Gigawatts and Wisdom: Toward an Ecological Ethics of Artificial Intelligence

Sam Harrelson
PhD Student, Philosophy of Religion (Ecology, Spirituality, and Religion), California Institute of Integral Studies
sharrelson@mymail.ciis.edu
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Abstract

The rapid expansion of energy-intensive artificial intelligence infrastructure has outpaced existing ethical frameworks focused primarily on algorithmic behavior. This paper argues that gigawatt-scale AI systems demand an ecological and theological reframing of AI ethics, one attentive to energy use, infrastructure, and formation. Drawing on phenomenology, ecological philosophy, and religious traditions, the paper critiques the equation of intelligence with scale and throughput, and advances *ecological intentionality* as an alternative framework grounded in relationality, restraint, and care. The paper concludes by outlining an ecological ethics of artificial intelligence oriented toward wisdom, accountability, and the limits of a finite planet.

I. Introduction: Reframing Artificial Intelligence After Colossus 2

In early 2026, Elon Musk announced that xAI's "Colossus 2" supercomputer had become operational, describing it as the world's first gigawatt-scale artificial intelligence training cluster, with plans to scale to 1.5 gigawatts within months.[1] The announcement was framed, as such declarations often are, as a milestone of technological achievement. The numbers were meant to inspire awe. Comparisons quickly followed, noting that the system's electricity consumption rivals or exceeds the peak demand of major metropolitan areas.

[1] Elon Musk, post on X (formerly Twitter), January 17, 2026, announcing the operational status of xAI's Colossus 2 supercomputer.

What is notable about this moment is not merely the magnitude of the computational infrastructure involved, but the way such magnitude is offered as self-evident justification. Scale is presented as progress. Energy consumption becomes a proxy for intelligence. The underlying assumption is that greater power input necessarily yields greater understanding. This paper begins from a different premise.

In *Artificial Intelligence at the Crossroads of Science, Ethics, and Spirit*, I argued that contemporary debates about AI are too often framed within narrow technical or moral horizons, neglecting the deeper spiritual and ontological questions that emerge when machines begin to shape how humans perceive, decide, and relate.[2] That argument remains necessary, but it is no longer sufficient. Developments like Colossus 2 bring into view a dimension of artificial intelligence that demands further attention to its material and ecological embeddedness.

Artificial intelligence does not exist in abstraction. It is instantiated in hardware, sustained by electrical grids, cooled by water systems, and dependent upon global supply chains of minerals, labor, and land. Recent assessments by the International Energy Agency estimate that data centers already account for approximately 1–1.5 percent of global electricity demand, with AI-driven workloads representing the fastest-growing share of that consumption.[3] Projections suggest that without significant changes in efficiency or governance, data center energy demand could more than double by the end of the decade. These are not marginal increases. They represent structural shifts in how energy is allocated across societies.

When AI training clusters reach the gigawatt scale, they do not only represent advances in computational power. They also reconfigure landscapes, priorities, and patterns of extraction.

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[2] Sam Harrelson, *Artificial Intelligence at the Crossroads of Science, Ethics, and Spirit* (2025).
[3] International Energy Agency, Electricity 2024: *Analysis and Forecast to 2026* (Paris: IEA, 2024).

A single gigawatt-scale facility requires continuous, stable energy equivalent to that consumed by hundreds of thousands of households, along with extensive cooling infrastructure that often places additional strain on local water systems.[4] These systems are spatially concentrated, yet their ecological impacts are diffuse, extending across regions and supply chains.

The ethical significance of this shift cannot be grasped solely through familiar frameworks of bias, alignment, or transparency. Nor can it be addressed adequately through appeals to innovation or market inevitability. What is at stake is not only how artificial systems behave, but how the pursuit of artificial intelligence reorganizes the human relationship to energy, place, and the more-than-human world.

From a phenomenological perspective, this reorganization matters because intelligence is not first a technical achievement but a *relational* one. Intelligence arises through situated attention, embodied responsiveness, and the capacity to be addressed by a world that resists total control.[5] Yet contemporary AI development increasingly equates intelligence with throughput, speed, and scale. Analyses by researchers at Epoch AI show that training compute for leading models has been growing at an exponential rate, closely tracking increases in energy consumption rather than qualitative shifts in learning architecture.[6] Intelligence, in this framing, becomes something purchased through electricity rather than cultivated through relation.

There is also, inevitably, a theological dimension to this transformation. Technologies that demand vast, continuous flows of energy function not only as tools but also as ordering forces. They shape habits of attention and expectation. They train communities in what is

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[4] International Energy Agency, *Data Centres and Data Transmission Networks* (Paris: IEA, 2023).
[5] Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Donald A. Landes (London: Routledge, 2012).
[6] Epoch AI, "*Trends in AI Training Compute,*" technical report, 2024.

considered valuable, expendable, or inevitable. As scholars writing in venues such as the IEEE have begun to note, the infrastructure supporting large-scale AI increasingly resembles critical civic utilities, while remaining largely governed by private interests and market logics.[7] In this sense, large-scale AI infrastructures operate liturgically, forming desires and assumptions long before explicit ethical judgments are made.

Here, I argue that the emergence of gigawatt-scale artificial intelligence marks a critical juncture. It forces a reckoning not only with the ethics of intelligent machines but with the ecological and spiritual costs of the intelligence we are choosing to cultivate. By bringing phenomenological insight, ecological theology, and critical attention to material infrastructure into conversation, I propose an ecological reframing of AI ethics that foregrounds limits, relationality, and care rather than domination and scale.

Primarily, this paper intervenes in contemporary AI ethics by shifting attention upstream from algorithmic behavior to infrastructural formation, arguing that energy, scale, and ecological embeddedness are not secondary concerns but constitutive of what intelligence becomes. The question, then, is not simply what artificial intelligence can do, but what kinds of worlds its pursuit makes possible, and which worlds it quietly renders uninhabitable.

II. Scale and Power: From Industrial Modernity to Gigawatt Intelligence

The association between scale and power did not originate with artificial intelligence. It is a defining feature of industrial modernity. From the steam engine to electrification, from the factory to the grid, technological progress has repeatedly been narrated as a story of enlargement.

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[7] IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems, *Ethically Aligned Design, 2nd ed.* (Piscataway, NJ: IEEE, 2023).

Bigger machines promised greater efficiency. Larger systems promised control. Power, in both its energetic and political senses, became the primary metric by which success was measured. This genealogy matters because contemporary AI inherits these assumptions largely unexamined.

Industrial societies learned to treat energy as a neutral input, something to be extracted, centralized, and optimized in service of productivity. The expansion of scale was justified by appeals to inevitability and growth, while the ecological and social costs were displaced spatially and temporally. Coal smoke drifted away from factory owners while rivers absorbed industrial waste downstream. Electrical grids obscured the labor and landscapes that sustained them. Artificial intelligence as an industry emerges from within this same logic and tradition, even as it presents itself as something radically new.

What distinguishes gigawatt-scale AI systems is not simply their novelty but the degree to which they intensify the industrial equation between intelligence and energy. Training large models increasingly requires centralized infrastructures capable of sustaining continuous, high-density power loads. The consequence is a renewed concentration of technological authority in the hands of those who can command energy at planetary scale. This concentration mirrors earlier industrial monopolies, though now operating at the level of cognition rather than manufacture.

To his credit, the sociologist Max Weber famously described modern power as inseparable from rationalization, calculation, and the expansion of instrumental reason.[8] Gigawatt-scale AI represents a further stage in this trajectory if that position is taken into

[8] Max Weber, *Economy and Society*, trans. Guenther Roth and Claus Wittich (Berkeley: University of California Press, 1978).

account. Intelligence becomes something that can be scaled, optimized, and owned, its value measured not by wisdom or responsiveness but by performance benchmarks and energy throughput. The rationalization of intelligence thus proceeds in tandem with the rationalization of energy. Yet scale is never merely technical. It is also political.

Large infrastructures require coordination, governance, and enforcement that privilege centralized or corporate decision-making and diminish local forms of agency. When intelligence production depends upon massive energy investments, it becomes increasingly inaccessible to communities and institutions operating at the human or ecological scale. Knowledge production shifts away from situated practices and toward systems that demand constant growth simply to justify their own existence.

This dynamic is not accidental. As historians of technology have noted, large technical systems tend to generate their own momentum and, once established, resist downsizing, redirection, or restraint.[9] Gigawatt-scale AI infrastructures thus carry with them a built-in bias toward continuation and expansion. The question of whether such systems should exist is quickly displaced by the question of how to supply them with ever more energy.

From a phenomenological standpoint, this shift has profound implications. Human perception and understanding emerge within bounded horizons. We know the world through bodies that occupy places, through rhythms shaped by daylight, seasons, and limitation. When intelligence is increasingly mediated by infrastructures operating far beyond these horizons, a

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[9] Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880–1930* (Baltimore: Johns Hopkins University Press, 1983).

gap opens between decision and consequence. Actions taken in one domain reverberate ecologically elsewhere, often invisibly. This gap undermines responsibility.

Ecological theologians have long warned that technological power detached from relational accountability leads to domination rather than care.[10] The pursuit of scale for its own sake risks transforming intelligence into a force that overwhelms rather than participates. In such a framework, the world becomes a substrate to be optimized rather than a community to which one belongs.

It is therefore insufficient to ask whether gigawatt-scale AI systems are efficient, profitable, or innovative. The more fundamental question concerns the kind of power they instantiate. Power exercised through scale tends toward abstraction. It distances agents from the consequences of their actions. It privileges metrics over meaning.

An alternative account of intelligence would begin elsewhere. It would understand power not as domination but as capacity for relation. It would treat limits not as obstacles to be overcome but as conditions for attentiveness and care. Such an account stands in tension with the prevailing trajectory of AI development, which increasingly equates intelligence with energy-intensive expansion.

The emergence of gigawatt-scale artificial intelligence thus marks not merely a technical escalation but a civilizational choice. It commits societies to a particular vision of power, one rooted in accumulation, centralization, and control. Whether this vision can coexist with ecological integrity and spiritual depth remains an open question, one that demands careful examination before the infrastructures that embody it become irreversible. Treating AI

[10] Leonardo Boff, *Cry of the Earth, Cry of the Poor* (Maryknoll, NY: Orbis Books, 1997).

infrastructure as an ethical object in its own right allows ecological impact, energy allocation, and regional consequence to be evaluated as formative conditions rather than downstream externalities.

III. Energy, Infrastructure, and Ecological Consequences

Discussions of artificial intelligence frequently invoke metaphors of immateriality. Data is said to reside in the cloud. Computation is imagined as weightless or a part of a Platonic aether. Intelligence appears to unfold in a placeless digital realm, abstracted from the ecological conditions that make it possible. Yet nothing about large-scale artificial intelligence is immaterial. Its operation depends on dense, highly specific infrastructures that bind it tightly to land, water, and energy systems.[11]

Gigawatt-scale AI training clusters require continuous, uninterrupted electricity supply. Unlike many industrial processes that can tolerate variability, AI systems demand stability. Interruptions degrade performance, corrupt training runs, and generate costly inefficiencies. As a result, these facilities exert disproportionate pressure on electrical grids, often prompting the construction of new generation capacity, transmission lines, and substations dedicated to their needs.[12] This grid-level reconfiguration increasingly positions AI infrastructure alongside heavy industry as a primary driver of regional energy planning decisions.[13]

This infrastructural demand is not evenly distributed. Data centers are typically sited where land is inexpensive, regulatory environments are permissive, and energy is readily

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[11] Benjamin Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2016).
[12] International Energy Agency, *Electricity 2024: Analysis and Forecast to 2026* (Paris: IEA, 2024).
[13] IEEE Power & Energy Society, "*Data Centers as Grid-Scale Loads*," IEEE Power and Energy Magazine 21, no. 4 (2023): 34–45.

available. These conditions frequently coincide with rural or economically marginalized regions. The ecological costs of AI thus accrue disproportionately to communities that derive little direct benefit from its outputs. What appears as technological progress in one location often registers elsewhere as environmental strain.[14]

Water use offers a particularly stark example. Large-scale AI facilities rely on extensive cooling systems to dissipate the heat generated by continuous computation. Depending on design, a single data center can consume millions of gallons of water per day, drawing from local aquifers, rivers, or municipal systems.[15] In regions already experiencing drought or water stress, such withdrawals intensify competition between industrial, agricultural, and domestic needs. The intelligence produced by these systems is therefore inseparable from hydrological reallocation.[16]

From an ecological perspective, these dynamics reveal a troubling asymmetry. Artificial intelligence is increasingly promoted as a solution to climate modeling, resource optimization, and environmental monitoring. Yet the infrastructure that enables such capabilities often exacerbates the very conditions they purport to address. Energy-intensive computation contributes to emissions, water-intensive cooling strains ecosystems, and land-intensive facilities fragment habitats. The promise of environmental insight comes at an ecological cost.[17]

This asymmetry complicates prevailing ethical narratives around AI. Much of the contemporary discourse focuses on downstream effects such as bias, misuse, or misalignment. While these concerns are significant, they leave unexamined the upstream material commitments

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[14] Shannon Mattern, *A City Is Not a Computer* (Princeton: Princeton University Press, 2021).
[15] International Energy Agency, *Data Centres and Data Transmission Networks* (Paris: IEA, 2023).
[16] Shaolei Ren et al., "*Making AI Less Thirsty: Uncovering and Addressing the Secret Water Footprint of AI Models,*" Proceedings of the ACM Conference on Fairness, Accountability, and Transparency (2023).
[17] Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (New Haven: Yale University Press, 2021).

that shape the field as a whole, and they fail to account for infrastructure risks, treating symptoms while leaving underlying drivers intact.[18]

Analyses by the International Energy Agency have begun to highlight this tension, noting that gains in computational efficiency are increasingly outpaced by demand growth.[19] Improvements in hardware performance are quickly absorbed by larger models, longer training cycles, and expanded deployment. The result is a rebound effect in which efficiency enables expansion rather than restraint. Energy consumption continues to rise, even as individual operations become marginally more efficient.[20]

This pattern reflects a deeper cultural assumption that intelligence is something to be *maximized* rather than *situated*. When intelligence is understood primarily as a scalable output, its ecological preconditions fade from view. The world becomes a resource base rather than a participant in meaning-making. Infrastructure is treated as neutral support rather than as an active mediator of values.[21]

Phenomenology offers a corrective to this abstraction. Human understanding emerges through embodied engagement with environments that both sustain and limit us. Attention is shaped by proximity, vulnerability, and dependence. When intelligence production is severed from these conditions, it risks losing its orientation toward care. The farther decision-making is removed from ecological consequence, the more difficult it becomes to sustain responsibility.[22]

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[18] Virginia Dignum, *Responsible Artificial Intelligence* (Cham: Springer, 2019).
[19] IEA, *Emissions from Data Centres and Digital Infrastructure* (Paris: IEA, 2024).
[20] Jevons, William Stanley, *The Coal Question* (London: Macmillan, 1865).
[21] Langdon Winner, "*Do Artifacts Have Politics?*" Daedalus 109, no. 1 (1980): 121–136.
[22] Merleau-Ponty, *Phenomenology of Perception*

There is also a temporal dimension to this disconnection. Infrastructure commits societies to long-term trajectories. Electrical grids, cooling systems, and land use patterns persist for decades. Once established, they shape future possibilities by constraining alternatives. The ecological consequences of gigawatt-scale AI are therefore not limited to current impacts but extend into the future, locking communities into energy-intensive futures that may prove increasingly untenable, from higher individual electrical rates to ecological damage.[23]

The question, then, is not simply whether artificial intelligence can be powered sustainably within existing systems. It is whether the pursuit of ever-larger intelligence infrastructures is compatible with the ecological limits of a finite planet. Addressing this question requires more than technical optimization. It demands a reevaluation of what counts as intelligence in the first place, and of the kinds of relationships with the earth that such intelligence presupposes.

IV. Intelligence, Relationality, and the More-Than-Human World

If gigawatt-scale artificial intelligence represents the intensification of an industrial logic that equates intelligence with energy throughput, then any meaningful alternative must begin by questioning that equation itself. What would it mean to understand intelligence not as a scalable output but as a relational achievement? What forms of knowing become visible when intelligence is situated within ecological limits rather than abstracted from them?

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[23] Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (London: Verso, 2011).

I propose ecological intentionality as a framework for evaluating intelligence beyond scale, one that understands cognition as emerging through relational attunement within ecological limits.

Phenomenology provides an essential starting point. Human intelligence does not arise in isolation, nor does it emerge from unlimited computational capacity. It is formed through embodied engagement with a world that both sustains and resists us. Perception, for Maurice Merleau-Ponty, is not the passive reception of data but an active, reciprocal relation between body and environment.[24] Intelligence, on this account, is inseparable from emplacement. It is shaped by gravity, texture, rhythm, and vulnerability. This insight becomes especially significant when extended beyond the human.

Recent work across philosophy, ecology, and science studies has increasingly emphasized that cognition is not confined to individual minds. Ecological systems exhibit forms of distributed intelligence through feedback, adaptation, and responsiveness.[25] Forests communicate chemically and mycorrhizally.[26] Rivers shape landscapes through iterative negotiation rather than linear control. These processes do not resemble algorithmic optimization, yet they display forms of knowing oriented toward persistence, balance, and relation. Our conception of non-human intelligences should include these lessons.

By contrast, contemporary artificial intelligence is overwhelmingly oriented toward abstraction. Training data is stripped of context while meaning is reduced to pattern recognition through an ever-increasing reliance on weights. Intelligence, therefore, is measured by

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[24] Merleau-Ponty, *Phenomenology of Perception*

[25] Francisco J. Varela, Evan Thompson, and Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience* (Cambridge, MA: MIT Press, 1991).

[26] Suzanne Simard, *Finding the Mother Tree* (New York: Knopf, 2021).

performance on benchmark tasks detached from lived consequence. The ecological costs of this abstraction are mirrored by an epistemic cost with a narrowing of what counts as knowledge.

This narrowing reflects a deeper metaphysical assumption. Intelligence is treated as something that can be isolated, intensified, and scaled independently of the world that makes it possible. Such an assumption stands in tension with ecological thought, which emphasizes interdependence, mutual vulnerability, and co-constitution.[27] When intelligence is abstracted from these conditions, it risks becoming extractive rather than responsive.

The concept of ecological intentionality offers a way to reframe this tension. Intentionality, in the phenomenological tradition, names the directedness of consciousness toward the world.[28] Yet this directedness is not unilateral. It presupposes a world that can be addressed, that pushes back, that exceeds full capture. Ecological intentionality extends this insight beyond human consciousness, recognizing that attention and responsiveness are distributed across living systems.

From this perspective, intelligence is not primarily a matter of domination or control. It is a capacity for attunement. It involves learning how to inhabit limits rather than overcoming them. Such intelligence is cultivated through participation, patience, and restraint. It emerges slowly, through repeated engagement with particular and unique places and conditions.

This stands in stark contrast to the prevailing trajectory of artificial intelligence development. Gigawatt-scale systems are designed to overcome limits through energy

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[27] Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: Harper & Row, 1980).

[28] Edmund Husserl, *Ideas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy, First Book*, trans. F. Kersten (The Hague: Martinus Nijhoff, 1983).

intensification. Where ecological intelligence adapts to constraint, computational intelligence increasingly dissolves constraint through scale. The result is not simply a different form of intelligence but a different relationship to the world.

The theological implications of this divergence are significant. Christian ecological theologians have long emphasized that creation is not a neutral resource but a community of meaning.[29] Knowledge, within this framework, is relational and participatory rather than extractive. Wisdom arises not from mastery but from fidelity to place and creaturely finitude. When intelligence is pursued through systems that require continual expansion and extraction, it risks violating these commitments at a structural level.

This does not imply that artificial intelligence must be rejected wholesale. Rather, it suggests that AI must be re-situated within an ecological horizon that places relationality before scale. Such a re-situating would require fundamental shifts in how intelligence is defined, valued, and pursued. It would prioritize sufficiency over maximization, participation over domination, and care over acceleration.

The question, then, is not whether machines can think or become intelligent, but whether the forms of thinking we are cultivating remain accountable to the worlds they are shaping and reshaping. An intelligence severed from ecological intentionality may be powerful, but it will struggle to be wise. And wisdom, particularly in an era of ecological precarity, cannot be reduced to computation.

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[29] Boff, *Cry of the Earth, Cry of the Poor*

V. Liturgical Power and Theological Discernment in an Age of AI Infrastructure

Technologies do not merely perform tasks. They shape habits. They train attention. They form desires. In this sense, all large-scale technological systems operate liturgically, whether or not they are recognized as such. They establish rhythms of expectation, patterns of trust, and implicit accounts of what is worthy of devotion. Gigawatt-scale artificial intelligence infrastructures are no exception.

Within religious traditions, liturgy names the practices through which communities are formed over time. It is not limited to formal worship but includes the repeated actions that orient bodies toward particular visions of the good.[30] When technological systems become pervasive enough to structure daily life, they begin to function analogously. They tell stories about power and possibility. They shape imaginations long before explicit beliefs are articulated.

The scale and invisibility of contemporary AI infrastructure intensify this effect. Energy flows are hidden behind interfaces, while ecological costs are displaced geographically. Decision-making authority is centralized and obscured rather than placed in the hands of local leaders, Indigenous voices, and invested stewards of the land. The result is a technological order that presents itself as inevitable, even salvific. Efficiency becomes virtue while expansion becomes destiny. In the end, constraint is reinterpreted as failure.

Religious traditions have long offered resources for discerning such dynamics. In the Christian tradition, concerns about power and scale are inseparable from reflections on creation and creatureliness. Early theologians such as Augustine of Hippo warned against *libido*

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[30] Catherine Pickstock, *After Writing: On the Liturgical Consummation of Philosophy* (Oxford: Blackwell, 1998).

dominandi, the desire to dominate that masquerades as order or progress.[31] For Augustine, knowledge severed from love becomes deformative rather than illuminating. Intelligence oriented toward control rather than care distorts both the knower and the known.

Medieval thinkers deepened this insight by situating knowledge within a broader moral and ecological horizon. Thomas Aquinas understood *sapientia* not as technical mastery but as wisdom ordered toward the flourishing of the whole.[32] Knowledge, in this account, is evaluated not by its power to manipulate but by its capacity to sustain right relation. Intelligence that undermines the integrity of creation fails this test, regardless of its sophistication.

These concerns are not unique to Christianity. Jewish traditions emphasize *tikkun olam*, the repair of the world, as a guiding principle for human action. Technological power is judged by its capacity to heal rather than fracture communal and ecological bonds.[33] Islamic philosophy likewise situates knowledge within a moral cosmology, where *ilm* is inseparable from responsibility to God, to community, and to creation.[34] Across traditions, intelligence divorced from accountability is treated with suspicion.

Indigenous religious and spiritual traditions offer particularly incisive critiques of extractive intelligence. Knowledge is understood as place-based, relational, and reciprocal. Wisdom is cultivated through sustained attention to land, ancestors, and nonhuman kin.[35] The accumulation of power without reciprocal obligation is viewed not as advancement but as an

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[31] Augustine of Hippo, *The City of God*, trans. Henry Bettenson (London: Penguin, 2003), XIX.12.
[32] Thomas Aquinas, *Summa Theologiae*, I–II, q. 57, a. 2.
[33] Jonathan Sacks, *To Heal a Fractured World: The Ethics of Responsibility* (New York: Schocken, 2005).
[34] Seyyed Hossein Nasr, *Religion and the Order of Nature* (New York: Oxford University Press, 1996).
[35] Vine Deloria Jr., *God Is Red: A Native View of Religion* (Golden, CO: Fulcrum, 2003).

imbalance. These traditions expose the moral poverty of intelligence pursued at a planetary scale without corresponding practices of care.

When viewed through these lenses, gigawatt-scale AI infrastructure raises pressing theological questions. What kind of formation does it enact? What virtues does it cultivate? What sacrifices does it normalize? The continuous demand for energy, land, and water trains societies to accept extraction as a baseline condition of intelligence itself. This habituation is liturgical in the deepest sense in that it shapes what feels normal, necessary, and beyond questioning or analyzing.

Theological discernment in this context cannot be reduced to ethical checklists or regulatory compliance. It requires attention to formation. It asks how practices shape persons and communities over time. It evaluates systems not only by outcomes but by the kinds of lives they make possible. Christian ecological theologians have increasingly emphasized that creation is not raw material but a community of subjects.[36] To relate to the earth as mere substrate for intelligence production is therefore not a neutral act but a theological failure. It reflects a refusal of creaturely limits and a displacement of trust from relational dependence toward technological control.

Yet religious traditions also resist despair. They offer practices of restraint, Sabbath, fasting, and attentiveness that interrupt cycles of accumulation.[37] These practices cultivate forms of intelligence attuned to sufficiency rather than excess. They remind communities that not all capacities should be exercised simply because they are available.

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[36] Sallie McFague, *The Body of God: An Ecological Theology* (Minneapolis: Fortress Press, 1993).
[37] Walter Brueggemann, *Sabbath as Resistance: Saying No to the Culture of Now* (Louisville: Westminster John Knox, 2014).

Even when articulated in explicitly religious terms, these traditions diagnose dynamics of formation and habituation that are equally visible in secular accounts of technology and power. The task before theological reflection on artificial intelligence is therefore not to reject technology outright, but to discern which forms of intelligence align with commitments to relationality, humility, and care. Gigawatt-scale AI infrastructure presents itself as a triumph of human ingenuity. Religious traditions ask a quieter but more demanding question: What kind of people are we becoming through the intelligences we build?

VI. Toward an Ecological Ethics of Artificial Intelligence

An ecological ethics of artificial intelligence cannot begin with rules alone. It must begin with orientation. The preceding sections have argued that contemporary AI development, particularly at the gigawatt scale, reflects a specific metaphysical and cultural vision of intelligence: one defined by expansion, abstraction, and energy-intensive control. An ecological ethics asks whether this vision is compatible with the conditions of life that sustain both human and more-than-human communities.

Ethics, in this sense, is not merely evaluative but formative and concerns how practices shape perception, how infrastructures train attention, and how repeated choices habituate societies toward particular futures situated in place.[38] Artificial intelligence thus demands ethical reflection not only for what it does, but also for how it reorganizes relationships among energy, land, labor, and meaning.

[38] Alasdair MacIntyre, *After Virtue*, 3rd ed. (Notre Dame, IN: University of Notre Dame Press, 2007).

Philosophical traditions attentive to limits provide a crucial starting point. Hans Jonas argued that modern technological power requires a new ethics oriented toward responsibility for distant and future consequences.[39] When actions scale beyond immediate perception, moral imagination must stretch accordingly. Gigawatt-scale AI infrastructure exemplifies this problem. Decisions made in boardrooms or data centers reverberate ecologically across regions, yet the distance between cause and effect often obscures accountability.

Ecological philosophy deepens this concern. Thinkers such as Aldo Leopold insisted that ethical maturity involves expanding the moral community to include soils, waters, plants, and animals.[40] From this perspective, intelligence that degrades ecological systems cannot be ethically neutral, regardless of its technical sophistication. An AI system that depends upon the depletion of aquifers, the intensification of emissions, or the fragmentation of habitats violates the land ethic by treating the world as expendable substrate.

Theological traditions reinforce this critique while adding a dimension of meaning and hope. Christian ecological theology emphasizes creatureliness, finitude, and mutual dependence as conditions of faithful life.[41] Intelligence, within this framework, is not a license for domination but a vocation of care. Technologies that require continual expansion and extraction risk forming communities in habits contrary to this vocation, normalizing excess rather than sufficiency.

Similar insights emerge across religious traditions. Jewish ethical thought emphasizes restraint and repair, judging human action by its capacity to sustain communal and ecological

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[39] Hans Jonas, *The Imperative of Responsibility: In Search of an Ethics for the Technological Age* (Chicago: University of Chicago Press, 1984).
[40] Aldo Leopold, *A Sand County Almanac* (New York: Oxford University Press, 1949).
[41] McFague, *The Body of God: An Ecological Theology*

wholeness.[42] Islamic environmental ethics situates knowledge within stewardship (*khilafah*), binding intelligence to accountability before God and creation.[43] Indigenous traditions insist that knowledge is inseparable from place and reciprocity, rejecting forms of intelligence that sever understanding from responsibility to land.[44] Together, these traditions converge on a shared intuition: intelligence that cannot live within limits is ultimately self-defeating.

An ecological ethics of AI must therefore articulate alternative criteria for evaluating intelligence. Rather than asking how large, fast, or powerful a system can become, it asks how well it participates in sustaining the conditions of life. Several guiding principles follow from this reframing.

First, relational accountability. AI systems should be evaluated based on their full ecological footprint, including energy sourcing, water use, land use, and downstream emissions. This requires transparency not only at the level of algorithms but at the level of infrastructure. Ethical intelligence must remain answerable to the places it reshapes.

Second, locality and proportionality. Not all problems require planetary-scale solutions. Ecological ethics favors appropriately scaled technologies that respond to specific contexts rather than imposing uniform systems everywhere. In regions such as the American Southeast, where water stress, heat, and energy infrastructure already strain communities, the siting of large AI facilities raises urgent local questions that cannot be deferred in favor of abstract global benefits.[45]

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[42] Sacks, *To Heal a Fractured World: The Ethics of Responsibility*
[43] Nasr, *Man and Nature: The Spiritual Crisis of Modern Man*
[44] Deloria Jr., *God Is Red: A Native View of Religion*
[45] IEA, *Electricity 2024: Analysis and Forecast to 2026*

Third, restraint and sufficiency. Religious practices such as Sabbath, fasting, and voluntary simplicity cultivate forms of intelligence attentive to limits.[46] Applied to AI, this suggests resisting the assumption that every increase in capability must be pursued. Ethical discernment includes the capacity to say no, or at least not yet.

Fourth, participatory discernment. Decisions about AI infrastructure should not be confined to technical elites. Communities affected by energy use, water extraction, and land conversion must have a meaningful role in shaping outcomes. Ethical intelligence emerges through dialogue, not unilateral optimization.

Finally, care for the future. Ecological ethics is inherently intergenerational. Infrastructure decisions made today commit societies to trajectories that will shape ecological possibilities for decades. An intelligence worthy of the name must remain attentive to those who will inherit its consequences.

These principles do not yield easy answers. They are not reducible to compliance metrics or efficiency targets. They require patience, humility, and a willingness to rethink what intelligence itself is for. Yet they offer a path beyond both uncritical enthusiasm and reactionary rejection.

The central claim of this paper is therefore *modest* but *urgent*. Artificial intelligence, especially at a gigawatt scale, confronts societies with a choice not only about technology but about orientation. We can continue to pursue intelligence as domination, measured by scale and sustained through extraction. Or we can begin to cultivate forms of intelligence aligned with ecological intentionality, grounded in relation, and accountable to the worlds they inhabit. The

[46] Brueggemann, *Sabbath as Resistance: Saying No to the Culture of Now*

future of artificial intelligence will not be determined solely by what machines can do. It will be shaped by what we are willing to become in relation to the Earth that sustains us.

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