest farms are planted, they cannot serve the role of proper habitats for the biodiverse species that were historically housed in these geographical regions. With this in mind, monocultural forests are perhaps better classed as forest *farms*, rather than forested woodlands. After all, the term ‘woodland’ implies a forested region that can play the ecological role of habitat and host to a variety of biodiverse flora and fauna. Replanted, monocultural forests do not meet this criterion; and, by extension, they fail to meet the condition of biotic continuity.

Production forests do, nevertheless, bear *some* degree of authenticity, for they are not digital simulations or constructed simulacra (e.g., they are not created from paper and concrete). So while it is true that their historical origins have been severed and their biotic continuity largely lost, a synchronic connection still obtains between subject and world for those who perceive them. More specifically, a subject who comes into perceptual contact with, say, a Sitka spruce is in fact appropriately perceptually connected to the Sitka spruce: that which she appears to see, all leafed and green, is truly a constituent of the monocultural landscape in which she’s situated. Production forests do, however, fail to meet condition (iii), relational role, for they serve as a mere means toward the production of capitalistic ends. This entails that opportunities to engage in the diachronic cultivation of reverential and reciprocal relationships with them are lost or eradicated altogether. Considered together, it is clear monocultural forest farms are only somewhat authentic insofar as they meet conditions (i)-(iii) to varying degrees.

Compare these monocultural forest plantations with the contemporary rejuvenation and expansion of the Caledonian woodland, populated by a variety of native species, including silver birch, Scots pine, and alder (Forestry Industry Council of Great Britain 1998):

This “new” form of forest cover is deliberately planted with assistance from the state’s Woodland Grant Scheme (WGS) [...] Of this coverage, some 15,386 ha are protected as Sites of Special Scientific Interest (SSSI), areas specifically set aside for national preservation status (Scottish Executive 1999b). They are actively protected from sheep- and deer-grazing

[...] Thus, while some forests persist as remnants of the past, their expansion clearly represents deliberate state investment, management, and protection (Robbins and Fraser 2003).

Let us focus, more specifically, on the Forest of Spey in the Cairngorm foothills, which is biotically continuous with primeval Caledonian forests:

[T]he Forest of Spey is a prominent example of the new “native” landscapes existing schizophrenically alongside the more extensive commercial monoculture plantations [...] “native” woodlands, such as Spey, represent a form of nature produced through political and economic processes to overcome the limits placed on the economy by previous environmental transformations. [...] The development of these forests comes to be specifically intended for direct consumption as *wild space*, even though these forests must be produced through evident political effort (Robbins and Fraser 2003: 108 — emphasis my own).

Restored forests like Spey exhibit a higher degree of biotic continuity than do monocultural forest farms: they contain both native flora and fauna generated through ecologically continuous reproduction and were cultivated via replanting efforts intended to match the native, biodiverse species that originally grew there.³² Due to this high degree of biotic continuity, they are therefore far *more* authentic than their monocultural cousins. However, though condition one—historical origins—is satisfied to a high degree, the authenticity that they exhibit is weaker than that of their historical progenitors. After all, though it seems to be the case, they have not in fact persisted over the course of

³² I acknowledge that there may very well be variation with respect to the important relational role that monocultures play for the humans who tend them. In order to illuminate this claim, it may be helpful to broaden our discussion beyond forests. For example, the way that organic wine growers tend their monocultural grapes in Sonoma County looks markedly different from, say, monocultural crop plantations in the cotton belts of Punjab. In this latter context, monocultural cotton plantations are relationally *oppressive*. Due, more specifically, to (in some cases, extreme) poverty, Punjabi farmers have been forced to purchase and to grow Bt Monsanto cotton seeds, divesting them of traditional ways of relating to native varieties and other, biodiverse species endemic to the region. Additionally, monocultural plantations—due to their lack of crop variation—are not pest-resistant in the long term (Andow 1991). As monocultures are particularly vulnerable to damaging infestations, the use of pesticides—including RoundUp—is widely employed. Pesticides contain an array of lethal, active ingredients (e.g., organophosphate, glyphosate, and chlorpyrifos), leaving Punjabi farmers particularly vulnerable to medical malaise (Khan et al. 2015). The oppressive combination of crushing socioeconomic pressures, low cotton crop yields, and the need for (unaffordable) medical care has driven Punjabi farmers farther into poverty. As a result, farmers suffer an array of detrimental psychological illnesses, including widespread cases of major depression. Tragically, with over 300,000 cotton farmer suicides, the Punjabi cotton belt has thus come to be known as the ‘Suicide Belt’ (Sidhu 2010). (To quote Thomas & Tavernier 2017 posit, even if one debates “[...] the association between seed monopolization and farmer-suicide [...] there is a link between the economic factors associated with Bt. cultivation and farmer suicide”). This case—amongst others, including e.g., eucalyptus monocultures in the Brazilian Amazon—suggests a link between pressing, socioeconomic need and monocultural plantations (and thus severances in right, ecological relationship).

millennia. Instead, their restoration has been facilitated by ecological scientists and foresters, who seriously considered and engineered the previously heather-strewn landscape to be conducive to the growth of replanted, biodiverse tree populations.

When considering condition three—relational role—it is helpful to note that the Forest of Spey and Caledonian woodlands more generally are touted (by reference to the above passage) as ‘wild spaces’ in Scotland. In this context, I understand ‘wild space’ to imply an ecological region that is legally designated for human recreation, biodiversity conservation, and restoration, which together afford opportunities for (e.g.) solitude and reverence. While the experiences induced in ecotourists to Spey may be of substantially less personal or cultural import than Sacred Groves are for the Lepcha of Sikkim who revere and maintain them, there is some degree of relationship (I posit) that is cultivated between visitors and the forests of Spey. Indeed, a more widespread cultural rejuvenation of reverence for forests may be facilitated by them, for rules of propriety restrict and govern activities performed on these public woodlands (in order to conserve their biodiversity). Altogether, this sounds quite a lot like the strictures that govern activities performed in the sacred groves of Sikkim. Thus, it makes sense to infer that restored Caledonian forests like Spey do meet condition three—relational role—to at least some (if only a very weak) cultural degree.³³ Having assessed whether non-commercial, Caledonian woodlands meet conditions (i)-(iii), it is clear that restored Caledonian forests exhibit a higher degree of authenticity than both monocultural, production forests and digital simulations (or other simulacra).

Considered together, restoration cases highlight that authenticity is not an all-or-nothing property that environments or entities do or do not bear. Instead, there are degrees of authenticity. Note that prioritizing authenticity constrains and recommends strategies for engaging in effective restoration efforts. Even if we acknowledge that biodiversity is dynamic (not static),³⁴ we can still justifiably claim that we ought to restore primeval Scottish forests in a way that best preserves their biotic continuity (through, say, restoring native varieties, including alder, pine, rowan, and birch). This enables biotically continuous forest restorations to play the ecological role of habitat for a variety of lost flora and fauna, which in turn affords visitors with opportunities for intellectual and psychophysiological transformation. As a direct result, the transformative power that restored forests bear (by e.g., affording opportunities for discovery and reverence), provides visitors with opportuni-

³³ Restored forests could potentially play an important role in the revival of e.g., druidic practices centered on the reverence for and maintenance of sacred Scottish groves. The revival of groves could therefore play a role in reviving pre-Christian Scottish cultural inheritances; Scottish druidism was wiped out—along with the region’s forests. They may serve to facilitate or to revive cultural ideals and practices that have been lost.

³⁴ That is, biodiverse environments change over time.

ties to cultivate meaningful relationships with more-than-human environments and their biodiverse constituents (Hobbs 2009; Holl & Smith 2007). Restoring Scottish forests to their biodiverse fullness (through working to reinstate biotic continuity) is thus integral. Conversely, planting forest monocultures substantially less good; we ought to avoid it when alternatives are available.³⁵

9.3 Authenticity and Ecological Generation

Now, let us assess the role that authenticity plays in determining what I will call *generation* cases. Ecological generation refers to the possibility of generating new biodiverse species by employing gene-editing or gene-combinatory technologies. Through the use of these technological advancements, overall biodiversity could in principle (and likely will in practice) be increased. Therefore, it might be plausibly thought that proponents of biodiversity conservation ought to whole-heartedly accept the advent of ecological generation on the basis of accepting the following, normative claim: we ought to maximize biodiversity, whenever possible.

Employing the philosophical machinery that I have so far outlined, it would behoove us to first note that the authenticity (if applicable) of a newly generated species, G_s would be indexed *to* G_s . After all, as G_s is biotically novel, its authenticity cannot be parasitic on any pre-existent species. This caveat serves to distinguish generation from de-extinction cases—those technologically marvelous instances wherein a biotically continuous species is resurrected from its evolutionary grave³⁶.

The biotic continuity of newly *generated* species, by contrast, could only be understood in terms of their capacity to fulfill an ecologically mutualistic role, which contributes to (or, at the very least, does not detract from) the flourishing of native species that populate the environments into which they are introduced. If freshly generated biotic species fail to play a mutualistic, ecological role and (like invasive varieties) dominate the ecological landscape, then this may give us some reason to pause and wonder whether they are ecologically authentic, in the sense that I have been so far recommending.

Novel species that are generated via e.g., re-combinatory technologies *may* be authentic in the sense of meeting condition (ii)—connection to world. More precisely, whether the way that they ap-

³⁵ Viable alternatives for forest restoration include biodiverse restorations that match the destroyed native varieties to a relevantly high degree, while simultaneously acknowledging that ecological systems are dynamic (that is, ever-changing) in nature. Additionally, by employing non-native species that fill important ecological roles, forest restoration can be conducted unproblematically. Finally, by employing traditional management practices—including efficient, controlled burns—forest restoration can facilitate the rejuvenation of human-more-than-human relationships, which simultaneously rejuvenate cultural norms and the flourishing of overall biodiversity.

³⁶ Campbell (2017) explores the case of generation and de-extinction in substantively more depth.

pear does in fact match the (surprising) way that they are must be determined on a case-by-case basis. It may appear in some cases (to those without prior epistemic knowledge of their origins) that these newly generated species were *not* selected for via evolutionary processes. This would be particularly true in cases wherein two surprising sets of reproductively isolated species were gene-edited and combined in order to create a hitherto unseen (and phenotypically unusual) species. Here, connection to world would be satisfied, for the way that they seem would in fact match the way that they are; on the basis of this evidence, perceivers would justifiably conclude that they were produced via gene-editing techniques—not over the span of millennia via natural selection.

However, there are cases wherein those who perceive the novel species may draw faulty conclusions on the basis of the phenotypic evidence with which they are presented. Consider a particular case of gene-editing, wherein two reproductively isolated species—S1 and S2—are combined to create a novel species. This novel species expresses the phenotypic features common to each, which are combined in a subtle—rather than surprising—set of ways. Those who perceive the novel species might therefore infer that S1 and S2 are not reproductive isolates. This would be the wrong conclusion to draw, but would nevertheless be a reasonable inference on the basis of the data with which they are presented. After all, it *seems* as though the novel species is the natural product of e.g., natural selection. Here, the way that the novel species appears does not in fact match the way that it is. In cases like this, newly generated species would fail to meet condition two—connection to world.

When considering whether novel species bear the appropriate historical origins, it is worth noting that the shallowness of their historical roots is not, on its own, a knock against their authenticity; newly born human babes are, after all, still authentic *qua* human beings, despite the fact they they have existed for only a very short time. Nevertheless, a deeper analysis of the relationship that obtains between natural selection, other evolutionary processes, and historical origins is warranted; for in the advent of complicated, gene-editing technologies, we may need to extend our conception of what evolution involves so as to conclude within its explanatory purview the anthropogenic pressures on biotic systems that are generated via human artifacts and technological achievements.

Finally, it is unclear whether novel, generated species could meet condition three, relation to world, as they lack deeply-rooted causal histories that could situate them within complex cultural-historical frameworks. This, I think, makes generation a particularly intriguing case and opens up conceptual space for far deeper exploration. For now, suffice it to say that, on the account of authenticity that I have articulated here, the degree to which newly generated species count as authentic is very much unclear.

9.4 Authenticity and Ecological Conservation

My overarching goal has been to demonstrate that authenticity plays an irreplaceable role in conditioning the transformative and restorative power of biodiverse environments—that, more specifically, which warrants their *conservation*. Therefore, the authenticity of biodiverse environments should take methodological primacy when considering, first and foremost, conservation cases. Nevertheless, we have also seen that authenticity serves a guiding role when considering environmental restoration. Here, we have an obligation to match authenticity to a relevantly high degree by, for example, re-planting native varieties and be re-instating traditional management practices that facilitate interwoven relationships between human populations and the lands for which they care. Finally, we have seen that the role that authenticity plays in generation cases is, at best, unclear. Any analysis of freshly generated species that employs authenticity as a primary metric will therefore have to proceed on a case-by-case basis.

X. Conclusions

10.1 Contextual Considerations

Before concluding, it is worth noting that—due to its contextual and spectral nature³⁷—discussions pertaining to authenticity should be flexible. On the one hand, the Experience Machine earlier discussed is still authentic *qua* experience machine. However, as it does not represent itself in Rowan's experience *as an Experience Machine*, the perceptual representations that it induces are inauthentic (and are thus the target of our analysis), for her connection to the world has been severed.³⁸ This case is contextually different from, say, that involving Margot and Abdu Two. Abdu Two, by contrast, is inauthentic along two dimensions: in virtue of (not being) the person (i.e., entity) whom he appears to be *and* by reference to the way that he (non-veridically) presents as Abdu.

10.2 Summary

In this piece, I have shown that something other than the phenomenological indistinguish-

³⁷ By this I mean: authenticity comes in degrees.

³⁸ Furthermore, the experiences that it generates are authentic *qua* phenomenological experiences, but are non-veridical—and so inauthentic—*qua* representations of a mountain meadow. (That is, they purport to represent a mountain meadow, when they in fact do not.)

bility of experiences matters to us: the authenticity of artifacts, environments, and people matters. Furthermore, I have shown that authentic artifacts and environments are better suited than their replicas to play significant cultural, intellectual, personal, and psycho-physiologically transformative roles in the lives of human persons. The same, I have argued, holds true for biodiverse, restorative environments; that is, their simulations—even if phenomenologically indistinguishable—are not suited to play the same cultural, intellectual, and restorative role.

To recapitulate, the first criterion—historical origin—states that an entity must have the appropriate historical origins in order to count as truly authentic. What is meant here by ‘appropriate’ historical origins? Admittedly, an answer to this question is closely connected to an explication of the second criterion. More specifically, in the cases that we have evaluated, the historical origins of the replicas and simulations do not match the kinds of historical origins that are appropriate to e.g., trees, mountains, Goyas, and Upper Paleolithic cave paintings. These entities all have very specific historical origins: trees are biological entities that grow from seed, mountains are the products of tectonic shifts, and paintings are painted by artists who occupy certain mental states at certain times. Trees are *not* virtual entities, Upper Paleolithic cave paintings are *not* made of plaster, wood, and acrylic paint, and a genuine Goya is *not* sketched by any artist other than Goya. When a simulation of e.g., a tree induces tree-like experiences, these appearances suggest that the entity that induced these experiences has its historical origins in the sprouting of a seed. However, as there is no match between what the appearance of a virtual tree purports to show and its actual historical origins, virtual trees are inauthentic. This account generalizes across cases, for the appearances of all of the replicated entities that we have evaluated suggest that these entities possess the appropriate historical origins when, in fact, they do not. With this in mind, the second criterion—connection to world—may be conceived of as a synchronic (that is, at-a-time) articulation of the first. It states that, in general, there must be a close match between how things seem to us in experience and how things in fact are. Condition two thus makes sense of the preference that we have for being connected to our environments—both epistemically and evolutionarily. Condition three—relational role—states that the artifact, entity, or environment must be the kind of thing that can appropriately play the role of partially constituting meaningful human relationships. This helps to make sense of the important relational role that non-human entities—including various plant species and natural features (e.g., manoomin)—play in the cultural lives and self-understanding of various human communities and individuals, alike.

Together, conditions (i), (ii), and (iii) comprise the set of necessary and sufficient conditions that an entity or object must meet in order to count as truly authentic. So even if it were possible to

perfectly simulate the restorative effects of exposure to biodiverse environments, we still have an obligation to conserve them. After all, they bear an important psychological, epistemic, aesthetic, and cultural significance that cannot be replicated.³⁹

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³⁹ However, as Ulrich suggests, simulations of biodiverse environments may still have an important role to play in, for example, hospital or inner city settings.

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