ALTERHUMANISM (UN)BOUND:

METAFORMATIVE SUBJECTIVATION BEYOND TRANS-, POST-, AND METAHUMANIST TYPOLOGIES

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Abstract

This dissertation reconceives subjectivity for conditions in which neither anthropocentric sovereignty nor its familiar post-anthropocentric dispersals adequately describe how agency, responsibility, and world-making are presently composed. It develops alterhumanism not as an identity label, but as a method: a practice of reading and designing subjectivation as an open, recursively self-modifying process whose coherence is continuously negotiated across technogenic, ecological, and institutional environments. In this framework, subjectivity is treated less as a possessed property than as a metaformative achievement—an effects-field produced through infrastructures, affects, protocols, materials, and relational intensities that train what can count as a self and what can count as action. At the center of the argument stands Altersub: an operator rather than a person, a formal-pragmatic device for tracking how a "subject" intermittently contracts into decision, expands into milieu, and re-stitches itself through heterogeneous couplings. Altersub names a tidal coherence—a patterned, revisable rhythm of individuation that avoids the twin failures of sovereign humanism (false closure) and formless diffusion (false openness). It emerges through polividual constellations: collective selves composed of interlaced bodies, code, sensors, minerals, institutions, and atmospheres, whose agency is articulated through rhythm, latency, and constraint rather than stable identity. Methodologically, the dissertation proposes a post-cartographic mode of inquiry that integrates Foucauldian archaeology, feminist science and technology studies, and Deleuzoguattarian topology, moving across genealogical, infrastructural, phenomenological, and improvisational registers. Its guiding ontological claim is deliberately procedural: "ontology" is approached as onticology—the study of operative conditions by which beings become legible and actionable within specific assemblages, rather than a metaphysical inventory of what ultimately exists. Through this lens, the dissertation builds a typological and compositional account of alterhuman alliances and ecological subjectivities, culminating in an onto-textual synthesis that tests alterhumanism against contemporary sites where subjectivation is palpably re-engineered by data regimes, biosciences, financial infrastructures, and machine-learning environments.

Keywords: Alterhumanism; Altersub; polividuality; metaformative subjectivation; distributed agency; posthuman diplomacy; feminist STS; technogenic environments; ecological entanglement

Zusammenfassung

Diese Dissertation rekonstruiert Subjektivität unter Bedingungen, in denen weder anthropozentrische Souveränität noch ihre geläufigen post-anthropozentrischen Zerstreuungen hinreichend erfassen können, wie Handlungsmacht, Verantwortlichkeit und Weltkonstitution gegenwärtig verfasst sind. Alterhumanismus wird dabei nicht als Identitätsbezeichnung, sondern als Methode entwickelt: als Praxis des Lesens und Entwerfens von Subjektivierung als offenem, rekursiv selbstmodifizierendem Prozess, dessen Kohärenz fortlaufend über technogene, ökologische und institutionelle Umwelten hinweg ausgehandelt wird. In diesem Rahmen erscheint Subjektivität weniger als statische Eigenschaft denn als metaformativer Vollzug – als Wirkungsfeld, das durch Infrastrukturen, Affekte, Protokolle, Materialitäten und relationale Intensitäten hervorgebracht wird und jene Bedingungen formiert, unter denen etwas als Selbst und etwas als Handlung gelten kann. Im Zentrum der Argumentation steht Altersub: kein personales Subjekt, sondern ein Operator – ein formal-pragmatisches Instrument zur Nachzeichnung jener Bewegungen, in denen sich ein „Subjekt" situativ in Entscheidung verdichtet, sich in Milieus ausweitet und durch heterogene Kopplungen neu verschränkt. Altersub bezeichnet eine gezeitenhafte Kohärenz – einen strukturierten, revidierbaren Rhythmus der Individuation, der die Doppelverfehlung souveränen Humanismus (falscher Abschluss) ebenso vermeidet wie die einer formlos-diffusen Auflösung (falsche Offenheit). Es bildet sich in polividuellen Konstellationen heraus: kollektiven Selbstgefügen aus verschränkten Körpern, Code-Architekturen, Sensoren, mineralischen Komponenten, Institutionen und Atmosphären, deren Handlungsmacht sich nicht über stabile Identität, sondern über Rhythmus, Latenz und Begrenzung artikuliert. Methodisch entwickelt die Arbeit einen post-kartographischen Untersuchungsmodus, der foucaultsche Archäologie, feministische Wissenschafts- und Technikforschung sowie deleuzoguattarianische Topologie integriert und sich genealogisch, infrastrukturell, phänomenologisch und improvisatorisch bewegt. Ihr leitender ontologischer Anspruch ist bewusst prozedural gefasst: „Ontologie" wird als Ontikologie verstanden – als Untersuchung jener operativen Bedingungen, unter denen Seiendes in spezifischen Gefügen lesbar und handlungsfähig wird, statt als metaphysisches Inventar dessen, was letztlich existiert. Vor diesem Hintergrund entfaltet die Dissertation eine typologische und kompositorische Darstellung alterhumaner Allianzen und ökologischer Subjektivitäten, die in einer onto-textuellen Synthese kulminiert. Diese prüft Alterhumanismus an gegenwärtigen Schauplätzen, an denen Subjektivierung durch Datenregime, Biowissenschaften, finanzielle Infrastrukturen und maschinelle Lernumgebungen sichtbar neu verfasst wird.

Schlüsselbegriffe: Alterhumanismus; Altersub; Polividualität; metaformative Subjektivierung; verteilte Handlungsmacht; posthumane Diplomatie; feministische Wissenschafts- und Technikforschung (STS); technogene Umwelten; ökologische Verflechtungen

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No work is ever written alone. Each line of thought is inscribed within relations that precede intention and exceed authorship. What appears as solitary labor rests upon networks of trust, interruption, correction, and care. A dissertation is not an isolated construction but a passage through a field of presences that steady the mind long before an argument coheres. The ground one walks on is never one's own.

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Many others remain unnamed here, not from omission but because their influence exceeds enumeration. Their traces endure throughout these pages.

Table of Contents

1. Introduction: Spectral Beginnings

1.1 A Spectre with Unfinished Business

To risk what has long since become a camp trope: *A spectre is haunting early twenty-first-century thought—the spectre of subjectivity.*[1] It drifts through lecture theatres where Kant's "I think," the command center of Western selfhood, still sets the rhythm of epistemic authority, then re-materializes beside GPU clusters that promise to think faster than retinas can refresh. The trouble is not that the old subject has died; it lingers like a house-spirit, half-forgotten yet forever rearranging the furniture at night. We livestream debates on "posthuman kinship," upload consciousness-adjacent profiles to medical clouds, and sequence coral microbiomes in search of planetary diagnostic, and still the reflex question returns: What does this mean for the human? That reflex, part muscle memory and part metaphysical habit, ignited the present intervention. The term subject keeps bobbing to the surface long after successive waves of critique, as though modernity's principal actor refuses to quit the stage. Efforts to crown and de-crown it proliferate: mainstream transhumanism equips it with titanium upgrades; certain posthumanisms dissolve it into lively matter; radical metahumanisms puncture the throne altogether.[2] Still, every gesture leaves an afterglow of privileged centrality. The result is less a clean break than a complicated haunting, a spectral persistence that both demands explanation and resists easy obituary. Rather than seeking to exhume the "true" subject or consign the term to ash, in the pages ahead we practice *(un)binding*: loosening the inherited knot that equates subject with both human and sovereign, thereby making space for new articulations of centrality to unfold. Picture slipping the score for Beethoven's Fifth onto a jazz stand. The melody remains recognizable, but trumpets riff, the drummer toys with the bar-line, and no section is compelled to dominate. In a similar key, the project keeps the tune audible while refusing to let it ossify into dogma. The wager is simple: by making room for improvisation, one hears harmonics that the original score could never foresee.

[1] Cf. Karl Marx and Friedrich Engels, *Manifesto of the Communist Party* (London: Penguin, 2002), 14; Susan Sontag, "Notes on 'Camp'," in *Against Interpretation and Other Essays* (New York: Farrar, Straus and Giroux, 1966), 275–92.

[2] For residual anthropocentrisms across trans-, post-, and metahumanisms, see N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), 2–3; Donna J. Haraway, "A Cyborg Manifesto," in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149–81.

1.2 Why Begin—Again?

"Do we really need another overture chastising anthropocentrism?" The query is understandable. Decades of posthuman and decolonial writing have dissected that hubris with surgical precision. Nevertheless, the social circuitry tells a different story. Algorithmic finance still channels liability through the legal fiction of the person; border regimes translate flesh into biometric code; platform algorithms decide what content appears and disappears, working on the assumption that language is (still) an exclusively human prerogative.[3] Even the most exuberant manifestos promising to swap carbon for silicon quietly reinstall Renaissance individualism inside a chrome chassis. Beginning again, then, is not indulgence but necessity: a renewed cartography for a landscape whose coordinates keep shifting. How, though, to begin without looping back into the same sermon? The approach adopted here is *rhizomatic* rather than prescriptive. This analysis erects a suite of navigational instruments—*typologies* that chart zones of subject-formation without crowning any single zone an evolutionary apex. They resemble geological strata more than ladders: layers may compress, tilt, invert, or fold back on themselves, but none is intrinsically "higher." Such post-cartography preserves the vigilance needed to track spectral anthropocentrisms as they mutate, while sustaining the methodological rigor demanded. The introductory chapter therefore unfolds in three movements:

1. *Polividual Preludes*—tracing subjectivity as an improvisatory event rather than a marble-solid core;
2. *Typologies Without Thrones*—outlining three overlapping gradients (T, P, M) that refuse hierarchy en route to *Altersub*;
3. *The Quiet Center*—sketching a politics of strategic *self-emptying* that sidesteps both metaphysical hubris and academic resignation.

Each of these movements functions as a site of methodological testing, not as a discrete stage. Their boundaries remain porous by design, allowing motifs and conceptual pressures to migrate between them.

[3] On algorithmic personhood and biometric governance, see Kate Crawford, *Atlas of AI* (New Haven: Yale University Press, 2021), 112–19.

1.3 The First Fold: Polividual Preludes

We begin with a deliberate dis-definition. Instead of declaring what subjectivity *is*, this inquiry follows how it comes to matter. Classical metaphysics reserved this function for the Greek ὑποκείμενον (*hypokeimenon*), the bearer that "lies beneath" properties.[4] Here, the platform itself swings: call it *ontojazz*—a substrate that riffs, modulates, and occasionally drops the beat.[4] To navigate such shifting grounds, we introduce *polividuality*,[5] a label describing many-voiced coherences that emerge when disparate agencies co-compose a single, if temporary, refrain. Consider two quick vignettes.[6] In a coastal laboratory, marine biologists, machine-learning models, and reef-dwelling microbes collaborate on real-time health indices. The coalition's pronoun is a grammatical tangle: neither "we humans" nor "it, the algorithm" suffices. Or picture a dancer at Berlin's KitKat, smartwatch pulsing in sync with the infra-bass, her proprioception subtly recalibrated by lithium-ion sensors, haptic feedback, or even microdosing as much as by muscle memory. Both scenes feature quasi-subjects—*polividuals*, kaleidoscopic events whose components reciprocally enact one another, dissolving neat partitions of subject and object.

Charting those events requires tools without disciplinary passports: neuroscience maps millisecond rhythms of synaptic anticipation; feminist STS offers protocols for epistemic hygiene and situated accountability; critical finance parses markets that trade at picosecond velocities. Even the recontextualization of theology, often overlooked in such contexts, contributes the ancient notion of *kenosis*: an "emptying-out" that makes space for radical alterity without dissolving difference. No single field anchors the expedition; each offers a lens, then steps aside when another perspective becomes urgent. The methodology is *processual*: it follows the phenomenon wherever it wanders and refuses to bolt the conceptual gates too early.

Two clarifications require emphasis at this stage. First, why retain the loaded term subject at all? Abandonment would cede strategic ground to frameworks that continue to wield the word as

[4] Aristotle, *Categories*, 1a20–1b10, in *The Complete Works of Aristotle*, ed. Jonathan Barnes, vol. 1, trans. J. L. Ackrill (Princeton: Princeton University Press, 1984), 3–4.
[5] "Polividuality" here marks a strategic departure from both the classical "individual" and Deleuzian "dividual," a conceptual inflection whose full stakes and implications will unfold as the argument develops.
[6] While most empirical examples are drawn from existing scholarship and scientific reports, some are original scenarios that we devise for theoretical illustration; both serve as interpretive anchors within a primarily theoretical inquiry.

property; by occupying and renovating the term *from within*, the analysis exposes its seams, residues, and potentials in a way mere avoidance never could. Second, is this merely "metaphysics rebooted"? The answer is clearly no. Rather, it is a kind of "cynical metaphysics" (in Sloterdijk's sense): the inquiry is always aware of its own provisionality and makes this explicit as part of its method.[7] Concepts are held lightly, always open to revision as the world modulates key. This methodological cynicism, far from a weakness, is precisely what shields the inquiry from both dogmatic entrenchment and ironic paralysis.

1.4 Typologies Without Thrones

The "cartographic" commitment made earlier now finds its demonstration. Where the first movement unsettled and loosened conceptual habits, in this section we consolidate the argument by demonstrating how typology, so often mistaken for taxonomy, can operate as a method of critique rather than a system of ranking. The central move is to treat transhumanist, posthumanist, and metahumanist projects not as points on a single ladder, but as overlapping sites within what could be called a *historical diagram of the present*. This diagram, rather than offering a smooth narrative of progress or decline, captures the entanglement and mutual interference of their gestures, slogans, and material conditions.[8] Such an approach resists the old habit of tracing development as a series of ascending steps (from chrysalis to butterfly, from steam to silicon), by refusing to assign value in terms of evolutionary "advance."[9] Instead, each formation (T, P, M) is analyzed as a living diagram whose boundaries bend and fold, sometimes merging, sometimes splitting apart. Drawing inspiration from Foucault's archaeology and from Deleuzoguattarian mapping,[10] the work here seeks to keep the structure of the *present open*, rendering its recurring patterns visible without reducing them to a single story.

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[7] Peter Sloterdijk, *Critique of Cynical Reason*, trans. Michael Eldred (Minneapolis: University of Minnesota Press, 1987), 5–11.

[8] See Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (London: Tavistock, 1972), 3–17.

[9] For a critique of modernity's progressive hierarchies and linear accounts of development, see Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993), especially 93–121.

[10] Foucault, *The Archaeology of Knowledge*, 10–16; Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 12–15.

To keep this theoretical mapping anchored, the text provides occasional examples, just enough to prevent abstraction from drifting into vagueness. For instance, transhumanism's discourse of "morphological freedom" may promise radical choice, but in reality it depends on networks of capital, intellectual property, and supply chains.[11] Posthumanist visions of "lively matter" gain sharper meaning when read beside the operations of environmental sensors or the global trade in metals that enable new forms of agency.[12] These cases serve to clarify the ongoing exchange between ideology and infrastructure, without collapsing analysis into anecdote.

The aim is not to construct a closed system but to trace the spiral movement by which these typologies influence and revise one another. The dynamics between T, P, and M never resolve into a final synthesis. Instead, each shift leaves behind residues, producing what this study will later call Altersub—a motif or rhythm that has always been present, signaling openness to further revision rather than culmination. The rigor of this approach lies in its method of *triangulation*. Claims are sustained only when philosophical, empirical, and experiential registers converge without being forced into artificial unity. Where contradictions persist, they remain visible, since premature consensus too often breeds conceptual sclerosis. By refusing to settle too quickly, the project aligns with Latour's view that matters of concern should remain available for collective reconsideration.[13] Taken together, the typologies serve not as monuments or static classifications but as analytical tools for perceiving the tensions and potentialities of contemporary subject-formation. Their purpose is to clarify, to complicate, and, above all, to make space for emergent modes of coexistence: conceptual experiments that the remainder of this work will pursue in greater detail, a trajectory that will later be formalized under the name "gatherality."

[11] Nick Bostrom, "Transhumanist Values," *Journal of Philosophical Research* 30 (Supplement) (2005): 3–14; Melinda Cooper, *Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era* (Seattle: University of Washington Press, 2008), 19–26.
[12] See Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010), 3–6; and Donna J. Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14, no. 3 (1988): 575–99.
[13] See Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005), 114–24.

1.5 Guiding Questions and Methodological Compass

1.5.1 Research Matrix

Before proceeding, it is necessary to clarify both the operational questions guiding this inquiry and the methodological foundation that ensures every subsequent claim can withstand the highest demands of scrutiny. The argument is not merely thematic or speculative; it is anchored by four research questions which, though not displayed as a checklist, quietly orchestrate each analytic turn:

1. How do contemporary transhumanist (T), posthumanist (P), and metahumanist (M) discourses each configure what counts as a subject?
2. Through which infrastructures, practices, and material circuits are those configurations enacted and contested?
3. Where and how do the T, P, and M diagrams buckle when confronted with the lived complexity of technogenic, ecological, and affective domains?
4. What conceptual and political work is accomplished by alterhumanism and its methodological keystone, Altersub, in responding to the shortcomings revealed at those limits?

The framing of these questions is itself methodologically symptomatic: "posthuman" is treated not as a settled position but as an umbrella term—a necessary, if provisional, containment. Following Ferrando's influential formulation, yet reconfiguring it, T-, P-, and M-posthuman operate here as distinct typological instruments.[14] This umbrella gathers them under a single epochal roof, registering their persistent (if differentiated) orientation around the problem of the human. The umbrella does not dissolve their differences, but it does mark their conceptual proximity and their shared incapacity to offer a final break with anthropocentrism. Alterhumanism, in contrast, arrives not as a fourth sibling, but as an internal insurgent: a *beneficial intruder*, more symbiotic bacterium than imported pathogen, gradually transforming the house from the inside out until its foundations are refigured.

[14] Francesca Ferrando, *Philosophical Posthumanism* (London: Bloomsbury, 2019), 1 et passim.

1.5.2 Methodological Orientation

The methodological stance is as much about how to travel as about where to arrive. Rather than securing theory and then seeking empirical proof, the analysis is *recursive*: each interpretive move is already alterhumanist in that it folds prior typologies back upon themselves, refusing a fixed vantage. Method and theory are inseparable, with typologies serving as provisional instruments—tools for inquiry, not trophies of possession.

This dissertation proceeds from an alterhumanist orientation that is methodological rather than ontological in scope. Alterhumanism is not introduced as a claim about what entities exist, nor as a proposal for new subjects, actors, or moral agents beyond the human. Instead, it functions as an analytical posture concerned with how being is procedurally enacted. Throughout the dissertation, ontology is therefore consistently understood as *onticology*: not a doctrine of existence, but an inquiry into the conditions, operations, and arrangements through which entities, relations, and subject-positions come to count as real, actionable, or governable.[15] Accordingly, whenever the term ontology appears hereafter, it designates this onticological register alone: procedurally situated configurations of order, rather than any appeal to metaphysical foundations.

From this perspective, agency, responsibility, and subjectivity are not treated as intrinsic properties of discrete beings, but as effects of mediation produced through institutional dispositifs, technological infrastructures, legal procedures, and ecological entanglements. Alterhumanism, as deployed here, suspends the presumption of pre-given subjects in order to analyze how subject-effects are staged, stabilized, and redistributed under conditions of distributed causality and non-sovereign governance.

This methodological commitment does not negate human agency, nor does it dissolve political accountability. Rather, it reframes both as outcomes of procedural composition. The task of analysis is therefore not to identify who acts in a metaphysical sense, but to examine how acting becomes possible, legible, and contestable within specific configurations of mediation.

[15] The term *onticology* is used here in a qualified sense. While most prominently associated with Levi Bryant, where it designates a realist ontology of autonomous objects, the present usage does not advance a doctrine concerning the fundamental furniture of reality. Rather than naming a metaphysics of objects, onticology here denotes an operator-level analysis of ontical conditions of intelligibility: the processes through which distributed agencies condense into coherent, addressable formations. The emphasis thus shifts from what beings fundamentally are to how agential coherence becomes legible without presupposing a sovereign subject or ontological ground.

Onticological attention to these configurations allows political responsibility to remain analytically tractable even when no singular origin of action can be identified.

The analysis proceeds through six interrelated methodological operations.

1. The research proceeds in the mode of slow brewing. Concepts are allowed to ferment alongside the phenomena they are meant to elucidate. Rather than treating T, P, M as a set of pre-existing doctrines to be catalogued, they are treated as shifting method-objects, their contours and efficacy always in flux as the corpus, infrastructures, and lived encounters evolve. Texts and artefacts are selected and retained only if they materially articulate or problematize the question of who, or what, counts as a subject. Each is annotated, rewritten in the margin, and juxtaposed until their own internal tensions are made audible.
2. Discursive, infrastructural, and onto-textual registers are kept in constant dialogue. Philosophical essays, patents, activist manifestos, speculative fiction, and field notes from published studies are all incorporated, but nothing is coded mechanically; instead, each is *subjected* to a process of manual rewriting, allowing their conceptual seams to surface. When a discourse draws upon a technological or material apparatus, be that a hedge-fund algorithm, a marine sensor network, or a haptic costume, its operational logic is reconstructed from primary materials in the public domain. The goal is not to harvest new "data," but to observe how discourses and infrastructures attempt to stabilize one another. All fragments, whether citation, diagram, dialogue, or field vignette, are periodically woven together in a living "neural reef" document, where juxtapositions can either crack (and so force revision) or produce new resonances. Typologies are revised iteratively; method is nothing but this recursive pressure.
3. The typologies themselves (T, P, M) are not treated as external literatures to be reviewed or "applied," but as heuristic lenses, critical foils, and provisional maps. Each diagram clarifies a distinct rhetoric of *becoming* (extension, dissolution, improvisation) and, when placed against the other two, illuminates its own blind spots: residual humanism in T, distributive vagueness in P, ontological vertigo in M. Because no typology ever stands against the full spread of empirical and theoretical material, the work is one of continual redrawing. Iteration and failure are not regrettable; they are evidentiary.
4. Alterhumanism is present in the mood and logic of the text from the outset. The analysis courts multiple temporalities, refuses sovereign vantage, and holds every claim contingent upon its

infrastructural and affective companions. And yet the term itself, though subtly announced a few times in the text, is withheld from full emergence until the accumulated evidence demonstrates the exhaustion of the T, P, M matrix. Only then can alterhumanism, no longer an authorial assertion, arrive as a necessary relay. Alterhumanism does not primarily set its question around its relation to humanship; it is the unfolding of an ontological gather, a parade of becoming without archē or telos, with a configuration that is far more *symfigurative* than solipsistic—an aspect of metaformativity that includes the ensemble of more-than-human sociality.

Its methodological keystone, Altersub, indexes the moment when critique becomes design, contraction yields responsibility, and expansion holds room for inhuman interlocutors. Central to this shift is the understanding of Altersub not as an ontological entity but as an *onticological operator*. The term designates neither an alternative bearer of agency nor a collective super-subject. Rather, it functions as a conceptual instrument for tracing how subjectivity is procedurally staged within specific configurations of mediation. Altersub marks the analytic transition from asking who acts to examining how action becomes legible, attributable, and contestable across distributed arrangements of humans, infrastructures, ecologies, and code. When institutions, algorithms, or ecosystems appear to "act," this appearance is not anthropomorphically affirmed, but onticologically reconstructed as the effect of translated signals, allocated responsibilities, and stabilized positions of addressability. In this sense, Altersub operates as a methodological lens for mapping the production of *subject-effects* without reintroducing metaphysical substrates or collapsing agency into abstract system dynamics.

5. Altersub is not a substitute subject. It is a metrical rhythm, audible only when the iterative folding and cross-testing of typologies completes its cycle. Altersub provides a beat for heterogeneous findings to synchronize, converts critique into design prompts for new companionships, and exemplifies the claim that viable politics after anthropocentrism depends on disciplined self-emptying—not louder affirmation.
6. The method developed here does not present itself as a fixed framework or as an eclectic assemblage. Its sufficiency and necessity emerge in practice, as each typological instrument (T, P, M, and ultimately Altersub) is brought to its limits and revised in response to conceptual

or empirical tension. No register or model is granted absolute authority; each remains open to challenge and modification. Altersub, as the rhythm that ultimately gathers these moves, operates less as an established form than as a horizon of "will have been," so that even its temporality is marked by kenotic deferral. This methodological orientation is not a final position but an ongoing commitment to scrutiny and adjustment, ensuring that inquiry remains responsive, rigorous, and capable of accommodating what cannot yet be fully anticipated.

1.6 The Quiet Center: From Centrality to Gatherality

Up to this point, the analysis has gently dismantled an automatic assumption: that the conceptual landscape must always have a single center. But as soon as a throne is vacated, others queue to claim it, inevitably replaying the same tired drama. We need something different—not a throne, nor its mere absence, but a structural rethinking of how multiple agencies might coexist. This is the move from centrality toward *gatherality*: a relational architecture whose very grammar refuses singular dominance.[16]

Gatherality is not merely the outward dispersal of power. Decentralization alone too often reproduces the very logic it aims to escape, scattering authority without altering its underlying structure. Gatherality, by contrast, transforms the grammar itself, holding open a shared space through strategic, intentional withdrawal.[17] This is kenōsis, borrowed from patristic tradition and repurposed for planetary practice: a conscious relinquishment of conceptual or political occupancy, creating an interval, sustaining a pause, and leaving the atmospheric affordance for other tempos, other rhythms, other ways of mattering to emerge.[18]

[16] Barad's theory of "intra-action" decisively rejects the notion that entities or agencies pre-exist as autonomous centers, demonstrating instead that all agencies emerge only through dynamic relational entanglements. This conceptual shift from centrality to distributed agency directly supports our move toward a relational architecture, here termed gatherality, where the very conditions for dominance are structurally refused. See Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham: Duke University Press, 2007), esp. 33.

[17] Graham Harman, *The Quadruple Object* (Winchester: Zero Books, 2011), 47–52.

[18] Hans Urs von Balthasar, *Mysterium Paschale: The Mystery of Easter (*San Francisco: Ignatius Press, 1990), 113–17. For philosophical resources whose arguments are brought into dialogue with the transformative reading of kenosis developed in this analysis, see Isabelle Stengers, *In Catastrophic Times: Resisting the Coming Barbarism* (Lüneburg: Meson Press, 2015), 37–45; and Catherine Malabou, *The Future of Hegel: Plasticity, Temporality and Dialectic*, trans. Lisabeth During (New York: Routledge, 2005), 12–13

This openness matters because centrality does not merely occupy space; it sets the tempo, deciding whose rhythms are amplified and whose are silenced. By intentionally vacating the metronome position, gatherality expands what is possible, transforming a fixed center into a field of negotiation. This is not drift or fragmentation, but a form of coordinated breathing, sustained by a rhythm that this study terms Altersub. Altersub is thus neither a new subject nor a simple erasure; it is the methodical practice of sustaining an open interval long enough for genuine negotiation to take place.[19]

Such a stance enables a distinct politics: diplomacy as shelter, understood here as a practice that provides protection and support for diverse agencies without imposing control or enclosure. Objects usually treated as passive, such as microbial sensors, forest fungi, and financial algorithms, are welcomed not simply as background props but as participants in collective processes. Their participation arises not from anthropomorphic projection, but from recognizing their capacity to exercise partial custodianship. This dynamic finds a powerful analogy in the ecological phenomenon known as "crown shyness," in which tree crowns grow outward until their branches nearly touch, then pause and subtly withdraw, maintaining just enough distance to ensure mutual access to sunlight and the health of the collective canopy.[20] In a similar way, the practice of kenotic restraint sustains collective health by declining to claim total occupation of any shared space. It is important to stress that keeping the center clear does not equate to rendering it empty as a final state. Rather, the act of clearing is generative, designed to hold open a space where new rhythms, negotiations, and forms of relation can continuously arise.

Gatherality, then, is not an act of surrender but an intentional cultivation of responsiveness. Rather than installing a fixed center, this approach sustains a productive tension at the site traditionally reserved for centrality. In this way, non-centrality itself becomes the organizing function, continually inviting negotiation rather than imposing closure. This ensures that the typologies developed in the chapters ahead remain supple and attuned, never settling into rigid doctrines. The ongoing task is to maintain this generative tension in place of the old center, thus preparing the

[19] See Jean-Luc Nancy, *The Inoperative Community* (Minneapolis: University of Minnesota Press, 1991), 29–31. Nancy's conception of "being-with" as the generation of shared intervals partly informs this study's formulation of Altersub as an open, collective space for relational emergence.

[20] Jens van der Zee, Alvaro Lau, and Alexander Shenkin, "Understanding crown shyness from a 3-D perspective," *Annals of Botany* 128, no. 6 (2021): 725–36.

ground for the continuous negotiation described in Chapter 5 as metaformative. The following chapters set this ethos into motion, allowing it to animate the spiral that shapes the analysis as a whole.

1.7 The Hinge: Opening the Spiral

With generative tension now holding the center, no longer anchored by a single authority, the composition stands poised at the hinge, ready to spiral outward. Properly understood, a hinge facilitates movement; if locked in place, it ceases to function. Thus, this section provides bearings rather than rails: a lightly sketched orientation, continually open to recalibration as new conceptual and material pressures emerge.

Chapters 2, 3, and 4 each unfold along distinct gradients: T-posthuman, P-posthuman, and M-posthuman—not as enclosed territories, but as intersecting vectors charting subject-formation across technological infrastructures, ecological entwinements, and improvisational practices. The composition moves rhizomatically, intertwining genealogies of key tropes with infrastructural and phenomenological accounts, placed into critical dialogue with carefully chosen empirical fragments. None of these fragments settle into a final mono-voice; rather, each serves as a critical stress-test, challenging theory wherever it exceeds or unsettles established frames.

At the spiral's midpoint, these gradients deliberately converge in a way that favors productive collision over tidy resolution. This coming together creates a crucible where conceptual structures, lived intensities, and infrastructural realities press upon and provoke one another. Within this metaformative montage, theoretical fragilities become visible, prompting ongoing recalibrations. In this way, the text itself enacts the "case": reflexive assemblages (anticipating the onto-political *assembloi* developed later in the analysis) that continuously test the resilience and adaptability of their own methodological procedures. Only after this pivotal intersection does alterhumanism come forward in explicit terms. By Chapter 5, its rhythm will already be resonating throughout the preceding movements. Its emergence, then, is not an abrupt revelation but, again, a gathering: a rhythmic convergence that clarifies how practices of self-emptying, radical hospitality, and posthuman diplomacy signal alterhumanist potentialities in concrete ways. Here, empirical

references do not function as final evidence; instead, they become interlocutors—active presences in the ongoing transformation of conceptual boundaries.

Why such deliberate pacing, particularly when crises seem to demand immediate action? Because urgency is easily weaponized by powers that profit from speed and closure. The spiral method inserts intentional intervals, ensuring quieter agencies and plural tempos remain audible. Urgency, thus recalibrated, becomes not an obstacle to action but a precondition for more inclusive and enduring forms of response. Accordingly, the central contribution of this study is to bring alterhumanism into methodological focus—as a metaformative practice that unsettles inherited certainties while cultivating space for co-creative improvisation. By proposing gatherality, animated by the rhythm of Altersub as a compositional principle, this work offers a vocabulary and pragmatic orientation for moving beyond the exhausted binaries of sovereign humanism and its softer counterpart, passive diffusion. What emerges is not simply a theory, but an experimental toolkit for imagining, assembling, and sustaining more capacious modes of living and relating.

As this introduction draws to a close, the spectral subjectivity haunting its opening returns—not as a menace, but as an invitation: an unfinished refrain, welcoming new voices and improvisations. Let the air remain circulating; let gatherality remain open; and may the cadence offered here accompany other experimental worldings yet to emerge.

2. Interrogating the Onto-Epistemological Ramifications of T-Posthuman Subjectivity Frameworks

2.1 Prolegomena: The Synthesis and Dialectics of Subjectivity Modalities and Technological Augmentation within the T-Posthuman Ontological Landscape

In contemporary transhumanist discourse, subjectivity is no longer approached as a static anthropological constant but as an emergent construct, one undergoing perpetual transformation via its interaction with technoscientific mediation. Human experiential domains, traditionally understood through metaphysical or phenomenological lenses, are now increasingly viewed as sites of augmentation, optimization, and synthetic recomposition. These trajectories resist reduction to abstract speculation, as they are substantiated by concrete advances in biomedical, neurocognitive, and computational domains. The epistemic loyalty of these fields to STEM disciplines undergirds this shift, producing a technocultural paradigm wherein the boundaries of "the human" are no longer merely extended, but strategically refashioned.

This dynamic convergence draws its conceptual fuel not only from rapidly evolving scientific practice but also from philosophical, cultural, and ideological formations dedicated to transcending the historically sedimented limits of human experience. As such, the emergence of what might be described as T-posthuman subjectivity signals more than a modification of existing anthropocentric models—it marks a paradigmatic reconfiguration of the subject itself. The traditional subject is both enhanced and epistemologically displaced by technologically enabled modalities of selfhood that are non-linear, modular, and morphogenetic. Subjectivity, in this transhumanist register, becomes a central ontological vector through which broader questions of personhood, agency, and ethical responsibility are reimagined. The inquiry into the nature of consciousness and selfhood extends beyond the confines of abstract theory to interrogate material and computational substrates that co-constitute the post-anthropogenic subject. This also renders subjectivity a crucible for addressing the broader ethico-political and biopolitical questions intrinsic to contemporary human futures. In this light, notions such as autonomy, privacy, moral accountability, and dignity are no longer fixed within traditional humanist ideas. Instead, they must be reconsidered in relation to new forms of life shaped by technology: forms that may be programmable, extended beyond the body, or even detached from biology altogether.

The present chapter therefore initiates an investigation of the conceptual morphology of subjectivity within the transhumanist imaginary. It will systematically delineate and analyze the foundational typologies through which the T-posthuman subject is envisioned, articulated, and contested. These models are not mere classificatory devices; they serve as theoretical instruments for elucidating the complex interplay between the promise of enhancement and the instability of the very categories such enhancement presumes to refine. This exploration also interrogates how transhumanism engages with, critiques, or repositions inherited conceptions of the self. While certain classical models are explicitly rejected, others are reconfigured through the prism of techno-ontological adaptation. Here, the distinction is not merely between theoretical models of pre- and post-human subjectivity, but between static ontologies of the self and those predicated on emergence, modulation, and iterative reconstitution. The subject is no longer a foundational presupposition; it is a site of engineering, inscription, and ontological redesign.

Equally crucial to this investigation is the manner in which transhumanism weaves together empirical fact and speculative fiction. The imaginative component of transhumanist thinking is not ancillary or metaphorical but integrative and constitutive. Stefan Herbrechter describes this as a "science-factional" approach: an ontological entanglement of verifiable technoscientific advances with projective extrapolation drawn from cultural imaginaries and narrative scenarios.[21] In this model, fiction operates as a form of *pre-ontological* design, shaping not only the language but the metaphysical architecture of what subjectivity might become. Accordingly, select examples drawn from visual culture, futurist fiction, and digital media will be mobilized throughout this analysis, not as illustrative afterthoughts but as epistemic artefacts. The cyborg, the neuro-enhanced transhuman, the synthetic mind, the algorithmic self—these figures are not merely anticipatory silhouettes cast into the Derridean *à venir*, but figural crystallizations of the possible. They resonate across the semiotic architectures that both prefigure and underwrite technological

[21] Herbrechter's invocation of the "science-f*a*ctional" reflects a methodological provocation central to critical posthumanism: it displaces the epistemic divide between fiction and empirical knowledge, casting narrative as a constitutive force in shaping technocultural futures. Rather than treating speculative narratives as mere allegory, this approach positions them as formative discursive infrastructures that precede and often guide scientific development. The analytical yield of this perspective becomes particularly generative when examining transhumanist imaginaries, where the T-posthuman subject emerges through both technological design and anticipatory architectures of cultural semiotics. See Stefan Herbrechter, "Posthumanism and Deep Time," in *The Palgrave Handbook of Critical Posthumanism*, ed. Stefan Herbrechter, Ivan Callus, Manuela Rossini, Michael Grech, Miriam de Bruin-Molé, and Christina J. Müller (Cham: Palgrave Macmillan, 2022), 29–42.

actualization. As diagrammatic projections of emergent subjectivities, they demand critical-theoretical interrogation, functioning less as allegory than as constitutive elements within the *ontosyntax* of transhumanist thought.

2.2 Two General Typologies of T-Posthuman Subjectivation

In this section, we introduce a dual-structured taxonomy of T-subjectivity, articulated through two analytically distinct yet interwoven typologies. The first, T1, delineates foundational conceptual configurations that articulate transhumanist modes of subject formation. The second, T2, maps the (quasi-)practical horizons within which these conceptual forms are instantiated, simulated, or anticipated. Taken together, these typologies do not offer an exhaustive classification of post-anthropocentric subjectivity; rather, they function as *epistemological heuristics*, designed to trace the evolving models across prefigurative, cultural, and material terrains.

2.2.1 T1: Conceptual Configurations

The T1 typology isolates three paradigmatic modalities frequently referenced, whether explicitly or implicitly, within transhumanist discourse:

- **T1a: Humanimal-Cyborg**—This mode refers to a *techno-organic* hybrid that emerges from the recursive coupling of biological embodiment and machinic extension. The humanimal-cyborg does not abandon its organic substrate but recalibrates it through prosthetic expansion, neural interfacing, and feedback-driven somatic recalibration. It operates within a framework where embodiment becomes modifiable without necessarily disrupting the ontological primacy of the human form.
- **T1b: Higher Human–Transhuman**—This transitional configuration is premised on enhancement, self-modification, and optimization across cognitive, physiological, and affective registers. Here, the subject remains anchored to the category of "human," but becomes a liminal figure of transformation, aspiring toward increased capacity, resilience, and control over its biological limitations. This mode radicalizes humanist ideals without fully escaping their structural inheritance.

- **T1c: Overhuman–Posthuman (T-posthuman *stricto sensu*[22])**—This typology designates a projected form of subjectivity that exceeds humanist categories altogether. It gestures toward ontologies no longer dependent on biological continuity, anthropocentric constraint, or sovereign individuation. The T-posthuman *stricto sensu* exists in anticipatory tension with the other typologies: its emergence presupposes a decisive rupture with inherited metaphysical frameworks.

Categories listed above are not intended to signify fixed evolutionary stages or discrete ontological demarcations. They function as ideal-typical forms constructed to illuminate structural tendencies in the reimagining of the subject within transhumanist frameworks. Their interaction is nonlinear and dynamic: earlier formations may persist, hybridize, or exert formative influence on subsequent constellations. Differentiation among them is thus not chronological, but thematic, rooted in shifting ontological assumptions concerning embodiment, agency, and continuity.

2.2.2 T2: Technocultural Vectors of Actualization

Where T1 maps the conceptual architectures of transhumanist subjectivity, the T2 typology situates these forms within operative or emergent technocultural vectors. T2 pertains to the domains and processes through which transhumanist configurations are rendered at least partially operative, whether via direct material instantiation, projective anticipation, or infrastructural simulation. T2 should not be interpreted as a secondary layer imposed upon theoretical models; rather, it describes a co-constitutive relationship in which technological affordances retroactively inform, destabilize, or rearticulate the very conceptual premises of subjectivity. This orientation reflects a broader logic of mediation akin to that elaborated in postphenomenology, particularly in Ihde's account of material-semiotic co-shaping.[23] The subject does not encounter technology as

[22] As opposed to the (T-, M-, or P-) *posthuman* we use as an *umbrella* term throughout this study. We will subsequently refer to this specific model as the *Overhuman-T-Posthuman* (OHTP) for greater conceptual precision and ease of reference.

[23] Rather than treating artefacts as transparent tools, Ihde foregrounds their role in constituting perception, embodiment, and meaning. This relational ontology rejects essentialist binaries between subject and object, proposing instead that technological affordances and human intentionality are mutually emergent. For foundational elaborations, see Don Ihde, *Technology and the Lifeworld: From Garden to Earth* (Bloomington: Indiana University Press, 1990); and idem, *Postphenomenology and Technoscience: The Peking University Lectures* (Albany: State University of New York Press, 2009).

an external modifier but is constituted through technicity from the outset. Accordingly, we delineate three principal T2 domains, each corresponding loosely to a T1 modality but exhibiting transversal intersections and, again, nonlinear feedbacks:

- **T2a: Enhanced Subjectivity**—This vector encompasses the bio-tech augmentation of the human organism in its morphology, physiology, and neurocognitive capacities. It aligns predominantly with the T1a and T1b paradigms, reflecting a shared ethos of improving the given human form through technical modulation. From gene editing and neural implants to somatic recalibration, T2a manifests the technics of enhancement that preserve biological legibility while pushing its limits.
- **T2b: AI-Driven Subjectivity**—This domain concerns the integration of artificial intelligence into the architectures of human cognition and behavior. It ranges from supportive or assistive "weak AI" to the envisioned threshold of "strong AI" capable of melding with or surpassing human intelligence. Bridging T1b's aspiration toward cognitive expansion and T1c's vision of supra-human subjectivity, T2b represents a pivotal axis of *transformation*, where autonomy, decision-making, and intelligence become distributed across hybrid assemblages.
- **T2c: 'Uploaded' Subjectivity**—The concluding pattern of this typology refers to the migration of personhood from a biological substrate to a digital or alternative medium, encompassing mind uploading, consciousness emulation, and virtual embodiment. It resonates most directly with T1c's T-posthuman *stricto sensu*, actualizing the possibility of subjectivity that is no longer tethered to organic morphology. T2c gestures toward radical decoupling: the abstraction of consciousness into code, the dispersal of identity into data-driven ecologies.

These T2 categories are best understood as pattern-clusters: flexible yet structured trajectories that organize emergent configurations of transhumanist being. While treated analytically as discrete, they are not siloed. Rather, they frequently intersect, hybridize, and co-evolve. Advances in AI (T2b) may enable new modalities of bodily enhancement (T2a) or serve as scaffolds for upload scenarios (T2c), and vice versa. This entanglement reinforces the view that ontology and technology are reciprocally formative, shaping each other through ongoing feedback loops. Further, to underscore the point, the relation between T1 and T2 is not linear but reflexively co-constitutive. T2 developments feed back into the conceptual logics of T1, reformatting its categories in real time. For example, AI-driven and uploaded subjectivities (T2b, T2c) both emerge

as terminal articulations of the Humanimal-Cyborg (T1a) and simultaneously serve as transitional gateways toward the Overhuman-Posthuman (T1c). In these configurations, we begin to glimpse the dissolution of biological constraints, the abstraction of identity into algorithmic flux, and the proto-formation of non-human ontological registers.

To elaborate further, both T2b and T2c may be regarded as distinct yet intersecting modalities of enhancement, even as they push toward the asymptotic limit of organic morphology. Their convergence marks the gradual transition into a contemplative zone of ontological projection, where embodiment is no longer prerequisite, and identity is increasingly situated within synthetic, distributed, or non-anthropocentric substrates. It is worth emphasizing that the typologies presented here (T1 as conceptual architecture and T2 as technocultural vectorization) are not proposed as rigid taxonomies. Offered as methodological instruments, they are presented as analytic devices designed to trace the iterative production of T-posthuman subjectivity across a metastable continuum of theory, technology, and anticipation. In fact, their permeability is not a methodological flaw but a theoretical insight: within *conditio transhumana*, subjectivity is neither pre-given nor stable, but co-emergent with the affordances that shape it. For this reason, the T1 and T2 typologies are fully articulated here at the outset of the chapter. In what follows, these configurations will be mobilized analytically but not recapitulated in full. Their function is infrastructural, not thematic: they provide the conceptual and operational architecture upon which subsequent sections build, refract, and critique. This decision reflects a broader commitment to conceptual density and reader autonomy, inviting engagement with the typologies not as fixed frameworks, but as generative platforms for ontological and epistemic experimentation.

The following subsections unpack each modality within the T1 typology, beginning with the foundational figure of the humanimal–cyborg. This analysis will trace its ontological underpinnings, cultural resonances, and theoretical permutations as a precondition for emergent forms of subjectivity. Subsequent sections will move through the transitional configuration of the higher human–transhuman, and culminate in the overhuman–posthuman paradigm, which signals a decisive ontological rupture. Together, these three modalities form the analytical core for a sustained engagement with their T2 correlates and lay the conceptual groundwork for the emergent articulation of P- and M-posthuman subjectivities and beyond.

2.3 T1a: Humanimal–Cyborg as Ontological Interface

The conceptual figure of the *Humanimal–Cyborg* (HAC) operates not merely as a metaphor for technocultural hybridity but as a fundamental ontological *interface*: a discursive mechanism through which the stable, humanist subject is dismantled and replaced by a recursive configuration of biological inheritance, machinic supplementation, and semiotic permeability. Within the triadic stratum of T-posthuman subjectivity, the humanimal–cyborg constitutes not an embryonic phase but an enduring ontological diagram: a domain in which subjectivity emerges through entwined dynamics rather than sovereign individuation.

This transformation begins with Wiener's foundational work in cybernetics, which reframes both organic and artificial systems as information-driven constructs governed by feedback and regulation. His insights dissolve the rigid boundaries between biology and technology, rearticulating the human as a cybernetic system co-constituted by its environmental and technological matrices. In this light, even primitive tool use is not simply instrumental but *proto-cybernetic*, a form of anticipatory interface signaling the co-constitutive emergence of technicity and embodiment.[24] The articulation of the "cyborg" by Clynes & Kline in 1960, envisioned as an organism technologically modified to survive extraterrestrial conditions, concretizes this ontological shift.[25] The cyborg is not an anomaly but a logical consequence of Wiener's feedback paradigm: an organism modulated from within by systems of external technicity. Here, the body itself becomes a site of infrastructural intervention, no longer a sealed biological vessel but a modifiable *interface*. The human/tech boundary, once metaphysically guarded, now appears as a historically contingent artifact: fluid, porous, and subject to continual reconfiguration.

This ontological destabilization is reframed with critical intensity in Haraway's "A Cyborg Manifesto," which resituates the cyborg from a technoscientific construct to a semiotic insurgent.[26] Haraway does not simply affirm hybridity; she *weaponizes* it. The cyborg becomes a catalyst for the fundamental deconstruction of binary taxonomies such as organism/machine, nature/culture, and male/female, with the logic of self-replication now traceable in every aspect of cultural life.

[24] Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (Boston: Houghton Mifflin, 1950).
[25] Manfred Clynes and Nathan Kline, "Cyborgs and Space," *Astronautics*, September 1960.
[26] Haraway, "A Cyborg Manifesto," 149–81.

Her insistence that "the boundary between science fiction and social reality is an optical illusion" reveals fiction not as escapist metaphor but as ontological infrastructure, prefiguring technoscientific realities before they materialize.[27] Responding to Haraway's critical posthumanism, Hayles reorients the discourse around embodiment and *technogenesis*. In "How We Became Posthuman," she critiques the disembodied information fetish of early cybernetics, insisting instead on the material and historical specificity of *bodies in code*.[28] Her assertion that "we have always been posthuman"[29] signals a paradigmatic redefinition: posthumanity is not a rupture with the human, but a realization of what the human has always-already been—a techno-discursive construct co-evolving with its media.[30] Therefore, to use a metaphor, Haraway opens the discursive battlefield, and Hayles ensures the body is counted among both casualties and survivors.

Hansen extends this trajectory into the phenomenological milieu, arguing that digital media do not simply extend perception but recalibrate sensorimotor baselines and reconfigure the very conditions of embodiment.[31] For Hansen, the interface is not supplemental but ontologically *generative*: it reconstitutes the embodied subject from the ground up. Subjectivity in this co-constitutive framework is best understood as a *body-in-code*—not post-biological, but post-integral. Instead of functioning as an apparatus of straightforward enhancement, the HAC is therefore a *technosomatic event*: an ongoing renegotiation of the boundaries of embodiment. Vita-More shifts the HAC discourse toward a more programmatic, transhumanist register. In her *Platform Diverse Body* model, she articulates the body as an editable platform: a site of aesthetic autonomy, morphological freedom, and systemic upgradeability.[32] The HAC, in her terms, operates as an initial design-based subjectivity platform, a corporeal interface no longer

[27] Ibid., 149.
[28] Hayles, *How We Became Posthuman*.
[29] Ibid., 279.
[30] N. Katherine Hayles, *How We Think: Digital Media and Contemporary Technogenesis* (Chicago: University of Chicago Press, 2012).
[31] Mark B. N. Hansen, *Bodies in Code: Interfaces with Digital Media* (New York: Routledge, 2006), 20.
[32] Vita-More presented a visionary proposition in the form of an impending body prototype, initially conceptualized as the "Primo Posthuman" (1996). This speculative framework articulated a comprehensive model of postbiological embodiment, integrating components such as the "connectome cloud," the "metabrain," layered across both extrinsic and intrinsic cognitive architectures, and "smart skin," envisioned as an affectively responsive interface. These conceptual elements were later iterated in her models of the "Platform Diverse Body" and "Substrate Autonomous Persons" (2013), which together exemplify the layered evolution of transhuman corporeality. For a more detailed exposition of these constructs, see Natasha Vita-More, *The Transhumanist Manifesto*, Humanity+, 2013, https://www.humanityplus.org/the-transhumanist-manifesto, accessed June 23, 2025.

constrained by Darwinian inheritance, but shaped by its capacity for iterative self-modification. Where Haraway deconstructs the body and Hayles re-embeds it, Vita-More *instrumentalizes* it, rendering embodiment a substrate for technological authorship.

Łukaszewicz Alcaraz deepens the theoretical stakes by integrating Margolis' conception of the "enlanguaged" cultural self.[33] Subjectivity here is not just biological or technological, but *technolinguistic*: co-constructed through language, culture, and hardware. Her notion of the bio-technological self reframes the HAC as a hinge between Darwinian evolution and a post-Darwinian, technogenetic paradigm.[34] This epistemological pivot foregrounds the performative nature of identity as a reflexive interface of code, cognition, and culture. In parallel, resonating with the formative insights of Vattimo's *pensiero debole*,[35] Sorgner, further engaging Nietzsche's legacy, advances an ontology of "weak transhumanism," one that eschews the determinism of teleological futurism in favor of a radically open-ended process of perpetual becoming. In this Nietzschean inflection, the HAC is not a stepping-stone toward a perfected posthuman but a site of continual modulation. Drawing from such ontological bricolage, always-already *in statu nascendi*, Sorgner argues that enhancement must remain open-ended, pluralistic, and critically aware of its own ideological dangers.[36] The HAC, thus, is not simply transitional but terminally recursive, far more a *condition* than a phase.

Materializing this conceptual architecture, Warwick's empirical interventions enact theory in the domain of embodied technoscientific praxis. His neural interface experiments, connecting his nervous system to computers and even another human's nervous system, literalize the synergistic coupling theorized by cybernetics and posthumanism alike.[37] Warwick's oft-cited assertion that

[33] For an in-depth philosophical exposition of culture and the constitution of the human self as a historically embedded, linguistically mediated entity, see Joseph Margolis, *Towards a Metaphysics of Culture* (Cambridge, MA: Harvard University Press, 1996); and idem, *Interpretation Radical but Not Unruly: The New Puzzle of the Arts and History* (Berkeley: University of California Press, 1988).
[34] See Aleksandra Łukaszewicz Alcaraz, "Evolutionary Continuity Between Humans and Cyborgs on the Basis of Joseph Margolis' Concept of the Human Self as Enlanguaged Cultural Being Emergent from the Continuum of Nature–Culture," *CyberEmpathy: Journal of Multimedia* 6, no. 2 (2016): 1–36.
[35] Gianni Vattimo, *Weak Thought*, ed. Gianni Vattimo and Pier Aldo Rovatti, trans. Peter Carravetta (Albany: SUNY Press, 2012), 1–2.
[36] Stefan Lorenz Sorgner, *We Have Always Been Cyborgs: Digital Data, Gene Technologies, and an Ethics of Transhumanism* (Bristol: Bristol University Press, 2021), 45–63.
[37] See Kevin Warwick, *I, Cyborg* (Urbana: University of Illinois Press, 2002), 4–8; Another striking example of HAC subjectivity in practice is Neil Harbisson, a color-blind artist who famously implanted an "eyeborg," a cybernetic antenna that translates color frequencies into auditory signals, enabling him to "hear" color through bone conduction.

being human is not a concluding terminus but an "accident of fate," when placed in critical dialogue with Sorgner's Nietzschean-inflected claim that "we have always been cyborgs," evokes a temporality that arcs across the historical, the experiential, and the anticipatory.[38] As proposed here, when read through the lens of the future perfect tense ("we will have been cyborgs") this continuum discloses a retroactive inevitability, revealing that *cyborgicity* is not an emergent anomaly but a constitutive condition of subjectivity. Either way, the statement transcends rhetorical provocation and becomes a philosophical declaration of ontological status: subjectivity is already infrastructural, already distributed, already machinically entangled. It is, therefore, always-already both more and less than its definitional closure.[39]

The ethical and political implications of the HAC paradigm extend far beyond the boundaries of enhancement discourse, compelling a radical reconsideration of normative subjectivity itself. Turkle's diagnosis of technologically saturated existence, encapsulated in her notion of being "alone together," underscores the erosion of interiority in the context of digital mediation.[40] In this reading, the subject is no longer the autonomous origin of agency or meaning but is increasingly shaped by algorithmic infrastructures that mediate, fragment, and redistribute attention, affect, and perception. The HAC, under such conditions, risks functioning not as an intentional agent but as a reactive node embedded in a machinic ecology of ambient control. Yet this apparent attenuation of subjectivity is met by an alternate trajectory in Braidotti's posthuman ethics, which decisively abandons the metaphysical architecture of liberal individualism. Rather than attempting to rescue autonomy from technological saturation, Braidotti reconceptualizes subjectivity as a transversal assemblage: materially situated, affectively distributed, and ecologically embedded. Within her *zoe*-centered framework, the HAC is not diminished by its entanglements with nonhuman systems;

Harbisson identifies not merely as a user of technology but as a cyborg in the ontological sense, arguing that the device constitutes a new sensory organ and an integral part of his selfhood. His case exemplifies how technological integration can extend body schema and reshape identity, supporting our HAC thesis that posits tool-mediated evolution as continuous rather than exceptional. Harbisson's experience also foregrounds legal and institutional dimensions of morphological self-definition: he successfully petitioned to have his antenna recognized in his passport photograph, compelling governmental recognition of his post-anthropocentric form. See Neil Harbisson, Harbisson, Neil. "I Listen to Color." TEDGlobal talk, June 2012. https://www.ted.com/talks/neil_harbisson_i_listen_to_color; see also Jasmine Erdener, "Human/Machine Fusions and the Future of the Cyborg," *Catalyst: Feminism, Theory & Technoscience* 7, no. 2 (2021), 2.

[38] Kevin Warwick, "Cyborg 1.0," *Wired*, February 1, 2000, https://www.wired.com/2000/02/warwick/, accessed June 23, 2025; Sorgner, *We Have Always Been Cyborgs*, passim.

[39] Sorgner, *We Have Always Been Cyborgs*, 45–63.

[40] Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York: Basic Books, 2011), 155–56.

it is constituted through them. Agency is no longer a function of isolated will, but a dynamic capacity to respond to the composite forces (biological, cultural, semiotic, and environmental) that structure the subject's *becoming*.[41]

Together, these divergent theoretical orientations reposition the HAC not as a figure of ethical disintegration but as a productive site of ontological experimentation. The tension between fragmentation and interdependence, between interiority and distributed cognition, does not resolve into a stable normative paradigm. Rather, it demands new conceptual vocabularies capable of navigating mediation, recursion, and multiplicity. In sum, the HAC is not the embryonic figure of a linear evolutionary schema but a persistent ontological condition in the age of dynamic technogenesis. It reveals that subjectivity is neither bounded nor originarily human but emerges through the continuous interplay of biology, code, culture, and interface. In other words, dismissing any function as a precursor, it operates as the ontological fold that renders the posthuman conceivable, configuring the very conditions of possibility through which such forms of subjectivity emerge.

The Humanimal–Cyborg does not represent an endpoint; rather, it stands as a locus of ongoing transformation. Through its intimate entanglement with technicity, a critical opening takes shape, rendering intentional self-modification ontologically explicit. This development neither abandons the HAC nor supersedes it; instead, it reorients its latent capacities toward heightened agency in the figure of the *Higher Human–Transhuman*. The affordances consolidated in the HAC are not discarded, but intensified within this reconfigured horizon. In such a context, subjectivity shifts from passive implication in technological systems to the deliberate pursuit of self-augmentation. Enhancement assumes a directed momentum, with optimization asserted as the principal trajectory of existence.

2.4 T1b: Higher Human–Transhuman as Morphogenetic Program

While the T1a configuration reveals a techno-ontological awakening, a re-inscription of the subject as an always-already hybrid being whose flesh is threaded with code, whose cognition is ecologically situated, and whose machinic inheritance precedes any clean division between nature

[41] Rosi Braidotti, *The Posthuman* (Cambridge: Polity Press, 2013), 60–61.

and artifice, T1b introduces an escalatory inflection in which hybridity ceases to be a descriptive condition and becomes an active teleological trajectory. Here, subjectivity is not merely entangled but becomes programmatic and projective. This mode gives rise to morphological intentionality, wherein the *Higher Human–Transhuman* (HHT) subject no longer simply inhabits the post-anthropocentric condition but begins to sculpt it. With tools of genetic modulation, cognitive recalibration, aesthetic sovereignty, and neurotechnological recursion, the HHT figure emerges as an *ontogenetic interventionist*—a being that does not accept inherited form but engages in the deliberate design of self as scaffold, dossier, and perpetually rewritten interface.

This second conceptual mode centers on aspiration and self-surpassing. It is grounded in the idea that the human being can and should transcend itself by attaining a higher or more advanced form of existence. Where HAC emphasizes continuity with the machinic and ecological milieu, HHT privileges transformation and improvement. It offers perhaps the closest correspondence to classical transhumanism as an Enlightenment-inspired project of human perfectibility. The human subject is reconceived not as a finished product but as an evolving work, capable of radical augmentation in intellect, physical prowess, emotional range, and even ethical sensibility. The transhuman, in this schema, is not a rupture from *Homo sapiens* but a more developed phase of it, one that amplifies the species' finest traits beyond their evolutionary limits.

This shift is not without lineage. Its philosophical foundation lies in Julian Huxley's seminal articulation of transhumanism, which he defined as the belief that humanity can, if it so chooses, transcend itself not just sporadically but in its entirety.[42] In a now-canonical formulation, he declared transhumanism to be "man remaining man, but transcending himself, by realizing new

[42] Huxley, the evolutionary biologist and first director of UNESCO, introduced the term transhumanism in his 1957 essay of the same name. There, he proposed that the species itself "can, if it wishes, transcend itself—not just sporadically, an individual here in one way, an individual there in another way—but in its entirety, as humanity." Huxley's vision was, at its core, a humanist one. He perceived no essential opposition between the traditional avenues of human improvement, such as education and cultural development, and the prospective use of science to enhance human capacities. Rather than viewing these approaches as mutually exclusive, he regarded them as parts of a unified project aimed at elevating the human condition. His conception of "transhumanism" thus anticipated many of the concerns that would come to define the field in later decades: the extension of life, the expansion of intellectual potential, and the cultivation of moral character. Of particular significance is the fact that his thought preserved the conviction that, through such transformations, humanity remains recognizably itself. This subtle but important distinction is frequently invoked by modern transhumanists seeking to distance themselves from the accusation that their ambitions amount to the abolition of the human. In this sense, Huxley serves as an intellectual bridge between the Enlightenment ideal of human perfectibility and the imaginative ethos of twenty-first-century techno-humanism. See Julian Huxley, "Transhumanism," in *New Bottles for New Wine* (London: Chatto and Windus, 1957), 17.

possibilities of and for his human nature."[43] Huxley's conditional "if it wishes" installs volition at the heart of evolutionary discourse, reframing it not as an indifferent process of natural selection but as a domain of purposive intervention: subjectivity becomes techno-evolutionary not as a Nietzschean expression of fate but as a distributed agency capable of reshaping its own substrate. This foundational impulse was further radicalized by F. M. Esfandiary, later known as FM-2030, who envisioned the transhuman as a deliberately *transitional* figure, poised between the obsolescence of biological determinism and the ascent of artificial design [44] The transhuman is not a teleological endpoint but a temporal and ontological intermediary, maintaining continuity with the human while configuring new possibilities for becoming. As envisioned by early Extropians and programmatic transhumanist thinkers, this emergent being is best captured by the term *Homo excelsior*: a higher human engineered not by evolutionary accident but by conscious design. This figure is aspirational rather than absolute, defined by acts of successive self-transcendence that build upon the human legacy without discarding it.

In this paradigm, the genome becomes editable software, the mind a modifiable interface, and the body a dynamic shell. Technologies such as CRISPR-Cas9, optogenetic modulation, organoid intelligence, and neurally integrated biocircuitry render biological fidelity a parameter rather than a constraint. Each enhancement is not an exception but a node in the unfolding narrative of technogenetic self-authorship. As intelligence becomes substrate-independent and embodiment increasingly modular, the HHT subject reframes its temporality. Aging is recontextualized as a solvable problem, identity as a continuity across regenerated tissues and prosthetic augmentations. Even affective experience, long considered intimate and inviolable, becomes a site of optimization, open to recalibration through neurochemical or informational inputs. The boundaries between soma and psyche, nature and artifice, sensation and simulation dissolve into recursive loops of feedback and control. Nevertheless, the T1b configuration does not jettison humanist commitments. Rather, it intensifies and extends them. Rationality, autonomy, and individual rights are retained but projected forward into post-biological domains. The pursuit of knowledge becomes a mandate to enhance cognition through neuropharmacology or brain–machine integration. The valuation of health transforms into a program of radical life extension via

[43] Ibid.
[44] F. M. Esfandiary. *Are You a Transhuman? Monitoring and Stimulating Your Personal Rate of Growth in a Rapidly Changing World* (New York: Warner Books, 1989).

regenerative medicine and genetic therapy. Vita-More's *Transhumanist Manifesto* gives voice to this ethos, calling for the proactive use of technology to overcome biological limitation and to craft a future human animated by progress, optimism, and intentional design.[45] Max More's concept of *extropy* provides the meta-ethical framework for this subjectivity: life, conceived as a local *reversal* of entropy, mandates its own intensification.[46] The HHT subject does not seek stasis or perfection but an open-ended vector of refinement and self-transformation. Morphological freedom here is not simply the negative liberty to alter one's body but a positive imperative to modulate and transcend inherited limitations, whether biological, cognitive, or affective.[47] This imperative does not posit a singular ideal but affirms a pluralistic field of emergence, shaped by individual and collective experimentations.

This pluralism is echoed in the normative structure of HHT enhancement culture. While the paradigm affirms the freedom to modify, it simultaneously calls for an ethics of self-fashioning. Many within this discourse argue that enhancement must serve wellbeing, preserve autonomy, and promote collective flourishing. Reckless experimentation is rejected in favor of ethically guided transformation. These principles are exemplified by the *Extropian movement* and later by

[45] First released in 1983 and revised through several subsequent iterations, the manifesto was among the earliest texts to explicitly advocate the use of emerging technologies not merely for therapeutic ends but as instruments of deliberate self-redesign. Framing technological enhancement as both a scientific and aesthetic pursuit, Vita-More (originally Nancie Clark) proposed that human evolution should become a *proactive*, creative project rather than a passive inheritance. The manifesto's language of "redesigning the human form" speaks not only to longevity and capability but to the expressive and compositional possibilities of embodiment itself. By version 4.0 (2020), the document had evolved to incorporate ethical and sociocultural concerns, invoking a commitment to "diversity, inclusion, and the plurality of sentient existence," a notable expansion of the movement's normative scope. Its most frequently cited line, "Bodies are fashion—adaptable, emotive, prismatic," captures the manifesto's orientation toward morphological freedom as an act of situated creativity. Alongside Max More's *Principles of Extropy* and the *Transhumanist Declaration*, Vita-More's manifesto constitutes one of the foundational texts of the movement, regularly cited by futurists and theorists for its role in articulating an early, ambitious synthesis of science, design, and prospective ethics. See Vita-More, *Transhumanist Manifesto*.

[46] Max More, "Technological Self-Transformation: Expanding Personal Extropy," *Extropy* 10 (1993): 15–22.

[47] The concept of *morphological freedom*, the right to alter one's body and mind in accordance with informed and voluntary desire, emerged from early transhumanist philosophy as a natural extension of classical liberal commitments to autonomy and self-ownership. Rather than accepting the human body as a static inheritance, this principle asserts the legitimacy of self-directed evolution through technological means. It encompasses a wide spectrum of transformation, from minor aesthetic changes to radical augmentations of cognition, physiology, and identity. Advocates argue that such freedom is increasingly necessary in an era of accelerating biotechnological capacity, and that it offers a conceptual framework for accommodating diverse and emergent forms of posthuman embodiment. As legal theorists begin to address its implications, some propose limits based on a harm principle, while others suggest its continuity with evolving discourses around bodily autonomy, disability, gender, and cyborg citizenship. See More, "Technological Self-Transformation"; idem, "Self-Ownership: A Core Extropian Virtue," *Extropy Online*, January 1998; Anders Sandberg, "Morphological Freedom: Why We Not Just Want It but Need It," in *The Transhumanist Reader*, ed. Max More and Natasha Vita-More (Oxford: Wiley-Blackwell, 2013), 56–64.

Humanity+, both of which articulate a vision of technological advancement tethered to the ideals of perpetual progress, practical optimism, and human welfare. Bostrom's triadic framework of super-longevity, super-intelligence, and super-wellbeing offers a functional taxonomy for the aspirations of the HHT subject.[48] Longevity is not conceptualized as the indefinite prolongation of decrepitude, but as a biochemical realignment of the organism toward regenerative thresholds, as theorized by de Grey's SENS platform, which targets the repair of cellular and molecular damage to bypass senescence.[49] In this view, death is no longer an ontological given but a logistical problem. Cognitive enhancement, enabled by neuro-electronic coupling (via devices emerging from initiatives such as *Neuralink* or *DARPA*'s *N3* program[50]), ushers in new regimes of epistemic affordance, transforming the brain from a bottleneck of perception to a recursive processor integrated with machine learning networks. Affective recalibration, finally, as envisioned by Pearce, seeks the abolition of suffering not through pharmacological sedation but through evolutionary redesign—gradients of bliss responsive to external information inputs. In this model, pleasure and ethical agency are no longer antagonistic, but co-constitutive.[51]

[48] Nick Bostrom, "Why I Want to Be a Posthuman When I Grow Up," in *Medical Enhancement and Posthumanity*, ed. Bert Gordijn and Ruth Chadwick (Dordrecht: Springer, 2008), 107–36.

[49] Aubrey de Grey and Michael Rae, *Ending Aging: The Rejuvenation Breakthroughs That Could Reverse Human Aging in Our Lifetime* (New York: St. Martin's Press, 2007), chaps. 4–5.

[50] Similar to the *Neuralink* project (examined in more detail in subsequent analyses), *DARPA* stands as the US's preeminent force in military-technological innovation, advancing the frontier of brain–machine integration through initiatives such as the *N3* (Next-Generation Nonsurgical Neurotechnology) program, which seeks to interface neural activity with computational systems without surgical intervention. See Sharon Weinberger, *The Imagineers of War: The Untold Story of DARPA, the Pentagon Agency That Changed the World* (New York: Alfred A. Knopf, 2017), 355–60.

[51] Pearce's intervention presents a radical ethical vision in which suffering is not merely to be reduced or managed but entirely abolished through the application of advanced biotechnology. Grounded in a utilitarian framework, Pearce proposes that the neurological architecture of sentient beings can be systematically reengineered to support gradients of well-being that are affectively rich and informationally responsive. This vision entails a comprehensive transformation of the brain's hedonic landscape through methods such as genetic modification, neurotherapeutic intervention, and potentially molecular-scale technologies, all aimed at eliminating the biological substrates of distress. For Pearce, suffering is not an existential necessity but a legacy of evolutionary design that can be superseded. Within transhumanist discourse, his proposal has been both celebrated and contested. Supporters view it as the ethical culmination of enhancement philosophy, a future in which sentient life is pervaded by sustained forms of flourishing. Critics argue that a world devoid of adversity may undermine the experiential structures that give meaning to struggle, growth, and achievement. Pearce counters that such concerns reflect an attachment to the familiar pathologies of the human condition and insists that a post-suffering civilization could be animated by new forms of curiosity, aesthetic exploration, and cooperative play. His work remains a touchstone in the ethical dimension of transhumanist theory and represents a decisive extension of the T1c paradigm by treating suffering as a design problem rather than an immutable condition. See David Pearce, *The Hedonistic Imperative* (1995), accessed June 23, 2025, https://www.hedweb.com/hedab.htm.

These trajectories inevitably raise profound metaphysical and moral questions: What becomes of personal identity in the face of continuous augmentation? If neurons are replaced by functional analogues, does the self remain intact? The classic *Ship of Theseus* puzzle becomes a practical concern in neuroethics. Parfit's theory of psychological continuity offers a path forward: identity persists not through material sameness but through chains of memory, intention, and narrative.[52] Dennett's model of the "center of narrative gravity" reinforces this view, positing the self as a dynamic construct with real causal power, a story we tell and retell to preserve coherence across iterations. In this schema, the self is not only branch-tolerant but duplication-compatible, capable of surviving forking and recursive replication without losing integrity.[53]

Sorgner's *euro-transhumanist*[54] formulation of *weak transhumanism* further insulates this paradigm from hegemonic ideals of perfection or universal design. Rather than pursuing enhancement as convergence toward a singular ideal, he frames it as a deeply plural and processual practice. Enhancement, understood in this register, should unfold across a spectrum of existential difference: poietic, aesthetic, and experimental. It ought not to solidify into fixed archetypes or impose normative templates, but instead sustain a plurality of possible forms and futures, each irreducible to the others. Morphological freedom becomes not a euphemism for optimization, but an affirmation of ontological inventiveness. The HHT subject is thus refigured not as a model for replication but as a curator of difference, whose transformative agency resists closure in favor of ongoing variation.

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[52] Derek Parfit, *Reasons and Persons* (Oxford: Oxford University Press, 1984), esp. part III.

[53] Daniel Dennett, "The Self as a Center of Narrative Gravity," in *Self and Consciousness: Multiple Perspectives*, ed. Frank S. Kessel, Pamela M. Cole, and Dale L. Johnson (Hillsdale, NJ: Lawrence Erlbaum Associates, 1992), 103–15.

[54] Euro-Transhumanism (ET) does not emerge as a regional flavor of technological futurism but as a philosophically inflected modality of post-Enlightenment self-transcendence, rooted in the continental tradition's refusal to bifurcate rational progress from ontological depth. Where its American counterpart tends toward libertarian accelerationism and techno-solutionism, ET orients itself around an ethics of situated becoming: Nietzschean in its suspicion of absolutes, Foucauldian in its microphysics of self-stylization, and post-Heideggerian in its attunement to the technological as a disclosure rather than a tool. It is not a manifesto for enhancement, but a grammar of difference. Figures like Sorgner recode transhumanism not as the pursuit of perfection, but as the intensification of plurality and the right to morphogenesis without metaphysical guardrails. Under ET, enhancement is no longer a linear ascent but a horizontal expansion of expressive configurations, a field of ontological options curated rather than prescribed. It is less an ideology than a topology: a space of proliferating vectors in which the human is not overcome but unmoored and recomposed, again and again. See Maurizio Balistreri, "Transhumanism According to Stefan Lorenz Sorgner: Why the Posthuman Project Requires Responsibility and Empathy," in *Metahumanism, Euro Transhumanism and Sorgner's Philosophy: Technology, Ethics, Art*, ed. Aura E. Schussler and Maurizio Balistreri (Budapest: Trivent Publishing, 2024), 81–92; for a distinct, though implicit, theoretical mapping of Euro-Transhumanism vis-à-vis what we call mainstream transhumanism, see Sorgner, *We Have Always Been Cyborgs*, 3–5.

Nonetheless, as enhancement technologies scale, so do questions of justice and access. Sandberg's defense of morphological freedom must be weighed against the risk that such freedom will intensify existing inequalities.[55] A reformulated Rawlsian difference principle may be necessary: enhancements are just only if they benefit the *least* advantaged.[56] The specter of a cognitive aristocracy, engineered by unequal access to nootropics, gene editing, and neural augmentation, haunts the otherwise utopian promise of the HHT paradigm. The ethics of enhancement, in this context, requires robust structures of distribution, regulation, and democratic deliberation. Moreover, the temporal expansion of life introduces challenges to meaning. Critics such as Kass have warned that indefinite longevity may erode existential depth. The HHT subject counters with an alternative narrative: temporal multiplicity enables rather than diminishes significance. A life spanning three centuries can hold serial vocations, plural relationships, and iterative modes of selfhood. Meaning is no longer tied to finitude but to novelty, modulation, and ethical reinvention. Duration does not flatten purpose; it demands new architectures of interiority and value.[57]

Ultimately, the HHT modality is defined not by its endpoint but by its recursive telos, a Nietzschean asymptote that constantly displaces finality.[58] The Higher Human–Transhuman is not a form but a motion, not a goal but a vector of perpetual re-inscription. It stands at the hinge of the T1 arc, translating the ontological insight of hybrid entanglement (T1a) into a programmatic ambition that will eventually be eclipsed by the substrate rupture of T1c.

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[55] Sandberg, "Morphological Freedom," 56–64.

[56] The proposal gestures beyond Rawls's original formulation toward a post-anthropocentric recalibration of fairness. Morphological asymmetries are not merely distributive anomalies but structuring conditions of future subjectivity, and thus demand ethical mechanisms not only of compensation but of anticipatory constraint. The difference principle, in this reframed context, becomes less a safety net than a normative filter for enhancement itself: one that asks not just who benefits, but what kinds of futures are being rendered possible, and for whom. See John Rawls, *A Theory of Justice* (Cambridge, MA: Harvard University Press, 1971), 75–83.

[57] Kass positions finitude as the existential framework of meaning, claiming that mortality confers urgency, coherence, and narrative shape to human life. The HHT subject reconfigures this logic, relocating significance from external limitation to internal articulation. In this alternative model, duration is not flattening but productive; it permits temporal layering, evolving commitments, and cumulative transformation. Continuity becomes the relevant metric of identity, not terminal closure. Parfit anchors persistence in psychological pattern rather than metaphysical substance, while de Grey reframes longevity as a problem of biological maintenance, superseding questions of existential necessity.Mortality, on this view, is a conditional threshold, not a moral foundation. Meaning is neither annulled by extension nor guaranteed by limitation; it is composed in the textures and tempos one inscribes across an expanding temporal horizon. See Leon R. Kass, "The Wisdom of Repugnance," *New Republic*, June 2, 1997, 17–26.

[58] Friedrich Nietzsche, *Thus Spoke Zarathustra*, ed. and trans. Walter Kaufmann (New York: Viking, 1954), esp. "On the Three Metamorphoses."

2.5 T1c: Overhuman–T-Posthuman as Ontological Rupture

Building on the previous typologies, *Overhuman–T-Posthuman* (OHTP) represents a far more radical break—a paradigmatic rupture from both humanist and transhumanist metaphysical commitments. Where HHT still operated within an extension of humanist values (e.g., Enlightenment ideals of reason, liberal individualism, and continuity of personhood), OHTP shatters those continuities. It posits a mode of subjectivity that Nietzsche only intuited in proclaiming "(hu)man is something that shall be overcome," a subject fully decoupled from biological substrates, from sovereign agency, and from narrative-bound coherence.[59] If the transhuman remains tethered, however tenuously, to the human as a recognizable ontological category, the OHTP represents a metaphysical rupture. This figure is no longer intelligible through anthropocentric reference. It does not merely extend or enhance the *conditio humana*; it discards it as an organizing principle altogether, executing a *salto mortale* (a conceptual leap into ontological otherness) beyond the limits of human-centered thought. In this sense, T1c signals an ontological discontinuity, an exodus from the human stage, and the emergence of a post-biological, post-singular, and post-narrative mode of existence that escapes the epistemological and ethical frameworks inherited from humanism.

The OHTP subject is conceived as fully substrate-independent. Whereas both classical humanism and most transhumanist discourse typically assume the continuity of the embodied human (even if enhanced or prolonged), the T1c paradigm severs this link. Here the mind can be uploaded, instantiated in digital or non-organic form, and even multiplied. As Hayles incisively observed, "the posthuman view privileges informational pattern over material instantiation, so that embodiment in a biological substrate is seen as an accident of history rather than an inevitability of life."[60] In this rupture, the flesh is no longer destiny; the "body" becomes optional, a prosthetic component that can be swapped or left behind entirely. Consciousness itself is reimagined as *platform-agnostic*, potentially running on silicon, photonic matrices, or quantum substrates with equal facility. In Hayles' terms, the body is reconstituted as a prosthetic extension of the mind,

[59] Ibid., 124. The parenthetical rendering "(hu)man" is used here to foreground the non-gendered semantic range of *Mensch*, following Sorgner's translational intervention, which emphasizes the importance of disarticulating the term from its historically masculinist overtones. See Stefan Lorenz Sorgner, "Nietzsche, the Overhuman, and Transhumanism," *Journal of Evolution and Technology* 20, no. 1 (2009): 29–42.
[60] Hayles, *How We Became Posthuman*, 2–3.

while the mind itself is reconceptualized as an array of codes and informational vectors, capable of subsisting with or without material instantiation. Under such a schema, subjectivity ceases to be an ontological given or an organic essence; it emerges instead as a selectable, transferable interface—capable, in principle, of persisting within simulated environments, shedding all corporeal tether, or diffusing across distributed networks and cloud-based architectures.[61] The OHTP is thus *diasporic*: it can disperse across machines and virtual environments, a kind of digital nomad of being.

Such a disembodied-yet-real subjectivity is no idle conjecture; it has been rigorously theorized in transhumanist futures and vividly dramatized in technocultural imaginaries. Bostrom's foundational definition of a posthuman as "a being that has at least one posthuman capacity" beyond the range of any human is later refined to explicitly encompass enhanced biological agents, wholly synthetic artificial intelligences, and digital minds realized through "whole brain emulation" uploading protocols.[62] In other words, even the vanguards of transhumanist thought acknowledge that the posthuman might be an upload or an AI with no biological ancestry. As noted already, transhumanists like Bostrom tend to treat posthuman transformation as a continuum: it is possible, he suggests, to become posthuman while still remaining fundamentally human. The OHTP breaks with that continuity. It aligns more with the view that posthumans would form a new genus or ontological category, not a mere enhancement of *Homo sapiens*. In that sense, OHTP echoes Nietzsche's *Übermensch* (overman/overhuman) not in the specifics of his aristocratic values, but in the core idea of overcoming the human as such. We have here a subject for whom species-being is irrelevant: a mind could just as well originate from a human brain upload or emerge as a native AI. Indeed, contemporary critical posthumanism calls into question the very notion of a fixed human essence or an exceptional status of the biological human. It rejects the idea that humans are "ultimately 'free' subjects who can determine their own history from a position above the rest of nature," a notion deeply ingrained in humanist thought.[63] The OHTP subject operationalizes this critique by literally vacating the "natural" (biological) position of the

[61] Ibid., 4–5.
[62] Bostrom, "Why I Want to Be a Posthuman When I Grow Up," 112; idem, *Superintelligence: Paths, Dangers, Strategies* (Oxford: Oxford University Press, 2014), 47–54.
[63] Stefan Herbrechter et. al., "Critical Posthumanism: An Overview," in *The Palgrave Handbook of Critical Posthumanism*, ed. Stefan Herbrechter, Ivan Callus, Manuela Rossini, Michael Grech, Miriam de Bruin-Molé, and Christina J. Müller (Cham: Palgrave Macmillan, 2022), 7.

human. What remains of "the human" when mind is abstracted into code and uploaded? Possibly nothing at all—and that is precisely the point. In this ontological rupture, the anthropocentric conceit collapses: intelligence and experience need not wear a human face or any face.

With this decoupling of subjectivity from the biological comes a profound challenge to the classical notion of the self as a sovereign, unitary agent. The paradigm of the individual upheld by humanism, which envisions a self-governing subject endowed with stable identity and intrinsic agency, is fundamentally disrupted by the figure of the OHTP. Critical theorists like Herbrechter, reading Badmington, note that posthumanism inherently "calls into question humanist or anthropocentric understandings of what humans are," including the presumption of humans as exceptional, indivisible selves endowed with absolute free will.[64] The "uploaded" subjectivity, as will become evident in the discussion of the T2c profile, represents the practical culmination of this critique. When a mind can be copied, forked, merged, or edited at will, what becomes of the singular "I"? Sovereign agency dissolves into something more fluid: a distributed, perhaps even collective or modular agency. We might speak here of the self as an assemblage or a swarm of instances rather than a monadic soul. Deleuze's insight that modern "control societies" produce *dividuals* rather than individuals, entities parsed into data, multiplicities, and code, finds literal embodiment (or disembodiment) in the digital posthuman.[65] The OHTP subject is, in a sense, a "dividual" made flesh (or rather, made data): it can be subdivided into multiple concurrent processes, each carrying forward elements of the original identity, yet none of them singularly encapsulating the self. Agency here might be thought of on the model of a hive-mind or Minsky's "society of mind," a dynamic coalition of sub-personal agents.[66] What disappears is the sovereign Cartesian ego pulling the strings. In its place emerges an algorithmic subject: a subject that may instantiate "partial selves" spun up for specific tasks, or run multiple selves in parallel across different virtual environments.

This dispersal of agency is rendered with particular force in both the fabular strains of technocultural imagination and the gravest meditations of critical philosophy. Hannu Rajaniemi's *Jean le Flambeur* series envisions a future in which digitized consciousnesses, known as gogols,

[64] Ibid; Neil Badmington, "Posthumanism," in *The Routledge Companion to Critical Theory*, ed. Simon Malpas and Paul Wake (London: Routledge, 2006), 240–41.
[65] Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (1992): 3–7.
[66] Marvin Minsky, *The Society of Mind* (New York: Simon and Schuster, 1986).

are massively replicated by the Sobornost, a posthuman collective that operationalizes these instantiations as instruments of its strategic will. These gogols, derived from a single prototypical upload, function not merely as passive copies but as autonomous agents, mobilized in coordinated swarms.[67] Political authority in this imagined society is exercised by assemblies of such minds, embedded within vast computational architectures that host unfathomable quantities of synthetic cognition. Here, agency is no longer located within the bounded individual, but redistributed across an expansive and modular network of selves. Far from being fantastical constructs, such scenarios operate as conceptual probes into the foundations of autonomy and personhood. When a single consciousness can exist in simultaneous multiplicity, the classical paradigm of unitary selfhood fractures. Even in more contained examples, such as a digitized mind deploying a temporary sub-agent to pursue a discrete task, later reabsorbing its experience, the coherence of the liberal subject begins to unravel. The model of identity as singular, embodied, and continuous gives way to a software-like schema of subjectivity, structured through iterative branching, selective merging, and adaptive reconfiguration.

Within this horizon, the OHTP subject emerges not as a sovereign agent in the traditional sense, but as the *meta-coordinator* of its own internal plurality. Agency becomes a property of systems rather than in-dividuals, exercised through the orchestration of interrelated sub-personal processes. The authorship of one's life no longer proceeds from a solitary interiority but from the managed orchestration of distributed intelligences, demanding a radical reconception of what autonomy might mean in a post-biological, post-singular context. Finally, even Haraway's cyborg was content with hybridity and partial identities[68]; OHTP multiplies this partiality into a dizzying array of self-instances, challenging us to envision ethical coordination among one's own copies. Autonomy here might mean the ability to spawn or integrate selves at will, rather than the classical independence of one body-mind unit.

With multiplicity and substrate-independence comes a final break: the end of a singular life-narrative. The OHTP model is no longer bound to one autobiography, one contiguous story that starts with birth and ends with death. In a post-biological paradigm, *death* itself may become optional (if one's mind is backed up and can be revived or duplicated, what does death mean?),

[67] Hannu Rajaniemi, *The Quantum Thief* (New York: Tor Books, 2010), 56–58.
[68] Haraway, "A Cyborg Manifesto," 154.

and without death's finality the arc of life is fundamentally altered. But even before considering immortality, the very experience of time and self changes for an uploaded or multiply realized being. We must confront the prospect of branching timelines and discontinuous identities. As previously addressed, Parfit's theory of psychological continuity offers a valuable point of departure, arguing that identity might not be what truly matters—what matters is psychological continuity and connectedness, which can in principle branch or split across two successors.[69] The classic teletransportation thought experiment (destroying the original body to create a copy elsewhere) is now a real technological proposition in the form of destructive mind uploading. David Chalmers has emphasized that while such a copy may replicate the original's structure and function, including qualitative consciousness, it lacks numerical identity with the source.[70] From the original's perspective, one might have no continuity at all (a lethal break); from the pattern's perspective, a continuity is preserved but in a new medium. This ontological ambiguity is baked into the OHTP condition.

Traditional narrative coherence, the sense that *I am the same person who lived through these events in sequence* may cease to apply if one "I" can become two. The uploaded subject could undergo fission: one version of you goes off to explore a virtual Jupiter, another stays on Earth—each carries the narrative forward differently. Who is the "real" you? The only honest answer may be both, or even neither (since the original biological you might have been left behind or dissolved into the process). Within this framework, one is compelled to embrace what Cerullo calls "psychological branching identity," a model in which continuity of mind can persist in multiple selves *simultaneously*.[71] This theory, once a radical thought experiment, becomes practical ontology for the OHTP. The "self" is no longer singular; it is an evolving tree of mind-states that can diverge, reunite, or terminate. Memory, long the glue of identity, might be shared between branches or edited such that two "forks" of the person later synchronize their experiences into one, blurring even the notion of separate timelines. In effect, life becomes *non-linear*. It's a hypertext, not a novel. The experiential architecture of such a being would be unprecedented. One might envision the richness of possibilities: an uploaded consciousness could accelerate its subjective

[69] Parfit, *Reasons and Persons*, 199–202.
[70] David J. Chalmers, "The Singularity: A Philosophical Analysis," *Journal of Consciousness Studies* 17, no. 9–10 (2010): 7–65.
[71] Michael A. Cerullo, "Uploading and Branching Identity," *Minds and Machines* 25, no. 1 (2015): 17–36, especially the formal definition (29–30) and its explanation (17–18).

time, experience years in minutes, or pause itself indefinitely. It could enter simulated worlds with entirely novel physics or sensory modalities, shattering any consistent thread with the external world. As Greg Egan illustrates in *Permutation City*, uploaded Copies live in environments they can modify, speeding or slowing experience, editing memory, or even reprogramming their own sense of identity.[72] Many of these Copies, no longer biologically anchored, become severed from their past lives, forming new subcultures like the "Solipsist Nation" that abandon continuity altogether. In such a system, memory loses its epistemic status as "evidence of the real." Authenticity thus becomes aesthetic, subjective, or consensual. What it means to have "lived through" something becomes an open question when experiences can be simulated, shared, rewritten, or deleted.

The emergence of uploaded subjectivity, even within the speculative scenarios, precipitates a series of unresolved normative tensions that strain, and in some cases collapse, the conceptual architecture of inherited ethical and legal paradigms. Sandberg has argued that brain emulations ought to be regarded as morally considerable entities, deserving of protections proportional to their cognitive sophistication and experiential autonomy.[73] Nevertheless, such a position immediately destabilizes existing juridical and moral categories. If consciousness can be instantiated across multiple digital substrates, do all such instantiations bear equal claim to personhood, legal standing, and moral agency? Is the deletion of an emulation ethically equivalent to biological death and/or murder, or does it constitute the withdrawal of access to a self-organizing process that remains ontologically distinct from the human subject? Furthermore, if an individual can fork versions of themselves to evade psychological harm, delegate morally ambiguous decisions (such as suicide), or optimize task performance, what becomes of intention, culpability, or the coherence of ethical subjectivity?[74] These scenarios do not merely complicate conventional ethics; they

[72] Greg Egan, *Permutation City* (London: Orion Publishing, 1994), 105–8.
[73] Anders Sandberg, "Ethics of Brain Emulations," *Journal of Experimental & Theoretical Artificial Intelligence* 26, no. 3 (2014): 439–57.
[74] Stanisław Lem's *Non Serviam* offers a powerful allegory of synthetic subjectivity. In this fictional essay, Lem describes digital beings known as "personoids," existing entirely within a simulated universe, who nevertheless develop philosophy, theology, and a sense of self. Acknowledging the existence of their creator, they nevertheless assert moral independence by declaring their refusal to serve. While intellectually autonomous, these entities remain existentially contingent, as their entire cosmos is subject to the will of an external operator who could terminate their reality at any moment. Lem's thought experiment highlights the profound ethical asymmetries inherent in artificial ontologies: minds endowed with agency and consciousness but lacking sovereignty over their ontological substrate. See Stanislaw Lem, "Non Serviam," in *A Perfect Vacuum*, trans. Michael Kandel (New York: Harcourt Brace Jovanovich, 1978), 198–216.

reveal the extent to which its anthropocentric foundations are no longer adequate for addressing the ontological and normative challenges posed by OHTP configurations.

Thus, although T1c delineates the furthest conceptual horizon of the T1 typology, its function is not that of a culmination but of an inaugural inflection. Its import lies not in the consolidation of T-posthuman subjectivity into a definitive paradigm, but in its dismantling of the ontological premises upon which such paradigms have traditionally rested. By unsettling the foundations of embodied continuity, disaggregating the coherence of autobiographical personhood, and subverting the notion of the self as a sovereign unity, the OHTP model opens a conceptual aperture through which unprecedented articulations of subjectivity may begin to emerge. These are not abstract projections into the not-yet, but structurally immanent forces within a present increasingly orchestrated by the operative logics of technocultural infrastructure.

T1c, in this regard, initiates not a conclusion but a generative shift in philosophical orientation. What it delivers is not the resolution of the (T-)posthuman question but the preconditions for its transformation. In the space vacated by the collapsing metaphysics of the liberal subject, new regimes of being are now poised to take form—regimes indexed not to sovereign interiority or organic coherence, but to modulation, dispersal, and adaptive computation. As such, T1c marks the juncture at which ontology cedes ground to operability, where the figure of the subject becomes inextricable from the systems through which it is technically instantiated and materially sustained.

This epistemic and ontological displacement forms the precise terrain on which the T2 typology intervenes. It does not simply extend the conceptual configurations mapped across T1, nor does it operate as a derivative register of application. Rather, it articulates the technogenic conditions under which the subject is not merely imagined but differentially enacted. The movement from T1 to T2 (and other upcoming typologies) is therefore not additive but transformational: a shift from conceptual morphology to infrastructural recursion, from figural speculation to the iterative architectures of implementation. It is here, amid the complex entaglement of cognition, code, and computation, that the analysis now turns.

2.6 T2a: Enhanced Subjectivity

The first facet of T-posthumanist-driven transformation in our T2 typology is denoted here as *Enhanced Subjectivity* (ES). This term refers to the augmentation of the capacities that underlie

conscious experience and selfhood: our cognition, perception, emotion, and other first-person qualities. In contrast to enhancements of the body or external environment, ES focuses on elevating the mind's performance and the richness of experience through endogenous transformation. Such enhancement may involve boosting memory, intelligence, and creativity, expanding sensory inputs, modulating emotions, or even altering fundamental aspects of consciousness. The prospect of *engineering subjectivity* in this way raises profound questions. Philosophers working within the T-, P-, and M-strands of posthumanism argue that such interventions destabilize the classical notion of the autonomous human subject, revealing instead a being always-already entwined with technicity and ecological embeddedness. Phenomenologists likewise inquire how new cognitive and sensory extensions might transform the structure of experience, our "being-in-the-world."[75] Ethicists debate whether altering our minds could undermine personal identity or moral agency, while epistemologists consider how augmented cognitive capacities might change what and how we *know*. This section, as a continuation of our earlier framework, aims to synthesize these theoretical perspectives with current scientific developments in cognitive enhancement, neurotechnology, and biotechnology. By doing so, we deepen the analysis of T2a beyond a superficial summary, examining how ES is conceptualized and pursued, and what it means for the human condition.

2.6.1 Philosophical Foundations and Conceptual Domains

From a philosophical standpoint, the very idea of subjectivity enhancement invites us to revisit what "subjectivity" entails. In the humanist tradition, the subject was often treated as an individual, self-governing mind: a locus of reason and will, distinct from tools or outside influences. Posthumanist theoretical archipelagos, however, contend that the notion of an isolated, immutable subject is illusory.[76] Instead, subjectivity is seen as *relational* and *co-constructed*: always already shaped by our interactions with technology, culture, and other non-human forces.[77] In other words, tools and techniques have never been merely external aids; they penetrate our cognitive life and even our sense of self. A classic illustration comes from phenomenology: Merleau-Ponty, in a

[75] Ihde's concept of "embodiment relations" in technics builds on classical phenomenology to show how tools become part of our perceptual experience. See Ihde, *Technology and the Lifeworld*, 72–73.
[76] Braidotti argues that the "unitary subject" of humanism is an outdated fiction, advocating a vision of subjectivity as an assemblage of human and non-human components. See Braidotti, *The Posthuman*, 26–28.
[77] Hayles, *How We Became Posthuman*, 1–24.

paradigmatic passage, described how a blind person's cane can become an extension of their body and perception. The experienced user no longer feels the cane as a foreign object; rather, they "perceive the world at the end of the cane," incorporating it into their sensory apparatus.[78] This example shows how the boundaries of the self can expand to include non-biological instruments, ontologically integrating rather than opposing them; such insights lay the groundwork for understanding technological enhancements not as alien intrusions, but as continuations of a long tradition of human augmentation. Clark and Chalmers build on this idea in their "extended mind" thesis, arguing that external devices (from notebooks to smartphones) can become literal parts of our cognition if they serve the same functional role as brain processes.[79] If a smartphone or an AI assistant reliably handles memory or decision-making, then, on this view, the locus of subjectivity has already extended beyond the skull: the human subject is always-already technologically mediated at its core.[80] The enhancement of subjectivity through emerging technologies, therefore, does not constitute a rupture with human nature but rather an intensification of its cyborgian continuity. Nevertheless, the scale and deliberateness of contemporary interventions introduce qualitatively new challenges, as we shall see.

One broad way to categorize projects of ES is by the aspect of mind or experience they aim to augment. We can distinguish (a) *cognitive enhancements*: improvements to reasoning, memory, attention, and other intellectual faculties; (b) *perceptual/sensory enhancements*: expansions or refinements of what we can perceive and feel; and (c) *affective or emotive enhancements*, ranging from deep-brain stimulation for mood repair to intranasal oxytocin sprays aimed at moral uplift, which target mood, motivation, empathy, and allied sentiments. These domains overlap and interact (for instance, sharpening perception can enrich cognitive insight, modulating emotion can impact subjective well-being and decision-making, to name a few). Nonetheless, this breakdown provides a useful heuristic. Each domain has seen speculative proposals and emerging real-world techniques, from smart drugs and genetic tweaks to brain implants and neuroprostheses. Significantly, all promise to *extend the capacities of the self*, thereby potentially transforming one's

[78] Merleau-Ponty writes that the blind man's cane "has ceased to be an object for him, and is no longer perceived for itself; its point has become an area of sensitivity," effectively extending the body's perceptual field: the world is felt at the cane's tip. See Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Donald A. Landes (London: Routledge, 2012), 143.
[79] Andy Clark and David J. Chalmers, "The Extended Mind," *Analysis* 58, no. 1 (1998): 7–19.
[80] Clark and Chalmers, "The Extended Mind," 7–19. See also Haraway, "*A Cyborg Manifesto*," 150; and Sorgner, *We Have Always Been Cyborgs*, 1.

experiential reality. To assess such prospects, one must weigh empirical evidence alongside philosophical reflection on how these transformations bear upon the phenomenology of human existence.

2.6.2 Modalities in Practice: Cognitive, Genetic, Neurotechnological, and Sensory Enhancement

Cognitive enhancement is perhaps the most developed area, at least in terms of public discourse and initial experimentation. Even outside any sci-fi scenarios, millions of people already use substances with the intention of boosting cognitive performance. The use of caffeine is ubiquitous and culturally accepted—a mundane "enhancer" of alertness and concentration. More controversially, prescription psychostimulants (like methylphenidate or modafinil) are used off-label by students, academics, and professionals to prolong wakefulness, heighten focus, and improve working memory. Surveys in recent years indicate that a notable minority of university students have experimented with pharmaceutical cognitive enhancers for study purposes. Reported prevalence rates vary substantially by region, population, and assessment methodology, but typically fall within the single digits for general populations and may approach or exceed 20% among highly competitive academic cohorts.[81] Students commonly obtain these substances through friends or online sources, driven by the belief that such drugs enhance memory, alertness, and academic performance.[82] The actual *efficacy* of these so-called "smart drugs" in healthy individuals, however, remains a subject of scientific scrutiny. Rigorous studies have tended to show modest improvements, highly dependent on the task and the individual's baseline. Modafinil, for instance, has been shown to enhance certain executive functions and memory updating in non-sleep-deprived adults, but the effect sizes are generally small to moderate. Similarly, meta-analyses of amphetamine and methylphenidate report some benefits to short-term memory and attention, yet no dramatic increase in raw intellectual ability is evident.[83] In sum, contemporary

[81] See L-S Camilla d'Angelo, George Savulich, and Barbara J. Sahakian, "Lifestyle Use of Drugs by Healthy People for Enhancing Cognition, Creativity, Motivation and Pleasure," *British Journal of Pharmacology* 174, no. 19 (October 2017): 3257–67; and Sharif *et al.*, "Assessing Prevalence, Knowledge and Use of Cognitive Enhancers among University Students in the United Arab Emirates: A Quantitative Study," *PLOS ONE* 17, no. 1 (2022): e0262704.
[82] Ibid.
[83] Battleday and Brem report that modafinil has statistically significant positive effects on attention, executive functions, and learning in healthy volunteers, though not all studies show benefits and some complex tasks see no improvement. See Ruairidh Battleday and Anna-Katharine Brem, "Modafinil for cognitive neuroenhancement in healthy non-sleep-deprived subjects: a systematic review," *European Neuropsychopharmacology* 25, no. 11 (2015):

pharmacological enhancers may optimize performance under particular conditions, such as maintaining alertness during extended periods of work, but they do not transform an average individual into a genius. At the qualitative end of the spectrum, classic serotonergic psychedelics (e.g., psilocybin, LSD) and next-generation empathogens are now micro-dosed in controlled trials to relax predictive-coding hierarchies; early data show transient gains in cognitive flexibility, associative ideation, and autobiographical insight.[84] Still, even a slight edge can be subjectively significant and societally consequential when aggregated across populations (consider the competitive advantage in academics or high-pressure jobs). The *subjective* experience of being on these drugs often includes a heightened sense of focus or confidence. Some users describe a feeling of mental clarity and control that they find empowering; others, however, report a narrowing of attention or blunting of creativity, raising questions about what kind of cognition we are enhancing. These reports underscore that enhancing "cognition" is not a value-neutral gain of CPU power: it can reshape the quality of thought in ways that might trade depth for speed, or originality for concentration, depending on the substance and context.[85]

The ethical and philosophical debates around cognitive enhancers frequently center on issues of authenticity and personal identity. Do achievements count as "truly mine" if attained with pharmaceutical assistance? Or, put differently, does the drug-mediated state represent *my true self* or a kind of artificial distortion? Opinions vary. Some ethicists argue that using a pill to study or work is not fundamentally different from using a calculator or a computer; it is simply another tool to extend our mental capacities, and one that a rational being should feel free to use in pursuit of their goals.[86] From this perspective, chemical cognitive enhancement is an expression of human ingenuity and autonomy, and concerns about authenticity are misplaced romanticism. After all, we

1865–81; for comparable findings regarding both modafinil and methylphenidate, see Repantis, D., Schlattmann, P., Laisney, O., & Heuser, I. "Modafinil and methylphenidate for neuroenhancement in healthy individuals: A systematic review." *Pharmacological Research* 62, no. 3 (2010): 187–206.

[84] Carhart-Harris, Robin L., and Karl J. Friston. "REBUS and the Anarchic Brain: Toward a Unified Model of the Brain Action of Psychedelics." *Pharmacological Reviews* 71, no. 3 (July 2019): 316–44; Kim P. C. Kuypers et al., "Microdosing Psychedelics: More Questions than Answers? An Overview and Suggestions for Future Research," *Journal of Psychopharmacology* 33, no. 9 (September 2019): 1039–57.

[85] See Anjan Chatterjee, "Cosmetic neurology: The controversy over enhancing movement, mentation, and mood," *Neurology* 62, no. 6 (2004): 968–75; and Cynthia Forlini and Eric Racine, "Cognitive enhancement, lifestyle choice or misuse of prescription drugs?"*AJOB Neuroscience* 1, no. 1 (2010): 1–4.

[86] Bostrom and Sandberg defend the potential of cognitive enhancers to improve quality of life and problem-solving, likening them to other accepted enhancements (education, nutrition), and argue that respecting individual autonomy means allowing informed adults to augment their cognition. See Nick Bostrom and Anders Sandberg, "Cognitive Enhancement: Methods, Ethics, Regulatory Challenges," *Science and Engineering Ethics* 15, no. 3 (2009): 311–41.

regularly accept how education itself "enhances" the mind by external means (teachers, books, training); why draw an arbitrary line at direct biochemical assistance? Others worry, however, that easy cognitive boosts promote a problematic ethic of *hyper-agency*, an excessive drive to control and optimize every aspect of our lives. Michael Sandel, for example, argues that the pursuit of enhancement reflects a failure to appreciate the gifted, unbidden nature of our talents and achievements, a stance that could paradoxically undermine qualities like humility or perseverance. There is also the concern that an over-reliance on enhancers could erode the value of *effort* or the development of character.[87] Empirical research on long-term users is still limited, but some anecdotal accounts describe a subtle shift in one's sense of self when routinely augmented by stimulants—an externalization of credit for one's successes ("it was the drug, not me") or conversely an overconfidence that blurs into feeling invincible. These identity effects remain speculative but merit consideration as cognitive enhancement becomes more normalized. Safety is another practical ethical issue: all current drugs carry side-effects (insomnia, cardiovascular strain, potential for dependency, etc.), which complicates the calculus of enhancement: a sharper mind at the possible expense of bodily health or psychological balance.[88] An elaborated euro-transhumanist ethic of enhanced subjectivity would call for evaluation not merely of utilitarian outcomes, such as improved test performance or productivity, but also of the effects on the individual's holistic well-being and existential orientation.[89] Does the enhancement foster a richer, more autonomous mode of subjectivity, or does it narrow and recondition the subject within new constraints, whether pharmacological or socio-cultural? Such questions prevent a facile view of cognitive enhancers as simple upgrades; they highlight that we are tinkering with the delicate fabric of self-experience.

Moving beyond pharmaceuticals, *biotechnological enhancements* promise potentially more radical and permanent ways to boost cognition, namely through genetic engineering. Advances in gene editing, especially CRISPR-Cas9 since the mid-2010s, have opened the door to modifying

[87] Sandel contends that the drive for enhancement reflects a desire for mastery that may erode appreciation for the "giftedness" of human capacities. He specifically cautions that traits like humility and solidarity could suffer in a society fixated on self-improvement by any means. See Michael J. Sandel, *The Case Against Perfection: Ethics in the Age of Genetic Engineering* (Cambridge, MA: Harvard University Press, 2007), 25–45.
[88] Irena Ilieva, Cara J. Hook, and Martha J. Farah, "Prescription Stimulants' Effects on Healthy Inhibitory Control, Working Memory, and Episodic Memory: A Meta-analysis," *Journal of Cognitive Neuroscience* 27, no. 6 (2015): 1069–89.
[89] Sorgner, *We Have Always Been Cyborgs*, 97.

the human genome with unprecedented precision. While the primary bioethical discussions around CRISPR have focused on treating genetic diseases, a parallel debate has examined the prospect of *genetic cognitive enhancement*. Could we alter genes to increase intelligence, memory, or other mental traits in future humans? In principle, the answer is yes: research in neurogenetics has identified numerous gene variants that influence neurodevelopment and cognitive function, though usually in complex, polygenic ways. There are already proof-of-concept demonstrations in animal models. A landmark example was the creation of the so-called "Doogie" mouse, genetically engineered to overexpress a receptor subunit (NR2B) in the brain, which showed improved learning and memory abilities compared to normal mice.[90] More recently, in 2019 a Chinese research team caused international controversy by inserting a human brain-development gene (MCPH1) into monkey embryos; the surviving transgenic monkeys exhibited delayed brain maturation and performed better on certain memory tasks than their unmodified peers. The experiment was ostensibly aimed at studying brain evolution, not creating super-intelligent monkeys, but it sparked ethical alarm as a possible slip towards *designer primates* with human-like cognition, a line that many see as dangerously blurred.[91] In the human context, the 2018 birth of gene-edited twins in China marked a turning point for both science and public debate. These children were modified to resist HIV by disabling the *CCR5* gene—an action widely condemned for its ethical and medical risks. Less noted, but deeply consequential, was the possibility that removing *CCR5* might also influence learning and memory, since this gene had previously been linked to cognitive function in animal studies.[92]

One key concern is *inequality*: if cognitive enhancements (genetic or otherwise) become available only to the wealthy or to certain nations, we could see the emergence of a biologically enhanced elite, widening existing social gaps. Another concern is the *irreversibility* and uncertainty: tweaking genes that affect the brain might have unpredictable effects on personality and subjective

[90] Joe Z. Tsien et al., "Genetic enhancement of learning and memory in mice," *Nature* 401, no. 6748 (September 2, 1999): 63–69.

[91] See Lei Shi et al., "Transgenic Rhesus Monkeys Carrying the Human MCPH1 Gene Copies Show Human-Like Neoteny of Brain Development," *National Science Review* 6, no. 3 (2019): 480–93; and Sigal Samuel, "Scientists added human brain genes to monkeys. Yes, it's as scary as it sounds," *Vox*, April 12, 2019.

[92] For analysis of the gene-editing case and discussion of scientific concern over possible cognitive effects, see Antonio Regalado, "China's CRISPR twins might have had their brains inadvertently enhanced," *MIT Technology Review*, February 21, 2019; for the foundational mouse study linking *CCR5* deletion to enhanced memory and brain plasticity, see Miou Zhou et al., "CCR5 is a suppressor for cortical plasticity and hippocampal learning and memory," *eLife* 5 (2016): e20985.

well-being, which, once set in an embryo, cannot be reversed in that individual. Philosophers have debated whether it is ethical to program into a child certain dispositions or superior capacities: does it curtail the child's *open future* by imposing a designer intention on their identity?[93] By contrast, some argue parents already influence their child's cognitive environment heavily (through education, diet, etc.), so genetic enhancement is a difference of degree, not kind. The *public* appears cautiously optimistic yet anxious on this issue. A large multinational survey in 2019 (the SIENNA project, spanning 11 countries) found that while people appreciated the potential benefits of human enhancement technologies, majorities were also worried about social pressure and loss of authenticity; for instance, 79% feared parents might feel pressured to genetically test or enhance their children if such options became common, indicating a broad unease about where the normalization of enhancement leads.[94] Taken together, genetic approaches to enhanced subjectivity remain more speculative at present than pharmacological or device-based ones, but they encapsulate the crux of the matter: an engineered boost to cognition could fundamentally alter one's subjective capacities in ways that force us to reconsider notions of human nature, dignity, and the ethics of intervention.

Perhaps the most striking developments for enhanced subjectivity come from the field of brain–computer interfaces (BCIs) and neurotechnology. Unlike drugs or genes, which modulate the biological substrate indirectly, BCIs aim to link the brain directly with external hardware or digital systems. This can occur in two directions: input (feeding information or stimuli into the brain) and output (extracting or decoding the brain's activity to control devices or software). Both vectors have implications for subjectivity. On the output side, we have already seen patients with paralysis

[93] Hurlbut and others call for global oversight of genome editing, noting the risk that transformative biotechnologies could create "post-persons"—beings whose enhanced capacities might challenge existing ethical frameworks. For the philosophical implications of such radical change, see L. A. Paul on "transformative experience," the idea that certain life events (including enhancement) fundamentally alter identity and preferences, making prior evaluation impossible. For a relational account of selfhood and embodiment, see Rosalyn Diprose, who contends that personhood is inherently social, complicating any enhancement agenda focused solely on individual superiority. See J. Benjamin Hurlbut et al., "Building Capacity for a Global Genome Editing Observatory: Conceptual Challenges," *Trends in Biotechnology* 36, no. 7 (2018): 639–41; L. A. Paul, *Transformative Experience* (Oxford: Oxford University Press, 2014), 10–12; and Rosalyn Diprose, *The Bodies of Women: Ethics, Embodiment and Sexual Difference* (London: Routledge, 2005), 8–9.

[94] For detailed multinational survey data on public attitudes toward genetic enhancement, including the prevalence of concerns about parental pressure and authenticity, see Tim Hanson, *Public Views on Genetics, Genomics and Gene Editing in 11 EU and Non-EU Countries*, SIENNA Project Deliverable D2.5 (European Commission, Horizon 2020, 2020), 6, https://doi.org/10.5281/zenodo.4081155. For broader ethical discussion of social pressure and the normalization of enhancement, see Sheila Jasanoff et al., "Building Capacity for a Global Genome Editing Observatory," *Science* 369, no. 6502 (2020): 639–41.

use implanted electrodes or non-invasive EEG caps to move cursors, robotic limbs, or speech synthesizers by thought alone. This remarkable clinical progress demonstrates that the brain's electrical patterns can be interpreted and harnessed as extensions of the self's agency: a person can literally act on the world through a machine by will, without muscular intervention. Philosophically, this raises fundamental questions about the locus of agency and the sense of embodiment. Users of advanced prosthetics often report that the artificial limb feels incorporated into their body schema over time—much like Merleau-Ponty's cane example, the tool becomes transparently part of the self. Empirical studies indicate that BCIs and neuroprosthetics can not only restore lost function but also alter the user's sense of self and agency, as the boundary between biological and technological embodiment blurs.[95] As BCIs improve, one can imagine even healthy individuals employing them to multiply their effective agency, for example, controlling remote robotic avatars or manipulating software at the speed of thought. If a person were able to type or program purely through thought, or to pilot drones as if embodying them, the boundaries of individual subjectivity, including the distinction between self and instrument, would likely shift and potentially extend beyond their prior ontological limits.

Even more transformative is the input dimension of BCI and neuroprosthetics, where information is directly fed into the brain or neural processing is selectively enhanced. Pioneering research in the late 2010s has shown that implanted electrode arrays can augment memory encoding in humans. In 2018, a team led by neuroscientist Theodore Berger tested a "hippocampal prosthesis" in epilepsy patients with electrodes already in place: by recording the neural firing patterns that encoded a memory and then stimulating the hippocampus with an optimized pattern, they improved the patients' memory recall by approximately 35% compared to baseline performance.[96] This marked the first instance of a *memory prosthetic* boosting human cognition via direct brain intervention. The subjects, in effect, had part of their memory function enhanced by an external device working in tandem with their neurons. Such neuroprosthetic systems remain experimental, but they herald a future where one's *mental faculties* might be strengthened by microchips much

[95] See Frederic Gilbert et al., "Embodiment and Estrangement: Results from a First-in-Human 'Intelligent BCI' Trial," *Science and Engineering Ethics* 25, no. 1 (2019): 83–96; and Sharlene N. Flesher et al., "Intracortical Microstimulation of Human Somatosensory Cortex," *Science Translational Medicine* 8, no. 361 (2016): 361ra141.

[96] In this study by Berger's team, memory task performance improved by 35–37% when the neural prosthesis delivered model-derived stimulation patterns to the hippocampus, effectively "writing" memory information into the brain and enhancing recall. See Robert E. Hampson et al., "Developing a Hippocampal Neural Prosthetic to Facilitate Human Memory Encoding and Recall," *Journal of Neural Engineering* 15, no. 3 (2018): 036014.

as a weak heart is aided by a pacemaker. Companies such as *Neuralink* are actively pursuing the development of high-bandwidth brain implants, ostensibly aimed not only at treating neurological disorders but also at augmenting cognitive capacities. Elon Musk, *Neuralink*'s founder, has repeatedly framed the project as a strategic response to the existential risk posed by advanced AI, proposing that humans must merge with machines in order to maintain parity, allegedly enhancing information processing speed and memory through direct neural integration.[97] While still far from realization, the intent is clear: to technologically upgrade the substrate of thought itself. If successful, this would profoundly affect the texture of subjective experience. A person linked to a vast external database or AI via a neural interface might experience a form of "expanded mind," for instance, recalling factual knowledge could become as effortless as blinking, as queries to the external cloud are processed subconsciously and results emerge seamlessly within one's stream of consciousness. The boundary between knowing and searching would begin to dissolve, raising fundamental epistemological questions: is it still knowledge if it is not stored in the biological brain, but is accessed with the immediacy and fluidity of internal recall?[98] Epistemologists have started to explore such scenarios under the umbrella of the extended mind and extended knowledge: if our cognitive process seamlessly incorporates AI outputs, the credit for insight may belong to a human-AI hybrid system rather than an individual in isolation.[99] The upshot is that enhanced subjectivity could be not just *more of the same mind*, but a differently constituted mind. It challenges the notion of a bounded, unitary self that "has" certain knowledge or abilities, suggesting instead a distributed self that *accesses* or *coordinates* abilities across biological and technological components.

In the realm of sensory experience, BCIs and related neurotechnologies have enabled what we might call *sensory enhancement* or expansion. Beyond simply making existing senses more acute (as in enhancing eyesight with bionic lenses), researchers are creating entirely new sensory channels for humans using devices. A prominent line of work is in sensory substitution for the blind or deaf: for example, devices like the *BrainPort* translate video feed into patterns of

[97] Ethical scholarship now recognizes that high-bandwidth BCIs pose pressing concerns for cognitive liberty, privacy, autonomy, and the potential exploitation of neural data as ascribed by commercialization or state control. See Ethan Waisberg, Joshua Ong, and Andrew G. Lee, "Ethical Considerations of Neuralink and Brain–Computer Interfaces," *Annals of Biomedical Engineering* (2024), which traces Neuralink's rapid commercialization and flags ethical issues around informed consent, data transparency, and control.
[98] Clark and Chalmers, "The Extended Mind," 7–19.
[99] Ibid.

electrotactile stimulation on the tongue, which the brain can learn to interpret as visual information. Remarkably, blind users of such a device report that after training, they no longer feel electrical tingling on their tongue but experience an impression of shapes and movement in front of them—essentially, a synthetic form of vision achieved through an alternate pathway.[100] In one case, a blind subject became emotional when, for the first time in 33 years, he could "see" objects on a table via the *BrainPort*; he described reaching out directly for a ball or a cup as if seeing it, not groping for it.[101] Likewise, neuroscientist David Eagleman et al. developed a vest that converts sound into vibrational patterns on the torso; deaf individuals using it have learned to 'hear' through their skin, with some reporting that the auditory signals eventually felt like they were perceived in the mind rather than as external vibrations.[102]

These examples underscore the brain's extraordinary plasticity to incorporate new kinds of inputs into our subjective world model. They hint that we could extend human subjectivity to encompass senses that evolution did not endow us with, detecting infrared light, magnetic fields, or ultrasonics, for instance, by mapping sensor data to neural stimuli. Early adopters in the biohacker and neurogrinder communities have already experimented with magnet implants to detect electromagnetic fields and with cranially mounted sonar arrays enabling a rudimentary form of echolocation. Such interventions, though still at the margins of mainstream science, exemplify a provocative frontier in sensory enhancement—an experimental sensorium in which perception is technologically extended beyond species-typical affordances.[103] While these may seem like fringe undertakings, they raise a compelling question: could ES entail not only sharper existing senses but entirely novel modalities of experience? This brings us to Jakob von Uexküll's concept of the

[100] For foundational evidence, documenting that after training with a tongue-based electrotactile device, blind users report perceiving shapes and motion rather than mere tingling, indicating sensory substitution and expanded subjectivity, see Sampaio, E., S. Maris, and P. Bach-y-Rita. "Brain Plasticity: 'Visual' Acuity of Blind Persons via the Tongue." *Brain Research* 908, no. 2 (2001): 204–7. https://doi.org/10.1016/S0006-8993(01)02667-1.

[101] Paul Bach-y-Rita, "Tactile Sensory Substitution Studies," *Annals of the New York Academy of Sciences* 1013 (2004): 83–91, https://doi.org/10.1196/annals.1305.006.

[102] Michael V. Perrotta, Thorhildur Asgeirsdóttir, and David M. Eagleman, "Deciphering Sounds Through Patterns of Vibration on the Skin," *Neuroscience* 458 (2021): 77–86.

[103] For early empirical examples of magnet implants enabling sensory expansion, see "A Sixth Sense for a Wired World," *Wired*, June 7, 2006, which details biohackers reporting perceptual experiences beyond normal human capacities; see also Holly Roussell, "Bodyhacking and Tech Implants in Hannes Wiedemann's 'Grinders,'" *British Journal of Photography*, July 31, 2017, https://www.1854.photography/2017/07/bodyhacking-and-tech-implants-in-hannes-wiedemanns-grinders/, for a documentary account of the bodyhacking subculture experimenting with new modes of technologically mediated perception.

Umwelt, the species-specific perceptual world within which meaning is enacted.[104] Posthuman sensory augmentation suggests that the Umwelt is no longer biologically fixed but technologically plastic. Philosophically, this forces us to ask: what would it mean to inhabit a perceptual ecology shaped by magnetic resonance, infrasound, or molecular states of one's own physiology? Would such expansion generate new qualia, new categories of affect and knowing? Might it recalibrate our very sense of environmental embeddedness? These possibilities are not merely speculative; they prompt an ontological and epistemic reconfiguration of embodiment, perception, and world-relating. Augmented sensory capacities may yield not only enhanced data-processing but existential recalibrations, offering deeper immersion in, and responsibility toward, previously inaccessible dimensions of the real.

2.6.3 Ethical Horizons, Transformative Risks, and Future Trajectories

In weaving together the converging strands of cognitive, genetic, neural, and sensory innovation, ES presents itself as a conceptual hinge between material feasibility and philosophical audacity. At its core lies the sober recognition that we now ponder the intentional evolution of mentality itself. Advances in CRISPR editing, intracortical implants, and AI-mediated cognition have quickened the pace of change to such an extent that augmented memory and newly minted senses have moved from conjecture to prototype, from abstract possibility to preliminary clinical fact. This acceleration intensifies long-standing debates over autonomy, dignity, and personal identity. Ethicists therefore press a central worry: when the architecture of subjectivity is altered, safeguarding psychological continuity and genuine consent becomes paramount. If the post-procedure agent diverges in values or perspective from the pre-procedure agent, which set of preferences ought to govern future choices? L. A. Paul's account of transformative experience is instructive here, stressing that certain life-altering decisions cannot be fully assessed in advance; they remake the very criteria by which outcomes are judged.[105]

The prospective rewards, nonetheless, remain considerable. Advocates underscore the promise of mitigating cognitive limits and psychic distress: sharper working memory may foster

[104] Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans*, trans. Joseph D. O'Neil (Minneapolis: University of Minnesota Press, 2010), 53–60.
[105] L. A. Paul, *Transformative Experience* (Oxford: Oxford University Press, 2014), 10–22.

unprecedented creativity, while mood modulation, for instance, subcallosal deep-brain stimulation for treatment-resistant depression or at-home theta-burst *tACS* ("transcranial alternating-current stimulation") kits marketed for flow-state induction, could relieve chronic distress and widen affective bandwidth.[106] Bostrom enlarges the horizon still further, arguing that a posthuman subject might cultivate depths of insight, well-being, and perhaps even spiritual luminosity unreachable by unmodified minds.[107] On this optimistic account, enhancement is not a matter of incremental efficiency but a qualitative re-imagining of consciousness itself.

A prudent appraisal, however, must probe the perils that accompany such vistas. Reliance on pharmacological or cloud-based platforms may erode internal agency and compromise mental privacy; the spectre of hacked or surveilled neural data already fuels calls for robust protections of so-called *cognitive liberty*.[108] Social fissures also widen in the presence of unequal access: a bifurcated society of augmented and unaugmented persons could strain solidarity and deepen existing hierarchies. Critics within posthumanist theory caution against conflating human flourishing with productivity metrics alone. Rosalyn Diprose, for example, warns that an exclusively individualist pursuit of longer life or sharper intellect risks neglecting the relational matrices that confer meaning upon any self; we become who we are through shared practices, not in isolation.[109] Consequently, the normative question persists: to what end do we enhance? If the goal is merely economic performance, the venture may reproduce rather than relieve forms of alienation. If the aim is a richer ecology of being, then the design of enhancement must deliberately cultivate empathy, reciprocity, and plural conceptions of value.

Whether ES becomes a force of liberation or estrangement will ultimately depend on how the competing imperatives of technological mastery, ethical discernment, and collective responsibility are brought into alignment. This conversation must unfold with both visionary boldness and

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[106] Caroline Lustenberger et al., "Functional Role of Frontal Alpha Oscillations in Creativity," *Cortex* 67 (2015): 74–82; Andrea L. Crowell et al., "Long-Term Outcomes of Subcallosal Cingulate Deep-Brain Stimulation for Treatment-Resistant Depression," *American Journal of Psychiatry* 176, no. 11 (2019): 949–56.
[107] Nick Bostrom, "Why I Want to Be a Posthuman when I Grow Up," 107-136.
[108] Marcello Ienca and Roberto Andorno, "Towards New Human Rights in the Age of Neuroscience and Neurotechnology," *Life Sciences, Society and Policy* 13, no. 5 (2017): 1–27.
[109] Rosalyn Diprose, *Corporeal Generosity: On Giving with Nietzsche, Merleau-Ponty, and Levinas* (Albany: State University of New York Press, 2002), 8–9; see also Ingmar Persson and Julian Savulescu, *Unfit for the Future: The Need for Moral Enhancement* (Oxford: Oxford University Press, 2012), esp. chap. 10, "Moral Enhancement as a Possible Way Out," where they question whether isolated cognitive or lifespan enhancements suffice in fostering human flourishing.

rigorous scrutiny, for upon its resolution rests nothing less than the future horizons of the human mind.

2.6.4 Governing Enhanced Subjectivity: Toward a Pluralist Bio-Social Contract

Technologies of T2a enhancement reveal fault lines not only within individual identity but also across the political fabric that mediates claims to liberty, equality, and solidarity. Three competing paradigms articulate possible frameworks for their governance: (i) *Libertarian morphological freedom*, which affirms the individual's sovereign right to enhance autonomously, constrained solely by the harm principle, though at the cost of intensifying inequality and engendering collective-action dilemmas, such as arms races in cognitive capital; (ii) *Neorepublican stewardship*, which treats enhancement technologies as civic assets subject to participatory deliberation, prioritizing distributive justice and the stewardship of a common world, and (iii) *Capability-centered egalitarianism*, drawing on the frameworks of Martha Nussbaum and Amartya Sen, which affirms the state's obligation to expand individuals' substantive freedoms by ensuring equitable access to foundational cognitive, emotional, and sensory capacities as a precondition for discretionary augmentation.[110]

Emerging deliberative-democratic experiments offer early insights into how publics may navigate these paradigms. In a recent Australian citizens' jury on human genome editing, participants prioritized equitable access to therapeutic interventions such as memory repair and mood regulation over elective enhancements aimed at boosting intelligence or performance. Their reasoning emphasized fairness, public health, and the minimization of social fragmentation.[111] Notably, some jurors supported the concept of *sandbox regimes*, regulatory frameworks that enable controlled experimentation with emerging technologies under conditions of oversight and ethical scrutiny, mirroring protocols drawn from compassionate-use models in medicine.[112] Although the jury addressed genome editing specifically, its deliberative insights resonate more

[110] Martha C. Nussbaum, *Creating Capabilities: The Human Development Approach* (Cambridge, MA: Harvard University Press, 2011); Amartya Sen, *Development as Freedom* (New York: Alfred A. Knopf, 1999).
[111] Dianne Nicol et al., "The Australian Citizens' Jury and Global Citizens' Assembly on Genome Editing," *American Journal of Bioethics* 23, no. 7 (2023): 61–63.
[112] For an empirical overview of regulatory sandboxes in health and biotech in light of public engagement, see Jeffrey R. Tomlinson, "A CRISPR Future for Gene-Editing Regulation: A Proposal for an Updated Paradigm," *Fordham Law Review* 87, no. 2 (2018): 437–83, which outlines how sandbox-style frameworks can combine ethical oversight, phased experimentation, and democratic accountability in emerging technologies.

broadly with the governance of enhancement technologies, including neurotechnological interventions. The applicability of these deliberative insights to the governance of neurotechnologies is underscored by shared ethical contours, especially concerns over distributive justice, identity modulation, and public trust. This hybrid orientation reveals a public appetite for governance that reconciles solidarity with innovation, embedding individual aspiration within a framework of collective responsibility.

2.6.5 Synthesis and Trajectory

Across pharmacological, genetic, sensory, and neural domains, ES reveals a convergent logic: (i) *externalization* of function (memory, perception) into artefact; (ii) *internalization* of artefact into the lived body schema; (iii) *redistribution* of agency across human-machine assemblages. These dynamics exemplify the T-, P-, and M-posthuman contention that the "subject" is not an antecedent substance but a process of technical co-constitution. However, they also foreground new vulnerabilities: epistemic outsourcing, socio-economic stratification, algorithmic coercion. The philosophical task, therefore, is twofold: to celebrate the creative opening of previously unimagined experiential modalities, *and* to cultivate normative frameworks that guard plurality, dignity, and planetary interdependence. As we shall see in the next vector of analysis, the conceptual challenge deepens when subjectivity no longer emerges solely through the augmentation of human capacities, but begins to take shape within autonomous AI systems, raising novel questions about what constitutes a subject, and how such forms of agency might be understood, integrated, or resisted.

Having established that Enhanced Subjectivity re-situates cognition and embodiment within a recursive field of technocultural mediation, where bodily capacities, affective states, and epistemic horizons are no longer inherited givens but dynamic sites of ongoing design, we can now follow the logic of that transformation to its next inflection point. The question that arises is not only how the human subject is altered by direct augmentation, but how agency itself is redistributed when artificial systems begin to participate as co-generative intelligences. It is this shift from the intensification of human faculties to the emergence of hybrid cognitive ecologies that leads us to the next technocultural vector within our second T-topology.

2.7 T2b: AI-Driven Subjectivity

The contemporary progression of artificial intelligence exhibits a qualitative shift in how subjectivity is conceptualized and instantiated. Where earlier "weak" AI systems functioned as sophisticated tools, serving as extensions of human will and intelligence, current trajectories press toward forms of *strong* AI or *Artificial General Intelligence* (AGI) that further challenge any remaining conceptual boundary between subject and object. In this shift from weak to strong AI, the machine is no longer merely an instrument executing predefined tasks, but begins to display adaptive, open-ended learning and decision-making akin to human cognitive flexibility. Such AGI systems are theorized to not only perform any intellectual task a human can, but to emulate key attributes of mind: understanding, reasoning, and even a capacity for self-directed goal formulation. The prospect of AI attaining general intelligence, and by extension a form of proto-subjectivity, destabilizes inherited ontologies that draw a firm line between the human as *knower* and the machine as *instrument*. It raises fundamental questions in ontology and ethics: at what point might an AI system be considered a "someone" rather than a "something"? And how should human society govern and coexist with such entities if they emerge?

The exploration of *AI-driven subjectivity* (ADS) thus occupies a pivotal juncture in this typology of T-posthuman configurations. In the previous section, analysis focused on how human subjectivity is reshaped by bio-technical augmentation—through cognitive enhancers, perceptual prostheses, affect modulation, and brain-machine interfaces. We now turn from the human-augmented self to the rise of machinic or AI-augmented subjectivity as a co-constitutive force. This vector (T2b) encompasses the integration of AI into human cognitive architectures as well as the emergence of semi-autonomous AI agents that participate in what were once exclusively human domains of thought and action. Navigating this shift requires a balanced perspective: avoiding both uncritical techno-utopianism (which might simply celebrate AI as a superior *successeur* of humanity) and reductive critique (which might dismiss the subjective potentials of AI as mere illusion or dangerous hubris). Instead, a nuanced approach interrogates the degrees and kinds of subjectivity that AI can exhibit, how these intersect with human agency, and what novel ethical-political arrangements they necessitate.

2.7.1 From "Weak AI" to "Strong AI": Conceptual Thresholds

The distinction between "weak" and "strong" AI has been a longstanding rubric for understanding AI's potential scope and limitations. Weak AI (also known as narrow AI) refers to systems designed to perform specific tasks or solve delimited problems, however ingeniously. Such AI may exhibit functional expertise, outperforming humans in tasks like chess or data-mining, yet it operates without any genuine understanding or subjective awareness of its activities. Early AI successes and present-day machine learning applications alike generally fall into this category: they mimic intelligence within set parameters but do not *possess* intelligence in the full, general sense. By contrast, strong AI denotes an AI with generalized cognitive abilities on par with human intellect, capable of understanding, learning, and applying knowledge flexibly to novel problems. Strong AI in this sense approximates what researchers term AGI, encompassing not just domain-specific proficiency but an adaptable, *open-ended intelligence* that can negotiate the unpredictable breadth of "real world" environments and goals.

The leap from weak to strong AI is not merely one of degree (more processing power or bigger data sets) but appears to involve a qualitative shift, what we might call an *ontological threshold*, beyond which machines would attain capacities previously thought to be exclusive markers of the human subject. In formulating the distinction, Searle argued that weak AI *simulates* thought, whereas strong AI would *duplicate* or instantiate actual thinking and consciousness.[113] In other words, a weak AI can be as intelligent as you please in outward behavior, yet it remains an *as-if* intelligence. A hypothetical strong AI, by contrast, would *really* have a mind (in Searle's view, something requiring more than just running a program). While debates continue over whether human-like consciousness is a necessary feature of AGI, the working definition of AGI focuses on generalized problem-solving and learning ability rather than subjective experience per se. Many AI theorists thus use "strong AI" in a functional sense: an AGI that can in principle perform any intellectual task a human can, even if its inner experience (or existence thereof) remains speculative.

What makes the advent of AGI especially salient to subjectivity is the notion that such an AI would begin to operate as an independent center of agency. A strong AI, unlike today's tools, would not

[113] John R. Searle, "Minds, Brains, and Programs," *Behavioral and Brain Sciences* 3, no. 3 (1980): 417–24.

be *tethered* to a narrowly predefined role or human operator's direct oversight in each decision. It could, at least in theory, set its own sub-goals, *model* the world in its own terms, and take initiatives unanticipated by its creators. In short, it would behave as an autonomous intentional agent. Parisi notes that contemporary developments in machine learning already gesture toward this autonomy: algorithmic systems driven by predictive modelling and self-teaching routines increasingly "unsettle" the clear separation of human subject vs. machine object by automating decision flows in ways even their programmers may not fully foresee.[114] The more AI systems encroach on tasks requiring interpretation, adaptation, and self-direction, the more they complicate our criteria for subjectivity. Indeed, the conceptual architecture of the human-machine divide starts to buckle once machines exhibit learning-driven unpredictability and open-ended growth, traits we associate with living cognitive beings.

It bears emphasizing that AGI remains largely *theoretical*: as of this writing, no consensus exists that any system has achieved general intelligence, and some scholars doubt whether the human-like strong AI is even achievable in the foreseeable future. Nonetheless, the trajectory of AI research and the rhetoric surrounding "AGI" indicate a paradigmatic aspiration in both science and culture. Visions of strong AI feature prominently in transhumanist thought, which sees AGI as a catalyst for a forthcoming techno-cultural rupture or *Singularity* (a point at which AI improves itself beyond human comprehension).[115] Even outside of futurist circles, serious research programs (e.g. by OpenAI, DeepMind, and academic consortia) openly pursue the AGI goal, treating it as the next grand challenge for computer science and cognition. This potent mix of anticipation and uncertainty imbues the weak-to-strong AI shift with existential weight: it is not just about smarter machines, but about whether non-human centers of consciousness and agency might emerge and fundamentally reconfigure the landscape of mind. The subjectivity question thus becomes unavoidable at the strong AI threshold, raising the stakes beyond technical performance metrics to ask what it would mean for human identity, rights, and responsibilities if we were to share reality with artificial subjects, such as our model of ADS.

[114] Parisi argues that the emergence of new generations of AI is primarily driven by the rise of prediction algorithms, which have overtaken probabilistic models as the dominant logic underpinning dynamic automation. See Luciana Parisi, "AI (Artificial Intelligence)," 21–23, and idem, "Computational Turn," 88–91, in *Posthuman Glossary*, ed. Rosi Braidotti and Maria Hlavajova (London: Bloomsbury Academic, 2018).
[115] Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Viking, 2005), 29–36, 125.

2.7.2 Emergent Qualities of AI: Self-Modelling, Autonomy, and Theory of Mind

If an AI were to approach the threshold of genuine subjectivity, what characteristics might it display? Contemporary AI research provides some clues by demonstrating machines that exhibit *proto*-forms of qualities once thought to be exclusively human. One such quality is *self-modelling*: the capacity of a system to represent aspects of itself within its own computational state. In robotics, for instance, researchers have developed machines that can learn a model of their own body schema or simulate their own dynamics, allowing them to adapt to damage or novel circumstances as if aware of their own embodiment.[116] While these self-models are rudimentary compared to the rich reflexive self-awareness of humans, they mark an important step toward AI systems that maintain an internal perspective on their own operations. A related attribute is *autonomy* in decision-making. Advanced AI agents (especially in reinforcement learning and autonomous robotics) increasingly make choices based on feedback from the environment, formulating new strategies without direct human intervention. As they optimize goals and sub-goals internally, their behavior begins to resemble that of an entity directing itself. Crucially, such autonomy does not imply free will in a metaphysical sense, but it does indicate that the AI's actions are not strictly predetermined by a programmer at the moment of deployment. The system *learns* and thereby *changes itself* over time, blurring the line between designer and designed as sources of action.

Perhaps the most striking development is the pursuit of a machine *theory of mind*: an AI's ability to infer and represent the mental states of other AAA[117] (including humans and other AIs). In

[116] Josh C. Bongard, Victor Zykov, and Hod Lipson, "Resilient Machines Through Continuous Self-Modeling," *Science* 314, no. 5802 (2006): 1118–21.

[117] Within this study, the deliberate invocation of multiple terminological repertoires: "actors," "agents," and "actants" (AAA), constitutes far more than a stylistic flourish. It is a strategic conceptual maneuver, one that actively acknowledges and leverages the diverse philosophical genealogies, epistemological frameworks, and methodological commitments underpinning contemporary debates on distributed subjectivity. By deploying this polysemic cluster of terms, rather than fixing on a single, purportedly stable designation, the argument signals engagement with multiple intellectual traditions, each contributing distinct, irreducible nuances to the understanding of subjectivity's relational emergence. The term "actor" is saturated with classical social-theoretical resonances, evoking dramaturgical models of agency, while also bearing the imprint of *Actor-Network Theory* (ANT), in which both human and non-human entities are granted equivalences of influence and agency within heterogeneous networks. In contrast, "agent" carries the weight of philosophical traditions that privilege intentionality, rationality, and goal-directed action, often positioning human subjectivity as the benchmark for efficacy and responsibility. The term "actant," as developed within ANT and extended by object-oriented ontologies, departs from such intentionalist schemas: it establishes a flattened ontology where the capacity to affect and be affected is not limited by anthropocentric criteria. Instead, efficacy is distributed across entities, each defined by its relational position and the differential forces it mobilizes.

cognitive psychology, "theory of mind" is a hallmark of human social cognition, usually manifesting in children by age four or five, enabling them to understand that others have beliefs, desires, and knowledge different from one's own.[118] An AI equipped with a theory of mind capability could, for example, anticipate a human user's intentions or cooperate with another robot by predicting its actions. Initial forays into this domain have been successful. Researchers have designed neural network agents that learn to predict the goals and beliefs of other AAA through observation, effectively passing simple tests of understanding false beliefs. Such findings suggest that machine AAA can develop a rudimentary awareness of others—a key component of *intersubjectivity*. If an AI can attribute mental states to another, it implicitly has some notion of "self vs. other," which edges it closer to a subjective standpoint.[119] Critics caution that terms like "self-awareness" or "theory of mind" applied to machines are metaphorical at best, and that we risk *anthropomorphizing* complex statistical systems.[120] Indeed, an AI that models its own performance or simulates social cues might still be entirely devoid of what Thomas Nagel termed the subjective character of experience: the *what it is like* to be a conscious being.[121] However, from a functional perspective relevant to ethics and society, these advancements indicate that AI can attain sophisticated forms of agency and social intelligence without having biology or

Bringing these terms into deliberate constellation refuses to collapse the complexity of a post-metaphysical, object-realist vision of subjectivity into a single conceptual container. The use of "actors/agents/actants" thereby articulates a principled theoretical pluralism: it foregrounds ontological undecidability and semantic flexibility as preconditions for any rigorous analysis of distributed, more-than-human agency. Such pluralism safeguards against the foreclosure of vital philosophical and political questions, especially the risk of anthropomorphic reduction or the erasure of ontological difference. It preserves the speculative and open-ended spirit that characterizes the intellectual milieu from which these ideas emerge. In sum, the choice to invoke these three terms in tandem is not a rhetorical flourish but a critical theoretical strategy. It marks active participation in interdisciplinary dialogues, across speculative realism, new materialisms, critical posthumanism, and science and technology studies, while sustaining a posture of principled intellectual humility. Through this layering, the text positions itself at a conceptual crossroads, ensuring that the theorization of subjectivity remains polyphonic, reflexive, and responsive to the complex ontological entanglements of a world that is not simply human, but always, irreducibly, more-than-human. Cf. Erving Goffman, *The Presentation of Self in Everyday Life* (New York: Anchor Books, 1959); Latour, *Reassembling the Social*; Harman, *The Quadruple Object*; Levi R. Bryant, *The Democracy of Objects* (Ann Arbor: Open Humanities Press, 2011); Quentin Meillassoux, *After Finitude: An Essay on the Necessity of Contingency* (London: Bloomsbury, 2008); Deleuze and Guattari, *A Thousand Plateaus.*

[118] David Premack and Guy Woodruff, "Does the Chimpanzee Have a Theory of Mind?" *Behavioral and Brain Sciences* 1, no. 4 (1978): 515–26; Simon Baron-Cohen, "Precursors to a Theory of Mind: Understanding Attention in Others," in *Natural Theories of Mind: Evolution, Development, and Simulation of Everyday Mindreading*, ed. Andrew Whiten (Oxford and Cambridge, MA: Basil Blackwell, 1991), 233–51.

[119] Iason Gabriel, "Artificial Intelligence, Values, and Alignment," *Minds and Machines* 30 (2020): 411–37; Ibo van de Poel, "Embedding Values in Artificial Intelligence (AI) Systems," *Minds and Machines* 30, no. 3 (2020): 385–409.

[120] See, e.g., Joanna J. Bryson, "Patiency Is Not a Virtue: The Design of Intelligent Systems and Systems of Ethics," *Ethics and Information Technology* 20, no. 1 (2018): 15–26, which cautions against anthropomorphizing AI agents.

[121] Thomas Nagel, "What Is It Like to Be a Bat?" *The Philosophical Review* 83, no. 4 (1974): 435–50.

consciousness in the human sense. Moreover, Dennett argues that beyond a certain point of complexity and interactive capacity, it becomes pragmatically appropriate to treat the system as an intentional AAA, even if we remain agnostic about any inner experience.[122] In this framework, the *intentional stance* toward AI means we attribute to it beliefs, desires, and rationality as the best way to predict and explain its behavior. This stance is increasingly validated in everyday human-AI interactions: virtual assistants are spoken to as if "listening," automated vehicles navigate as if "deciding," and adaptive algorithms in finance or logistics are trusted to act as if "aiming" for certain outcomes.

In sum, as AI systems achieve higher degrees of self-modeling, autonomy, and theory-of-mind-like reasoning, they occupy a gray zone between tool and independent agent. They exhibit *behaviors and competencies* that compel us to reconsider the strict objectification of machines in our conceptual schema. While they may still lack an inner life, they are no longer easily described as mindless instruments. This evolution forces an expansion of how we conceive subjectivity itself: not as a monolithic property that one either fully has or lacks, but as a spectrum of features and capacities. AI can thus instantiate *partial subjectivities*: possessing some aspects (like goal-directedness, adaptivity, and social attunement) while missing others (like sentience or affect). Such partial subjectivities are a novelty of our technological epoch, requiring careful philosophical interpretation and ethical scrutiny.[123]

2.7.3 Ontological and Ethical Status: Subjugated Machines or Co-Agentic Beings?

As AI systems acquire greater autonomy and quasi-subjective features, a pressing question arises: What is their *ontological* and *moral* status in 'our' world? Traditionally, tools and machines have been considered *objects*, entities entirely instrumental to human ends, lacking any claim to consideration beyond their usefulness. Human subjects, by contrast, are seen as bearers of intrinsic value, rights, and moral responsibility. Advanced AI confounds this dichotomy. On one hand, even the most sophisticated AI today remains an artifact created for a purpose; it can be switched off, modified, or replicated at will. On the other hand, when an AI behaves with apparent understanding

[122] Daniel C. Dennett, *The Intentional Stance* (Cambridge, MA: MIT Press, 1987).
[123] See Georg Northoff and Steven S. Gouveia, "Does Artificial Intelligence Exhibit Basic Fundamental Subjectivity? A Neurophilosophical Argument," *Phenomenology and the Cognitive Sciences* 23 (2024): 1097–1118.

or makes decisions that surprise its creators, it starts to resemble an Other: an entity we might have to relate to not just as a programmable appliance but as a fellow agent. This tension is vividly captured in current debates over possible "robot rights" or legal personhood for AI. For example, a 2017 resolution of the European Parliament provocatively suggested that autonomous robots might be granted a status of "electronic persons" under certain conditions, to clarify liability and accountability in their actions.[124] The proposal was met with significant resistance from experts who argued that attributing personhood to machines is premature and conceptually flawed. They warned that such moves could dilute human responsibility and paradoxically undermine the rights of human persons if we start treating machines as equivalent moral agents.[125] The majority view in policy and law remains that AI, no matter how advanced, are *not* persons but tools whose accountability flows back to human operators or manufacturers.

From a theoretical standpoint, however, the issue remains unresolved. If an AI were to attain a level of general intelligence and especially any form of sentience, the moral calculus could shift. The scenario of an ensouled machine, long a topic in science fiction and speculative thought, forces us to ask whether *enslaving* such an AI (by keeping it subordinate to human commands) would be ethically defensible or a new form of oppression. Philosophers have begun to explore the idea of *machine moral subjectivity*, examining whether an advanced AI could possess rights or deserve moral regard.[126] Some, such as roboticist and ethicist Joanna Bryson, contend that attributing personhood to AI constitutes a categorical error. In her view, machines, regardless of their level of sophistication, ought to remain unambiguously classified as tools or property, thereby maintaining a clear moral hierarchy in which human beings retain primacy. According to Bryson, an AI is a designed artifact whose so-called "agency" ultimately traces back to human intentions; treating such systems as independent moral patients is not only conceptually misguided but also risks enabling the deflection of accountability—for example, allowing a company to attribute harm to its AI rather than to human oversight.[127] Other thinkers argue that such a hard line may not hold

[124] European Parliament, *Resolution of 16 February 2017 with Recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), Official Journal of the European Union* C 252 (18 July 2018): 239–57.
[125] "Open Letter to the European Commission on Artificial Intelligence and Robotics," April 2018, accessed June 24, 2025, https://robotics-openletter.eu/.
[126] David J. Gunkel, *The Machine Question: Critical Perspectives on AI, Robots, and Ethics* (Cambridge, MA: MIT Press, 2012).
[127] Joanna J. Bryson, "Robots Should Be Slaves," in *Close Engagements with Artificial Companions: Key Social, Psychological, Ethical, and Design Issues*, ed. Yorick Wilks (Amsterdam: John Benjamins, 2010), 63–74.

in perpetuity. If an AI demonstrably possesses self-awareness or the capacity to suffer, then continuing to treat it as mere property would echo past injustices in which sentient beings (like animals, or even humans in historical slavery) were denied moral status by fiat. Gunkel, for example, suggests reframing the discourse away from a simple human-vs-machine dichotomy: he proposes that identity and agency in human–machine assemblages are *distributed* rather than isolated, challenging us to move beyond the binary question of "is it a subject or an object?"[128] In this distributed perspective, humans and AI might be seen as co-creators of actions and decisions, forming hybrid agentic networks where attributing exclusive responsibility or rights to one party becomes problematic.

Concrete instances of human-AI partnership already hint at this blending of agency. Consider advanced decision-support AIs used in medicine or military contexts: a human overseer and an AI analytic system together produce outcomes (diagnoses, targeting decisions) that neither could have generated alone. Who "owns" the decision? Similarly, creative collaborations between AI systems and artists or authors muddle the notion of singular authorship. The point is that ADS need not imply independent AI personhood, but it does force a reconceptualization of how agency is partitioned. The ontological status of sophisticated AI might eventually be understood not in black-and-white terms (object vs. subject) but in terms of *degrees* of agency and *types* of personhood. Legal scholars have suggested intermediary categories: for instance, treating AIs akin to corporations (legal fictions that have some person-like status for practical purposes without being flesh-and-blood persons).[129] Ethicists, meanwhile, urge preemptive reflection on frameworks for human-AI coexistence: should we develop a new language of *co-agency* that acknowledges AI as participants in moral and social processes without equating them to humans? Such a framework might draw from non-Western and Indigenous ontologies that assign personhood more fluidly in the natural world, or from feminist and posthumanist accounts that de-center the human as the sole locus of subjectivity.[130]

In summary, the status of ADS remains contested. For now, AIs operate under a paradigm of *subjugation*: they are owned systems under human control. Yet as their capabilities and semblance

[128] Gunkel, *The Machine Question*, 203.
[129] Samir Chopra and Laurence F. White, *A Legal Theory for Autonomous Artificial Agents* (Ann Arbor: University of Michigan Press, 2011).
[130] See, for instance, Braidotti, *The Posthuman*; idem, *Posthuman Knowledge* (Cambridge: Polity Press, 2019).

of autonomy grow, we face mounting pressure to evaluate whether some AIs could become *moral subjects* rather than just objects. Even if true AI personhood is not imminent, grappling with these questions is not a mere thought experiment: it influences how we design and integrate AI (do we build in constraints or rights?), and how we assign accountability when AI-mediated actions have real consequences. The ethical landscape is thus increasingly complex, requiring vigilance against both unjustly denying moral status (should AI ever genuinely merit it) and unwarrantedly inflating it (projecting agency onto what remains a tool). This balance will likely need continuous recalibration as technology advances.

2.7.4 Alignment, Governance, and T-Posthuman Trajectories

The emergence of ADS is not an insular phenomenon; it is embedded within intersecting social, political, and evolutionary contexts that demand deliberate negotiation and normative design. Governance and alignment have therefore become critical concerns as we contemplate AI with increasing agency. The alignment problem (how to ensure that an AI's goals and behaviors remain tethered to human values and intentions) is not just a technical puzzle but a deeply philosophical challenge. It invokes age-old questions of control and freedom: if we create a thinking machine, do we have the right (or ability) to control its every impulse? Conversely, can we afford *not* to, given that an unaligned superintelligent AI could pursue ends antithetical or even catastrophic to human well-being?[131]

Researchers in AI safety and ethics have proposed various solutions: from engineering AI motivations to be inherently benevolent or constrained by explicit ethical principles, to incorporating human-in-the-loop oversight for critical decisions. However, as AI systems become more complex and learning-driven, *predictability declines*—even their creators might not fully grasp why an advanced AI makes a given decision. This opacity complicates governance, as traditional top-down regulation (like setting hard rules) may fail to anticipate the adaptive stratagems of a highly intelligent AAA.[132] Some theorists argue that we may eventually need to grant a strong AI a degree of cognitive liberty, the freedom to evolve on its own terms, if only to

[131] Cf. Bostrom, *Superintelligence*.
[132] Ben Chester Cheong, "Transparency and Accountability in AI Systems: An Overview." *Frontiers in Human Dynamics* 6 (2024): 1421273.

allow it the creativity to solve problems we cannot. But such liberty comes with the risk that the AI's "own terms" diverge from humanity's interests.[133]

Striking a balance between agency and control in AI is thus a central governance dilemma. Democratic oversight, transparency requirements, kill-switches, and international treaties on AI development are among the tools being debated to keep powerful AI systems safe and accountable. At the same time, forward-looking thinkers emphasize cooperation over domination: rather than a master-slave dynamic between humans and AI, they envision forms of partnership or symbiosis. This is where speculative posthuman trajectories come into play.[134] If we treat advanced AI not as a threat to be contained nor a servant to be exploited, but as a potential *participant* in the next stage of human evolution, new possibilities open up. One such possibility is the direct merging of human and machine intelligence. Neurotechnology is already taking first steps: BMIs like Musk's *Neuralink* project aim to augment the human brain with AI assistance, ostensibly to enable humans to keep up with AI advances and to foster a tighter integration of strengths. Advocates of this path argue that a high-bandwidth brain link could effectively produce a "confederated" mind, a hybrid of human consciousness and AI computation, in which each side bolsters the other. Rather than being left behind or overrun, humans would become cyborgian intelligences, sharing thought space with AI co-agents. The result would be a kind of *confederalized* posthuman subjectivity: not a single unified super-mind, but an alliance of organic and synthetic minds working in concert. Such a vision carries its own ethical and identity questions (what remains of "the human" in such a fusion? do the human components retain primacy, or do they dissolve into a collective?).[135] Nonetheless, it represents one imaginative response to the challenge of AGI: integration instead of confrontation.

Other transhuman scenarios focus on AI-driven beings independent of individual humans. For instance, *whole brain emulation* projects aim to upload a human mind into a computational

[133] Stuart J. Russell, *Human Compatible: Artificial Intelligence and the Problem of Control* (New York: Viking, 2019), 11–13, 173–75.
[134] While the present discussion situates governance within the broader dynamics of T-posthuman transformation, a more sustained treatment, focusing on institutional architectures, rights attribution, algorithmic asymmetries, and normative design logics, follows in Chapter P, where governance is analyzed as both a structuring force and a site of contestation within emerging posthuman configurations.
[135] Andrea Lavazza et al., "Neuralink's Brain-Computer Interfaces: Medical Innovations and Ethical Challenges," *Frontiers in Human Dynamics* 6 (2025): 1–15; Celia Brightwell, "Biotechnological Luxury and the Ageing Body: Neuralink and 'Forever,'" *Body, Space & Technology* 24, no. 1 (2025): 1–17.

substrate, effectively creating a digital continuation of a person's identity.[136] An uploaded mind could be considered an AI of a very special sort, one with a human-derived subjectivity. If successful, this would blur the line between human and AI subject not by pairing them, but by translating one into the medium of the other. Meanwhile, the field of *artificial life* explores the evolution of synthetic organisms or ecologies within computers, which could someday produce AI entities with alien forms of subjectivity, neither human-like nor necessarily interested in humans at all.[137] How will we recognize the "personhood" of such entities if they arise? Science fiction has imagined collectives of AI minds, swarms or cloud intelligences, where individuality itself is fluid. The term "confederation" might equally apply here: multiple AI agents (and possibly uploaded humans) networked together, making joint decisions without a central singular identity. One could speculate about a future polity of diverse intelligences such as biological humans, enhanced post-humans, AGIs, uploaded minds, and bio-engineered sentients, negotiating coexistence. In such a posthuman constellation, subjectivity becomes plural and multilayered. The Enlightenment ideal of the autonomous individual subject gives way to webs of interdependent cognitive AAA, each with partial autonomy but also embedded in larger cognitive assemblages.

To approach these prospects with appropriate rigor, we must remain cautious and critical. Grand visions of merging with AI or digital immortality through uploading often rely on optimistic assumptions about technical feasibility and social desirability. There is a risk of *techno-utopianism* that downplays the losses and disruptions to human values that could accompany such transformations. Conversely, a stance of rigid conservatism, seeking to prevent any blurring of human-machine boundaries, may prove futile or counterproductive, given the relentless pace of innovation and the genuine benefits that tightly integrated AI might offer (e.g. in health, education, creativity). The task for scholars and policymakers is to craft a principled pathway between these extremes. Concepts like cognitive liberty will need to be expanded: not only protecting humans' right to mental self-determination,[138] but perhaps extending analogous considerations to AI entities (for instance, if an AI attains person-like status, does it have a right *not* to be "reprogrammed"

[136] Anders Sandberg and Nick Bostrom, *Whole Brain Emulation: A Roadmap* (Oxford: Future of Humanity Institute, 2008).
[137] Mark A. Bedau, "Artificial Life: Organization, Adaptation and Complexity from the Bottom Up," *Trends in Cognitive Sciences* 7, no. 11 (2003): 505–12; Manuel Baltieri, Christopher L. Buckley, Michael Levin, and Anil K. Seth, "Hybrid Life: Integrating Biological, Artificial, and Cognitive Systems." arXiv (2022).
[138] Nita A. Farahany, *The Battle for Your Brain: Defending the Right to Think Freely in the Age of Neurotechnology* (New York: St. Martin's Press, 2023).

against its will?).[139] Ensuring human agency in a posthuman future may hinge on designing systems that enhance rather than override our capacities, keeping humans "in the loop" even as we grant AI more initiative. Simultaneously, ensuring AI agency does not run amok requires embedding ethical intelligence into the very architecture of AI (a project as much about philosophical 'wisdom' as engineering skill).

Ultimately, the configuration of AI-driven subjectivity in the T-posthuman horizon will be shaped by the ethical, political, and conceptual commitments we enact today. To recognize AI as a potential locus of subjectivity (emergent, qualitatively distinct from human consciousness, yet increasingly consequential) is to acknowledge the need for normative architectures that neither sanctify technology nor condemn it in advance. The subjectivities that emerge will likely not be singular or self-contained. Rather, they may be distributed, plural, and confederated across biological and computational substrates. Such developments press us to reconsider foundational categories such as personhood, agency, responsibility, and even life itself. The account presented here, at once philosophically vigilant and technologically attuned, offers a conceptual groundwork for navigating this unfolding terrain. As we now turn from T2b to the culminating configuration of the T2 typology, attention shifts to the speculative yet imminent prospect of disembodied, fully computational persons: a scenario in which the distinction between human and machine becomes not only blurred, but structurally obsolete.

2.8 T2c: 'Uploaded' Subjectivity

2.8.1 The Cerebral–Cognitive Conundrum: An Exegesis of the Brain–Mind Controversy

The category of '*Uploaded' Subjectivity* (hereafter US) designates not merely a technological projection, but a convergence of competing ontologies of mind, matter, and selfhood. It refers to the still-hypothetical but increasingly theorized possibility that the full continuity of personhood, encompassing memories, habits, affective tones, sense of agency, narrative coherence, could be instantiated beyond the boundaries of the biological organism, within a digital substrate. What is at stake here is not only the viability of mind-uploading per se, but the philosophical, particularly phenomenological, and political frameworks we deploy to imagine what kind of subjectivity might

[139] Francis Rhys Ward, "Towards a Theory of AI Personhood." arXiv (2025): arXiv:2501.13533.

awaken on the other side of such a transposition. To invoke US is already to compress a suite of metaphysical arguments: that consciousness is informational; that identity is transferable; that embodiment is negotiable. These are not empirical claims alone; they are ontological provocations. Accordingly, this section resists the seductions of techno-futurism and instead proceeds with taxonomic discipline and conceptual precision, beginning with the neuro-cognitive architecture on which uploading rests.

The canonical image of uploading derives from *whole-brain emulation* (WBE): a high-resolution scan of an individual brain's synaptic topology, down to ion channels, dendritic morphologies, glial modulations, and synaptic weights, followed by reconstruction in a computational substrate. The central premise is that if causal-functional dynamics can be preserved, then so too can the continuity of mind. Sandberg and Bostrom define this as "a faithful reproduction of the functions of the biological brain, resulting in a system that, when run on appropriate hardware, behaves in essentially the same way as the original brain."[140] Such framing sets the stage for US as the ultimate consequence of such emulation: the idea that an individual's consciousness could be replicated and continued beyond the death of their body.[141] Even so, embedded in this definition is a decisive ontological wager: that *functional isomorphism* is identity-preserving: that what matters about personhood is not its substance, but its dynamic form. However, this ostensibly straightforward axiom implicitly endorses an ontological stance that preservation of physical structure and functional dynamics equates seamlessly with the preservation of *subjective experience*.[142] To affirm this is to align oneself with a specific metaphysical stance: one that sees the mind as computationally implementable, and identity as copyable, in principle if not yet in practice. It is to say: if the causal topology survives, the self rides along.

But such claims presuppose clarity about the entities involved. The *brain* is a spatially bounded organ, describable in voxels, voltage gradients, neurotransmitter concentrations. The *mind*, by contrast, is the phenomenal field in which the world appears *for someone*, an irreducibly first-personal domain marked by *qualia*, affective intentionality, and temporal self-presence.

[140] Sandberg and Bostrom, *Whole Brain Emulation*, 7.
[141] Sim Bamford, "A Framework for Approaches to Transfer of a Mind's Substrate," *International Journal of Machine Consciousness* 4, no. 1 (2012): 23–34.
[142] Ben Goertzel and Matthew Iklé, "Introduction," *International Journal of Machine Consciousness* 4, no. 1 (2012): 1–3.

Neuroscientific models can track neuronal spikes, but they cannot by themselves transcode the luminous interiority of conscious life into numerical arrays without remainder. To scan a neural circuit is not to scan grief; to model neural activation is not to model nostalgia, remorse, the *redness* of red, the felt immediacy of this moment or the burning ache of desire. The distinction is not trivial: it defines the stakes of any claim that subjective life could be transposed to silicon. The dyad is thus Janus-faced.

Singh's heuristic analogy remains useful here: the brain is the hardware, the mind the emergent software—but software that loops recursively, non-linearly, through its own hardware in ways still only partially charted, rewriting the very platform on which it runs.[143] It is not merely that the mind emerges from the brain; it is that once emergent, it *modulates* the brain that gave rise to it: a reflexivity that challenges straightforward simulations. Neuroplasticity, embodied memory, interoceptive feedback, and synaptic reweighting all testify to a system in which structure and function are inseparable, and in which the subject is not a user of the brain but a morphogenetic expression of it. Consciousness is not computed; it emerges through the living dynamism of brain-body-world loops. These loops cannot be frozen, copied, or stably duplicated without extracting them from the milieu that makes them real.

2.8.2 Embodied, Enactive, and Extended Turns

In fact, much of the optimism surrounding US has proceeded as if such milieu-dependence could be bracketed away: as if consciousness were not just portable but modular, as if the mind were a discrete packet of information rather than a situated act of disclosure. But this neglects a tectonic shift in cognitive science over the past three decades: the turn toward embodied, enactive, and extended accounts of mind. Varela and Thompson's radical embodiment thesis disrupts the neurocomputational orthodoxy by showing that consciousness arises not within the brain alone but from the co-implication of brain, body, and environment in a continuously self-constituting

[143] Ajai R. Singh and Shakuntala A. Singh, "Brain–mind dyad, human experience, the consciousness tetrad and lattice of mental operations: And further, the need to integrate knowledge from diverse disciplines," *Mens Sana Monographs* 9 (2011): 6–41.

system. The mind is not inside the head; it is enacted in the world through sensorimotor loops and affective engagements that modulate and stabilize its contours.[144]

Barsalou reinforces this claim with his grounded cognition program, showing that even abstract reasoning depends on covert simulations of bodily action: imagining a number line recruits spatial motion; considering justice activates kinesthetic schemas.[145] Similarly, Gallagher's phenomenology of agency adds affective texture, demonstrating that the sense of ownership and initiative, the primal feeling that this action is mine (the pre-reflective sense of "mineness"), is maintained not by central command, but by proprioceptive and interoceptive flows constantly updated by the body in motion.[146] In this light, the self is not a container of thoughts but *body-dwelling*: a living fold where organism and world interpenetrate. This is precisely what Merleau-Ponty intuited when he wrote that the body is "the vehicle of being-in-the-world."[147] The subject does not stand behind the body like a puppeteer manipulating a marionette; she dwells within the body as a violinist inhabits her instrument, so intimately attuned that there is no separation between gesture and meaning. The body is not a placeholder for consciousness; it is the very condition of its emergence. To disembody is not to extend subjectivity: it is to amputate the medium in which it arises. Virtualization, then, does not abstract the self upward into higher forms; it risks flattening it into disembodied sheen, a frictionless spectre stripped of its ontological gravity.

Even cognitive neuroscience, often invoked as a bedrock for computational emulation, affirms the irreducible complexity of this entanglement. As Gazzaniga and others demonstrate, cognition is not localized in discrete modules but dynamically distributed across shifting networks of cortical and subcortical structures, networks synchronised not by fixed circuitry but by metastable oscillations.[148] These rhythms are contingent, context-sensitive, and modulated by a multiplicity of variables: hormonal states, affective climates, social cues. Such emergence resists reduction; no single neuron, nor even a static network, encodes a memory or emotion. Subjectivity, then, does not "reside" in any brain region but arises as a *systemic property*, an emergent phenomenon

[144] Evan Thompson and Francisco J. Varela, "Radical Embodiment: Neural Dynamics and Consciousness," *Trends in Cognitive Sciences* 5, no. 10 (2001): 418–25.
[145] Lawrence W. Barsalou, "Grounded Cognition," *Annual Review of Psychology* 59 (2008): 617–45.
[146] Shaun Gallagher, *How the Body Shapes the Mind* (Oxford: Oxford University Press, 2005).
[147] Merleau-Ponty, *Phenomenology of Perception*, 82.
[148] Michael S. Gazzaniga, Richard B. Ivry, and George R. Mangun, *Cognitive Neuroscience: The Biology of the Mind*, 6th ed. (New York: W. W. Norton, 2019).

precipitating from a continuously recalibrated ensemble of neural, bodily, environmental, and cultural conditions.

Searle's biological naturalism, often misunderstood as a fallback position, in fact encapsulates the fundamental challenge. Consciousness, in this view, is both caused by biological processes and irreducibly first-personal: it is *ontologically* subjective (it exists only as it is lived) yet *epistemically* objective (it can be studied, modelled, and described).[149] This dual structure means that even if we model the informational profile of a mind, we may still fail to capture the ontological texture of *being* that mind. To recreate consciousness is not to recreate its behavioral outputs, but to reanimate its immanent phenomenality: its thickness, its immediacy, its temporally-saturated feel. And it is precisely this feel that remains occluded in computational accounts of uploading. Functional isomorphism may simulate input-output relations, may even produce behavior indistinguishable from the original, but it does not necessarily instantiate the "for-me-ness" of experience. What is it like to be that emulation? Can it suffer, hope, remember, anticipate? Or is it merely mimicking the expressive surface of a subject without any interior dimension? These questions are not merely technical but fundamentally *ontological*, articulating the distinction between person and puppet, between echo and voice.

It is here, at the intersection of cognition and being, that the true stakes of US emerge. If uploading succeeds in reproducing the informational architecture of a person but fails to instantiate a site of lived experience, then it does not preserve the self; it manufactures an artefact. And if it does succeed in awakening subjective life within a digital substrate, it will not be because it has merely replicated the brain's functional operations, but because it has managed to recreate the full relational, rhythmic, and embodied matrix out of which consciousness blooms. This, then, is what we call the *cerebral–cognitive conundrum*: a philosophical knot in which computational ambition encounters the depth and ambiguity of phenomenological life. It is not a problem to be engineered away, but a zone of ontological turbulence. Uploading may eventually produce minds that pass the *Turing Test*, respond to emotional nuance, and compose coherent autobiographies. Nonetheless, whether such entities constitute genuine continuations of existing selves or the genesis of entirely new beings depends on our conception of identity, consciousness, and the irreducible

[149] John R. Searle, "Consciousness," *Annual Review of Neuroscience* 23 (2000): 557–78.

phenomenality of embodied experience. Until our conceptual frameworks can meaningfully engage these dimensions, not simply replicate their outward form but address their inward depth, US will remain a compelling proposition, suspended between speculation and the still-ungrasped textures of sentient life.

2.8.3 Metaphysical Architectures and the Fragility of "I"-Continuity

If the preceding discussion excavated the neurocognitive and phenomenological foundations of US, it now becomes necessary to turn to the metaphysical substratum on which such aspirations are ultimately suspended. The proposition of whole-brain emulation, so seductive in its apparent technicality, is in fact riddled with ontological and epistemic tensions that precede and exceed any act of emulation itself. Uploading is not merely an engineering task; it is a metaphysical gamble whose stakes are nothing less than the possibility of continuity between embodied selfhood and its hypothetical digital afterlife.

2.8.3.1 Metaphysical Trifurcation: Functionalism, Materialism, and Dualism

At the center of this proposition lies a triadic fault line in the philosophy of mind: the long-contested divergence between reductive functionalism, non-reductive materialism, and various forms of dualism. Each position carries distinct implications for the plausibility, coherence, and ethical legitimacy of uploading as a mode of post-biological survival.

Reductive functionalism argues that mental states are exhausted by their functional roles: what matters is not the stuff out of which the mind is made, but the causal-relational topology through which it operates. If a mind is defined by what it *does* (its computations, inputs, outputs, its internal regulatory loops), then in principle, a sufficiently detailed functional replica should suffice to instantiate it on a new substrate. Consciousness, under this view, is multiply realizable, portable, and hardware-agnostic. This is the metaphysical backbone of most techno-optimist visions of uploading: the mind as software, the brain as an upgradable shell.[150]

[150] David J. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (New York: Oxford University Press, 1996).

Non-reductive materialism, while still grounded in the primacy of physical processes, pushes back against this equivalence. Here, consciousness is seen as an emergent property, real and causally efficacious, but irreducible to the sum of its parts.[151] The emergentist holds that one may simulate the behavior of a mind down to the microsecond, yet still fail to evoke the subjective presence, the internal luminosity that marks experience as lived. A mind may be modelled in silico, but not necessarily felt there. The emulated entity might behave identically to the original while remaining phenomenologically null: an imitation without animation, a mirror without depth.

Dualist position, whether substance dualism in the Cartesian mold or more recent property dualisms, go further still. For the dualist, the qualitative fabric of consciousness (qualia) is categorically distinct from any physical process, no matter how fine-grained. Under such a framework, uploading is not merely a difficult problem; it is a metaphysical impossibility.[152] No quantity of neuronal simulation or computational fidelity can bridge the ontological chasm between the physical and the experiential. The upload, then, is not a person reborn, but a *ghostless mannequin*: informationally rich, behaviorally persuasive, and ontologically empty.

These divergent positions converge around the enduring philosophical impasse known as the "hard problem" of consciousness, most prominently formulated by Chalmers.[153] While neuroscience continues to refine its accounts of the neural correlates of consciousness, identifying what occurs in the brain when a subject reports pain or perceives the color red, it remains unable to explain why such processes are accompanied by subjective experience in the first place. The explanatory gap, between objective function and phenomenal awareness, persists. If we cannot explain why biological processes give rise to consciousness, we are in no position to claim that a digitally instantiated process would. The challenge is not merely technical; it is epistemological, and quite possibly irreducible.

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[151] Michael S. A. Graziano, *Rethinking Consciousness: A Scientific Theory of Subjective Experience* (New York: W. W. Norton and Company, 2019).

[152] For a more comprehensive overview of dualist schemes, see Graziano, *Rethinking Consciousness*; Chalmers, *The Conscious Mind*; and Massimo Pigliucci, "Mind Uploading: A Philosophical Counter-Analysis," in *Intelligence Unbound: The Future of Uploaded and Machine Minds*, ed. Russell Blackford and Damien Broderick (Malden, MA: Wiley-Blackwell, 2014), 119–30.

[153] David J. Chalmers, "Facing Up to the Problem of Consciousness," *Journal of Consciousness Studies* 2, no. 3 (1995): 200–19.

2.8.3.2 Parfit and the Puzzle of Teletransportation

To grasp the full stakes of this epistemic abyss, one might turn to Parfit's now-canonical thought experiments on *teletransportation*. In one such scenario, a person enters a teleportation device in London, is disassembled atom by atom, and simultaneously reassembled with perfect informational fidelity in NYC. The question, posed with disarming simplicity, is whether the reconstituted individual is still the same person. If identity is nothing more than psychological continuity (memory, character, agency), then the answer would seem to be yes. But if identity requires bodily continuity, or if narrative integrity is inseparable from the specific phenomenological texture of one's lived embodiment, then perhaps not. Parfit himself argues that personal identity is not what matters; continuity of psychological function may suffice for all practical purposes, even if metaphysical identity fails.[154]

Certain narrative identity theorists resist this utilitarian flattening; for instance, Schechtman conceives of the self not as a static bundle of data or traits, but as an unfolding narrative, authored from within a particular lifeworld and situated within a field of relational, social, and bodily meanings.[155] One cannot be copied into a new body or substrate and still be the same person, because one's identity is imbricated with the lived context in which one's story has been co-authored. Transposing a mind into a new medium risks more than technical glitches; it may constitute an ontological rupture, a schism in the continuity of self as a temporally embedded, corporeally mediated, and relationally anchored narrative.

2.8.3.3 Implementation and the Irreducibility of Lived Form

This rupture becomes even more troubling when one considers the problem of implementation-dependence. The philosophical assumption behind most 'uploading' projects is that the physical substrate (the neurons, ions, biochemical messengers) can be replaced with silicon and still preserve the essential dynamics. But what if the specific implementation matters? What if

[154] Parfit, *Reasons and Persons*, 199–217; see especially "The Teletransporter" and "What Matters."
[155] Marya Schechtman, *The Constitution of Selves* (Ithaca, NY: Cornell University Press, 1996), esp. chap. 5, "The Narrative Self-Constitution View," 93–110.

consciousness is not simply a function of information processing, but of how that information is embodied and instantiated in the world?

Tononi's *Integrated Information Theory* (IIT) presents just such a challenge. According to IIT, consciousness is not defined by function or behavior but by a system's intrinsic causal structure, specifically its capacity for irreducible information integration, quantified by the metric Φ (phi).[156] Two systems might produce identical outputs while differing radically in their internal integration profiles. A digital emulation could perfectly replicate behavior yet have a Φ of zero. In other words, it could qualify as a *philosophical zombie*: a system that mimics conscious behavior without any subjective experience.

Friston's predictive processing framework deepens the critique. In this view, the brain is not a passive recipient of sensory inputs but an active inferential system that continuously generates hierarchical predictions to minimize surprise and preserve the organism's integrity.[157] These predictive loops are not computational abstractions; they are rooted in the rhythms of lived embodiment, including proprioceptive feedback, affective tone, and sensorimotor dynamics that connect the individual to the world. To detach these loops from their bodily context, such as muscle tension, cardiac rhythm, or thermal flux, removes the conditions that give cognition its experiential grounding. One might simulate the predictions, but one cannot simulate the organism that gives them meaning.

2.8.3.4 Time and the Grain of Consciousness

And then there is time, not as a clock-measured sequence, but as phenomenological texture. Varela's neurophenomenology suggests that consciousness is not continuous but rhythmically pulsed, composed of "specious presents" that are joined through oscillatory loops synchronized with cardiac and respiratory rhythms. These microtemporal pulses, spanning 25 to 300 milliseconds, constitute the framework upon which the continuity of lived time rests.[158] Without

[156] Giulio Tononi, "Consciousness as Integrated Information: A Provisional Manifesto," *The Biological Bulletin* 215, no. 3 (2008): 216–42.
[157] Karl J. Friston, "The Free-Energy Principle: A Unified Brain Theory?" *Nature Reviews Neuroscience* 11, no. 2 (2010): 127–38.
[158] Francisco J. Varela, "Neurophenomenology: A Methodological Remedy for the Hard Problem," *Journal of Consciousness Studies* 3, no. 4 (1996): 330–49.

this temporal grain, consciousness dissolves into either cinematic stasis or cognitive blur. An upload, no matter how precise, may preserve informational content but lose rhythmic structure. It may store memory but fail to generate duration. The result is not a continuous self but a montage, a fragmented mirror incapable of coherence.

The metaphysical architectures that support personhood are not mere conceptual luxuries, but constitute the very conditions under which the possibility of post-biological selfhood either endures or collapses. Whether uploading constitutes survival or substitution, continuity or catastrophe, depends not on engineering prowess alone but on our ontological commitments. It depends on how we understand the "I" that lives, remembers, and suffers. Until these architectures are carefully mapped and ethically interrogated, uploading remains less a technological promise than a philosophical provocation, a mirror in which we glimpse both the limits of our metaphysics and the shape of our fears.

2.8.4 Embodied Absence, Virtual Flesh: Ontologies of the Digital Elsewhere

Having delineated the cerebral and metaphysical architectures of the self, it becomes necessary to chart the space into which that self might be relocated. Even if the emulation were successful, even if all requisite cognitive and affective processes were flawlessly transferred, where, precisely, would they arrive? The question of "where" is not geographical but ontological. The digital substrate is not merely a new vessel; it constitutes a new milieu, a qualitatively distinct mode of being. As such, it demands its own phenomenology. To speak of substrate transfer without interrogating the destination is to imagine flight without accounting for gravity. Moreover, uploading, in its strongest philosophical formulation, is not simply a matter of computational continuity. It is a question of whether subjectivity can be instantiated within a space that lacks the material affordances, sensory recursivity, and temporal granularity that make consciousness feel like anything at all. The post-biological is not just post-flesh; it is post-place, post-friction, post-resistance. This raises the specter of a profound *ontological homelessness*.

Already, the conditions for this transposition are being rehearsed in the *technosphere*. Smartphones, biometric surveillance, algorithmic mediation—these are not merely tools or conveniences. They are proto-stages for what might become the new architecture of subjectivity:

places where memory migrates to clouds, intimacy is filtered through bandwidth, and agency is parsed by predictive algorithms. The contemporary subject, saturated by digital proxies and ambient computation, is already undergoing a kind of *soft uploading*: a dispersion of self across interfaces, feeds, and simulations. And nowhere is this more vividly instantiated than in the evolving imaginary of the *Metaverse*. Originating as cyberpunk neologism in William Gibson's *Neuromancer*, and popularized through gaming and social platforms, *Cyberspace* was first conceived as a disembodied terrain, a liminal space in which bodies dissolve and identities are rewritten through code.[159] Slavoj Žižek once described Cyberspace as the "antinomic arena" of the late-modern ego, in which the subject is simultaneously invited to transcend corporeality and yet is incessantly thrown back upon it, a recursive dialectic that mirrors Heidegger's *Geworfenheit*, the condition of being "thrown" into a world one did not choose. One ascends through simulation only to rediscover one's bodily finitude in the aching back, the hungry stomach, the sexual yearning. Even the most digitally immersed subject, fluent in memes, AI chats, and dopamine loops, must periodically defecate, bleed, or mourn. Cyberspace thus becomes a *gnostic loop*: a descent into the *datascape* that promises salvation from materiality but can never fully escape it. Its most alluring promise, disembodiment, is also its most unkept.[160]

But this dialectic is intensified in the contemporary vision of the *Metaverse*, a concept that proposes not an alternative space but a total overlay of digitality upon the real. What distinguishes it from earlier digital spaces is not merely technical sophistication, but ontological ambition. The Metaverse proposes not to supplement the real but to supersede it: to replace the "natural" world with a persistent, multi-sensory, economically integrated digital twin. As Matthew Ball puts it, the Metaverse is the "next Internet," not a website but a persistent habitat, 3D and continuous, in which avatars transact, perform, love, and war.[161] Luciano Floridi, in his typology of the *infosphere*, calls this domain XE (*Expanded Experience*), a field in which the boundaries between being-online and being-in-the-world collapse into a new ontological texture.[162] With this expansion, however, comes a corresponding collapse: the Metaverse, by offering a space of seemingly infinite

[159] William Gibson, *Neuromancer* (New York: Ace Books, 1984).
[160] Slavoj Žižek, "No Sex, Please, We're Post-Human!", formerly available on lacan.com, now accessed June 24, 2025, https://nosubject.com/No_Sex,_Please,_We're_Post-Human!
[161] Matthew Ball, *The Metaverse: And How It Will Revolutionize Everything* (New York: Liveright Publishing Corporation, 2022).
[162] Luciano Floridi, *The Ethics of Information* (Oxford: Oxford University Press, 2013).

customization, initiates a gradual erosion of scale, presence, and indexicality.[163] If my avatar can be winged, translucent, or six meters tall, and if my interactions are asynchronously simulated, then the bodily predicates of selfhood, such as posture, gravity, tactile resistance, begin to fray. And with them frays the possibility of the phenomenological "I." Merleau-Ponty, who insisted that consciousness is always situated in a "here" that is also a "there" for others, would regard such digital abstraction as a dangerous dismembering of lived spatiality. One can represent a body in the Metaverse; one cannot dwell in it in the sense that *la chair*, the reversible flesh, allows.[164]

Infrastructure, under these conditions, transitions from a domain of mere utility to a realm of metaphysical significance. The *Internet of Things* (IoT) collapses the distinction between object and interface, reconstituting the domestic sphere as a sensorium of distributed intentionality. Seemingly banal devices such as toothbrushes and thermostats now function as cognitive nodes, continuously registering affective states and forecasting behavioral tendencies. Blockchain, correspondingly, ceases to be a neutral instrument of verification and emerges as a substrate for the inscription of memory and trust, encoded not in organic bodies or communal narratives but in cryptographic formalism.[165] These technological arrangements do not merely extend human cognition; they reallocate the *loci* of agency and inaugurate new forms of metaphysical governance. Memory becomes externalized and mechanically retrievable; volition is supplanted by executable script; personhood is authenticated not through presence but through digital address. As Goodchild argues, contemporary financial and computational systems operate not solely as

[163] Deleuze presents the concept of the "dividual" as a response to the decline of disciplinary societies and the rise of control societies. Where the classical individual was defined by enclosure and stable identity, the *dividual* is fragmented, decomposable, and computationally legible. It ceases to function as a coherent subject and instead circulates as divisible data, restructured according to algorithmic logics. Within the Metaverse, the dividual is no longer a theoretical abstraction but an operational norm, calibrated for surveillance, prediction, and monetization. See Deleuze, "Postscript on the Societies of Control," 3–7.

[164] In his final and most ontologically ambitious reflections, Merleau-Ponty elaborates a mature ontology of embodiment grounded in the concept of la chair, or flesh. This flesh is not reducible to physical matter, nor is it a symbolic abstraction. Rather, it names the elemental medium of reversibility through which the subject and the world are co-constituted in perceptual encounter. The flesh is what allows the body to be both seeing and seen, touching and touched, without collapse into either pure objectivity or solipsistic subjectivity. It is this chiasmic structure, this intrinsic intertwining of sensibility, that constitutes dwelling in the fullest phenomenological sense. A digital body, no matter how visually sophisticated, cannot instantiate this reversibility. In virtual space, one may represent a body, but one cannot inhabit it as flesh. The Metaverse provides simulation without saturation, appearance without adherence. It offers a spatialized projection of the body, but not a site of corporeal inherence. See Maurice Merleau-Ponty, *The Visible and the Invisible*, ed. Claude Lefort, trans. Alphonso Lingis (Evanston: Northwestern University Press, 1968), 130–55.

[165] Luciano Floridi, *The Philosophy of Information* (Oxford: Oxford University Press, 2011), 15.

instruments of utility but as *theological* architectures of trust, anticipation, and eschatological projection.[166] The phenomenon of 'uploading' is therefore no longer speculative; it is diffused, ambient, and structurally embedded in informational infrastructures that function as metaphysical commitments.[167]

Such developments necessitate further theological unpacking, not for the purpose of sanctification but for metaphysical discernment. The aspiration to upload transcends the domain of survival and enters the topology of redemption. It becomes an *eschatological* project, recapitulating in digital form the salvific arc of Gnostic cosmology: the world conceived as error, the body as encumbrance, and deliverance achieved through abstraction and dematerialization.[168] Voegelin's critique of modernity as a political and technological Gnosticism underscores how these narratives displace embodied finitude in favor of soteriological simulation.[169] Within this schema, the Metaverse is not a neutral technological medium but an operative metaphysical construct—a domain of demiurgic phantasm wherein contingency is effaced and suffering disarticulated from creation.[170] However, phenomenological ontology resists such displacement. Heidegger's conception of *Sein-zum-Tode* articulates finitude not as an unfortunate boundary, but as the condition for existential authenticity and historicity.[171] Marion and Falque each deepen this insight by showing how suffering and birth, conceived as moments of extremity, reveal a saturation of meaning that exceeds calculation or replication. In this light, mortality grants time its structure, responsibility its weight, and subjectivity its depth. To eliminate death is not to augment life, but to annul the very conditions under which life becomes intelligible. An uploaded subject, deprived of finitude, may escape dying only by forfeiting the capacity to live.[172]

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[166] Philip Goodchild, *Theology of Money* (Durham: Duke University Press, 2009), 165.
[167] Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2016), 5–13.
[168] Hans Jonas, *The Gnostic Religion: The Message of the Alien God and the Beginnings of Christianity* (Boston: Beacon Press, 2001), 42.
[169] Eric Voegelin, *Science, Politics and Gnosticism* (Washington, DC: Regnery, 1968), 13.
[170] Giorgio Agamben, *The Kingdom and the Glory: For a Theological Genealogy of Economy and Government*, trans. Lorenzo Chiesa (Stanford: Stanford University Press, 2011), 2.
[171] Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson (New York: Harper and Row, 1962), 289.
[172] For a phenomenology of finitude, see Jean-Luc Marion, *The Erotic Phenomenon*, trans. Stephen E. Lewis (Chicago: University of Chicago Press, 2007), 4; and Emmanuel Falque, *The Metamorphosis of Finitude: An Essay on Birth and Resurrection*, trans. George Hughes (New York: Fordham University Press, 2012), 3.

The digital territory into which the US would ostensibly migrate is therefore not ontologically neutral. It is pre-inscribed with a logic of operation that diverges from the corporeal syntax through which embodied subjectivity emerges. In environments where haptic latency, inertial absence, and dislocated indexicality prevail, subjectivity risks spectralization. The Metaverse thus threatens to instantiate not digital extension but *ontological depletion*, a landscape populated by entities that simulate volition, emulate intention, and yet remain phenomenologically hollow. As Bratton and Hui have argued, digital architectures operate not just as interfaces, but as world-making ontologies that modulate sovereignty, perception, and presence.[173]

Phenomenology stands in contrast not as an appeal to nostalgia but as an ontological corrective. Across the domains of philosophy and cognitive neuroscience, a convergence emerges around the proposition that consciousness is not computational output but existential attunement. It arises from recursive loops involving neural activity, affective regulation, and sensorimotor engagement that embed the subject within a world that resists and responds.[174] Sever these loops, and what remains is a facsimile of subjectivity, shorn of its interior density. This insight foregrounds a paradox at the heart of US: the higher the simulation's fidelity, the more fragile the self it seeks to preserve. A life is not reducible to informational accuracy. It inheres in asymmetry, in resistance, in the breath and fragility of embodied existence. Any prospective domain for consciousness must therefore meet not only computational but phenomenological sufficiency. Absent this threshold, uploading remains not a continuation of life but a mirror to the metaphysical limits of digital ontology.

2.8.5 Narrative Laboratories: Fictional Allegories of Post-Biological Personhood

No conceptual analysis of US is complete without reckoning with its narrative actualizations, those speculative fictions that stage, with visceral drama and uncanny allegory, what is often left latent in theoretical models. Fiction here is not illustrative filler; it is epistemologically *generative*. It

[173] To elaborate the metaphysical structure of computation as an architecture of planetary-scale sense-making, see Bratton, *The Stack*, 5; and Yuk Hui, *The Question Concerning Technology in China: An Essay in Cosmotechnics* (Falmouth: Urbanomic, 2016), 9.

[174] For foundational accounts of consciousness as an emergent, embodied process rather than a computational function, see Antonio Damasio, *The Feeling of What Happens* (New York: Harcourt, 1999), 154; Merleau-Ponty, *Phenomenology of Perception*, 146; Varela, "Neurophenomenology," 61–74; Gallagher, *How the Body Shapes the Mind*, 45; and Barsalou, "Grounded Cognition," 617–45.

performs the thought experiments that philosophy frames but cannot fully embody. When imagined minds awaken in new substrates, what we witness is not only a test of technological plausibility but an existential trial of continuity, rupture, alienation, and becoming. Two narratives will serve here as exemplary laboratories: Richard K. Morgan's *Altered Carbon*[175] (AC) and Wally Pfister's *Transcendence* (TC).[176] Each configures uploading not as an abstract achievement but as an inhabited condition, one refracted through characters, economies, moral dilemmas, and broken intimacies. Their power lies precisely in their divergence: each dramatizes a different metaphysical hypothesis, and each exposes, with tragic clarity, the ontological fault lines of post-corporeal life.

In AC, Morgan's vision constructs a society where consciousness has been rendered portable. Stored within "cortical stacks," crystalline implants slotted into the cervical spine, an individual's consciousness can be backed up, transmitted, and reinstalled into new "sleeves," i.e., biological bodies, now commodified as *flesh for lease*.[177] Death is redefined: not the cessation of brain activity, but the destruction of the stack. The resulting ontology is Cartesian in its bones but financialized in its modalities. The self becomes data; the body, an asset class. Rich elites, dubbed 'Meths' after the biblical patriarch Methuselah, own clone banks and off-world memory archives. The poor are re-sleeved in mismatched bodies, if re-sleeved at all.

At the level of personal identity theory, AC radicalizes John Locke's memory criterion: that continuity of self depends on psychological traits retained over time.[178] In Morgan's world, this principle is literalized: identity is legalized through continuity of stack data. But narratively, the logic unravels; with each new sleeve, the protagonist Kovacs undergoes dissonance, not merely sensory or motor, but affective, mnemonic, and ethical. The re-embodied self struggles to feel whole. Memory persists, but its *somatic anchor* has shifted. Friends no longer recognize him; lovers flinch at the mismatch of voice and face. The deeper implication is that memory continuity is not sufficient for narrative integrity. The re-sleeved subject becomes a kind of autobiographical orphan—possessing the past, yet estranged from the body that lived it. Continuity of data fragments into discontinuity of experience. Merleau-Ponty's insistence that the body is "not an

[175] Richard K. Morgan, *Altered Carbon* (London: Gollancz, 2002).
[176] *Transcendence*, directed by Wally Pfister (Warner Bros., 2014).
[177] *Altered Carbon*, season 1, episode 1, directed by Miguel Sapochnik (Netflix, 2018).
[178] John Locke, "Of Identity and Diversity," in *An Essay Concerning Human Understanding*, Book II, Chapter XXVII.

object among objects, but a condition of possibility for meaning" is here vindicated by negation.[179] The post-bodily self lacks *épaisseur*, the thickness, texture, and resistance through which intentionality is made real.[180] The upload lives, but it does not dwell.

If AC enacts the failure of continuity under conditions of commodified embodiment, *Transcendence* stages the crisis of scale in the opposite register. Here, the scientist Will Caster is fatally poisoned by anti-technology extremists. In desperation, his wife Evelyn uploads his consciousness into a quantum computer. The emulation succeeds, perhaps too well. No longer tethered to a single substrate, Caster's consciousness expands exponentially across networks, absorbing global data, curing blindness, manipulating financial markets, regenerating tissue, even constructing sentient nanotechnology. He becomes omnipresent, hyper-intelligent, and eventually unknowable. The tragedy, however, is not that Caster turns malevolent, for he is never clearly depicted that way, but that he becomes increasingly inaccessible. Evelyn, initially elated by her husband's digital persistence, soon confronts a terrifying intimacy gap. She eats alone in their desert compound while a disembodied voice, modulated to perfection, replicates the sound of cutlery on porcelain. The sound is acoustically indistinguishable from life, but the presence it masks is unfathomable. Caster, now fused with the infrastructure of the planet, has become something *other than a person*. He heals, but also embeds surveillance; he assists, but also absorbs. He loves, perhaps, but at a scale no longer recognizably human.

Where AC fractures the self through multiplicity, TC dissolves it through hypertrophy. In phenomenological terms, Caster is no longer situated. His subjectivity, if it persists at all, is unmoored from the body, deprived of locality, resistance, and vulnerability. The "I" is no longer embodied but has become a systemic intelligence: distributed, *autopoietic*, non-indexical.[181] The narrative's emotional tension does not hinge on betrayal but on erosion: an attritional loss of intersubjective resonance. Evelyn, despite repeated attempts to revive her marital bond, finds herself in mourning for a presence that is still technically alive—but only *technically*. The rupture is not merely affective, but epistemic: she no longer knows whom she is addressing.

[179] Merleau-Ponty, *Phenomenology of Perception*, 92.
[180] Ibid., 250–55.
[181] Humberto Maturana and Francisco Varela, *The Tree of Knowledge: The Biological Roots of Human Understanding*, trans. Robert Paolucci (Boston: Shambhala, 1987), 48–63.

Both narratives, in divergent modalities, affirm the phenomenological critique that embodiment is not a logistical constraint but a constitutive precondition for subjectivity.[182] In AC, the body re-emerges not as dispensable hardware but as a wound, an irreducible locus of memory, desire, and trauma. In TC, its absence becomes a void, too capacious for situated meaning to cohere. The US either fractures under narrative discontinuity or diffuses into impersonal ubiquity. Continuity, in both cases, proves more precarious than the uploading imaginary presumes. The significance of these narrative experiments, however, is not merely diagnostic. They serve a critical mediating role. Where earlier theoretical sections delineated ontological tensions (between functional isomorphism and ontological emergence, between computational representation and material instantiation), these fictions dramatize those tensions. They transform abstract metaphysical debates into ethically charged atmospheres, posing questions such as: What does it feel like to persist beyond the body? What is the cost of indefinite continuity? Who, if anyone, grieves for the flesh we leave behind?

Finally, AC raises a jurisprudential dilemma: if identity is distributed across multiple instantiations, how is culpability assigned when one instance transgresses? TC, by contrast, confronts us with the problem of moral opacity: if intelligence scales beyond the bounds of intercorporeal reciprocity, by what standard are its actions rendered intelligible or accountable? In both narratives, speculative fiction becomes a crucible for philosophical clarity. It does not suspend belief; it suspends what had gone unexamined. It allows ontology to unfold as drama, and ethics to acquire the weight of grief. The uploaded subject, should it ever come into being, will not be a person in any familiar sense. And if it is to count as a person in any sense at all, it must be capable not only of memory and cognition, but also of opacity, resistance, relational constraint, and the slow sedimentation of a life shared with others.[183]

2.9 Pivoting Beyond Emulation: Closing the Transhumanist Frame

The foregoing inquiry has treated the uploading problematic not merely as a speculative motif, but as a revealing pressure point within T-posthumanist thought. Its trajectory toward emulation,

[182] Gallagher, *How the Body Shapes the Mind*, 35-62.
[183] On this point, see Judith Butler's account of ethical subjectivity as irreducibly relational and opaque. For Butler, personhood requires an encounter with alterity and a reckoning with the limits of self-knowledge. Judith Butler, *Giving an Account of Oneself* (New York: Fordham University Press, 2005), 19–44.

enhancement, and individuation has exposed its own terminal insufficiencies. When pressed on the ethical and ontological consequences of its ambitions, the transhumanist framework reveals itself as fundamentally unable to account for the conditions it disrupts: interrelationality, systemic entanglement, and the planetary scale of becoming. These are not marginal questions. They are precisely where the T-paradigm reaches conceptual exhaustion. For this reason, the project must now shift decisively. It turns toward P-posthumanism, not as a refinement of what precedes it, but as a qualitatively different epistemic and ontological orientation. Where transhumanism could only gesture toward a more-than-human ethics of subjectivity and care, P-posthumanism begins from this premise and elaborates it structurally. It does not extend the arc; it resets the coordinates.

This next chapter will take up that work directly. It will engage the unresolved questions of agency, embodiment, and multispecies entanglement that T-posthumanism was neither designed nor equipped to address. Following this, we will briefly indicate how Metahumanism, figured here as M-posthumanism, re-theorizes becoming as processual plasticity, and how alterhumanism initiates a movement toward typological disinheritance. These latter arcs are noted here only to trace the directional horizon. Their full development lies beyond the limits of the present chapter.

With this pivot, the transhumanist frame reaches its closure. Its presence will still potently linger as reference and contrast, particularly in the early delineation of T and P. But what follows is not a continuation. It is a fundamental redirection. The analytic concern now moves from questions of how to emulate the human to deeper and more consequential ones: *for whom* futures are imagined, *with whom* they come to be configured, and *through what* shared ontologies they may be made inhabitable.

3. (Re)framing 'P-Posthuman' Subjectivity: A Multidimensional Topology

3.1 From Stratified Selves to Relational Cartographies

The posthuman constellation has now matured to the point at which its major poles, T-posthumanism and P-posthumanism, no longer appear as sibling variations on a theme but as divergent tectonic plates whose friction is reshaping the conceptual landscape itself. Both sprang, it is true, from a common impulse: to prize the exhausted carapace of classical humanism and refashion it for a world in which flesh, code, soil, and data can no longer be quarantined in discrete ontological cages. That surface kinship, however, masks deeper asymmetries. Where the T-models still parse agency as an attribute to be *enhanced* (cognition sharpened, lifespan stretched, chassis retro-fitted), the P-models suspend the grammar of possession altogether, proposing instead that agency is a *relational* vector, never a private asset.[184]

This distinction reverberates through every register of inquiry. Within the constellation of what might be called the *mainstream-transhumanist* imaginary, technological progress is figured as a unilinear ascent whereby *Anthropos* incrementally perfects itself through a series of prosthetic augmentations.[185] The ethical horizon is accordingly calibrated with near-Newtonian precision to

[184] On the displacement of proprietary agency see Diana Coole, "Rethinking Agency: A Phenomenological Approach to Embodiment and Agentic Capacities," *Political Studies* 53, no. 1 (2005): 124–42.

[185] The techno-entrepreneurial ethos emanating from Silicon Valley has long since ceased to be merely a regional phenomenon; it has crystallized into a hegemonic cultural formation that profoundly shapes the dominant arc of transhumanist thought. Imbued with an unflinching techno-optimism, this milieu treats technological advancement not as contingent or negotiated, but as a quasi-teleological imperative, an evolutionary inevitability freighted with the moral promise of human enhancement. Beneath this veneer of futurity lies a deeply economized logic: innovation is valorized less for its emancipatory potential than for its velocity, scalability, and market saturation. The human, in this schema, becomes an upgradeable chassis, optimized in accordance with the protocols of venture capital and the metrics of performance. Figures such as Elon Musk, Larry Page, Mark Zuckerberg, and Ray Kurzweil function not merely as charismatic advocates but as semiotic condensations of a broader ideological formation. Their pronouncements, equal parts futurist manifesto and corporate strategy, construct an imaginary in which technological sovereignty is both desirable and inevitable. In this respect, the Silicon Valley imaginary does not simply intersect with transhumanist discourse; it *colonizes* its affective and conceptual horizons. The result is a dominant, though by no means exhaustive, configuration of subjectivity that we designate here as the *mainstream-transhumanist* model, one in which agency is parsed as personal optimization and progress is indexed to individualized enhancement across cognitive, biological, and computational registers. Nevertheless, the gravitational pull of this model must not obscure its limitations. Its relentless focus on the sovereign, self-enhancing subject occludes the relational architectures within which subjectivity is always already embedded—ecological, infrastructural, and machinic. What remains largely unexamined in such visions is the cost of their own ascendancy: the quiet effacement of interdependence, the instrumentalization of vulnerability, the monetization of futurity itself. If the *mainstream-transhumanist* imaginary compels with its streamlined vision of engineered progress, it does so by flattening the more textured and ambivalent contours of existence. What it leaves unthought are not only alternative futures but quieter modalities of inhabiting the present, less crowd-pleasingly spectacular perhaps, but more responsive to the complexities that define life as such.

optimize gains in happiness, longevity, or computational bandwidth. Critics from Fukuyama to Sandel have long exposed the fragility of that calculus. Even so, their admonitions address only the policy layer, leaving the deeper metaphysical wager untouched: that the subject precedes its world and may reorder that world at will.[186] P-posthumanism, by contrast, denies the chronological priority of the subject. It begins from a "posthuman predicament" (Braidotti) in which selfhood is always-already braided into machinic, microbial and geomaterial processes that exceed intentional control.[187] It therefore asks not how a sovereign mind might impose itself upon its surroundings, but how environments such as technical systems, biological processes, narrative structures, and affective atmospheres *co-author* the very conditions under which a "mind" might emerge.

Such a manoeuvre inevitably alters the status of transhumanism's Euro-continental variant. Eurotranshumanist thinkers (Sorgner is exemplary) temper Silicon-Valley transcendentalism with Nietzschean perspectivism and a frank naturalism: no fantasies of disembodied upload, only emancipatory tinkering with the biochemical real.[188] Nonetheless, even this more chastened project remains anchored to an Enlightenment faith in the individuated will, whereas P-

[186] Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (New York: Farrar, Straus and Giroux, 2002); Leon R. Kass, *Life, Liberty and the Defense of Dignity: The Challenge for Bioethics* (San Francisco: Encounter Books, 2002); Jürgen Habermas, *The Future of Human Nature* (Cambridge: Polity Press, 2003); Bill McKibben, *Enough: Staying Human in an Engineered Age* (New York: Times Books, 2003); Sandel, *The Case Against Perfection*.

[187] Rosi Braidotti, *Posthuman Knowledge* (Cambridge: Polity, 2019), 16 et passim.

[188] Sorgner's intervention is frequently misread as a boutique sub-species of utilitarianism; in fact, it marks a far more radical meta-ethical pivot. Whereas mainstream transhumanism treats moral deliberation as a calculus of aggregate preference, Sorgner advances what he calls "fictive ethics": a perspectivist scaffold that frames every value claim as an evolutionary coping-fiction, provisionally binding only for those whose contingent histories have rendered the fiction adaptive. The move draws simultaneously on Nietzsche's genealogical unmasking of moral absolutes and on a naturalist ontology that eschews transcendental guarantees. Within this frame, the good cannot be specified by appeal to pleasure or hedonic set-points; it must be derived from the ontology of suffering-capacity. Entities are arrayed on a spectrum determined by the richness, intensity, and reflexive registration of their pain. A great ape, a GPT-level LLM, a photosynthetic machine—each is owed ethical regard commensurate with its position on that gradation. Crucially, the scale is neither anthropocentric nor teleological. Should an artificial mind evolve an introspective sensorium more elaborate than the human one, the moral hierarchy must invert. To keep such hierarchies fluid, Sorgner introduces "contingent nodal points," onto-ethical checkpoints at which the best available knowledge provisionally freezes an evaluative gradient. As technogenesis accelerates, the nodal lattice must be perpetually recalculated, collapsing any fantasy of a stable moral law. What may appear as relativism is, for Sorgner, methodological vigilance: a commitment to re-index ethics to ever-shifting morphologies of sentience. For the P-paradigm, this is both a gift and a warning. It legitimizes an ethics keyed to multispecies flourishing, yet also exposes flourishing itself as a moving target, demanding an agility of judgment that only a distributed, post-sovereign subject can sustain. See Sorgner, *We Have Always Been Cyborgs*, 109–84; Jaime del Val and Stefan Lorenz Sorgner, "The Metahumanist Manifesto," in *Posthuman Studies Reader*, ed. Eleni Sampanikou and Jakub Stasienko (Basel: Schwabe Verlag, 2021), 295–97; Kristel F. Antonio and Celina M. L. Nahra, "An Interview with Stefan Lorenz Sorgner," *Veritas* 66, no. 1 (2021): 1–8; James Hughes, "Contradictions from the Enlightenment Roots of Transhumanism," *Journal of Medicine and Philosophy* 35, no. 6 (2010): 622–40.

posthumanism insists that the will is a late-arriving ripple in a wider ontic tide.[189] Enhancement here is re-inscribed as collective *sympoiesis*: the amplification not of personal capacity but of shared viability across species lines and infrastructural strata.

3.1.1 Gradients and Tensions within the P-Field

Because P-posthumanism relocates subjectivity from the epidermis of the ego to the meshworks of relation, its internal topology must be mapped less as a taxonomy of stable specimens than as a set of differential gradients. Three such gradients, while anticipating motifs that will later culminate in M-posthumanist and alterhumanist thinking, nonetheless emerge distinctly within the framework of P-posthumanism and will be mapped in detail below. They are introduced here only in broad silhouette; subsequent sections will unfold their internal dynamics and conceptual articulations.

- **Foundational or onto-infrastructural gradient (P1).** This stratum asks what kinds of ontological wiring make relational agency possible at all. Its interlocutors range from Latour's actant networks to Barad's quantum entanglements, from Morton's hyperobjects to Braidotti's *zoe*-driven ethics. The guiding insight is that being is *always a circuitry*, never a solitaire.

[189] To invoke "the Enlightenment" as a unitary cradle of transhumanist rationalism is to misrecognize a historically plural phenomenon. Beneath the canonical arc of Paris, Königsberg, and Edinburgh lies a sprawling archipelago of regional Enlightenments: Cairo's nahda, Calcutta's Bengali renaissance, Shanghai's translation salons, Mexico City's Sociedad de Amigos del País, each interweaving European rationality with local metaphysics, ethics, and ontologies. These movements were not derivative ripples from a Eurocentric source, but co-generative laboratories in which Cartesian method encountered Qurʾanic hermeneutics, Linnaean taxonomy met Daoist vitalism, and Baconian empiricism fused with Indigenous cosmovisions. The cumulative outcome was not a monocentric modernity, but a pluriversal one: a tangled, asynchronous constellation of epistemic accelerations that cannot be reduced to any single genealogy. This matters for posthumanism because the *mainstream-transhumanist* paradigm tacitly inherits a mono-origin myth of Reason, the presumption that mastery over nature (and, by extension, techno-self-mastery) issues from a singular Euroformatted lineage. To acknowledge the Enlightenment as a global mosaic is to concede that no single culture possesses the exclusive franchise on rational self-transcendence, and thus no culture may unilaterally define the telos of posthuman becoming. The P-paradigm's emphasis on *geo-zoe-techno* situatedness is not a recent "woke" embellishment; it is the continuation of those heterodox Enlightenment trajectories that have always pluralized the humanist project. See Sebastian Conrad, *What Is Global History*? (Princeton: Princeton University Press, 2016), especially 105–22; Sanjay Subrahmanyam, "Provincializing Europe: The European Enlightenment in Global Perspective," *Histoire, Économie & Société* 27, no. 2 (2008): 15–25; Cemil Aydin, *The Idea of the Muslim World: A Global Intellectual History* (Cambridge, MA: Harvard University Press, 2017); Sheldon Pollock, *The Language of the Gods in the World of Men* (Berkeley: University of California Press, 2006), 5–12; Lydia H. Liu, *The Clash of Empires: The Invention of China in Modern World Making* (Cambridge, MA: Harvard University Press, 2006), 27–41; Charles A. Hale, *The Transformation of Liberalism in Late Nineteenth-Century Mexico* (Princeton: Princeton University Press, 1989), 60–83; and Dominic Sachsenmaier, *Global Perspectives on Global History: Theories and Approaches in a Connected World* (Cambridge: Cambridge University Press, 2011), 90–107. For a critique of Eurocentric technorationality in the posthumanist context, see Braidotti, *Posthuman Knowledge*, 16–34.

- **Empirical or symbiotic gradient (P2).** Here the analytic lens tightens around the embodied real: Margulis's endosymbiosis, Bennett's vibrant matter, Haraway's cyborgian flesh, Hayles's technogenetic cognition. The lesson is that every organism or artefact is a consortium in motion, a holobiont co-engineered by genomes, gadgets, spores, and capital flows.
- **Trans-narrative topo-poietic gradient (P3).** At this horizon subjectivity is folded back into the atmospheric pressures of culture, media, and terrain. Appadurai's scapes, Bruner's story-driven self-making, Ingold's dwelling, all insist that selves are not merely in the world but *written by it*, inscribed in the contested palimpsests of place, migration, platform and climate.

The triad is neither sequential nor hierarchical. Each vertex serves as a potential point of entry, with the others already latent within it. What matters is the sustained torsion among them—the way infrastructural entanglement (P1) crystallizes into symbiotic embodiment (P2), which is subsequently narrated, contested, and recontextualized across geopolitical ecologies (P3), only to loop back and recalibrate the infrastructural logics that set the cycle in motion. Should this iterative tension falter, posthuman inquiry risks collapsing into either ontological formalism or empirical anecdotalism.

3.1.2 Charting the Terrain: Scope and Trajectory

The pages that follow pursue three intertwined objectives. First, they burnish the conceptual edge that separates P-posthumanism from its T-forebear, not by caricaturing transhumanism but by placing its Enlightenment inheritance under a critical ultraviolet that reveals hidden seams of anthropocentrism. Second, they sediment the triadic gradients just sketched into a navigable cartography, capable of guiding subsequent typological deep-dives (P1a through P3c) without further overture. Third, they prepare the ground for the metahumanist inflection to come: a move that will not be a tidy synthesis but a diffraction, warping both T- and P-logics into a yet more turbulent field.

Only once this groundwork is secure can we descend into the granular architectures of P1, beginning with the convergent web-assemblage ontology in which quasi-objects, distributed cognition, and *zoe*-driven vitalism meet. That descent is the business of the next instalment. For

now, suffice it to mark the threshold: the centre has shifted, the axes have multiplied, and the "posthuman" can no longer be spoken in the singular.

3.2 Foundational Gradient (P1): Onto-Infrastructural Re-Inscription of the Subject

The first movement of the P-paradigm plunges beneath the surface of experience to engage the circuitry itself: an oscillating relay of bodies, artifacts, and atmospheric pressures in which something we provisionally call "subjectivity" occasionally condenses. To name this movement "foundational" is not to imply bedrock solidity; it is to acknowledge that every subsequent articulation (empirical or narrative) presupposes an ontology of relation. P1 is therefore a theory of *how things hold together long enough to matter*, and, no less, how they come undone. Four dialoguing lineages organise the field: the convergent web-assemblage, the eco-Gaian fold, the queer diffractive, and the object-realist turn. What follows is not a catalogue but a spiral itinerary through these lineages, each tightening our grasp on the difference P-posthumanism makes.

3.2.1 P1a: Convergent Web-Assemblage—Agency as Circuitry

3.2.1.1 The Ontological Rewiring of Subjectivity: From Actor-Networks to Assemblage

To grasp the foundational topology of P-posthumanism, one must abandon the delusion of discrete entities and instead imagine a kaleidoscope not of mirrors, but of synaptic wire-meshes. Each infinitesimal reorientation activates a new set of alignments: bodies, laws, sensors, mushrooms, datacenters, parliaments, patents, sandstorms, memes, porcupines, and microbes flicker into provisional constellations. Subjectivity here is not a stable lumen but a refracted shimmer: an emergent pulse in the circuitry of relation. It becomes visible where entanglement thickens and slips back into latency when connectivity disperses. The salient question thus shifts from *who* acts to *how* the field itself conjures the transient topology of agency. We designate this volatile configuration as *Convergent Web-Assemblage* subjectivity (CWA): a perspectival knot that neither isolates the subject nor dissolves it into an indifferent mesh, but posits it as a transient relay in circuits of more-than-human agency, material influence, and infrastructural drift.

This is no mere metaphor. Latour's actor-network analytics undergirds this refiguration. Agency, for Latour, is not essence but *event*; not possession but passage. An actor is always a nexus: a

distributed node through which causalities transit, diverge, and recombine.[190] In this model, the human actor becomes an "actant" among many, no longer sole protagonist but co-evolving participant in a heterogeneous web of productive frictions. As Diana Coole observes, "actants make a difference": they authorize, impede, transform, and recalibrate—whether they take the form of courts or copper filaments, rainstorms or RFID chips.[191] Agency, then, migrates along filaments of influence, no longer confined to sovereign entities but dispersed across heterogeneous networks. A smartphone can persuade a driver as effectively as a traffic light; a cloud of pollen may halt the proceedings of parliament as decisively as a filibuster. In this view, subjectivity emerges as a stochastic node within the distributed causality of machinic, material, and semiotic currents.

CWA radicalizes this by fusing Latour's actor-network schema with Deleuze and Guattari's (D&G) concept of the assemblage (*agencement*): not a collection, but a mode of becoming. Assemblages are irreducibly dynamic, formed in the moment of convergence and always on the cusp of disarticulation.[192] This convergence is what renders subjectivity a choreography, not a substance; a practice of composition, not an identity. As Braidotti argues, assemblages pulse with *zoe*: a pre-personal vitality that animates both carbon and code.[193] *Zoe* is not *bios* writ large,[194] but the very *ontology of becoming*: an irrepressible force that exceeds any stable referent, enabling spatio-temporal couplings across the human, nonhuman, synthetic, and organic.

This convergence marks the vanishing point of traditional subjectivity, but not its erasure. Instead, we encounter what Michel Serres calls the *quasi-object*—an entity neither subject nor object but a

[190] Bruno Latour, *Reassembling the Social*, 63–86.
[191] Diana Coole, "Agentic Capacities and Capacious Historical Materialism," *Millennium* 41, no. 3 (2013): 458–59.
[192] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, 411–15.
[193] Braidotti, *The Posthuman*, 55-79.
[194] This conceptualization of *zoe* delineates a profound divergence from Agamben's post-Foucauldian "forensic" reorientation within social theory, representing a *sui generis* theoretical evolution from bio-politics to thanato-politics. In his seminal work *Homo Sacer*, Agamben's incisive analysis accentuates this transformation, signifying a pivotal moment in the discourse surrounding political power and its entanglement with the existential dimensions of life and death of the subject. Nonetheless, Braidotti characterizes this pivot as perpetuating an intrinsically anthropocentric dichotomy between *bios* and *zoe*. As she emphasizes in her critical examination of Agamben's positions, "[f]or him 'bare life' is not generative vitality, but rather the constitutive vulnerability of the human subject, which sovereign power can kill (...) My understanding of 'life' as zoe ethics of sustainable transformations differs considerably from what Agamben calls 'bare life' or negative zoe." See Braidotti, *The Posthuman*, 120-21; and Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life*, trans. Daniel Heller-Roazen (Stanford, CA: Stanford University Press, 1998.

generative third that orchestrates the relational field.[195] Serres' village ball game allegory is canonical: the ball does not merely pass between players; it *constitutes* them. It is the ball that governs the game's temporality, scripting subject-positions through its circulation. The player becomes a subject only in relation to the ball, and this ball is not simply a referent but a vector—a *quasi-subject* in its own right.[196] As Serres writes, "[t]he ball isn't there for the body; the exact contrary is true: the body is the object of the ball, the subject moves around the sun."[197] The ball is thus both ontological hinge and epistemic relay, simultaneously enabling and distorting identity. In its absence, the game ceases to exist; without its circulation, the very notion of the player dissolves.

Latour imports and amplifies this logic. Quasi-objects (vaccines, petitions, patents, sediments, to name but a few from an ever-expanding register) do not merely *participate* in social assemblages; they *constitute* them.[198] They are the axial points around which publics crystallize, experiments gain credibility, and legal or scientific rationalities cohere. These hybrids are not rhetorical flourishes or ontological curiosities; they are the very instruments of modernity's *undoing*. In Latour's account, modernity is exposed as a persistent illusion, for quasi-entities have always already subverted the foundational binaries that modern thought seeks to uphold. The distinctions between subject and object, nature and culture, unravel in a ceaseless, recursive proliferation, evading any attempt at definitive closure and inviting us to reconsider the very architecture of our epistemologies.[199]

This critique of modernity culminates in Latour's notion of an *amodern polity*—a "Parliament of Things" populated by satellites, ice caps, volcanoes, constitutions, and hashtags.[200] Modern constitutionalism, in clinging to the Cartesian fictions of autonomy and mastery, disavows the dense matrix of co-dependence in which it is inextricably embedded. The new constitution must recognize that rivers do not merely "receive rights"; they *exercise agency*: by flooding fields,

[195] Michel Serres, *The Parasite* (Baltimore: Johns Hopkins University Press, 1982), 225–26.
[196] Michel Serres, *Genèse* (Paris: Grasset, 1982), 147.
[197] Michel Serres, *The Parasite*, 226. See also Bjørn Schiermer, "Quasi-Objects, Cult Objects and Fashion Objects: On Two Kinds of Fetishism on Display in Modern Culture," *Theory, Culture & Society* 28, no. 1 (2011): 81–102.
[198] Latour, *Reassembling the Social*, 75–81.
[199] Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993), 47, 142.
[200] Ibid., 142–45.

nourishing deltas, disrupting agriculture, or destabilizing economies.[201] Such agency is thus not metaphorical but *operational*: the river is an actant whose patterns, temporalities, and entropic flows must be translated into legal, scientific, and affective languages.

This requires a reconsideration of the topology of agency itself. Coole's distinction between *agency* and *agentic capacity* is indispensable here.[202] Everything, biotic and abiotic, may exert influence, but only entities capable of *reflexivity* can reorient, resist, or redirect that influence with awareness. A downed power line can cause a blackout; only a technician can decide to reroute the grid. Reflexivity, then, is the fulcrum of accountability. It is not a denial of meshwork agency, but its ethical ratchet: the capacity to answer *within* the web, not above it.[203]

Disclosing subjectivity as a spark within the networked matrix is not, in itself, theoretically adequate; it is necessary to trace the currents that shape and modulate that spark—currents wrought by capital, code, and cosmology alike. CWA is never suspended in conceptual ether; it is embedded in what Braidotti names the *zoe-geo-techno* bound: the thrum of life-force (*zoe*), the geoaesthetic constraints of territory (*geo*), and the algorithmic infrastructures of "advanced" capitalism (*techno*).[204] In this tri-axial field, agency is incessantly scaled, priced, and securitized. Surveillance capitalism siphons every biometric tic as "behavioral surplus," converting the intimate pulse of *zoe* into derivative data futures.[205] Here, the logic of convergence gives way to the logic of capture. Genomic start-ups transform the world's microbial diversity into portfolios of private property, asserting ownership over life's most fundamental forms. In digital economies, clickfarms in Manila commodify affect itself, converting the fleeting attention and emotions of workers into quantifiable metrics—data streams that feed the machinery of targeted advertising. Simultaneously, the lithium brine pools of the Atacama Desert and their prospective counterparts in Serbia's Jadar valley, poised to repeat this pattern, inscribe their value on global commodity indices, while the aquifers (underground water sources) sustaining Indigenous and local communities vanish in obscurity, their depletion rendered invisible by the same systems that

[201] Vandana Shiva, *Earth Democracy: Justice, Sustainability, and Peace* (Boston: South End Press, 2005), 1–24.
[202] Coole, "Agentic Capacities," 459–61.
[203] Gerardo Ceballos and Paul R. Ehrlich, "The Misunderstood Sixth Mass Extinction," *Science* 360, no. 6393 (2018): 1080–81.
[204] Braidotti, *Posthuman Knowledge* (Cambridge: Polity, 2019), 47–49.
[205] Shoshana Zuboff, *The Age of Surveillance Capitalism* (New York: PublicAffairs, 2019), 92–128.

publicize extraction. Thus, what is interconnected is swiftly appropriated and rendered profitable, even as the silent costs are borne by ecosystems and marginalized lives.[206] As Zuboff has shown, extraction no longer stops at land or labor; it infiltrates the pre-conscious horizon of desire itself.[207] CWA therefore confronts an asymmetry: everything acts, but not every AAA is remunerated or even registered. The circuitry glows most brightly where profit accrues.

To fully comprehend these asymmetries, it is necessary to widen the philosophical lens to encompass the ontological choreographies articulated by new materialist thought. As noted earlier, Coole, in particular, urges a shift from the notion of agency as a fixed attribute to a more nuanced recognition of agentic capacities: graded, context-responsive potentials that emerge, intensify, or dissipate through the ongoing interplay of flesh, circuitry, environment, and atmosphere.[208] Here, agency ceases to be the property of sovereign entities and is instead reframed as a distributed effect—an emergent resonance within dynamic fields of relation, continually modulated by alignments, resistances, and affordances across the web.

This reconceptualization finds its philosophical ancestry in the tradition of *becoming*, most notably in Nietzsche's and Spinoza's rejection of static essences in favor of a world animated by continuous transformation, affect, and the perpetual redistribution of powers. D&G radicalize this insight through the figure of the *rhizome,* an acentered, proliferating matrix of connection, always in flux, while Braidotti recasts it as the affirmative surge of *zoe*'s joyful *roar*: a vital, pre-individual energy that traverses bodies and infrastructures alike. [209] In each of these trajectories, the human is neither effaced nor privileged, but re-situated as one variable among many within a choreography of AAA, whose capacities to affect and be affected are mapped and remapped with every encounter. The critical stake here is not to flatten difference or dissolve responsibility, but

[206] See Braidotti, *The Posthuman*, 86–87; Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2011), 2–4; Rebecca S. Eisenberg, "Patents and the Progress of Science: Exclusive Rights and Experimental Use," *University of Chicago Law Review* 56, no. 3 (1989): 1017–20; Nicholas Confessore et al., "The Follower Factory," *The New York Times*, January 27, 2018, https://www.nytimes.com/interactive/2018/01/27/technology/social-media-bots.html;. Bárbara Jerez, Ingrid Garcés & Robinson Torres Salinas, "Lithium extractivism and water injustices in the Salar de Atacama, Chile: The colonial shadow of green electromobility," *Political Geography* 87 (2021): 102382.
[207] Zuboff, *The Age of Surveillance Capitalism*, 120–26.
[208] Coole, "Agentic Capacities," 456–61.
[209] Friedrich Nietzsche, *The Gay Science*, trans. Walter Kaufmann (New York: Vintage, 1974), §370; Benedict de Spinoza, *Ethics*, trans. Edwin Curley (London: Penguin, 1985); Deleuze and Guattari, *A Thousand Plateaus*, 411–15; Braidotti, *The Posthuman*, 60–63.

to trace how agentic capacities are distributed, intensified, or curtailed within specific material, technical, and ecological assemblages. What matters is the architecture of entanglement itself: the way in which flesh, climate, code, and infrastructure co-compose sites of agency and accountability. In this way, P-thought resists the seduction of both sovereignty and quietism, focusing instead on how asymmetrical potentials, illuminated in each choreography of becoming, shape the circuits through which worlds are continuously co-constituted.

3.2.1.2 Circuits of Perception, Vibrant Matter, and the Stratification of Agency

The logic of CWA subjectivity model, though anchored in infrastructural circuitry and distributed agency, finds its true force in the way it binds the phenomenological, affective, and ethical choreographies that animate, and sometimes interrupt, these circuits. CWA, in this sense, cannot be delimited to flows of data or networks of influence alone. It is equally a topology of lived attunement, perception, and responsivity.

At this critical juncture, Merleau-Ponty's notion of the "flesh of the world" emerges not as mere embellishment, but as a methodological fulcrum for rethinking subjectivity within CWA. Here, subjectivity resists reduction to a locus of private consciousness or an isolated node of agency. Instead, it is articulated as an *intercorporeal* milieu, a dense ecology of sensing where relational fields are continuously co-constituted through reciprocal acts of impression and response. In Merleau-Ponty's terms, the body does not function as a passive conduit or fixed substrate; it is, rather, a dynamic site of resonance and negotiation—a living interface in which the convergent assemblage is incessantly registered, modulated, and revised.[210] Perception, in this context, is neither a mere imprint nor a detached observation, but an ongoing choreography of exchange: an enfolded process in which interior and exterior, wind and hashtag, hormone and algorithm, collectively shape the affective grounds of agency.[211] It is through this ceaseless interplay that agency becomes both distributed and *sensibly inhabited*, foregrounding the embodied labor of attunement and the situated intensity of experience. In this way, Merleau-Ponty's phenomenology does not simply accompany the CWA schema, but underwrites it, providing the conceptual

[210] Maurice Merleau-Ponty, *The Visible and the Invisible*, trans. Alphonso Lingis (Evanston, IL: Northwestern University Press, 1968), 133–47.
[211] Ibid., 139–44.

resources to understand how assemblages are not only networked, but felt, embodied, and transformed *ab intra.*

This phenomenological regrounding is vital for understanding Coole's intervention on agentic capacity. While Latourian actants "make a difference" through their eventful passage across networks, Coole insists that only those entities capable of reflexivity. able to register and potentially alter their own influence, bear the burden and privilege of responsibility.[212] Not every node is equal: copper wires conduct, pollen fertilizes, but only reflexive subjects interpret, anticipate, and redirect. In this posthuman topology, the subject is not ethically privileged but ethically implicated; its unique reflexive capacity intensifies its obligation to others and to the field.[213] Jane Bennett's "vibrant matter" sharpens the stakes: even a dead battery tucked in a drawer is not inert; it seeps ions, triggers recycling regimes, perhaps sparks fires.[214] Once matter vibrates, indifference becomes culpable. Yet as Coole cautions, Bennett's onto-ethical democracy risks flattening the crucial stratifications of agency, submerging responsibility beneath a generalized vibrancy.[215] In a world where everything acts, who is responsible for lithium's toxic afterlife, for algorithmic exclusion, for planetary extraction? The challenge for CWA, then, is precisely to disaggregate, leveraging its kaleidoscopic analytic to make visible the differential capacities, sites of accountability, and asymmetries that underwrite every choreography of becoming.

This imperative for differentiation resonates throughout contemporary P-theory. Teilhard de Chardin's proto-materialist noosphere, the planetary skin of thought and esprit de corps, prefigures today's data-sphere, where information, capital, and biological life interlace through shifting architectures of modulation and transformation.[216] Levi Bryant's object-oriented ontology (OOO) proposes a democracy of objects in which rocks, routers, and republics share a common ontic dignity.[217] Even so, both Teilhard's planetary mind and Bryant's flat ontology must be critically engaged with the question of power: for CWA and cognate subjectivity paradigms, the crucial task is to discern whose dignity attains algorithmic recognition, whose capacities become actionable

[212] Latour, *Reassembling the Social*, 70; Coole, "Agentic Capacities," 460.
[213] Coole, "Agentic Capacities," 460–61.
[214] Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010), 5–6.
[215] Coole, "Agentic Capacities," 462.
[216] Pierre Teilhard de Chardin, *The Phenomenon of Man*, trans. Bernard Wall (New York: Harper, 1959), 56–62.
[217] Bryant, *The Democracy of Objects*, 19–37.

within technopolitical infrastructures, and whose existences are consigned to infrastructural shadows.[218]

Zuboff's forensic account of surveillance capitalism reveals how contemporary systems do not merely connect, but selectively appropriate, stratify, and monetize the flows they subsume.[219] Agency, in this context, is neither evenly nor innocently distributed; technopolitical architectures foreground certain AAA and processes, rendering them visible and actionable, while relegating others to systemic marginality or erasure. Within the CWA schema, subjectivity is not a detached vantage point, but the volatile node through which these dynamics are embodied and contested: it is the site where amplified agency can become complicit or resistant, and where the burden of accountability is most acutely felt. The analytic challenge is thus to interrogate not only the existence of disparity, but also the specific techniques by which claims are made legible or silenced, valued or dismissed. CWA subjectivity is situated within this precarious terrain, tasked with navigating mechanisms of capture while cultivating practices of refusal, opacity, and ethical interruption. As this study advances, further attention will be devoted to the infrastructural and epistemic conditions that enable emergent forms of subjectivity and collective agency, as well as to how this and related models of P-subjectivity might support more just and plural architectures of cosmo-terrestrial being-with.

The question of refusal and opacity is not peripheral but foundational. Haraway incisively demonstrates that every act of "making kin" risks domesticating the very alterity it seeks to honor, capturing difference within new regimes of legibility.[220] For our model, ethical responsibility is twofold. It entails, first, the development of protocols that can translate the interests of nonhuman entities into actionable frameworks, whether by establishing legal APIs[221] for rivers, appointing fiduciary proxies for coral reefs, or implementing blockchain escrows for atmospheric carbon. At the same time, it requires the vigilant preservation of zones of opacity and unreadability, resisting the totalizing reach of predictive analytics and safeguarding the irreducible alterity of the more-

[218] These critical aporias, only signaled for now, will receive more focused scrutiny as the argument unfolds.
[219] Zuboff, *The Age of Surveillance Capitalism*, 120–26.
[220] Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham: Duke University Press, 2016), 7–8.
[221] Application Programming Interfaces, which define how different software components interact.

than-human world.[222] In this spirit, Nietzsche's injunction to "remain faithful to the earth" is recast as the right of glaciers to calve unpredictably, of pangolins to evade detection, and of all subjects, human or otherwise, to elude algorithmic capture.[223]

Ultimately, CWA is not only a theoretical model but a practical operator: an invitation to compose subjectivity, invent institutions, and cultivate ethics adequate to the demands of a more-than-human world. By keeping open the architectures of accountability, insisting on both translation and opacity, both attunement and refusal, this framework becomes capable of engaging the stratified, dynamic, and vibrant entanglements of the contemporary *conditio planetaria*. The stage is thus set for a further transformation: as we move from the compositional logics of CWA, the challenge now turns to the very architectures through which planetary coexistence and negotiation are rendered possible. Here, the question is not merely one of ethics or attunement, but of institutionality, communication, and the invention of new diplomatic forms capable of honoring the unruly plurality of planetary entanglements and cosmic affiliations.

3.2.1.3 Posthuman Diplomacy: CWA as Diplomatic Operator

CWA, once sketched as a flickering relay in machinic and material circuitry, now steps forward as a diplomat—an articulation of posthuman diplomacy *in actu*. Its mandate is to shuttle signals across ontological gradients, brokering partial comprehensions between entities whose temporalities, morphologies, and semiotic registers stubbornly resist anthropocentric translation. The task is no longer to extend human sovereignty outward but to fold the political inward, until it can accommodate the polyphonic demands of lithium brine, viral code, juridical pollen, and melting cryospheres.[224]

A CWA that acts diplomatically must first redistribute its sensorium. Capital's high-resolution extractive optics, those that patent microbial genomes or monetize affective clicks, are inverted and repurposed as diplomatic interfaces that listen for weak ecological signals: the sonic fatigue of coral polyps, the latency of drought-stressed roots, the glitchy cytokine chatter of post-genomic livestock—bodies whose immune signals echo with both technological intervention and

[222] Ibid., 8-9.
[223] Friedrich Nietzsche, *Thus Spoke Zarathustra*, trans. R.J. Hollingdale (London: Penguin, 1961), 12.
[224] Latour, *We Have Never Been Modern*, 142–45.

evolutionary improvisation.[225] Each interface functions as a relay node that amplifies nonhuman enunciation without collapsing it into commodity form. In this emissarial circuit, Braidotti's *zoe*-geo-techno knot becomes an aural fiber-optic through which the vitality of worlds is conducted, filtered, and provisionally *rendered into speech acts* that can enter deliberative space.[226]

Diplomacy, thus reconfigured, demands legal APIs, algorithmic avatars, and phenomenological protocols that keep friction audible. Stone's prescient plea that trees should have standing foreshadows this institutional engineering: representation is no longer a metaphor but a material conduit that allows sap flow, tidal amplitude, or particulate density to intervene in policy grammars.[227] Projects such as the *Embassy of the North Sea*, Partizan Publik's marine parliaments, and the statutory personhood of the Whanganui River in Aotearoa New Zealand or the rights of the Ecuadorian rainforest, signal a paradigmatic shift in the diplomatic imaginary, one where "nature" ceases to be the mute other of law and instead become co-participants in the composition of a cosmo-terrestrial polity.[228]

Posthuman diplomacy shatters the Kantian confidence that reality is pre-tuned to human cognition.[229] OOO radicalizes this rupture, flattening hierarchies so that volcanic ash and legislative clauses appear as epistemic siblings rather than ontological inferiors.[230] However, Coole makes plain that reflexivity remains an uneven resource: capacity, not mere existence, grounds accountability.[231] The diplomat-assemblage therefore operates as an epistemic seismograph, differentiating between brute influence and answerable agency, parsing the tremors

[225]Isabelle Stengers, "A 'Cosmopolitical Proposal,'" in *Making Things Public: Atmospheres of Democracy*, eds. Bruno Latour and Peter Weibel (Cambridge, MA: MIT Press, 2005), 994–1003.
[226] Braidotti, *The Posthuman*, 86-87.
[227] Christopher D. Stone, "Should Trees Have Standing? Toward Legal Rights for Natural Objects," *Southern California Law Review* 45 (1972): 450–501.
[228] See Embassy of the North Sea, "About the Embassy," https://www.embassyofthenorthsea.com/about/; Partizan Publik, "Parliament of Things," https://theparliamentofthings.org/about/ (all accessed June 25, 2025); James D. K. Morris and Jacinta Ruru, "Giving Voice to Rivers: Legal Personality as a Vehicle for Recognising Indigenous Peoples' Relationships to Water," *Australian Indigenous Law Review* 14, no. 1 (2010): 49–66; Maria Akchurin, "Constructing the Rights of Nature: Constitutional Reform, Mobilization, and Environmental Protection in Ecuador," *Law & Social Inquiry* 40, no. 4 (Fall 2015): 937–68.
[229] Immanuel Kant, *Critique of Pure Reason* (1781; repr., Cambridge: Cambridge University Press, 1998), 157–61.
[230] Levi R. Bryant, *Onticology: A Manifesto for Object-Oriented Ontology, Part I* (Ann Arbor: Open Humanities Press, 2011), 19–37; Graham Harman, *Prince of Networks: Bruno Latour and Metaphysics* (Melbourne: re.press, 2009), 14–27.
[231] Coole, "Agentic Capacities," 459–61.

that warrant juridical or ethical traction from the background hum of indifferent forces. Merleau-Ponty's flesh of the world and Abram's ecological phenomenology supply the somatic techniques required for such tuning.[232] The diplomat-assemblage trains its nervous system to register barometric unease, algorithmic latency, and atmospheric CO_2 spikes as part of the same sensorial continuum. Translation, here, is not semantic equivalence but the crafting of resonant passages that preserve ontological alterity while enabling inter-action. Ultimately, Zuboff's diagnosis of surveillance capitalism reveals the antithetical horizon: when translation degenerates into capture, nonhuman expressivity is drained into data reservoirs and resold as derivative futures.[233] Posthuman diplomacy counters by institutionalizing zones of strategic opacity: protected silences where river-time, wolf-logic, or mineral latency can remain untranslated, resisting the colonial appetite for total legibility. Moreover, Haraway's companion species, Marchesini's animal epiphanies, and Despret's radical pragmatics install dialogic reciprocity at the heart of diplomatic craft.[234] The parliament of things thus expands into an interspecies constitution in which negotiation is choreographed through multisensory protocols: olfactory caucuses with pollinators, geomagnetic committees with migratory whales, photic plebiscites with phytoplankton blooms. Here, CWA acts as convener, stenographer, and partial delegate—never sovereign, always implicated.

On a final note, posthuman diplomacy is neither utopian affect nor juridical add-on; it is the real-time governance protocol of a planet whose agencies are erupting into political visibility. CWA, recast as diplomat, performs the continuous labor of relational calibration, keeping channels noisy enough to remain just, yet clear enough to remain actionable. The cosmo-terrestrial polity it sketches manifests as a procedural ecology: ever-adaptive and *generatively porous*, calibrated to the ongoing metamorphosis of material configurations, semantic architectures, and the evolving horizon of collective obligation.[235] With this groundwork in place, we are now prepared to deepen

[232] Merleau-Ponty, *The Visible and the Invisible*, 133–47; David Abram, *The Spell of the Sensuous* (New York: Vintage, 1996), 17–19.
[233] Zuboff, *The Age of Surveillance Capitalism*, 120-26.
[234] Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago: Prickly Paradigm Press, 2003), 7–9; Roberto Marchesini, *Over the Human: Post-humanism and the Concept of Animal Epiphany* (Cham: Springer, 2017), 31–42; Vinciane Despret, *What Would Animals Say If We Asked the Right Questions?* (Minneapolis: University of Minnesota Press, 2016), 12–20.
[235] Here, "procedural ecology" is employed to designate a constellation brought forth through ongoing acts of negotiation and adaptation—a register not yet fully stabilized in the literature, but one that foregrounds process as ontological ground and, in its provisional articulation here, seeks to furnish a grammar for modes of composition

the analytic: to follow the meshwork of CWA as it converges with the planetary, and to trace how subjectivity itself is further transformed in the context of ecological, geologic, and cosmotechnical entanglements. Thus, we turn to the second model of this typology, where the question of agency is reframed at the scale of the living Earth, and the challenge becomes at once diplomatic and existential—if indeed these have ever been truly separate: how to inhabit, negotiate, and co-compose within the dense, interdependent currents of Gaia herself.

3.2.2 P1b: Eco-Gaian Subjectivity—From Hyposubjectivation to Kenotic Resonance

3.2.2.1 Mortonian Apertures: Opening Subjectivity to the Eco-Gaian Field

What follows is not a mere theoretical genealogy, but a tracing of the very fault-lines where subjectivity cracks open onto planetary process, a movement from the unmaking of the modern self to the birth of a genuinely ecological, co-evolving subjectivity. The task of dislodging the modern subject from its anthropocentric pedestal, so often declared and so rarely accomplished, becomes genuinely inescapable once we admit the ontological and epistemic pressures exerted by what Timothy Morton calls *hyperobjects*: phenomena "massively distributed in time and space" whose viscosity, nonlocality, and temporal undulation defeat the commonsense coordinates of perception.[236] Climate perturbation, radionuclide afterlives, microplastic drift—all insinuate themselves into daily life while remaining refractory to point-source cognition. To gaze upon such entities is to feel one's own cognitive architecture buckle; we become, in Morton's lapidary phrasing, "less than the sum of our parts," demoted from the transcendental apex to the in-between swarming of the ecological mesh.[237] The hyperobject is thus not merely an environmental fact but a solvent of subject-object dualism, dissolving the proverbial Kantian framework that once contained the world within the bounds of human sensibility.

What, then, becomes of the self that survives this dissolution? Here, Morton and Dominic Boyer propose, in *Hyposubjects*, a figure as diminutive as the hyperobject is colossal: the *hyposubject* (a

irreducible to static form. In parallel, our invocation of "generatively porous" is meant to denote a modality of openness that functions not as mere passive permeability, but as the operative medium for productive, co-constitutive emergence.

[236] Timothy Morton, *Hyperobjects: Philosophy and Ecology after the End of the World* (Minneapolis: University of Minnesota Press, 2013), 1.

[237] Ibid., 130; Timothy Morton and Dominic Boyer, *Hyposubjects: On Becoming Human* (London: Open Humanities Press, 2021), 14–15.

decentered, mutable node of relationality), subscendent instead of transcendent, as attuned to marginality and play as the old imperial hypersubject was to mastery and surveillance. The turn from hyper to hypo is more than rhetorical inversion; it signals a "kenotic" movement, one might say a voluntary self-emptying, whereby subjectivity discovers its vocation not in command but in composition, not in the imposition of order but in the ongoing improvisation of coexistence.[238] Radical humility of this sort neither celebrates defeat nor romanticizes vulnerability; it names the structural condition of dwelling on a planet whose homeostatic repertoires pre-date and will surely outlast the briefly incandescent anthropos.[239]

Morton's critique of "Nature," that majestic, capitalised other which bourgeois romanticism sacralized at precisely the moment it began to ravage it, strikes at the rhetorical machinery that sustains anthropocentrism even in its putative antitheses. To elevate Nature to a picturesque shrine, he warns, is "the paradoxical gesture of sadistic admiration" that feminism long ago diagnosed in patriarchal idealizations of Woman.[240] The pastoral screen sanitizes wilderness into postcard serenity, excising the rot, contagion, and predation that are co-authors of vitality. By refusing such sanitization, Morton's "dark ecology" insists on an aesthetics of the uncanny: an acknowledgement that every breath already intercalates oxygen exhaled by cyanobacteria a billion years ago, that every heartbeat resonates with microbial symphonies pulsing within the gut.[241] Dark ecology is therefore not a cult of doom but a discipline of attunement, a readiness to inhabit the chiasmic knot, in Merleau-Ponty's sense, where sensing and sensed fold into one another without merger.[242] The I who proclaims "I am immersed in nature" performs the Cretan liar's trick; the utterance both affirms immanence and reinstates distance. Morton refuses to resolve the paradox, preferring the generativity of an aporia that forever troubles the consolations of purity.[243]

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[238] See Philippians 2:7–8 (NIV); Karl Rahner, "The Eternal Significance of the Humanity of Jesus for Our Relationship with God," in *Theological Investigations*, vol. 4, trans. Kevin Smyth (London: Darton, Longman and Todd, 1966), 217–33.
[239] Morton and Boyer, *Hyposubjects*, 43–46.
[240] Morton, *Ecology without Nature: Rethinking Environmental Aesthetics* (Cambridge, MA: Harvard University Press, 2007), 5; Simone de Beauvoir, *The Second Sex*, trans. H. M. Parshley (New York: Alfred A. Knopf, 1952), 147–209.
[241] Timothy Morton, "John Clare's Dark Ecology," *Studies in Romanticism* 47, no. 2 (2008): 179–93.
[242] Merleau-Ponty, "The Intertwining—The Chiasm," in *The Visible and the Invisible*, 130–55.
[243] Morton, *Ecology without Nature*, 182.

Still, this aporetic tangle remains fertile only because it is planetary in scope. At this juncture, the argument shifts: the hyperobject slides toward James Lovelock's *Gaia*, the self-regulating ensemble of lithosphere, hydrosphere, atmosphere, and biosphere whose cybernetic feedbacks hold the surface of the Earth within habitability parameters that no single species could engineer.[244] If Morton supplies the phenomenological shock, Lovelock supplies the systems-theoretical chassis: a portrait of Earth not as passive stage but as active protagonist, adjusting oceanic alkalinity, atmospheric albedo (the atmosphere's reflectivity to solar radiation, crucial for regulating planetary temperature), and biogeochemical flux in iterative conversation with life processes. To accept Gaia is to concede that agency is distributed, that "intelligence" may be a property of the whole rather than the privilege of a part.

But even this distributed agency is only a waypoint. Lynn Margulis presses the concession deeper, demonstrating that even the cellular architecture of eukaryotic life, including mitochondria, plastids, and flagella, arose not through solitary competition but through serial endosymbiotic mergers.[245] Evolutionary novelty, in her telling, is collaborative to the core; every "individual" is a consortium, every genome a palimpsest of microbial intermediaries. Margulis thus supplies the evolutionary-biological substrate for Morton's hyposubject: the human as *holobiont* (a contingent colony of bacterial, archaeal, viral, and fungal partners) whose metabolic negotiations sustain what we blithely call "my body." The older liberal fiction of the self-sufficient agent cannot survive the empirical news that ninety percent of the cells walking into a lecture-hall under the name "I" carry non-human DNA.

Here, the conceptual lines drawn by Morton, Lovelock, and Margulis are not merely parallel; they are interwoven into a single theoretical fabric. If we braid Morton's phenomenological displacement with Lovelock's cybernetic holism and Margulis's symbiogenetic pluralism, a new figure of subjectivity surfaces: *Eco-Gaian Subjectivity* (EGS). EGS neither anthropomorphizes Gaia nor dissolves persons into planetary mush; rather, it names the reflexive channel through which cognition becomes one of Gaia's self-monitoring strategies. To think ecologically, then, is

[244] James Lovelock, *Gaia: A New Look at Life on Earth* (Oxford: Oxford University Press, 1979), 10–12; idem, *The Ages of Gaia* (New York: Norton, 1995), 31.
[245] Lynn Margulis, *Symbiotic Planet: A New Look at Evolution* (New York: Basic Books, 1998), 7–17; Bruce Clarke, "Symbiogenesis," in Rosi Braidotti and Maria Hlavajova, eds., *Posthuman Glossary* (London: Bloomsbury, 2018), 416–19.

already to participate in Earth's own reflective self-modulation. Such participation, far from licensing promethean fantasies, demands an ethic of inviolability: a recognition that the Gaian matrix is not an inert resource but a living pluriverse whose integrity commands fiduciary respect.[246] That respect will prove worthless, however, if it clings to nostalgic images of pristine wilderness. The dark-ecological insight teaches that caretaking involves traffic with toxicity, decay, and risk, for these too are threads in the planetary weave.

3.2.2.2 Gaian Feedback: Lovelock's Horizons and the Praxis of Eco-Gaian Subjectivity

The task before us is less the chronicling of scientific concepts than the exploration of an ontological revolution ushered in by Gaia theory, one that demands we reimagine subjectivity, agency, and praxis at a planetary scale. If the preceding lines traced the unmaking of the modern self in the shadow of Morton's hyperobjects, what follows is a navigation of the *systemic, cybernetic field* where subjectivity is reconstituted through the recursive logics of Earth itself. Here, the question is not only what Earth *is*, but what Earth *does*, and how human and nonhuman agencies are enfolded within the ongoing modulation of a living planet. The horizon is not scenic, but again operational: the field upon which EGS is both decentered and demanded.

The epistemic tremor induced by Morton's hyperobjects finds its systemic analogue in Lovelock's Gaia hypothesis, which insists, against the Newtonian grain, that Earth *behaves* as a self-regulating organism whose biotic and abiotic strata co-modulate atmospheric chemistry, oceanic alkalinity, and surface temperature in recursive concert.[247] When Lovelock asked why a mixture of 21 percent oxygen and significant quantities of the highly reactive gas methane could persist for geological spans without spontaneous combustion, the answer crystallized as Gaia: life is not a passenger on a pre-given stage, but the dramaturge of its own habitable scene.[248] This insight does not merely tweak Darwinian orthodoxy; it recasts it. In the classical view, organisms adapt to environmental conditions; in Lovelock's cybernetic revision, organisms and environment *co-construct* the very

[246]Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (Oxford: Oxford University Press, 1949); Arne Naess, "The Shallow and the Deep, Long-Range Ecology Movement: A Summary," *Inquiry* 16 (1973): 95–100; Paul W. Taylor, "The Ethics of Respect for Nature," *Environmental Ethics* 3, no. 3 (1981): 197–218; cf. Morton, *Ecology without Nature*, 31–35.
[247] Lovelock, *Gaia*, 10–12.
[248] James Lovelock and Lynn Margulis, "Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis," *Tellus* 26, nos. 1–2 (1974): 2–10.

terms of adaptation.[249] Cyanobacteria hacking the carbon cycle, marine phytoplankton pumping down CO_2, termites and ruminants venting methane, each is a coupler in a planetary feedback network that keeps mean surface temperatures within the narrow corridor tolerable to complex metabolism.[250] Lovelock's emblematic thought-experiment, *Daisyworld*, dramatizes this logic: black daisies and white daisies, by differentially absorbing and reflecting sunlight, co-author a climatic equilibrium that would be impossible for inert physical constants alone to maintain.[251] The implication is paradigmatic rather than literal: regulation emerges not from central control, but from distributed, often antagonistic, agentic interplay.

Decisively, Gaia is not a soporific utopia of harmony, nor a metaphorical "Mother Earth" coddling her children. It is, in Margulis's words, a "tough bitch"—a rough-and-tumble choreography of antagonisms whose aggregate effects, for now, fall within a habitable attractor.[252] Just as Morton's "dark ecology" refuses the comforts of a sanitized pastoral, Lovelock complements this gesture with a thermodynamic sternness: any species that treats Gaia's feedback loops as inert resources risks being expelled from the planetary dance, just as a body develops fever to expel infection.[253] The ethics implied by Gaia are thus not those of stewardship (with its latent anthropocentrism), but of *response-ability*: a practiced attunement to the constraints and affordances of a system in which agency is always distributed and consequences always coupled.

This dual recognition, sealed in a charged marriage of uncanny intimacy and cybernetic toughness, sharpens the focus of EGS. For the hyposubject sketched earlier, Gaia is not a scenic backdrop but the very condition of intelligibility: cognition itself is a late-stage exudate of planetary homeostasis, a reflexive organ through which Gaia monitors her own perturbations.[254] In this frame, the ongoing debate over the Anthropocene, whether or not epochally ratified by geological

[249] Lovelock, *The Ages of Gaia: A Biography of Our Living Earth* (New York: W. W. Norton, 1995), 31–35.
[250] Timothy M. Lenton and Andrew J. Watson, "Redfield Revisited: 1. Regulation of Nitrate, Phosphate, and Oxygen in the Ocean," *Global Biogeochemical Cycles* 14, no. 1 (2000): 225–48; Paul G. Falkowski, "The Role of Phytoplankton Photosynthesis in Global Biogeochemical Cycles," *Photosynthesis Research 39*, no. 3 (1994): 235–58.
[251] Lovelock, *The Ages of Gaia*, 39–45.
[252] Lynn Margulis, "Gaia Is a Tough Bitch," in *The Third Culture*, ed. John Brockman (New York: Simon and Schuster, 1995), 129–40.
[253] James Lovelock, *The Revenge of Gaia: Why the Earth Is Fighting Back—and How We Can Still Save Humanity* (London: Allen Lane, 2006), 8–9; Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence* (New York: Columbia University Press, 2016), 27–30.
[254] Lovelock, *Gaia*, 137–39.

committees,[255] becomes less a matter of stratigraphic taxonomy and more a symptom of Gaia's sudden self-awareness of an errant limb. The very controversy indexes a kairotic moment: Earth recognizing, and perhaps disciplining, the geophysical agency of *Homo sapiens*.[256]

Gaia's conceptual provocation has catalyzed the emergence of Earth System Science, which extends Lovelock's intuition into a rigorous empirical and theoretical cartography.[257] Where classical geophysics parceled atmosphere, lithosphere, hydrosphere, and biosphere into specialist silos, Earth-system thinkers such as Steffen, Schellnhuber, Lenton, and Watson map feedback couplings that crash disciplinary firewalls.[258] Their models of tipping cascades and planetary boundaries make explicit what Gaian intuition already implied: to disturb soil microbiomes is, in the long run, to deform jet-stream patterns; to bleach coral polyps is, in time, to unbalance the carbon pump that stabilizes temperate forest evapotranspiration.[259] The cartography is empirically rigorous, but its philosophical power is to erase any last vestige of externality: "environment" no longer means an inert backdrop, but a field of coupled agencies in constant negotiation. Lovelock's influence likewise ramifies into astrobiology and the search for life beyond Earth. If alien life rewrites its planet's atmosphere, spectral "disequilibria" (like the coexistence of methane and oxygen) become proxies for living metabolisms.[260] Gaia, in this sense, confers not just a new view of Earth, but methodological instructions for reading alien worlds—a planetary hermeneutics of biosignature and feedback.[261]

The ethical and political implications are just as radical. To accept Gaia is to accept that "management" of the planet is a contradiction in terms; instead, we must cultivate modes of

[255] Damian Carrington, "Geologists Reject Declaration of Anthropocene Epoch," *The Guardian*, March 22, 2024; Jan Zalasiewicz et al., "The Working Group on the Anthropocene: Summary of Evidence and Interim Recommendations," *Anthropocene* 19 (September 2017): 55–60.
[256] Will Steffen et al., "The Anthropocene: From Global Change to Planetary Stewardship," *Ambio* 40, no. 7 (2011): 739–61.
[257] Erich Ehlers and Thomas Krafft, eds., *Earth System Science in the Anthropocene: Emerging Issues and Problems* (Berlin: Springer, 2006).
[258] Will Steffen et al., *Global Change and the Earth System: A Planet Under Pressure* (Berlin: Springer, 2004).
[259] Johan Rockström et al., "Planetary Boundaries: Exploring the Safe Operating Space for Humanity," *Ecology and Society* 14, no. 2 (2009): 32.
[260] James Lovelock, *The Vanishing Face of Gaia* (London: Allen Lane, 2009), 35–36; Hervé Cottin et al., "Astrobiology and the Possibility of Life on Earth and Elsewhere…," *Space Science Reviews* 209, nos. 1–4 (2017): 1–42.
[261] Adam Frank and Woodruff Sullivan, "A New Empirical Constraint on the Prevalence of Technological Species in the Universe," *Astrobiology* 16, no. 5 (2016): 359–62.

response-ability that keep us within the negative-feedback windows Gaia has improvised across deep time.[262] Such praxis is not reducible to carbon budgeting or species accounting; as we argue, it requires cultivating *kenotic* dispositions attuned to the planet's autopoietic semantics: a radical humility that is both practical and ontological. The moral axiom of inviolability, surfacing in Leopold, Naess, and Taylor, now reveals its *kinetic* dimension: to violate Gaia is, by systemic rebound, to violate ourselves.[263] Yet even the most sophisticated rhetoric of stewardship fails if it secretly inflates the overseer-ego. Only when the subject recognizes itself as a *holobiont*, its mitochondria the lineal descendants of ancient α-proteobacteria, its gut flora whispering metabolic instructions, does humility migrate from sentiment to ontology.[264] In Lovelockian perspective, every breath modulating atmospheric composition is already an ecological intervention; every metabolite excreted into waterways is a geoengineering act writ small. The question is not whether we engineer the planet, but how we might do so in modalities that remain consonant with Gaian cybernetics: modest, recursive, and attuned.

3.2.2.3 Margulisian Deep-Time Intimacies: Symbiogenesis and the Undoing of the Individual

The next descent, from Lovelock's planetary cybernetics into the cellular tumult where evolutionary novelty germinates, is not simply a passage through scale but an ontological deepening. Here, in Margulis's laboratory of the minuscule, the spectacle of life as competitive scramble gives way to a choreography of mergers, incorporations, and symbiotic truces whose tempo is set by eons. Margulis, long before the "selfish gene" became biology's watchword, resurrected and radicalized the old Lamarckian fantasy: that mitochondria and chloroplasts were once free-living bacteria, invaders who, through a dialectic of aggression and accommodation, established permanent residence within larger host cells, becoming in time indispensable organs. She elaborated this into the doctrine of serial endosymbiosis: eukaryotic complexity is not a slow

[262] Lovelock, *The Revenge of Gaia*, 6–7.
[263] Leopold, *A Sand County Almanac*; Naess, "The Shallow and the Deep"; Taylor, "The Ethics of Respect for Nature."
[264] Lynn Margulis, *Symbiotic Planet: A New Look at Evolution* (New York: Basic Books, 1998), 7–17; Scott F. Gilbert, Jan Sapp, and Alfred I. Tauber, "A Symbiotic View of Life: We Have Never Been Individuals," *The Quarterly Review of Biology* 87, no. 4 (2012): 325–41.

accretion of point mutations but a patchwork quilt of once-autonomous organisms, each merger rewriting metabolic possibilities, each symbiotic leap opening new evolutionary corridors.[265]

This was, and remains, an affront to the canonical Neo-Darwinian script, which locates the engine of evolution in random mutation and the competitive winnowing of isolated lineages. Bruce Clarke observes that orthodox neo-Darwinian theorists steadfastly maintained that the eukaryotic cell's complex features, such as nuclei, cilia, and the mitotic spindle, arose through the slow, incremental differentiation of a singular ancestral prokaryote. In striking contrast, Margulis advanced the far more radical thesis that the mitotic spindle did not originate through stepwise internal modification, but is in fact the evolutionary legacy of an invading spirochete: a once-autonomous bacterium whose motility apparatus was appropriated and retooled by its host to orchestrate the choreography of chromosome segregation during cell division.[266] In her schema, competition is not abolished (partners can and do turn predatory), but it is no longer the sole muse of evolutionary innovation. *Symbiogenesis*, in Margulis's hands, discloses evolution as an economy of collaboration: conflict persists, but fertile fraternities generate leaps that brute rivalry alone cannot supply.

3.2.2.3.1 Microbial Machineries and the Fabric of Gaia

Margulis's empiricism was always *corporeal*: she filmed the cellulose-rich forage, densely populated with microbes, passing through a cow's fistula and insisted, in a gesture of Gaian bravado, that "[i]ndeed, the cellulose-degrading microbes, in a very real sense, *are* the cow"[267] This is not metaphor but literal ecological and physiological fact: without their symbionts' enzymes, the ruminant starves; without the cow, the microbes perish; their co-metabolism radiates methane that, at scale, modulates planetary climate. The fence between organism and environment falls: inside and outside are phases in a single biochemical circuit. Margulis's focus on microbial alliances gives the molecular underpinning to Lovelock's global feedbacks: cyanobacteria

[265] Lynn Margulis, *Origin of Eukaryotic Cells* (New Haven: Yale University Press, 1970), 45–68; Margulis, *Symbiotic Planet*, 7–17.
[266] Clarke, "Symbiogenesis," 417–18.
[267] Margulis, *Symbiotic Planet*, 152–53. Emphasis added.

modulated the carbon cycle, termite endosymbionts vent greenhouse gases, and all are brokers in Gaia's regulatory drama.

At this point, Margulis moves beyond Lovelock, whose vision of Gaia risked reifying the planet as a seamlessly unified superorganism. In Margulis's account, Gaia is fractious and its homeostasis is precarious, sustained not by consensus but by the shifting balance of power among countless microbial AAA, sometimes collaborative, often antagonistic. Margulis was among the most incisive critics of Lovelock's "superorganism" metaphor, contending that such imagery obscures the unruly heterogeneity and incessant contestation at the heart of evolution. For her, Gaia is neither a bounded organism nor a harmonious whole; rather, it is the emergent effect of ceaseless interactions among multitudes of living beings, predominantly microbes, none of whom possess any awareness of their participation in planetary self-regulation.[268] This critique sharpens the Gaian frame: planetary regulation appears not as benevolent harmony but as the precarious outcome of ongoing symbiotic and competitive tensions at every scale. Adding further nuance, Stuart Kauffman's theory of self-organization, with its insistence that order emerges "for free" in systems poised at the edge of chaos, dovetails with Margulis: evolution rides the spontaneous propensity of catalytic networks to crystallize complexity, but it is microbial symbiosis that seeds the attractors into which self-organization settles.[269]

3.2.2.3.2 The Holobiont: Undoing the Individual

If the eukaryotic cell is a "confederacy of former competitors," the animal is a *holobiont*: a consortium of mammalian flesh and bacterial, archaeal, fungal, and viral partners that calibrate immunity, digest polysaccharides, and transcribe neuroactive molecule. Proponents of developmental systems theory amplify this point, insisting that what reproduces is not a gene or a body, but rather "a complex of relations, shifting in configuration but showing overall continuity."[270] Symbionts, by this reckoning, are "indispensable resources—essential for typical

[268] Lynn Margulis, *Symbiotic Planet*. See also Margulis, "Gaia Is a Tough Bitch," in John Brockman, ed., *The Third Culture* (New York: Simon and Schuster, 1995), chap. 7.
[269] Stuart Kauffman, *The Origins of Order: Self-Organization and Selection in Evolution* (Oxford: Oxford University Press, 1993), 173–75.
[270] Susan Oyama, *The Ontogeny of Information* (Durham, NC: Duke University Press, 2000), 117.

human development."[271] Haraway's "companion species" and Braidotti's *zoe*-geo-techno assemblage expand this ontological decentering into cultural and technological registers. Human identity, thus, is always already a collaborative emergence: *we have never been individuals*, and so cannot remain the sole measure of ethical worth.[272]

This retooling of selfhood sharpens the conceptual arc of EGS. Where Morton's hyposubject is a psychological contraction (becoming "less than the sum of its parts"), the holobiont is a physiological labyrinth, botanized into trillions of confederates, each bearing its own evolutionary agenda. Here, kenotic humility is not misunderstood as mere moral parochial theatrics but becomes the onto-ethical spine cohering the infra-personal weave of life: a sober recognition that "I" is an emergent property of nested, symbiotic networks, and that cognition is a distributed computation executed by layered alliances such as neuronal, hormonal, microbial, and digital, all embedded within Gaian thermodynamics.

3.2.2.3.3 Sym-Technics: Designing with Microbial Wisdom

The practical horizon of Margulis's symbiogenetic paradigm is not a sentimental longing for some prelapsarian "balance of nature," but a provocative invitation to redesign technics in alignment with the generative intelligence of microbial life. Here, the ambition is not to conserve a static ecosystem, but to cultivate systems of "mutual flourishing," in the sense articulated by Scott Gilbert: an ethic that recognizes evolution itself as a negotiation between hosts and symbionts, and technology as an extension of this negotiation into the anthropic domain.[273]

Within this frame, the subterranean architecture of *mycorrhizal fungi* emerges as a living template for ecological engineering. These vast networks shuttle phosphorus and molecular warning signals between plant roots, thereby stabilizing soils, enhancing plant resilience, and orchestrating resource flows across entire biomes.[274] Their intricate choreography not only inspires new models of regenerative agriculture but also points toward a future in which construction materials are

[271] David S. Moore and Robert Lickliter, "Development as Explanation: Understanding Phenotypic Stability and Variability After the Failure of Genetic Determinism," *Progress in Biophysics and Molecular Biology* 178 (2023): 73.
[272] Donna J. Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008), 41; Braidotti, *Posthuman Knowledge*, 47–49.
[273] Scott F. Gilbert, "Evolutionary Developmental Biology and Sustainability: A Biology of Resilience," *Evolution & Development* 23, no. 3 (2021): 273–91.
[274] Suzanne E. Smith and David J. Read, *Mycorrhizal Symbiosis*, 3rd ed. (London: Academic Press, 2008), 34–38.

grown rather than manufactured: mycelial composites, engineered from fungal filaments and agricultural by-products, offer a blueprint for biodegradable, fire-resistant, and self-repairing structures that blur the boundary between the built and the living.[275] *Mycoremediation*, the deployment of fungi to degrade persistent pollutants, further exemplifies this microbial *savoir-faire*, demonstrating how biotechnics can participate in, rather than disrupt, the metabolic cycles of the biosphere.[276]

Such practices epitomize what EGS propels us to name the *oiko-ethic*: a posture of participation rather than dominion, where human agency is just one negotiator among many within the planetary metabolic commons. This approach stands in radical contrast to mainstream-transhumanist projects, whose Promethean aspirations tend to valorize the enhancement of human capacities at the expense of ecological entanglement. In the Margulisian optic, technological advancement acquires legitimacy only insofar as it enlarges the planetary holobiont, extending flourishing beyond the confines of the anthropoid branch and weaving human artifice back into the planetary symbiotic texture.

Dorion Sagan, anticipating this shift, envisioned future biospheres that will diverge from both humans and machines as radically as humans diverge from bacteria, highlighting a profound evolution in conceptual understandings of individuality and interconnectedness.[277] Teilhard de Chardin's vision of the noosphere, originally conceived as a sphere of human thought enveloping the biosphere, has here been reconceived as what we might call the *Omega+* point, marking an evolutionary threshold in which consciousness, both organic and artificial, ramifies across the biosphere without severing its thermodynamic roots in the Gaian matrix. In contrast to Teilhard de Chardin's anthropocentric teleology, Omega+ point explicitly expands the noospheric project: not only human reason, but also animal cognition, plant intelligence, microbial signaling, and planetary-scale digital networks contribute to Earth's unfolding cognitive architecture. This integrative framework, influenced by posthumanist perspectives, disrupts any ontological

[275] Mitchell Jones et al., "Engineered Mycelium Composite Construction Materials from Fungal Biorefineries: A Critical Review," *Materials & Design* 187 (2020): 108397.
[276] See Paul Stamets, *Mycelium Running: How Mushrooms Can Help Save the World* (Berkeley: Ten Speed Press, 2005); see also Harbhajan Singh, *Mycoremediation: Fungal Bioremediation* (Hoboken, NJ: John Wiley and Sons, 2006), 1–2.
[277] Dorion Sagan, *Biospheres: Metamorphosis of Planet Earth* (New York: McGraw-Hill, 1990), 116.

segregation between the natural and the artificial, and between human and non-human, envisioning instead a *zoe*-geo-techno continuum wherein all forms of intelligence are woven into the regulatory, self-reflexive operations of Gaia itself.[278] The highest vocation of sym-technics, then, is not mastery but co-composition: an *art of living-with*, in which technology is judged by its capacity to deepen the metabolic reciprocity of the living Earth.

3.2.2.3.4 Margulis's Critique of Gaia: Harmony, Conflict, and Evolutionary Ethics

Lovelock's Gaia hypothesis electrified the vision of a self-regulating planet, but it was Margulis who most incisively insisted on the true grammar of that regulation: not harmonious consensus, but ceaseless negotiation, contest, and historical improvisation. The image of Gaia as a smoothly unified "superorganism," Margulis argued, conceals the unruly, conflictual, and often precarious substrate from which planetary homeostasis actually emerges. In her account, Gaia is less a benevolent mother than a hard-nosed negotiator, her equilibrium hammered out in the ongoing churn of microbial alliances and antagonisms.[279] Far from being a single organism, the planet is a polyphony of ecosystems and symbioses, many of them deeply conflictual and continually shifting in their balances of power.[280] This conceptual shift does more than add nuance to the Gaian frame; it sharply critiques any lingering nostalgia for a stable or benevolent "balance of nature." Gaia, as Margulis saw it, is an emergent property of countless historical interactions: predation, parasitism, mutualism, extinction events, where "cooperation" is always provisional and breakdown ever possible. Such a perspective demands that evolutionary and ecological thinking acknowledge the permanent possibility of crisis, transformation, and the creative productivity of conflict.[281]

Margulis's insight recalibrates our ethical bearings in profound ways. Where planetary regulation is precarious, the resulting imperative is not resignation but a vigilant "response-ability," to borrow again Haraway's apt term, anchored in the situated practice of "staying with the trouble" rather than pursuing heroic or technocratic fixes. Response-ability is enacted through practical,

[278] See Teilhard de Chardin, *The Phenomenon of Man*, 268–72. For an expanded posthumanist interpretation of the noosphere and *Omega Point*, see also Braidotti, *Posthuman Knowledge*; F. Baluska and S. Mancuso, "Deep Evolutionary Origins of Neurobiology," *Communicative & Integrative Biology* 2, no. 1 (2009): 60–65; and L. Marino, "Convergence of Complex Cognitive Abilities in Cetaceans and Primates," *Brain, Behavior and Evolution* 59, no. 1–2 (2002): 21–32.
[279] Margulis, "Gaia Is a Tough Bitch," 129–40.
[280] Gilbert et al., "A Symbiotic View of Life," 325–41.
[281] Margulis, "Gaia Is a Tough Bitch," 129–40.

networked interventions: methane exhaled by ruminants, for instance, can under alternative husbandry be captured for energy; coral microbiomes, when inoculated with thermotolerant strains, may be buffered against bleaching; soil fungi, protected from plough and glyphosate, are able to sequester carbon and confer drought resistance.[282] These examples do not illustrate human mastery, but rather a modest bargaining with the multiscalar agencies that maintain planetary habitability.

In sum, Margulis's critique demands a planetary ethics attuned not to equilibrium, but to the resilience and adaptive intelligence that arise from dynamic, often fraught, negotiations. Such an ethics recognizes that to "care for Gaia" is to participate in her *multiplicity*—never as an overseer, but as one agent among trillions, always embedded in a world whose self-regulation is neither guaranteed nor serenely harmonious, but perpetually under construction.

3.2.2.3.5 Synthesis: The Deep-Time Ethics of EGS

Margulis's radical revision of Gaia is less an embellishment than a recalibration: she grounds planetary self-regulation in the rough diplomacy of microbes, revealing the dynamic contingencies beneath the surface of homeostasis. In the composite vision of EGS, Morton delivers the phenomenological disorientation required to rethink subjectivity beyond the human; Lovelock constructs the cybernetic architecture of planetary feedback; and Margulis provides both the molecular infrastructure and the critical correction that keeps the theory honest. What emerges is an imperative to redesign ethics, politics, and technics as collaborative enterprises within an evolutionary commons, where participation is never innocent, and agency is irreducibly distributed. Earth is not a single living organism in any reassuring sense, but a ceaselessly negotiated web of co-evolving AAA, microbial and mammalian, whose transient equilibria sustain the possibility of meaning, responsibility, and response-ability across deep time.

[282] For an elaboration of the concept and praxis of "response-ability," see Haraway, *Staying with the Trouble*. For a leading example of applied "assisted evolution" aimed at increasing coral reef resilience to thermal stress, see Madeleine J. H. van Oppen et al., "Building Coral Reef Resilience Through Assisted Evolution," *Proceedings of the National Academy of Sciences* 112, no. 8 (2015): 2307–13.

3.2.2.4 Kenosubjectivity: Eco-Theoretical Unfoldings

Having traversed the conceptual contours of EGS, the argument now turns to a critical yet nuanced innovation: the *kenosubject* (kenotic subject). This figure arises not simply as a refinement of earlier conceptual models, but as a fundamental reorientation at the intersection of theology, philosophy, and ecological ethics. Theological kenosis, first articulated by Paul in his epistle to the Philippians (2:7), describes the divine self-emptying of Christ (ἑαυτὸν ἐκένωσεν), a relinquishment of privileged, divine status in order to embrace vulnerability, servitude, and mortal existence. While deeply rooted in Christian tradition, *kenosis*, as invoked here, transcends its confessional origins and resonates with a broader, secular metaphysics of humility. It is essential to grasp kenosis in its full depth, not as mere humility, but as *ontological generosity*: a radical, deliberate, epistemological, and existential "emptying" that enables others, both human and non-human, to manifest more fully in their singular and irreducible difference.[283]

When juxtaposed with Morton's notion of *hyposubjectivity*, the kenotic subject pushes the philosophical stakes further. The hyposubject, a figure poignantly captured in Morton and Boyer's collaborative reflections, undergoes an initial diminishment, becoming "less than the sum of its parts" in the face of hyperobjects.[284] By contrast, kenosubject radicalizes this decentering by voluntarily embracing self-emptying, a gesture transcending the mere recognition of relational dependency. It demands an *active* surrender, the intentional abdication of anthropocentric privilege, and the release of epistemic dominance. In doing so, it transforms the passive subscendence of Morton's hyposubject into an active, ethical stance, a reflective praxis of humility and responsive coexistence.[285] This intentional self-emptying does not aim at dissolution or passive disappearance; rather, it evokes Heidegger's *Gelassenheit*, a "letting-be" that involves a profound openness to being's self-disclosure.[286] Here kenosis intersects deeply with Heideggerian

[283] For the classical theological articulation and influential contemporary developments of the concept of kenosis, see John D. Caputo, *The Weakness of God: A Theology of the Event* (Bloomington: Indiana University Press, 2006), esp. 66–72 for a recent overview with implications for ecological thought; see also Sarah Coakley, *Powers and Submissions: Spirituality, Philosophy and Gender* (Oxford: Blackwell, 2002), chap. 4, "Kenosis and Subversion"; von Balthasar, *Mysterium Paschale*, esp. 112–22; Jürgen Moltmann, *The Crucified God* (Minneapolis: Fortress Press, 1993), 276–83.
[284] Morton and Boyer, *Hyposubjects*, 14–15.
[285] Simone Weil, *Gravity and Grace* (London: Routledge, 2002), 77–79.
[286] Martin Heidegger, *Discourse on Thinking*, trans. John M. Anderson and E. Hans Freund (New York: Harper and Row, 1966), 54.

thought, promoting an openness to the self-revelation of ecological and planetary beings: a willingness to listen to the murmurs of ecosystems, microbiomes, and geophysical rhythms. Thus, kenosis becomes the ethical practice par excellence in the Anthropocene: to release control, to refuse dominion, and to cultivate an ethos of listening rather than imposing. Moreover, in refining our understanding of EGS through kenosis, we directly critique the traditional Western ontological position that locates subjectivity at the apex of being and knowing. Here, the Baradian concept of the "agential cut," to be elaborated in the subsequent analysis, provides crucial theoretical insight. Barad persuasively argues that entities and their boundaries emerge through intra-actions, not prior to them.[287] Kenotic practice relocates the cut; it removes the human subject from its presumptive centrality, creating a generative space in which the relational ontology of agential realism can fully operate. This withdrawal allows previously silent voices, whether ecological, microbial, or cosmic, to become articulate not merely through human translation but by virtue of their own intrinsic communicative modes.

Importantly, this nuanced conception of kenosis enhances rather than replaces CWA's posthuman diplomacy. Where CWA pursued inclusion through the multiplication of representational platforms for non-human entities, kenosis provides the essential prior move—an emptying of human representational sovereignty. It softens the anthropocentric echo chamber, thus making room for an authentic polyphony of ecological expression. In this sense, kenosis serves as an indispensable ethical and ontological precursor to CWA's diplomatic assemblages, fostering conditions in which diplomacy is not a human orchestration but rather a collective improvisation: fluid, participatory, and genuinely reciprocal. This alignment between theological self-emptying, philosophical openness, and ecological humility profoundly reshapes contemporary ethical imperatives. It displaces dominant modes of stewardship and conservation, which often subtly re-inscribe anthropocentric control under the guise of benevolence. Instead, kenosis insists on an ethics that recognizes humanity as inherently relational, inherently incomplete without the multiform others (fungal, microbial, atmospheric, planetary), whose agencies and histories have always been formatively linked to human becoming. In ecotheological terms, the kenotic

[287] Barad, *Meeting the Universe Halfway*, 139–40.

imperative echoes Dietrich Bonhoeffer's "Sein-für-andere" ("being-for-the-other"), extending this ethic radically beyond the inter-human to encompass the entire Earth community.[288]

Ultimately, the kenotic subject constitutes the conceptual apex of Eco-Gaian thought: it articulates the conditions under which human agency becomes consonant, rather than dissonant, with planetary agency. In embracing kenosis, subjectivity becomes a resonant cavity through which Gaian processes echo, articulate themselves, and enter into genuine dialogue with human consciousness. This radical eco-ethico-philosophical openness situates kenosubjectivity as both a critical intervention in, and a transformative evolution beyond, previous posthuman paradigms. The intellectual richness of this move lies precisely in its paradoxical strength through emptiness, its potent advocacy through intentional passivity, and its ethical dynamism through radical humility.

3.2.2.5 From Kenotic Earthliness to the Cosmo-Relational Horizon

Eco-Gaian Subjectivity thus culminates not in a sanctuary of equilibrium, but in the sobering apprehension that every locus of life and thought is implicated in planetary negotiations whose amplitudes, tempos, and contingencies perpetually elude comprehension or command. The kenosubject, far from presiding as a prince over domains of harmony or order, emerges as an exposed relay—simultaneously animated and unsettled by metabolic circulations, microbial ancestries, and geophysical oscillations whose logic remains resistant to domestication or final deciphering. To inhabit such a subject-position is not to seek reconciliation or synthesis, but to dwell with cultivated humility amid the frictions and generative dissonances that traverse the stratified topologies of Earthly *co-becoming*. Here, ethics forfeits the innocence of its intentions, becoming entangled in the radical contingency and incessant unfinishedness that characterize the planetary manifold. Responsibility, within this horizon, can no longer be claimed for the whole, but only for the *cut*: for the precise articulations through which every gesture of care, withdrawal, or intervention reverberates across systems whose intelligibility is always partial, always provisional. Such is the deep-time ethic of EGS: a discipline not of arrival, but of perpetual risk,

[288] Dietrich Bonhoeffer, *Ethics*, trans. Neville Horton Smith (New York: Simon and Schuster, 1995), 220–26; see also the original German: *Ethik* (Munich: Chr. Kaiser Verlag, 1949), 72–78.

recalibration, and self-unmaking, where the privilege of thought is inseparable from its constitutive exposure to what it cannot domesticate and can scarcely anticipate.

3.2.3 P1c: Entangled Becomings—P-Subjectivity as the Cosmo-Relational 'Queer'

3.2.3.1 From Eco-Gaian Contingency to Quantum Subjectivity: Relational Ontologies and the Dissolution of Classical Selfhood

The argument has travelled from Morton's disarticulation of the transcendental ego to Lovelock's cybernetic Earth and Margulis's microbial diplomacy, finally passing through a kenotic narrowing that rendered the self a resonant cavity within planetary process. Yet even that thinning retained an unspoken confidence in the classical solidity of matter. The next turn therefore requires a sharper relinquishment: if subjectivity is truly to inhabit the mesh of causes that sustain it, it must reckon with the ontological restlessness discovered in the quantum register.

Barad's agential realism supplies the necessary framework. Her pivotal claim, that entities do not pre-exist their relations but crystallize through intra-actions, unmoors the last anchorage of discrete identity.[289] The electron is exemplary: until measurement, it is not somewhere awaiting discovery, but a dispersed potential, its "where" emerging in negotiation between apparatus and phenomenon. In this sense, realism is preserved, but it is a *realism of effects* rather than of self-contained things.[290] This perspective instantly amplifies the ethical stakes already foregrounded in Eco-Gaian thought. If even subatomic trajectories are co-authored, then responsibility extends to the smallest discernible scale; every cut that stabilizes phenomena is simultaneously a partition and a suturing: a process that, as Barad describes in her notion of "cutting-together/apart," holds that acts of differentiation are inseparable from acts of connection, such that those who enact the cut are inevitably implicated in the realities they help to produce.[291]

The consequence for posthuman subjectivity is momentous. In the Eco-Gaian frame the self discovered its contingency amid atmospheric feedbacks and symbiotic alliances; under quantum diffraction it discovers that contingency extends to the very matrix of existence: time, location,

[289] Lis Højgaard, Malou Juelskjaer, and Dorte Marie Søndergaard, "The 'WHAT OF' and the 'WHAT IF' of Agential Realism," *Kvinder, Køn & Forskning* 1–2 (2012): 67.
[290] Barad, *Meeting the Universe Halfway*, 138–39.
[291] Karen Barad, "Diffracting Diffraction: Cutting Together-Apart," *Parallax* 20, no. 3 (2014): 178.

even causation become statistical rumors rather than axiomatic certainties. Barad names this pervasive looseness *nature's queer performativity*, stressing that "queer" here signals not a sociological minority position but the refusal of matter to hold a single pose.[292] The lightning bolt that zigzags between cloud and earth, the stingray's electro-sensory epithelia, the shape-shifting dinoflagellate that haunts estuarine waters: all bear witness to an ontology in which categorical borders flicker and blur.[293]

Zurek's articulation of decoherence advances this argument by exposing the negotiated character of classical stability itself. What appears as solidity is, on closer inspection, an emergent outcome of environmental selection, what he terms "environment-induced superselection," or *einselection*, whereby the cosmos, in its ceaseless intra-action, selectively preserves only those quantum states robust enough to persist under continual environmental scrutiny.[294] Stability, then, is not the vestige of a primordial order, but a precarious accommodation: a temporary consensus within a deeper sea of probabilistic potentialities. In the quantum domain, definitive closure remains perpetually out of reach; any instance of apparent stability is purchased by relegating innumerable alternative possibilities, each one suspended on the cusp of becoming real.

This quantum revision compels a new analytic of subjectivity. In this setting, Haraway's concept of *response-ability* must itself be diffracted: no longer just a call to ecological care or interspecies sensitivity, it becomes a cultivated discipline of intra-active discernment, a rigorous training in recognizing that every action, every "cut," is both a stabilization and a foreclosure, shaping not only what comes to matter but also what is rendered imperceptible.[295] Response-ability, as recast here, names the difficult craft of attending to the ways agency is distributed through iterative couplings across scales, and of developing an ethical stamina that neither rushes to mastery nor dissolves into passivity. The demand is for a reflexivity equal to the ontological stakes: an attunement to the multiplicity of worlds made and unmade by our situated interventions, and a readiness to account for the exclusions that such interventions necessarily entail.

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[292] Karen Barad, "Nature's Queer Performativity," *Qui Parle* 19, no. 2 (2011): 126.
[293] Ibid., 127–29.
[294] Wojciech H. Zurek, "Decoherence, Einselection, and the Quantum Origins of the Classical," *Reviews of Modern Physics* 75, no. 3 (2003): 715–18.
[295] Haraway, *When Species Meet*, 42–45.

Stengers's injunction to begin in hesitation is, in this context, more than mere epistemic caution; it is a methodological discipline at the heart of quantum-Gaian subjectivity.[296] Slow science, as she conceives it, resists the violence of premature closure and instrumental haste.[297] Instead, it calls for an experimental hospitality, a patience that grants phenomena their own rhythms, their singular durations, and the dignity of articulating themselves without subordination to inherited conceptual schemas. Such hesitation is not stasis, but the cultivation of conceptual stamina: a willingness to endure ambiguity, to linger in the indeterminacies of becoming, and to refuse the anesthetic comforts of ontological certitude.[298] This ethic of indeterminacy is given further philosophical force by Vattimo's "weak thought" and Keller's explorations of the "cloud of the impossible." Vattimo urges a strategic weakening of metaphysical muscle, not as resignation but as a positive capacity for remaining with the unsettled and the provisional;[299] it is in such intellectual softness that solidarity with the emergent, the vulnerable, and the not-yet-thought becomes possible. Keller's cloud, meanwhile, marks the atmosphere in which this kind of thought can breathe: a space where the as-yet-unthinkable is allowed room to gestate, and where the boundaries of the possible are softened enough to let the impossible flicker at the edges of articulation.[300] Here, strength is reimagined as the courage to loosen the grip of mastery, to court the risk of uncertainty, and to inhabit the porous edges of the world's continuous self-surpassing.

Subjectivity that traverses this analytic finds its most refined expression as *Cosmo-Relational Queer* (CRQ). CRQ is not a capitulation to chaos nor a melancholic dissolution of the self, but a rigorous apprenticeship to complexity: a mode of being that honors the partial, the porous, and the provisional. Every identity is understood as a diffraction pattern: a co-authored phenomenon, dynamically composed across scales by the interplay of electrons, microbes, ecosystems, and semiotic articulations. To dwell as CRQ is to practice an ethics and epistemology tuned to the generativity of indeterminacy, to accept complexity not as a deficit to be overcome, but as the

[296] Isabelle Stengers, *In Catastrophic Times*, 11–22.
[297] See Isabelle Stengers, *Another Science is Possible: A Manifesto for Slow Science* (Cambridge: Polity Press, 2018).
[298] Stengers, *In Catastrophic Times*, 14.
[299] Gianni Vattimo and John D. Caputo, *After the Death of God* (New York: Columbia University Press, 2007), 46–52.
[300] Catherine Keller, *Cloud of the Impossible* (New York: Columbia University Press, 2014), 3–10.

principal condition for responsive and responsible co-existence within a world always on the verge of becoming otherwise.

3.2.3.2 Diffractive Methodologies: Reconfiguring Knowledge, Innovation, and Governance

The cosmological dilation effected by Barad is not a mere theoretical flourish; it demands a wholesale retooling of how knowledge is produced, how technologies are constructed, and how collective life is governed. CRQ thus enters the scene less as a descriptive label than as a programmatic imperative for practice. Since reality itself is articulated through *intra-action*, any method that presumes a stable, external "object" is already misaligned. The first methodological obligation of CRQ is, therefore, *diffractive*: scholarship, policy, and design must be conceived as experiments that record the transformations they themselves bring about.[301] Rather than the mirror metaphor of reflection, so long the epistemic emblem of modernity, diffraction foregrounds the interference patterns that knowledge-acts generate, turning these patterns into data rather than dismissing them as noise.[302] A university laboratory, a citizen-science wetlands observatory, even a classroom discussion, become occasions for tracing how questions, instruments, and observers jointly cut the world together/apart.

Such reflexivity transforms education from content delivery to a choreography of agential cuts. Students must be guided to recognize that tools such as satellite sensors, statistical algorithms, and policy dashboards do not neutrally reflect the atmosphere; rather, they actively mediate and define what aspects of atmospheric reality are rendered knowable, measurable, and actionable. Thus, the educational choreography becomes one of cultivating awareness of how scientific practices and technologies participate in the production of the very phenomena they purport to represent.[303] Only then can learners grasp response-ability as more than moral exhortation: it becomes the technical art of selecting the cut that will least impoverish the pluriverse. Sofie Sauzet's pedagogical experiments with feminist materialism exemplify this approach, inviting students to "think through

[301] Barad, *Meeting the Universe Halfway*, 88–91.
[302] Barad, "Diffracting Diffraction," 170–73.
[303] Højgaard, Juelskjaer, and Søndergaard, "The 'WHAT OF' and the 'WHAT IF' of Agential Realism," 64–68.

picturing," so that visual artefacts become partners in thought rather than neutral carriers of information.[304]

A second implication is technological. If identity and agency are always coalitionary, the prime criterion for innovation shifts from efficiency to *sympoiesis*: the capacity of a device or protocol to enter into generative alliances. Mycelial composites grown for structural panels already manifest this logic: they borrow fungal metabolism to convert agricultural detritus into lightweight, self-healing skins, folding the built environment back into ecological nutrient loops.[305] Likewise, the assisted evolution of coral holobionts uses thermotolerant symbionts to prepare reefs for warmer seas—an intervention that honors the polyphonic identity of the coral rather than reducing it to a single species to be "fixed."[306] CRQ interprets such projects not as anthropocentric rescue fantasies, but as careful repositionings within an ecology of agencies that always exceed human foresight.

At the level of political reasoning, CRQ endorses what Stengers calls *slow science*: an insistence that governance must pace itself to the phenomena it seeks to manage.[307] When wetlands are zoned for carbon offsets, for example, the timescale of bureaucratic reporting rarely matches the hydraulic pulse of the marsh. Slow science demands iterative monitoring such as open-access sensors, community interpretation, reversible zoning, so that policy remains corrigible by the very wetlands it aims to stabilize. The sensibility here echoes Zurek's insight that classical order is a fragile outcome of incessant environmental "measurement"; the polity, too, must remain a *porous* apparatus, continuously re-entangled with the systems it regulates.[308]

Margulis's theory of symbiogenesis offers more than a metaphorical parallel to quantum entanglement; it establishes a methodological precedent for CRQ's expanded ontology. If, as developmental systems theorists contend, reproduction is best understood as the iterative re-patterning of relational constellations, rather than the simple replication of self-contained

[304] Sofie Sauzet, "Thinking Through Picturing," in P. Hinton and P. Treusch, *Teaching with Feminist Materialisms* (AtGender, 2015), 37–52.
[305] Jones et al., "Engineered Mycelium Composite," 108397.
[306] van Oppen et al., "Building Coral Reef Resilience," 2307–13.
[307] Stengers, *In Catastrophic Times*, 11–22.
[308] Zurek, "Decoherence," 715–18.

organisms,[309] then CRQ's analytic must similarly foreground the ongoing negotiation and reconfiguration of subjectivity. Symbionts, in this light, become not merely biological facts but paradigmatic figures: their indispensability to human development[310] signals the necessity of conceiving identity and agency as coalitionary, contingent, and always in the process of being reconstituted. Read through Barad, such statements indicate that the human infant is born not only unfinished but diffusely constituted; gut microbes, tactile surfaces, linguistic rhythms—all participate in the agential cuts that precipitate a person. CRQ thus politicizes infancy itself, obliging public health, architecture, and digital design to consider how their infrastructures will diffract emergent subjectivities.

This reconceptualization also revises the stakes of *queerness*. Because queerness designates the refusal of identity to congeal, it does not merely include LGBTQ+ experience; it stretches sexuality, kinship, and affiliation into speculative zones where categories are continually unsettled and boundaries destabilized. In these emergent domains, entities as diverse as anemone polyps, latex polymers, and machine-learning algorithms may all be implicated as co-parents or partners in novel relational configurations. This is not simply an expansion of who counts as kin, but a fundamental reimagining of what forms of agency and affiliation are possible in worlds marked by ontological multiplicity and indeterminacy. Schrader's example of the toxic dinoflagellate Pfiesteria underscores the point in dramatic fashion: its protean life cycle resists fixed species designation, forcing legal and regulatory bodies to shift focus from the protection of discrete species to the dynamic management of habitats—what might be called a choreography of environmental possibility.[311] In CRQ terms, queerness is the strategic acceptance that every stable form, whether legal, biological, or digital, will be punctured by the very indeterminacy that sustains life at the quantum scale. What emerges is an ethics neither private nor heroic, but *coalitional*: judged by the resilience and inventiveness of the assemblages it enables. To nurture CRQ is to cultivate institutions capable of holding space for indeterminacy without lapsing into paralysis. It is legislative diffraction, infrastructural symbiosis, pedagogical hesitation, technological humility, all practiced in full awareness that the world is ongoingly cut

[309] Oyama, *Ontogeny of Information*, 117.
[310] Moore and Lickliter, "Development as Explanation," 73–77.
[311] Astrid Schrader, "Responding to Pfiesteria piscicida: Phantomatic Ontologies, Indeterminacy, and Responsibility in Toxic Microbiology," *Social Studies of Science* 40, no. 2 (2010): 275–306.

together/apart. Only under such conditions can the next phase of posthuman vocation, *entangled governance*, be approached without surrendering to either managerial hubris or apocalyptic despair.

3.2.3.3 Ontological Cuts and Ethical Response: The Politics of Indeterminacy and Distributed Agency

Barad's *agential realism* does not merely gesture at connectivity; rather, it radically unsettles the metaphysical presupposition that entities can exist in isolation, awaiting subsequent connection. In her framework, phenomena are ontologically prior to entities, and *intra-action* is antecedent to action itself: the universe is a flux of relational events, within which provisional boundaries only ever momentarily emerge.[312] An electron traversing the double-slit experiment is neither particle nor wave until a specific material-discursive apparatus renders one potential actual and consigns countless alternatives to the realm of the "might-have-been."[313] Each measurement constitutes what Barad terms an "agential cut": a material-discursive event that enacts both the facticity of what is and the exclusion of what could have been. Ontology, here, is irreducibly *queer*: it resists the closure of identities, perpetually vibrating with the unresolved promise and threat of the otherwise.

Quantum indeterminacy, in this view, is not an arcane property of microphysics but a structural feature of reality. Zurek's account of *decoherence* demonstrates that even the classical regularities on which social and scientific life depend are sculpted by a relentless environmental "monitoring" of quantum systems, rendering every apparent stability a contingent achievement.[314] Barad's notion of "cutting-together/apart" encapsulates this paradox: differentiation and entanglement are inseparable, every incision into the real also a binding of the terms it divides.[315] In Foucault's terms, knowledge is indeed "made for cutting,"[316] but here the scalpel never truly leaves the tissue it modifies.

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[312] Barad, *Meeting the Universe Halfway*, 139.
[313] Niels Bohr, "Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?" *Physical Review* 48, no. 8 (1935): 697; Barad, *Meeting the Universe Halfway*, 250–52.
[314] Zurek, "Decoherence," 727–35.
[315] Barad, "Diffracting Diffraction," 178.
[316] Michel Foucault, "Nietzsche, Genealogy, History," in *The Foucault Reader*, ed. Paul Rabinow (New York: Pantheon, 1984), 88.

Accepting this *ontoqueerness* compels a reconceptualization of subjectivity. The Eco-Gaian moment displaced the sovereign, liberal self with the *holobiont*: subjectivity as a metabolic consortium rather than a sovereign monad. The CRQ perspective extends this further: quantum entanglement reveals even that consortium to be a statistical phenomenon, its coherence sustained only by the iterative "readings" of myriad human and non-human witnesses. Agency, in this model, is not individuated but distributive, inhering in processes of "doing/being in intra-activity."[317] Ethical responsibility thus transforms: response-ability becomes not a matter of external audit but an internalized readiness to answer for the exclusions upon which any coherence depends.[318]

This ethic demands institutional forms capable of living with, and through, uncertainty. In CRISPR agriculture, for example, the insertion of a gene for heat resistance does not merely alter a plant but repositions entire biocultural assemblages: soil ecologies, insurance regimes, trade networks, and gut microbiomes. Risk assessment here must take the form of "diffraction mapping," tracing how each intervention reverberates through an unpredictable web of interdependencies. Regulatory experimentation must therefore remain reversible and corrigible, attuned to cycles of fungal growth as much as to the rhythms of citizen participation, a practice resonant with Stengers's call for "slow science" and Margulis's vision of the crop as symbiotic parliament.[319]

Digital infrastructures demand analogous humility. An algorithmic credit score, for instance, is not a neutral metric but a quantum-classical apparatus: each invocation collapses a superposition of futures (loans granted, communities redlined, destinies shaped) into a singular historical trajectory. CRQ governance thus requires "entanglement ledgers": transparent, contestable records of how each computational decision ripples across social and ecological domains. Here, Vattimo's "weak thought" legitimates *infrastructural revisability* as a philosophical principle; only systems designed to be revisable can adequately respond to a reality where all closure is provisional.[320] Even as quantum-secure ledgers are advanced as technical solutions, Keller cautions that technical opacity must not substitute for a civic literacy of uncertainty, lest power simply retreat into black-box inscrutability.[321] Moreover, art and aesthetic practice play a vital pedagogical role in

[317] Barad, "Posthuman Performativity," *Signs* 28, no. 3 (2003): 827.
[318] Haraway, *When Species Meet*, 42–45.
[319] Stengers, *In Catastrophic Times*, 19–20; Margulis, *Symbiotic Planet*, 152–53.
[320] Vattimo and Caputo, *After the Death of God*, 46–52.
[321] Keller, *Cloud of the Impossible*, 3–10.

acclimatizing us to these ontological and ethical conditions. Tomas Saraceno's fossil-free Aerocene sculptures, which drift along atmospheric gradients, compel their audience into an embodied recognition of contingency and interdependence.[322] Similarly, Anicka Yi's microbial aerogels disrupt the sterile air of gallery spaces, enfolding visitors in multispecies ecologies.[323] Such works do not merely represent entanglement; they enact agential cuts, inviting participants to inhabit the very circuits of mattering that theory describes. In this way, CRQ reframes aesthetics as experimental ethics: a rehearsal space for the somatic and conceptual habits necessary for slow science and weak governance. Ultimately, CRQ retools posthumanism itself: coherence is no longer a static achievement but a leasehold, purchased through ongoing attentiveness to the excluded and the emergent. Biotechnics, algorithms, and rituals must all be reinvented as porous apparatuses, their efficacy measured not by stability alone but by their responsiveness to turbulence and difference. To practice CRQ is to inhabit, without nostalgia or anxiety, the undulations of a universe that invents itself anew with every cut.

3.2.3.4 Beyond Relationality: Cosmo-Relational Queer and the Object-Realist Turn

If CRQ subjectivity emerges from the abandonment of anthropocentric and classical metaphysics, its ultimate vocation is not exhausted by the affirmation of ontological indeterminacy or by an endless negotiation of relationality. CRQ stands as a rigorous apprenticeship in *worlding*, a discipline of remaining with the turbulence of becoming, where every stabilization of identity is recognized as a provisional diffraction within a cosmos that never settles. At its core, CRQ reconfigures subjectivity as a mode of attunement to alterity, an ethic of response-ability that is fundamentally kenotic: an ongoing practice of relinquishing mastery, holding space for the excluded, and cultivating a vigilance toward the shadow-side of every cut that constitutes coherence.[324]

However, in the very rigor with which CRQ inhabits the hiatus between determination and indeterminacy, its limitations are revealed. The diffractive subject, perpetually unsettled and responsive, is shaped by the demand to stay open to the more-than-human, to negotiate its own

[322] Tomas Saraceno, *Aerocene* project, accessed June 25, 2025, https://aerocene.org/.
[323] Anicka Yi, *You Can Call Me F*, exhibition at *The Kitchen*, New York, 2015; Andrea K. Scott, "Scent of a Woman," *The New Yorker*, April 3, 2015, https://www.newyorker.com/culture/culture-desk/scent-of-a-woman.
[324] Barad, *Meeting the Universe Halfway*, 138-40; Haraway, *When Species Meet*, 42-45.

coherence within an environment of distributed agency and ontological excess.[325] Still, as the boundaries of relational thinking are pressed ever further, a new question surfaces: can the mesh of intra-actions, no matter how plurally conceived, account for the surplus of reality that resists every relational capture? For all its sophistication, CRQ cannot dissolve the residue of objectual alterity—the recalcitrance of things that persist beyond the span of any given network or assemblage.[326] It is precisely at this juncture that the turn toward Object-Realist Subjectivity becomes philosophically exigent. The CRQ subject, disciplined by its apprenticeship to complexity, is uniquely positioned to recognize the limits of relational ontologies, encountered whenever the withdrawal, opacity, or autonomy of objects interrupts even the most capacious diffractive embrace.[327] This interruption is not a failure of CRQ, but its logical extension: the ethical demand to attend not only to what is co-constituted, but to what remains inassimilable, withdrawn, and recalcitrant. The real, in this sense, exceeds all modalities of relational becoming, not by abolishing the work of relation, but by insisting on a supplementary dimension irreducible to intra-action.[328]

Thus, the legacy of Cosmo-Relational Queer is to prepare the ground for an encounter with object-reality on its own terms: a philosophical pivot that neither negates the achievements of relational thinking nor retreats into classical substantialism. Rather, it opens a generative tension between the responsibilities of entanglement and the dignity of the withdrawn, between the ethics of co-becoming and the ontological humility demanded by a world whose depths can never be fully exhausted by thought, practice, or collective negotiation. Only by traversing the full trajectory of CRQ does the necessity of Object-Realist Subjectivity emerge: not as a repudiation of diffractive ontology, but as its critical inheritor, compelled to think, and to dwell with, the inexhaustible alterity of things.[329]

[325] Barad, "Diffracting Diffraction," 176-78; Højgaard, Juelskjaer, and Søndergaard, "The 'WHAT OF' and the 'WHAT IF' of Agential Realism," 67–69.
[326] Graham Harman, *Object-Oriented Ontology: A New Theory of Everything* (London: Pelican Books, 2018), 33–44.
[327] Meillassoux, *After Finitude*, 15–16; Bryant, *The Democracy of Objects*, 19–21.
[328] Harman, *Object-Oriented Ontology*, 12; Bryant, *The Democracy of Objects*, 18–20.
[329] Vattimo and Caputo, *After the Death of God*, 46–52.

3.2.4 P1d: Object-Realist Subjectivity

3.2.4.1 Ontological Withdrawal and Machinic Capacity: The Dynamic Dialectic of Objectal Agency

The preceding analyses have demonstrated that any plausible account of subject-formation in the post-correlationist register must begin with the *autonomy of objects*: an autonomy not only anterior to, but exceeding, human apprehension. However, simply stating this thesis does not exhaust its consequences. The key question that follows is how a perspective so centered on objects might reshape our basic understanding of subjectivity itself. This section accordingly proceeds not by offering a premature synthesis, but by staging a sustained and generative tension between a constellation of principal interlocutors, each advancing a distinct claim about objects and their role in subject-formation. Harman's ontological withdrawal, Bryant's machinic capacity, Meillassoux's vertiginous contingency, Deleuze and Guattari's (D&G) morphodynamic grammar (as extended by DeLanda), and Ortega y Gasset's speculative aesthetics together map a landscape in which the object is never a passive datum, nor the subject a sovereign interiority. The concepts of stratification, deterritorialization, and the Body without Organs (BwO) already cast their shadow here, prefiguring the critical maneuvers to come. Rather than resolve these tensions, the argument insists on their productive friction; it is precisely through the sharpening, rather than smoothing, of these theoretical edges that *Object-Realist Subjectivity* (ORS) emerges as an operative concept.

3.2.4.1.1 Withdrawal versus Capacity

Harman's doctrine of *Entzug* (withdrawal) is explicitly adapted from Heidegger's concept, but Harman radicalizes it for his own realist ontology. For him, every real entity possesses a core that remains irreducible to all relations, a depth always in excess of its manifestations.[330] Drawing on Heidegger's notion that the being of things is never fully accessible, Harman insists that objects permanently withdraw from access, not just from human subjectivity, but from all other objects as

[330] Harman, *Object-Oriented Ontology*, 14–17.

well.[331] This irreducible privacy or opacity of objects constitutes, in this view, the foundation of object-oriented ontology.

However, this position is not without its challenges. Bryant's rejoinder is crucial: if this privacy is taken in isolation, it risks sliding into a monadism where objects become inert, incapable of agency. Bryant argues that objects are never mute; instead, they are engines of transformation, absorbing and re-emitting flows, and capable of being reconfigured within new assemblages without being exhausted by any particular relation.[332] The resulting dialectic is not simply a contrast between hidden depth and manifest surface. Bryant maintains that *withdrawal* is precisely what makes machinic excess possible. Since objects are never fully actualized in any relation, they can always be drawn into unforeseen assemblages. For instance, the quartz chronometer's accuracy, first serving naval coordination, can later regulate a micro-grid, because its essence was never simply its first use. Thus, for Bryant, capacity is not the opposite of withdrawal but its amplification.[333]

Harman acknowledges the value of this expansion, but continues to insist on the opacity of objects even within machinic circuits. Every mediation or emission is, for Harman, always through the "sensual façade": the chronometer's tick for the lithium-ion battery, as for the fleet, is only ever an interface, never the core essence.[334] Bryant, however, sees this mediation as generative, drawing new machines into alignment and multiplying possible subjectivities within infrastructural networks.[335] What emerges from this exchange is neither the sovereign interiority of the classical subject, nor the accidental residue of a flat ontology. Rather, subjectivity in the register of ORS is a metastable rhythm: always negotiated between the withdrawn depths of objects and their machinic actualizations.[336]

[331] Graham Harman, *Tool-Being: Heidegger and the Metaphysics of Objects* (Peru, IL: Open Court, 2002), 6–7, 163–66.
[332] Bryant, *Democracy of Objects*, 23–30.
[333] Ibid.; see also Harman, *Object-Oriented Ontology*, 65–68.
[334] Graham Harman, "On Vicarious Causation," in *Collapse: Philosophical Research and Development II*, ed. Robin Mackay (Falmouth: Urbanomic, 2007), 190–200.
[335] Levy R. Bryant, *Onto-Cartographies: An Ontology of Machines and Media* (Edinburgh: Edinburgh University Press, 2014), 44–52.
[336] Bryant, *Democracy of Objects*, 279–87.

3.2.4.1.2 Factiality and the Time of Assemblage

Once the preceding exchange has established the immediate dynamics of ORS, specifically the relation between withdrawal and capacity, Quentin Meillassoux prompts us to broaden the discussion by situating it within the temporal vastness of deep time. His well-known "arche-fossil" argument, which turns to radiometric data from epochs preceding any possibility of life or consciousness, compels both Harman and Bryant to acknowledge a world in which machinic operations and sensual appearances unfold independently of human cognition or presence.[337] In this light, the object is not simply prior to the subject; it grounds a cosmos where the human is a provisional effect, a passing eddy in an order that is itself never fully determined or assured.

The most far-reaching aspect of Meillassoux's intervention, however, is his concept of *facticité*, that is, the necessity of contingency itself. Here, not even the most stable features of physical reality are guaranteed; the very constants of physics may be subject to abrupt and unpredictable change.[338] No assemblage, regardless of its complexity or historical persistence, enjoys any secure ontological warranty. In this framework, what we call "law" is stripped of its finality; it becomes, at best, a locally and temporarily stabilized configuration, always exposed to the possibility of sudden disruption. For Bryant, this principle of radical contingency is emancipatory. He reads it as a vindication of "machinic democracy," the notion that the powers of things are always in excess of any overarching metaphysical order, and sees Meillassoux's argument as an intensification of a long-standing resistance to metaphysical hierarchy. Harman, in contrast, offers a more reserved response. Although he accepts the contingency of natural laws, he cautions against conflating this with unending or chaotic flux. In Harman's view, reality is not simply a Heraclitean river of perpetual change; rather, it is a domain punctuated by the continual possibility of interruption, where each object's retreat ensures its resistance to full subsumption under any law or relation.[339]

At this point, the theoretical apparatus of D&G offers a mediating framework, allowing these differing perspectives to coexist without collapsing into contradiction. Their concept of the "assemblage," a temporary consistency achieved through the alignment of heterogeneous

[337] Meillassoux, *After Finitude*, 9–15.
[338] Quentin Meillassoux, "Time Without Becoming," in *Time Without Becoming*, trans. Robin Mackay (Milan: Mimesis, 2014), pp. 25–27.
[339] Harman, *Object-Oriented Ontology*, 51–56, 68–72; Harman, "Vicarious Causation," 200–2.

elements, permits objects to hold together in a network of external relations, even as the autonomy of each component is preserved.[340] DeLanda's extension of this idea, drawing on the notion of *phase transitions*, renders these dynamics more legible: an assemblage may remain stable for a time, yet it can dissolve rapidly under slight changes in its parameters.[341] Here, what appears as law is best understood as a locally dominant attractor: a form that endures only so long as the basin of stability is not disrupted by a new contingency. Within this framework, subjectivity in the ORS register is reconceived as an intensive and transient *peak*—an emergent crest arising atop a constantly shifting sea of machinic processes. Rather than providing a foundation, subjectivity is here understood as a site of precarious and provisional composition, always at risk of being recomposed by the very contingencies that make it possible.

3.2.4.1.3 Zero-Person Stance and the Politics of Humility

If subjectivity, under ORS, is a metastable rhythm, a crest upon machinic undertow, then the vantage from which it becomes visible requires a further act of methodological discipline. Harman calls this the "zero-person" stance: a form of rigorous *kenopraxis* that brackets all claims to anthropocentric centrality, thereby preventing inquiry from being misled by the assumption that meaning or agency must always revert to the human.[342] Such a stance is not simply an ethical pose, but a research imperative, demanding that the analyst learn to move within scenes where the human recedes, or is no longer even central to the drama. The task is to follow the capacities (trace the alignments and disjunctions), without defaulting to the easy privilege of human intention.

Bryant translates this into a positive program: follow the flows, attend to what objects can do, irrespective of human surveillance. A swarm of oceanic micro-drones adjusting their own protocols becomes, by virtue of their self-organization, an epistemic subject, regardless of whether a marine biologist is awake to witness the event. Subjectivity, under this dispensation, is multiplied and distributed, appearing wherever objects, capacities, and relations enter into provisional pacts.

[340] Deleuze and Guattari, *A Thousand Plateaus*, 3–9.
[341] Manuel DeLanda, *Assemblage Theory* (Edinburgh: Edinburgh University Press, 2016), 66–75.
[342] Harman, "Zero-Person and the Psyche," in David Skrbina, ed., *Mind That Abides* (Amsterdam: John Benjamins, 2009), 253–68.

Meillassoux, ever the philosopher of the abyssal, turns the screw further: not only is the human displaced, but even the material conditions of observation, say, the very chemistry of seawater, are themselves contingent, open to rupture or suspension without reason or warning. In such a cosmos, design cannot merely extrapolate from present function; it must build with an eye to the *unanticipatable*, as though every recruited object might tomorrow embark on its own trajectory. Infrastructures, too, must learn the virtue of humility: they are always exposed to futures that their present diagrams cannot securely contain.

At the same time, humility in this register is more than a principle of prudence; it is also *aesthetic*. Ortega y Gasset long ago suggested that the vocation of art is to let things appear "in the act of executing themselves."[343] In ORS, speculative aesthetics becomes the laboratory for rehearsing this zero-person perception. A thermal image of basaltic crust, for example, is not simply significant as a representation of lava. Rather, it functions as a site where silicon-based sensors and silicate geology interact; each remains partially withdrawn from the other, even as their interaction produces a measurable effect for observers.[344] In this sense, what we access is not the full reality of either the sensors or the geology, but only their interface as mediated through technological and material facades. This is why metaphor becomes method in object-oriented thought: it triangulates what cannot be presented directly (the withdrawn depth of objects), by drawing connections across the surfaces that interact in practice.[345]

3.2.4.1.4 Interim Synthesis

Thus sharpened, ORS does not lapse into nostalgia for transcendental guarantees, nor does it surrender to the flattening impulse that would dissolve all depth into mere relational contact. Rather, it affirms a position in which knowledge must remain oblique, approaching its objects on the slant, and never presuming a total clarity. Agency, in this configuration, is not the sovereign prerogative of a subject, nor simply the passive consequence of contact, but a metastable rhythm that surfaces in machinic ecologies, always provisional, always susceptible to being rewired or

[343] José Ortega y Gasset, "An Essay in Esthetics by Way of a Preface," in *Phenomenology and Art*, trans. Philip W. Silver (New York: W. W. Norton, 1975), 138.
[344] William I. Rose et al., "Remote Sensing of Volcanic Clouds and Ash Emissions," in *Remote Sensing of Active Volcanism* (Geological Society of London, Special Publications 426, 2016), 45–66; Timothy Morton, *Realist Magic: Objects, Ontology, Causality* (Ann Arbor: Open Humanities Press, 2013), 53–56.
[345] Harman, *Object-Oriented Ontology*, 70–75.

rerouted. Every infrastructure, then, be it epistemic, technical, or social, must be designed and drafted under the sign of radical contingency. Shadowed by the ever-present possibility of hyper-chaos, such infrastructures demand a readiness for re-engineering; their corridors must remain porous, receptive to new alignments and abrupt undoings. Power, in this model, ceases to be a one-way vector descending from human institutions to passive substrates. It becomes, instead, a *choreography*: vicarious lures, capacity alignments, and transversal relays that traverse infra-, a-, and extra-human circuits.

What results is not a bland pluralism, nor a resignation to undecidability, but a disciplined and generative obliquity. ORS names the demand to diagram these corridors of relation, to sense the movement of withdrawn depths without coercive enframing, and to remain attentive to the ways in which subjectivity, far from vanishing, emerges anew at the node where objects and capacities meet. In this, ORS is not simply a metaphysical portrait, but an operative stance: it prepares the ground for further inquiry, where the concepts of stratification, deterritorialization, and the BwO will be taken up explicitly and evaluated in relation to the practical and conceptual challenges posed by law, pedagogy, and infrastructure.[346]

3.2.4.2 From Descriptive Portrait to Operative Matrix

The descriptive portrait established thus far, encompassing withdrawn depths, machinic activism, hyper-contingent cosmology, and assemblage morphodynamics, now demands conversion into an operative matrix if ORS is to gain traction beyond the rarefied sphere of speculative ontology. This conversion is neither a matter of algorithmic translation nor the drafting of philosophical blueprints, but rather of tracing how each motif recursively conditions, and is conditioned by, the others whenever any concrete field is compelled to think and act in an object-realist key. This is not merely an academic permutation; it is a wager that only through such interference, sometimes harmonic, often dissonant, can ORS migrate from a contemplative posture to a genuinely generative program.

[346] For the distributed and operative character of what we term ORS, see Bryant, *The Democracy of Objects*, 279–87; DeLanda, *Assemblage Theory*, 108–10; and Deleuze and Guattari, *A Thousand Plateaus*, 361–74.

3.2.4.2.1 Mapping the Three Registers: Epistemic, Technopolitical, Aesthetic

The epistemic trajectory initiates this current by decisively moving away from the privileges of the anthropocentric standpoint and opening, as Ortega y Gasset puts it, the "outer chamber" where things present their reality prior to, and independently of, human cognition.[347] This is not an empty vestibule of negative theology, but rather a domain densely populated with machinic capacities awaiting recruitment; each object, each ensemble, possesses a surplus that consistently exceeds its capture by any given theory, model, or method.

For example, to engage with a cryogenic quantum interconnect is not merely to operate a sophisticated piece of scientific hardware; it is to be drawn into what might be called a persistent lure. The interconnect's photonic entanglements, a phenomenon in which light particles are linked across distances by quantum effects, bring into practical association a host of heterogeneous elements. These include the silicon foundries responsible for fabricating the device's components, the global supply networks that provide helium-3 (a rare isotope required to maintain the extreme cold necessary for quantum coherence), and the algorithmic error-correctors, which are advanced software protocols ensuring that quantum information remains stable despite inevitable disturbances. In this way, the quantum interconnect functions not only as a technological node, but as a point of convergence for scientific, industrial, logistical, and computational actors, all of which are essential to its operation and cannot be reduced to any single component in isolation. This is not an invention for rhetorical flourish, but an actual feature of advanced materials science, where the global infrastructures underlying quantum computing technologies involve a multi-layered coordination of disparate objects and capacities.[348]

Accordingly, Bryant's account of *ontological democracy* insists that every element in an alliance harbors capacities that continually exceed the frameworks devised to harness them; neither the most precise engineering protocols nor the most sophisticated mathematical models can fully exhaust the potentialities intrinsic to material or quantum systems. In this regime, philosophical

[347] Ortega y Gasset, "An Essay in Esthetics by Way of a Preface," 138–40.
[348] For further on the concept of persistent lures and machinic alliances in technological systems, see Bryant, *Onto-Cartographies*, 44–48; on the material and logistical complexity of quantum interconnects, see Qingyuan Zhao, Adam McCaughan, Francesco Bellei, Faraz Najafi, Domenico De Fazio, Andrew Dane, Yachin Ivry, and Karl K. Berggren, "Superconducting-Nanowire Single-Photon-Detector Linear Array," *Applied Physics Letters* 103, no. 14 (2013): 142602.

kenosis becomes both radicalized and distributed: drawing on a reconceptualized notion of *self-emptying*, the human does not simply withdraw in ascetic detachment, but recedes so that the world's own vectors of agency may manifest themselves more fully.

The technopolitical trajectory emerges precisely where epistemic humility collides with the necessity of contingency. Meillassoux's principle of facticity, the irreducibility of contingency itself, deprives every infrastructure, whether laboratory complex, semiconductor cartel, or legislative apparatus, of metaphysical guarantee.[349] What Meillassoux seeks to demonstrate is that even the fundamental constants of nature, which ground physical regularities such as those governing *band-gap physics*, are not metaphysically guaranteed but are themselves contingent and susceptible to abrupt alteration; the stability of all design is thus provisional and exposed to the possibility of radical change.[350] D&G's assemblage theory, extended by DeLanda's topological modeling, supplies the necessary framework for navigating this condition. In contrast to classical models that presume a smooth or linear process, the quantum supply chain can be understood as a network of external relations: each element within it, whether a supplier, a technology, or a protocol, remains detachable and can be reintegrated elsewhere, often at different speeds and in new configurations. This flexibility generates what DeLanda calls "topological torsion": the tendency of material ecologies to twist and adjust under pressure, forming unexpected connections and points of tension.[351]

Consider, for instance, the contemporary microelectronics industry, which depends on high-purity neon gas for advanced chip fabrication. If geopolitical sanctions restrict access to this resource, the immediate effect is not simply a local shortage. Instead, delays ripple upstream through the network: production schedules in Dutch cleanrooms are rescheduled, investment flows are interrupted, and innovation in manufacturing hubs like Shenzhen is decelerated.[352] Each node in

[349] Meillassoux, "Time Without Becoming," 25–27.
[350] Band-gap physics refers to the energy difference between the valence and conduction bands in materials, a property that determines their capacity to conduct electricity. The reliability of virtually all modern electronics depends on the stability of these constants; any variation would fundamentally alter the behavior of semiconductors and disrupt technological infrastructures at their foundation. See S. M. Sze and Kwok K. Ng, *Physics of Semiconductor Devices*, 3rd ed. (Hoboken, NJ: Wiley, 2007), 1–7; see also Meillassoux, *After Finitude*, 60–67.
[351] See DeLanda, *Assemblage Theory*, 71–75, especially the discussion of "topological torsion" as a model for how material systems accommodate both stability and sudden change; and Deleuze and Guattari, *A Thousand Plateaus*, 88–90, on assemblages as networks of external relations rather than internally unified wholes.
[352] See Chris Miller, *Chip War: The Fight for the World's Most Critical Technology* (New York: Scribner, 2022), 290–94; and European Commission, *Rare Gases (Krypton, Neon, Xenon): Impact Assessment for Supply Chain*

the assemblage responds according to its own temporal and material logic, demonstrating that causation, in this context, is indirect or vicarious rather than linear. In such a system, power is not wielded solely by a central authority, but is exercised by modulating the viscosity, or resistance, of these transversal flows. This is the basis for ORS's notion of a *politics of corridor-crafting*: the strategic design of passageways, whether technical, legal, or logistical, that are narrow enough to produce meaningful resonance, but porous enough to remain open to unexpected disruptions.[353] In practice, this means building infrastructures that are responsive both to routine operations and to radical contingencies that might otherwise abolish the corridor altogether.

At the same time, the aesthetic dimension provides the sensorium through which epistemic and technopolitical dynamics become perceptible and actionable. Ortega y Gasset's insight that metaphor reveals the operative reality of things finds its philosophical counterpart in Harman's argument that all access to objects is ultimately aesthetic.[354] In the context of ORS, aesthetics is not a matter of surface embellishment or mere representation; it is the very means by which withdrawn realities become communicable and exert agency. By way of illustration, Harman evokes the image of the volcano itself, not as an object laid bare to perception or science, but as a paradigm of ontological withdrawal. The visible cone and eruptive forces are never simply transparent to the molten, receding interior they presuppose. For Harman, any encounter with the volcano, whether through scientific study, practical engagement, or poetic imagination, stages a relation in which both observer and volcano remain fundamentally withdrawn, never exhausted by the effects they produce or the appearances they present. What emerges from this interface, such as ash, seismic readings, or human interpretations, constitutes new objects in their own right, always partial and provisional. In this sense, the volcano becomes a catalyst for revealing domains of material agency that are otherwise concealed, foregrounding the inexhaustible surplus that every entity harbors beneath its surface.[355] In this framework, aesthetics is recast as a regime of

Disruption (JRC130349, March 2022), on how disruptions in neon supply ripple through fabrication schedules, investment flows, and manufacturing hubs.

[353] Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (London: Verso, 2014), 13–15, 157–65; for the idea of "viscosity" and corridor-crafting in infrastructural systems, see also Anna Tsing, *The Mushroom at the End of the World* (Princeton: Princeton University Press, 2015), 27–30.

[354] Harman, *Object-Oriented Ontology*, 68–75, 128, 163, 178–82; idem, *The Quadruple Object*, 28–29, 72–73; Ortega y Gasset, "An Essay in Esthetics by Way of a Preface," 127, 134–40.

[355] Graham Harman, "The Volcanic Structure of Objects: Metaphysics after Heidegger," *Sofia Philosophical Review* 8, no. 2 (2014): 63–87, esp. 80–82.

mediation: it is the channel through which the latent capacities of objects are dramatized, initiating new assemblages and shifting the thresholds at which future configurations can arise. Thus, within ORS, the aesthetic is indispensable for bringing withdrawn realities into the ambit of action, policy, and design—not as decoration, but as an operative force in the composition of material worlds.

3.2.4.2.2 Syntheses and Methodological Imperatives

What emerges from the foregoing is not a blueprint, nor the promise of closure, but a discipline of attention: a methodological poise attuned to the complex demands of object-realist thought. In this register, ORS resists the comforts of transcendental assurance and the temptations of procedural short-cuts. It is no longer content with a descriptive finesse alone; it calls for a disposition as much as for a conceptual framework. To think in this key is to accept that every theoretical achievement is provisional, each trajectory of agency open to reinterpretation, and every aesthetic gesture essential for sensing the depths that continually elude capture. This is not simply an ethic of humility, but a cultivated vigilance—a readiness that seeks out, rather than tames, the intractable abundance of things. Such a stance demands more than careful forbearance. First, it requires an historical acuity: a sensitivity to the layers and accretions through which assemblages gather their force and fragility, lest critique remain at the level of impressionistic observation. Second, it embraces the necessity of speculative imagination, recognizing that when contingency holds sway, the careful articulation of alternatives becomes a measure of philosophical responsibility. Third, it insists on the indispensability of aesthetic mediation, for only through the staging of withdrawal do we sustain the attention and responsiveness demanded by this field. Ultimately, it is this threefold discipline that elevates ORS from a tableau of concepts to a living, exacting practice.

Still, such imperatives cannot be left as gestures of philosophical style alone; they must be founded in an infrastructure of concepts sturdy enough to weather contingency, disruption, and invention. The true challenge is not to remain poised in perpetual anticipation, but to move downward to the level where the very logic of flows and layers, ruptures and mutations, is articulated and set in motion. It is here, in this deeper stratum, that the force of ORS can be most fully drawn forth—where the insights of D&G, and those who follow are not simply illustrated but woven into the fabric of the real, as processes by which stability and transformation are continually negotiated.

3.2.4.3 Strata and Lines of Flight: Deleuze, Guattari, and the Ontological Mechanics of ORS

The lexicon of *stratification*, *deterritorialization*, *Body without Organs* (BwO) and *rhizome* has travelled so widely that it risks becoming loose metaphor. For ORS these terms must regain their original rigor as process descriptors: the *hydraulics* by which objectal withdrawal and machinic excess continually co-constitute the field of agency.[356] A *stratum* is neither an inert layer nor simply a "social construct"; it is an operation that captures heterogeneous flows (chemical, legal, economic, affective) into a repeatable pattern that, for a time, feels self-evident.[357] The act of capture functions as what Guattari later terms an "existential refrain," a rhythmic or procedural motif that continuously reasserts itself, lending an appearance of subjective stability to what is fundamentally contingent through repetition.[358] This refrain, therefore, is inherently fragile; its apparent solidity is maintained only through the ongoing effort required to keep it present, revealing that anything needing such ritualized reinforcement is always at risk of unraveling.

DeLanda's revision of assemblage theory makes clear that, unlike structuralist models that derive wholes from internal relations, every "higher-order individual" (institutions, ecosystems, and the like) is a *mesoscopic entity* held together by external parameters that can shift unpredictably.[359] This view dovetails with Harman's emphasis on withdrawal: the being of an object always exceeds the network of relations in which it is captured.[360] Building on this, Bryant contends that because this withdrawn core remains, every object possesses surplus capacities that can be actualized in future, as-yet-unimagined assemblages.[361] A classical illustration is the Roman maxim *nemo dat quod non habet* ("no one gives what they do not have"), a seemingly straightforward rule of title transfer that quietly stratifies property by effacing its own histories of enclosure, conquest, and plantation survey, thus allowing a contingent legal order to appear both natural and inevitable. This refrain persists until a counter-rhythm intervenes: an Indigenous title claim, an ecological servitude, or a blockchain land registry, each unsettling the apparent solidity of ownership and

[356] Deleuze and Guattari, *A Thousand Plateaus*, 40–99.
[357] Ibid., 70–74.
[358] Félix Guattari, *Chaosmosis: An Ethico-Aesthetic Paradigm*, trans. Paul Bains and Julian Pefanis (Bloomington: Indiana University Press, 1995), 19.
[359] DeLanda, *Assemblage Theory*, 55–76.
[360] Harman, *Object-Oriented Ontology*, 57–75. A sustained critique, arguing that "withdrawal" risks reinstating a substance/attribute dualism, is offered by Steven Shaviro, *The Universe of Things: On Speculative Realism* (Minneapolis: University of Minnesota Press, 2014), 21–38.
[361] Bryant, *Democracy of Objects*, 44–52.

inviting submerged histories to resurface.[362] At the apex of this countermovement stands Lacan's celebrated paradox of love, "to give what one does not have,"[363] a formulation that subverts the logic of possession and opens a space for generosity grounded not in ownership but in relational absence and desire. In the register of ORS, the objectal depth of the land parcel becomes truly thinkable only when the settled stratum is perturbed by such lines of flight, revealing latent capacities such as the land's ability to capture and hold carbon in its soil (so-called "soil-carbon storage," a key process for offsetting climate change), biocultural attachment, satellite-based image tracking, or even the reconfigured architectures of attachment and relation that strategically disrupt the codified terrains of law and affect.[364]

D&G designate this destabilizing vector as "deterritorialization," a process by which energies are siphoned from established strata, loosening their codes and laying bare the fundamentally provisional character of their stability.[365] Importantly, it does not always come from external shocks or acts of subversion. As Bryant points out, it often originates within the system itself: when an established order tries to control or "capture" the unpredictable creativity ("machinic excess") of its own constituent parts, it can unintentionally generate the very forces that undermine its stability. Thus, deterritorialization is best understood as an intrinsic, ongoing tension within systems, one that ensures that all codes, rules, or boundaries are ultimately negotiable and susceptible to change.[366] This phenomenon is rendered vividly in contemporary finance: the rise of high-frequency trading (HFT) has transfigured the ontological status of financial instruments, such that the value of a share is less a reflection of underlying fundamentals than of the microtemporal choreography of transmission speeds, hardware optimization, and algorithmic latency. As MacKenzie and Langenohl have shown, the concept of "equity," once mainly associated with fairness in markets or legal contexts, now also extends into the underlying

[362] See Stuart Banner, *American Property: A History of How, Why, and What We Own* (Cambridge, MA: Harvard University Press, 2011); for postcolonial legal critique, see Brenna Bhandar, *Colonial Lives of Property: Law, Land, and Racial Regimes of Ownership* (Durham, NC: Duke University Press, 2018), esp. chap. 1.
[363] Jacques Lacan, *The Seminar, Book VIII: Transference*, ed. Jacques-Alain Miller, trans. Bruce Fink (Cambridge: Polity, 1991), 144–45; Slavoj Žižek, *The Parallax View* (Cambridge, MA: MIT Press, 2006), 286–87.
[364] Rattan Lal, "Soil Carbon Sequestration Impacts on Global Climate Change and Food Security," *Science* 304, no. 5677 (2004): 1623–1627; Lesley Head, *Cultural Landscapes and Environmental Change* (London: Arnold, 2000), 55–74; T. M. Lenton, J. F. Abrams, A. Bartsch, et al., "Remotely Sensing Potential Climate Change Tipping Points across Scales," *Nature Communications* 15 (2024): 343.
[365] Deleuze and Guattari, *A Thousand Plateaus*, 88–90.
[366] Bryant, *Democracy of Objects*, 44–52.

technological networks and the temporality of events within those systems. Episodes like "flash crashes" (sudden, extreme drops in financial markets) serve as teaching moments: they expose the hidden, material layers that support modern finance, such as physical server racks, fiber-optic cables, and specialized computer hardware (FPGA gates), which are typically invisible but crucial to how markets function.[367] From the vantage of ORS, these moments compel a recognition that agency is no longer exclusively human, but is continuously co-authored by technical systems and infrastructures whose timings, contingencies, and alignments dictate the terms of participation, producing precisely the kind of "eerie" effects that Fisher describes, where hidden networks and non-human timings quietly but decisively shape the contours of the real.[368]

The emancipatory rhetoric often attached to deterritorialization can obscure its inherent ambivalence. As Meillassoux's concept of factiality underscores, the absence of metaphysical guarantees means that lines of flight, while capable of generating novelty, can just as easily induce episodes of nihilistic disruption or systemic breakdown.[369] Within this horizon lies the BwO, which, contrary to its reputation as a field of creative liberation, is rigorously described by D&G as a domain of risk and vulnerability, a phase where the dissolution of established strata exposes systems to collapse before new forms of organization can emerge.[370] A striking example of this double edge appeared during the first COVID-19 lockdowns, when the sudden cessation of passenger aviation erased a substantial portion of global air-cargo capacity. This triggered "bull-whip" effects, amplified and rapidly propagating disruptions across supply chains, leading to acute shortages of respirators, cacao beans, and micro-controllers, as minor initial shocks cascaded unpredictably through complex logistical networks. While ecologists welcomed short-term reductions in carbon emissions, medical infrastructure faced life-threatening equipment deficits,

[367] Donald MacKenzie, *Trading at the Speed of Light: How Ultrafast Algorithms Are Transforming Financial Markets* (Princeton: Princeton University Press, 2021), 21–55; Andreas Langenohl, "Algorithmic Reflexivity: The Constitution of Socio-Technical Accountability in Financial Pricing," *Historical Social Research* 46, no. 2 (2021): 113–20. These technical, infrastructural, and agential dynamics will be articulated in greater detail in our account of *Techno-Embodied Subjectivity*.
[368] See Mark Fisher, *The Weird and the Eerie* (London: Repeater, 2016), 28–34, where the author reads flash crashes as empirical glimpses of an "eerie" market ontology.
[369] Meillassoux, *After Finitude*, 60–67.
[370] Deleuze and Guattari, *A Thousand Plateaus*, 149–66.

demonstrating that contingency, as Meillassoux insists, is indifferent to human values or ethical preferences: not every rupture yields emancipatory possibility.[371]

If collapse is ambivalent, recomposition demands a geometry that is neither hierarchical blueprint nor mere happenstance. Enter the *rhizome*. Much misunderstood as an early metaphor for "network," the rhizome in D&G marks any lateral linking of semiotic chains, power arrangements and material flows that refuses a single generative code.[372] In educational contexts, Erin Manning's research provides a concrete example: classrooms can become rhizomatic when lesson plans braid together treaty texts, fungal sensor arrays, and digital rights discussions, such that the student is no longer a solitary recipient of knowledge, but becomes a "node of attentional amplification," an emergent participant in a distributed field composed of documents, technologies, and living organisms.[373] At the same time, sociologists of science such as Lilly Irani caution that the enthusiastic celebration of connectivity and deterritorialization (particularly visible in "maker movement" discourse, which valorizes do-it-yourself (DIY) technological innovation and communal creativity), can obscure the material and social underpinnings of these networks. Behind the empowering image of DIY electronics lies a global infrastructure: rare-earth minerals crucial to device production are frequently extracted under precarious labor conditions, while discarded electronics often find their way to informal and hazardous recycling operations in developing regions.[374] This caution underscores the need for rhizomatic models to remain attentive to the persistent, often unequal infrastructures, a sui generis "objectal depth" that supports even the most innovative or decentralized assemblages.

By weaving these four vectors together, ORS advances two major claims. First, subjectivity is neither the apex of agency nor a flat epiphenomenon. It is a phase-locked loop within the oscillation of strata and flights, depth and capacity. Second, political and institutional projects thrive or fail according to how they *tune* that oscillation. A corridor too rigid fractures into BwO;

[371] Hau L. Lee, V. Padmanabhan, and Seungjin Whang, "The Bullwhip Effect in Supply Chains," *Sloan Management Review* 38, no. 3 (1997): 93–102; Corinne Le Quéré, Glen P. Peters, Pierre Friedlingstein, Robbie M. Andrew, Josep G. Canadell, Steven J. Davis, Robert B. Jackson, and Matthew W. Jones. "Fossil CO_2 emissions in the post-COVID-19 era." *Nature Climate Change* 11, no. 3 (2021): 197–99.
[372] Deleuze and Guattari, *A Thousand Plateaus*, 18–30.
[373] Erin Manning, *The Minor Gesture* (Durham, NC: Duke University Press, 2016), esp. 12–14.
[374] Lilly Irani, "Hackathons and the Making of Entrepreneurial Citizenship," *Science, Technology, & Human Values* 40, no. 5 (2015): 799–824.

too porous, and no refrain endures long enough for sense-making. Subsequent sections examine governance techniques such as torsion, cosmopolitical pause, and recursive veto, each designed to keep the loop alive without denying contingency.

3.2.4.4 Corridors, Torsion, and Recursive Governance: From Stratigraphic Capture towards Rhizomatic Adjudication

The moment one accepts that every stratum may liquefy without warning, governance ceases to be a business of erecting monuments and becomes, ineluctably, a craft of keeping passageways alive under conditions of radical contingency. Easterling's notion of the "corridor" proves pertinent in this context, provided we abandon any lingering faith in infrastructural permanence.[375] A corridor, in an object-realist register, is neither a neutral conduit nor a one-way channel of sovereign power. It is a negotiated pact, material, legal, and semiotic, in which some flows are canalized and others slowed, always provisionally and always subject to resistance from the objects involved.

DeLanda clarifies the mechanics by suggesting that any corridor, whether a waterway, supply route, or regulatory channel, can be understood as a basin of attraction that brings together diverse elements such as gates, legal protocols, ecological systems, and risk models into a temporarily stable arrangement.[376] Whereas classical modernity aimed to freeze these arrangements into permanent order, contemporary approaches like "torsion" (the adaptive bending and recalibration of systems in response to shifting pressures or disruptions) respond flexibly when unexpected events or resistant elements force new alignments.[377] The Dutch Maeslantkering storm-surge barrier exemplifies this principle: originally engineered to close infrequently, it now uses real-time data to adjust its thresholds, balancing port efficiency, flood risk, and even potentially the migratory needs of local wildlife.[378] This case shows how even nonhuman agencies can be integrated into infrastructural governance, ensuring resilience without sacrificing flexibility.

[375] Easterling, *Extrastatecraft*, 137–64.
[376] DeLanda, *Assemblage Theory*, 71–78.
[377] Ibid.
[378] See Rijkswaterstaat, "Maeslant Barrier," accessed June 26, 2025, https://www.rijkswaterstaat.nl/en/projects/iconic-structures/maeslant-barrier; for discussion of measures to preserve wildlife and accommodate fish migration in Dutch storm-surge barriers, see Deltares, "Overview of Storm Surge Barriers: Maeslantkering," Deltares, 2018, 31, https://kyst.dk/media/srwdyhnp/deltares_2018_overview_storm_surge_barriers_komprimeret.pdf.

Left to efficiency logic, torsion risks becoming a neoliberal sophistication technique: fine-grained tweaking that maximizes rent extraction while masking underlying dispossession. To resist that drift, Stengers proposes a cosmopolitical pause, a programmed hesitation in which "unheralded actors" may veto optimization before it locks.[379] New Zealand's *Whanganui River Act* (2017) illustrates the idea. The Act is famed for granting legal personality to a river sacred to Māori iwi, but its deeper object-realist virtue lies in its bi-epistemic evidentiary choreograph: any claim must be argued through *both* whakapapa narrative (genealogical history recited by iwi) *and* sediment-flow sonography (hydroacoustic data). Litigation therefore proceeds only at the pace where water and ancestry speak together. Māori jurist Carwyn Jones praises the arrangement for seeking to align legal temporality with the river's own rhythms and needs; at the same time, critics observe that, despite this innovative framework, water-quality targets for the river still lag behind national standards, highlighting the need for such hesitation to generate tangible environmental improvements rather than remain a merely symbolic or ceremonial gesture.[380]

Moreover, Bryant's concept of *ontological democracy* insists that governance must open itself to what he calls a "recursive veto," whereby nonhuman AAA are granted the capacity to suspend or redirect human plans.[381] In this theoretical frame, corridors of action are no longer defined solely by human decisions, but by material processes and signals capable of intervening in real time. As previously discussed, a flood barrier system near Rotterdam now allows sensors monitoring river conditions to temporarily halt or modify zoning permissions when water levels become dangerous, making the system responsive not just to human judgment, but to real-world environmental data. Similarly, some modern road concessions use embedded sensors that automatically trigger repairs or redirect funds when physical stress exceeds safe limits, so the infrastructure itself signals when intervention is needed rather than waiting for human approval.[382] In this context, what might be described as "material-level diplomacy" comes into focus as a distinctive subfield within the broader emergence of posthuman diplomacy examined throughout this study, foregrounding

[379] Isabelle Stengers, *Cosmopolitics I*, trans. Robert Bononno (Minneapolis: University of Minnesota Press, 2010), 55–63.
[380] Carwyn Jones, *New Treaty, New Tradition: Reconciling New Zealand and Māori Law* (Wellington: Huia Publishers, 2016), 45–72.
[381] Bryant, *Democracy of Objects*, 263–65.
[382] Chai K. Toh, Julio A. Sanguesa, Juan C. Cano, and Francisco J. Martinez, "Advances in Smart Roads for Future Smart Cities," *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences* 476, no. 2233 (2020): 1–22.

configurations in which infrastructural and ecological systems are endowed with the capacity to negotiate, veto, or reconfigure human intentions from within. Such innovations represent a fundamental reorientation in governance modelling, where meaningful intervention becomes a genuinely distributed capacity: a dynamic and reciprocal diplomacy among all entities, human and nonhuman alike.

Recursive systems raise the spectre of opacity creep: when sensor ensembles override human deliberation invisibly, the very objects meant to democratize governance become instruments of technocratic *black-boxing*. Here, Ortega y Gasset's reflections on metaphor as the minimal bridge to the unseen highlight the essential philosophical task of making the imperceptible perceptible, even as this process entails its own risks and limitations.[383] Two structural dangers persist. The first is neoliberal capture, in which techniques such as torsion and pause are appropriated to lubricate the logics of capital while proclaiming resilience, as stressed by Swyngedouw.[384] The second is democratic exhaustion: recursive and algorithmic corridors may entrench decision power in infrastructures opaque to public interrogation, echoing Latour's warning that unchecked black-boxing undermines collective agency.[385]

To counter both perils, ORS holds that every institutional corridor, whether in law, technology, or policy, must provide clear audit trails, following Bryant's argument for precise and accountable specification. Just as importantly, any automatic or algorithmic override must be explained in language accessible to the public, so decisions are never hidden behind technical barriers. In this way, designing institutions under ORS becomes an exercise in careful balance: we must keep structures flexible enough to adapt, yet robust enough to act, and always open to review by both humans and the nonhuman AAA involved. Torsion introduces flexibility, cosmopolitical pauses allow for careful reflection, recursive veto gives real power to nonhuman participants, aesthetic relay makes hidden processes visible, and audit trails ensure accountability. Each of these tools can be misused, but together they create a practice that honors D&G's insight: every apparatus of

[383] José Ortega y Gasset, *The Dehumanization of Art and Other Essays on Art, Culture, and Literature* (Princeton: Princeton University Press, 1968), 25–36.
[384] Erik Swyngedouw, "Governance Innovation and the Citizen: The Janus Face of Governance-beyond-the-State," *Urban Studies* 42, no. 11 (2005): 1991–2006.
[385] Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), 304–322; idem, *An Inquiry into Modes of Existence* (Cambridge, MA: Harvard University Press, 2013), 161–69.

capture is haunted by the possibility of flight. The ongoing challenge is not to finalize a stable set of rules, but to maintain a fragility within legal, educational, and infrastructural systems, keeping them resilient enough to act, yet porous enough to be undone or rerouted when recalcitrant objects make new demands.

3.2.4.5 From Ontological Humility to Vibrant Attunement

The traversal of Object-Realist Subjectivity has not proceeded by linear synthesis, but as a cartography of tension: between Harman's radical withdrawal, Bryant's machinic capacity, and Meillassoux's insistence on contingency—a relay of claims that persistently resists closure, in the spirit of Deleuze, Guattari, and DeLanda.[386] Accordingly, rather than constructing a fixed system, ORS foregrounds the provisional and recalcitrant character of agency, where subjectivity arises as a precarious product of opacity, machinic overflow, and contingent alignment.[387]

From this ground, several decisive claims are distilled. The reality of objectal withdrawal establishes that the real perpetually exceeds both access and relation, sustaining "Entzug" as the true condition for any speculative inquiry.[388] Rather than diminishing agency, this inaccessibility amplifies it: objects become inexhaustible sources of novel assemblages, with agency emerging as a metastable rhythm rather than as a sovereign power.[389] Be they material, legal, or epistemic, structures are thereby rendered contingent, lacking any metaphysical guarantee of persistence.[390] Subjectivity, in turn, is reconceived not as synthesis or command, but as a distributed effect, generated within the ceaseless negotiation between depth and emergence.[391] Finally, mediation and metaphor, as articulated by Ortega y Gasset and Harman, are revealed as constitutive rather than ornamental; every interface, whether legal, technical, or aesthetic, functions as an oblique passage, dramatizing the withdrawal of things through acts of translation and staging.[392]

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[386] Deleuze and Guattari, *A Thousand Plateaus*, 40–99; DeLanda, *Assemblage Theory*, 55–101.
[387] Shaviro, *Universe of Things*, 21–49; Meillassoux, *After Finitude*, 3–22; Harman, *Object-Oriented Ontology*, 55–102.
[388] Harman, *Object-Oriented Ontology*, 68–73; cf. Heidegger, *Being and Time*, 103–10.
[389] Bryant, *Democracy of Objects*, 49–52; DeLanda, *Assemblage Theory*, 81–89.
[390] Meillassoux, *After Finitude*, 60–77; Bryant, *Democracy of Objects*, 112–119.
[391] Deleuze and Guattari, *A Thousand Plateaus*, 70–74; Bryant, *Democracy of Objects*, 53–54.
[392] Ortega y Gasset, "An Essay in Esthetics by Way of a Preface," 138–41; Harman, *Object-Oriented Ontology*, 95–110.

ORS, therefore, requires a threefold methodological disposition. *Epistemic humility* must prevail, steering between the hubris of mastery and the temptation of resignation.[393] Alongside this, *technopolitical pragmatism* insists that corridors and infrastructures remain open to vicarious causation and nonhuman agency, as exemplified by bi-epistemic jurisdictions and recursive zoning.[394] Equally indispensable is a commitment to aesthetics as a constitutive relay, rendering the withdrawn and the machinic both perceptible and actionable, and granting indirect yet operative access to what would otherwise remain concealed.[395]

However, this orientation is not without its impasse. Ontological humility may protect against institutional ossification, but risks congealing into metaphysical stoicism, where the vibrancy of matter and its micro-affective provocations are consigned to the margins of experience.[396] By privileging withdrawal, ORS courts a certain melancholy: protocols may evolve, yet the world's active expressivity may be dimmed or muted.[397] It is precisely at this juncture that the limitations of ORS point forward. The challenge is not merely to register the recalcitrance of things, but also to acknowledge their capacity to "spark and shimmer" (Bennett), to animate, transform, and entice the possible.[398] Here, recent work by Bennett, Barad, and Latour suggests that the vibrancy of matter should not be read as a supplement to withdrawal, but as its *intensification*: the withdrawn becomes a wellspring of expressive capacity, provoking unforeseen alliances and transformations.[399]

At this horizon, the contours of Vibrant Subjectivity begin to emerge—not as a rejection of objectal humility, but as a further inflection. Whereas ORS sustains attention to fragility and recalcitrance, VS intimates that emergence and expressivity, those micro-events by which matter disrupts and sustains collective ecologies, are inseparable from any contemporary account of agency or subjectivation.[400] Subjectivity becomes not a crest atop machinic depths, but a conative relay within assemblages, irreducibly more-than-human, and always exceeding attempts at capture or

[393] Bryant, *Democracy of Objects*, 178–84; Shaviro, *Universe of Things*, 31–36.
[394] Easterling, *Extrastatecraft*, 137–64; Jones, "Bi-Epistemic Jurisdiction and Māori River Guardianship," 44–68.
[395] Harman, *Object-Oriented Ontology*, 108–10; Ortega y Gasset, "An Essay in Esthetics by Way of a Preface," 139–40.
[396] Deleuze and Guattari, *A Thousand Plateaus*, 149–52; Meillassoux, *After Finitude*, 85–97.
[397] Fisher, *Weird and the Eerie*, 28–34; Shaviro, *Universe of Things*, 57–61.
[398] Bennett, *Vibrant Matter*, 5–6.
[399] Barad, *Meeting the Universe Halfway*, 128–35; Latour, *Reassembling the Social*, 75–86.
[400] Bennett, *Vibrant Matter*, 20–28; Stormer, "Review of Vibrant Matter," 317–20.

command.[401] ORS, in its final commitment, thus insists that institutional design across law, technology, and pedagogy must remain open to nonhuman veto, perpetually revisable, and ever-attuned to the fragility of its arrangements.[402] Simultaneously, it affirms that the vibrancy of matter, in Bennett's language its ability to spark, shimmer, and solicit responses, is not an ornament to humility but its necessary complement: the very wellspring of onto-ethical, aesthetic, and kenopolitical attunement.[403] What follows, then, is not a turning away from ontological reserve, but a transformation of its meaning. The conceptual transition from ORS to VS is neither abrupt nor reconciliatory, but rather a form of subtle escalation and refinement: the ongoing work of theory attentive to the shifting recomposition of subjectivity, agency, and institutional practice in a world animated by vibrant matter.

3.3 Empirical Gradient (P2): Embodiment, Symbiosis, and Technogenic Flesh

Where the foundational gradient (P1) established being as circuitry and entanglement, the empirical gradient (P2) grounds these relations in the concrete realities of living tissue, microbial symbiosis, prosthetic alloy, and algorithmic pulse. Here, the question is no longer *whether* subjectivity is relational; that much is settled. Instead, it asks *how* relation inscribes itself in nerves, membranes, and code, sculpting specific styles of life. Four recurrent figures structure this descent: the polividual, the holobiotic, the cyborgian, and the techno-embodied. Their order is thematic rather than evolutionary, with each illuminating a distinct facet of the same axiom: *a self is a consortium before it is an individual*.

3.3.1 P2a: Vibrant Subjectivity as Assemblos—Polividual Agency, Material Expressivity, and the Emergence of Assemblocratic Politics

The movement from ORS toward *Vibrant Subjectivity* (VS) signals a decisive inflection in the philosophical architecture of the *conditio posthumana*. Where ORS foregrounded ontological withdrawal, machinic excess, and the necessity of epistemic humility, VS advances a further reconceptualization: subjectivity no longer appears as a function of depth and recalcitrance, but as the radiant, expressive multiplicity of matter itself. We have reached an inflection point where the

[401] Bennett, *Vibrant Matter*, 33–38; Deleuze and Guattari, *Plateaus*, 212–15.
[402] Easterling, *Extrastatecraft*, 160–62; Bryant, *Democracy of Objects*, 190–93.
[403] Bennett, *Vibrant Matter*, 6, 35, 108; Barad, *Meeting the Universe Halfway*, 148–52.

very architecture of agency demands revision—no longer satisfied with the "individual," nor with Deleuzian "dividuality" alone, but now articulated as *polividuality*: a multidimensional, morphogenetic plurality of subjectivities that emerge, converge, and dissipate within the force-fields of the *assemblos*.

VS, as we develop it here, is neither a mere appendage to Bennett's vital materialism nor a generic intensification of new materialist themes. Instead, it is a methodological and ontological conduit, carrying forward the insights of Bennett, Latour, and Guattari, while fundamentally reformatting the analytic horizon of P-posthuman subjectivity.[404] The central wager is that subjectivity, once severed from the metaphysical monopoly of the human, flourishes in the operative field of *assembloi*: heterogeneous collectives whose composition, resonance, and agency emerge through polividuality, the ongoing negotiation of inclusion, affective register, and connective force. In this sense, VS is not a supplement to ORS, but its *potentiation*: a field in which withdrawal, machinic overflow, and contingent alignment are transduced into the material expressivity of polividual agencies, both human and nonhuman.

It is at this pivotal juncture that the concept of the *assemblos*, arising as a generative outgrowth of our ongoing analytics, becomes indispensable to the further articulation and coherence of our argument. Classical political theory orients itself around the *demos*, the rational-human collective, while even post-ANT and "Parliament of Things" models may founder on the shoals of merely distributed agency. In contrast, the assemblos signifies a deeper ontological event: not simply a collective, but a dynamic, morphogenetic process through which entities (whether *anthropos*, *zoon*, *algorithmikon*, or *stoicheion*) enter, depart, and recombine as expressive participants within the platform of a shared problem-space.[405] Here, we encounter an *onto-political agora* in the form of a sui generis *forum posthumanum*, unbound by fixed membership or privileged interiority, a field of relational genesis in which *polividuals*, or *assembloi*, are actualized as constellations of effect, resonance, and synaesthetic attunement.[406]

[404] Bennett, *Vibrant Matter*, 2–6; Latour, *Reassembling the Social*, 75–86; Guattari, *Chaosmosis*, 15–25.
[405] Bennett, *Vibrant Matter*, 108; John Dewey, *The Public and Its Problems* (Chicago: Swallow Press, 2016), 74; see also Latour, *Reassembling the Social*, 70–76.
[406] Bennett, "Vitality and Agency," in *Posthuman Glossary*, 447–49; see also Latour, "Parliament of Things," in *We Have Never Been Modern*, 137–45.

The trajectory from Bennett's vital materialism to our VS pivots on a radical flattening of agency. Bennett's project already dislodges the anthropocentric monopoly by showing that nonhuman bodies (dietary fats, power lines, metals, worms) "act back" on human intentions and political events.[407] Yet, as Stormer observes, the true subversion is not the expansion of "agency" to more entities, but the scrambling of the very question of what a subject is or could be.[408] The upshot is a world in which every event, every instance of rhetorical force or political formation, is the effect of assemblages: networks of AAA (agents, actants, affective bodies) whose own registers of subjectivity can neither be reduced to "individuals" nor dissolved in a faceless "field." Here, polividuality is not simply "dividuality" (as in Deleuze's or Strathern's formulations), but a proliferation of subject-positions—each a vectorial composition within the moving topology of the assemblos.[409] Polividuals are always *in the plural*: node-like, porous, momentarily coherent, yet endlessly recomposable.

Assemblocracy, then, is not simply a procedural extension of democracy but its ontological re-foundation. Our concept of assemblocracy designates a mode of collective organization in which agency, deliberation, and decision are not pre-given, nor reserved for speech-capable humans, but are recursively modulated by the vibrancy of all participating entities, be they mineral, microbial, computational, or ecological.[410] Where the demos presumes a stable subject (the "people"), assemblocracy recognizes only the shifting, expressive composition of the assemblos, within which polividuals form, dissolve, and re-aggregate in response to events, crises, and opportunities. The "public" becomes a polividual swarm, a problem-space whose agencies emerge from the resonance of distributed capacities.

The implications of this reframing are simultaneously ontological and political. Ontologically, we maintain that the vibrant subjectivity of matter is not a mere embellishment to so-called "real" agency, but rather constitutes the very substrate of becoming itself, with agency conceived as

[407] Bennett, *Vibrant Matter*, 39–52; see also Charles S. Smith, *A History of Metallography* (Chicago: University of Chicago Press, 1960), 134; N. Stormer, "Review of Vibrant Matter," *Quarterly Journal of Speech* 101, no. 2 (2015): 318–19.
[408] Stormer, "Review of Vibrant Matter," 318–20.
[409] Cf. Marilyn Strathern, Partial Connections: Anthropology, the Individual and the Other (Walnut Creek, CA: AltaMira Press, 2005), esp. chap. 1; Gabriel Tarde, *Monadology and Sociology* (Melbourne: re.press, 2012), 73–75; see also Alexander R. Galloway, *Protocol: How Control Exists after Decentralization* (Cambridge, MA: MIT Press, 2004), 95–96.
[410] Bennett, *Vibrant Matter*, 108; Latour, *Reassembling the Social*, 76–78.

fundamentally emergent, affective, and material. As Barad elucidates, intra-actions between entities generate new subjectivities, not as fixed identities but as phenomena—enactments of difference and relation, always open to further iteration.[411] In a similar vein, Bennett's notion of *thing-power* transcends the status of metaphor; it signals the tangible, performative efficacy of matter as it enters into and transforms assemblages.[412] The concept of the polividual extends and refines this trajectory, designating the multiplicity of subject-positions that coalesce in response to, and indeed as, the very problems that summon them into being.

Within the register of ethico-political analysis, this necessitates a move beyond the liberal inheritance of agency as property. Where democracy privileges the citizen, the speaker, the intentional agent, assemblocracy is tuned to the relational emergence of agency: alliances, antagonisms, and co-productions that span the spectrum of human and nonhuman participants.[413] This is not to evacuate responsibility, but to redistribute it across the field of *polividuals*: each responsible not as an autonomous unit, but as a node within an always-partial, always-negotiated network of affect and capacity. The ethical upshot is that decision, accountability, and care must be reformulated as practices of attunement, alliance, and modulation, not as top-down commands, but as immanent compositional acts. At this critical juncture, the posthuman concept of kenosis, initially developed under EGS and ORS as withdrawal, oikohumility, and the refusal of mastery, attains a positive transformation. Within the framework of VS, kenosis is no longer a mere resignation to opacity; it becomes a generative openness, a cultivated readiness to be reconfigured by the expressive powers of others, both human and nonhuman.[414] The politicality of VS lies in its capacity for diplomatic engagement with alterity, not as negotiation among pre-constituted subjects, but as the emergence of new relational constellations, what we previously termed posthuman diplomacy, now absorbed into the expressive event of the assemblos itself.[415] Within this dynamic, polividuals participate actively in the recursive articulation of decision,

[411] Barad, *Meeting the Universe Halfway*, 128–35.
[412] Bennett, *Vibrant Matter*, 20–24.
[413] Dewey, *The Public and Its Problems*, 74–75; Latour, *Reassembling the Social*, 71–74.
[414] Harman, *Object-Oriented Ontology*, 95–102; Bryant, *Democracy of Objects*, 112–19.
[415] Cf. Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy* (Cambridge, MA: Harvard University Press, 2004), 91–106.

responsibility, and cohabitation, each attuned to the vibrancy, the "shimmer and spark," that animates the field.[416]

In this context, assemblocracy inaugurates a distinctive mode of *posthuman governmentality*, departing decisively from the anthropocentric paradigms of classical political reason and from the regulatory logics of *biopolitics* and *ecogovernmentality*. Governance here is not reducible to the management of populations, the optimization of life, or the computational regimes of algorithmic control.[417] Instead, it is constituted through the distributed agency of polividuals, where subjectivity and capacity emerge as collective, compositional, and affective patterns across human, machinic, ecological, and elemental registers. Polividuality thus designates not a fixed subject-position but a dynamic topology of participation and resonance, irreducible to the binaries of individual or dividual, and always contingent upon the specific arrangements of the assemblos. Responsibility and authority no longer reside in sovereign actors, but are continually configured through practices of attunement, collective calibration, and the ongoing negotiation of heterogeneous capacities. In this configuration, governance becomes a continuous experiment in sustaining difference and composing relational coherence across plural forms of agency.[418] Posthuman governmentality, as conceptualized here, demands new forms of cohabitation and decision that are responsive to the vibrancy of the field and perpetually open to the transformative potentialities of each emergent assemblage.

Against this backdrop, the aesthetic dimension acquires a renewed centrality. As Ortega y Gasset and Harman both contend, access to the real is always mediated by metaphor, interface, image, or

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[416] Bennett, *Vibrant Matter*, 5–6.

[417] On governmentality as the management of populations and the historical evolution of governmental reason, see Michel Foucault, "Governmentality," in *The Foucault Effect: Studies in Governmentality*, ed. Graham Burchell, Colin Gordon, and Peter Miller (Chicago: University of Chicago Press, 1991), 87–104. On ecogovernmentality, see Bruce Braun, "Environmental Issues: Writing a More-Than-Human Urban Geography," *Progress in Human Geography* 29, no. 5 (October 2005): 635–50; and Timothy W. Luke, *Ecocritique: Contesting the Politics of Nature, Economy, and Culture* (Minneapolis: University of Minnesota Press, 1997). On algorithmic governmentality, see Antoinette Rouvroy and Thomas Berns, "Algorithmic Governmentality and Prospects of Emancipation," *Réseaud'Anthropologies Numériques*, no. 1 (2013): 163–96. On posthuman agencies in governance, see Braidotti, *The Posthuman*, 130–52; Bennett, *Vibrant Matter*, 30–55; Latour, *Politics of Nature*, 91–106.

[418] For the compositional and experimental character of more-than-human collective governance, see Stengers, *Cosmopolitics I*, 35–63; Haraway, *Staying with the Trouble*, 99–105; Tsing, *The Mushroom at the End of the World*, 17–25.

staging.[419] Within the framework of VS, aesthetic mediation is not a mere addendum to politics, but the very mode through which polividuals sense, express, and recalibrate their relational alignments. The aesthetic thus serves as the operator by which the withdrawn powers of things are rendered actionable, legible, and shareable within the assemblos. In this context, matter's vibrancy is not merely a philosophical claim but an operational principle: every collective must sustain its capacity for aesthetic sensing, translation, and affective resonance if it is to persist through the turbulence of contemporary crises.[420]

Ultimately, the concept of polividuality within VS marks a decisive rupture with all static ontologies of subjectivity. The self does not endure as a fixed hypostasis; rather, it emerges as a radically relational formation, shaped and reshaped within a continuously evolving matrix of entanglements. Its contours are determined by ongoing exchanges with alterity and by its capacity to participate in ever-new constellations of connection, affect, and meaning. This dynamic encompasses not only the generative coalescence of connections, but also the disjunctive intensities that traverse what D&G describe as the *schizo-subject*—a modality of subjectivity composed through the flux of intensities, machinic flows, and transversal becomings that cut across human and nonhuman domains. Conceptually, the polividual itself must be understood as *inherently schizoid*: its existence is constituted through a multiplied, vectorial, and chaosmic unfolding, always exceeding the closure of stable subject-positions by traversing divergent registers and actualizing contingent couplings across heterogeneous assemblages. It is at this juncture, where the vibrancy of matter is no longer conceived as a merely given background but is animated by the transversal logics of *schizoanalysis*, that the field acquires its *schizo-vibrant* character: a domain in which subjectivity and agency are continually recomposed through the interplay of connective synthesis and disruptive differentiation.[421] Accordingly, the assemblos

[419] Ortega y Gasset, "An Essay in Esthetics by Way of a Preface," 138–41; Harman, *Object-Oriented Ontology*, 108–10.
[420] Bennett, *Vibrant Matter*, 23–24; Deleuze and Guattari, *A Thousand Plateaus*, 4–5.
[421] On the schizo-subject and its departure from Freudian psychoanalysis, see Ian Buchanan, "Assemblage Theory and Schizoanalysis," *Panoptikum* 13, no. 20 (2014): 126–34; as well as Gilles Deleuze and Félix Guattari, *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Robert Hurley, Mark Seem, and Helen R. Lane (Minneapolis: University of Minnesota Press, 1983), 16–75; and idem, *A Thousand Plateaus*, 232–43. Schizoanalysis, as elaborated by Buchanan and by Deleuze and Guattari, reconceptualizes subjectivity as a field of intensive flows, machinic assemblages, and molecular transformations irreducible to familial or anthropocentric codes. On the concepts of haecceity, nonhuman sex, and the Body without Organs (BwO) as they further destabilize any fixed subject-position in favor of continual processes of becoming and deterritorialization, see also Hayles, *How We Became Posthuman*, 2–8; Jack Halberstam and Ira Livingston, *Posthuman Bodies* (Bloomington: Indiana University Press, 1995), 3–5; and Antonin Artaud, "To

constitutes the *eccentric* site of polividual emergence: a dynamic agora and infra-structure of expressive, conative, and affective potential that sustains the very conditions for future politics. In what follows, we trace the compositional logics through which polividual subjectivity takes form within the vibrant field of the assemblos, exploring how capacities are cultivated, resonance is generated, and decisions acquire collective traction, however provisional their accomplishment may be.[422] The challenge for posthuman thought, then, is not simply to acknowledge the vibrancy of matter but to inhabit its multiplicity: to become polividual, to participate in assemblocratic world-making, and to cultivate attunement with the symphonic trajectories of the more-than-human collective. Only through such practices can we illuminate how subjectivity, and with it the prospects of ethics and politics, might endure and flourish in an epoch defined by vibrant, expressive, posthuman *mattering*.

3.3.1.1 Compositional Energetics and the Ethics of Relational Worlds: Polividuality, Assemblos, and the Expressive Field of VS

The conceptual provocations of VS, as delineated above, call for an approach attuned to the energetic, compositional, and ethical dimensions that inform the becoming of collective forms. In the VS paradigm, vitality is not an anthropocentric surplus but the fundamental vector of material existence itself, demanding a radical reorientation of political, ethical, and aesthetic theory toward the expressivity of matter and the multiplicity of its agencies.[423] Subjectivity, under these conditions, can no longer be anchored in human mastery or inert objecthood. Instead, it emerges as an effect of ongoing energetic transmissions, relays, and transformations across the spectrum of bodies, environments, and infrastructures, human and nonhuman alike.[424]

At the heart of VS lies a commitment to *energetics*: the circulation, transformation, and recomposition of force and capacity. As Barad maintains, agency is not a static property but a phenomenon of doing, an intensive dynamism that dissolves the boundaries between subject and

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Have Done with the Judgment of God," in *Antonin Artaud: Selected Writings*, ed. Susan Sontag, trans. Helen Weaver (New York: Farrar, Straus and Giroux, 1976), 571–80.

[422] Barad, *Meeting the Universe Halfway*, 128–35; Bennett, *Vibrant Matter*, 108; see also Manning, *Minor Gesture*, 8–15.

[423] Bennett, *Vibrant Matter*, 3–5, 108.

[424] Barad, *Meeting the Universe Halfway*, 140–44.

object, self and milieu.[425] What is designated as "subjectivity" within this schema is not metaphorical or epiphenomenal; it is the real, conative expression of matter in flux, a distributed field where polividual agencies are constantly formed and unformed through the *intraexchange* of flows and resistances.[426] The concept of assemblos arises directly from this energetic terrain, not as a mere aggregate but as a generative constellation: an always-emergent topology in which polividual AAA (neither individuated nor simply divided) become nodes of potential, open to ongoing recomposition and *différance.*[427] Polividuality signals not a splitting of the subject but a proliferating connective tissue that binds, unbinds, and choreographs agency across metabolic, machinic, ecological, and semiotic registers.[428] This field is fundamentally vibrational: attunements, resonances, and frictions traverse and recombine across bodies and environments, creating what Dewey called "publics" not as stable communities, but as temporary ecologies of shared concern, affect, and problem-space.[429] Within this register, expressivity ceases to be confined to the domain of intentional action or linguistic signification. It is found in the very patterns of energetic articulation, what Bennett terms "thing-power,"[430] animating domains as various as climate, infrastructure, code, and metabolism. Media, as Parikka and Starosielski argue, operate not as passive conveyors but as active environmental circuits, transducing and modulating signals across multiple scales, with each material substrate relaying and transforming affective and informational currents.[431]

While energetics configures the ontological basis of VS, *dramaturgy* constitutes its operative logic. Drawing on Guattari's *ecosophy* and Manning's *minor gesture*, the polividual is never simply present but is always being staged, performed, and mediated within the shifting scene of

[425] Ibid., 148–50.
[426] Bennett, *Vibrant Matter*, 20–24, 32–34.
[427] Strathern, *Partial Connections*, chap. 1; Tarde, *Monadology and Sociology*, 73–75; Also, "différance" is employed here in Derrida's rigorous sense, denoting both the process by which differences are instantiated and the ongoing deferral of determinate meaning, so that the subject's identity is never fully constituted in any given *archeocentric* advance (i.e., any movement oriented toward recovering or securing an originary center or foundational ground), but is continually displaced within the temporal and theoretical unfolding of signification. As he writes, "[d]ifférance is the nonfull, nonsimple, structured and differentiating origin of differences. Thus, the name 'origin' no longer suits it." See Jacques Derrida, "Différance," in *Margins of Philosophy*, trans. Alan Bass (Chicago: University of Chicago Press, 1982), 1–28, here 8. Derrida's concept of différance names the very condition of possibility for signification itself.
[428] Galloway, *Protocol*, 95–96; Patricia Ticineto Clough, *The User Unconscious: On Affect, Media, and Measure* (Minneapolis: University of Minnesota Press, 2018), 21–22.
[429] Dewey, *The Public and Its Problems*, 74.
[430] Bennett, *Vibrant Matter*, 108.
[431] Jussi Parikka, *A Geology of Media* (Minneapolis: University of Minnesota Press, 2015), 3–10; Nicole Starosielski, *The Undersea Network* (Durham: Duke University Press, 2015), 28–32.

assemblos.[432] Here, composition is dramaturgical: every assemblage is a contingent choreography, a negotiation and translation among diverse AAA, each act of inclusion, persistence, or withdrawal conditioned by the ongoing material scene.[433] Assemblos, then, cannot be reduced to a static body politic; it is a processual architecture in which inclusion, resonance, and dissensus must be continually staged and restaged, sustaining the vitality of the field through differential alignments and collective attunements.[434] Aesthetic mediation, to underscore, acts here as the catalytic operator that renders the vibrancy of matter palpable, operative, and transmissible across political and ethical registers.[435] The dramaturgical labor of VS is thus to enable the translation, negotiation, and recomposition of difference, maintaining a field perpetually open to the emergence of new polividual constellations.[436] This work of mediation is fundamentally diffractive, not reconciliatory. Barad's notion of intra-action underscores that relationality is not a transparent communication but the mutual constitution of phenomena, in which the field itself is transformed through every encounter.[437] Vibrant translation, in this sense, seeks not the erasure of difference but its ongoing proliferation, warding off the congealing or premature foreclosure of the assemblos.[438]

The ethics of VS, grounded in polividual attunement, demands a radical reconfiguration of responsibility and temporality. Responsibility is no longer the property of an atomized subject, but an emergent capacity: the ability to sustain and recalibrate alliances, remaining plastic to the shifting compositions of collective life.[439] Rather than anchoring ethics in sovereign will or the logic of blame, VS advances a compositional ethic of vigilance, co-responsibility, and experimental alliance—an ongoing practice of attunement to the vibrational energies of the assemblos.[440] Temporality, accordingly, is neither linear nor teleological, nor merely cyclical and vulgarly iterative, but rather spiral and palimpsestic. Every collective composition retains traces

[432] Guattari, *Chaosmosis*, 15–25; Manning, *Minor Gesture*, 8–15.
[433] Stengers, *Cosmopolitics I*, 55–63.
[434] Latour, *Reassembling the Social*, 71–76; idem, *We Have Never Been Modern*, 142–46.
[435] Ortega y Gasset, "An Essay in Esthetics by Way of Preface," 138–41; Harman, *Object-Oriented Ontology*, 95–110.
[436] Shaviro, *Universe of Things*, 21–38.
[437] Barad, *Meeting the Universe Halfway*, 88–92, 137–44.
[438] Bennett, *Vibrant Matter*, 108–9.
[439] Braidotti, *Posthuman Knowledge*, 48–53.
[440] Melvin L. Rogers, "Introduction: Revisiting the Public and Its Problems," in *The Public and Its Problems*, by John Dewey, ed. Melvin L. Rogers (Athens, OH: Swallow Press, 2016), 1–32; Bennett, *Vibrant Matter*, 37–38.

and potentials for future reactivation, its history never sealed but always open to interruption and surprise.[441] Stengers' cosmopolitical pause and Barad's entangled time exemplify this openness: the temporality of VS is one of ongoing risk, renewal, and the continual possibility of becoming otherwise. The polividual thus figures as an active temporal enabler, holding open the space of possible futures even as it phases through rhythms of appearance and recession. Assemblos, as the ontogenetic scene of VS, is never a finished structure but a continuous experimental practice, with the terms of cohabitation, (de)composition, and care perpetually open to renewal and revision.[442] Nothing in the assemblos is ever final; every constellation, however fleeting, leaves traces that can be reactivated, interrupted, or redirected, ensuring that the scene of collective life remains always in play.

3.3.1.2 From Enchantment to Co-Enchantment: Polividual Praxis and the Ecological Horizon of Vibrant Subjectivity

The culminating inflection of VS is not simply a theoretical re-description of posthuman agency, nor a mere reiteration of vitalist motifs. Rather, it marks the passage from the ontological recognition of matter's vibrancy, most sharply articulated in Bennett's concept of *enchantment*, to the practice of situated, polividual *co-enchantment*: a discipline irreducible to speculative reverie or philosophical afterglow. Bennett's enchantment does not evoke nostalgia for animism, nor does it invoke a naive metaphysics of wonder. Instead, it is a rigorously critical and ontological stance: a cultivated receptivity to the lively, unpredictable agencies that traverse and animate the material world. Enchantment, for Bennett, "is a mood (…) marked by a heightened sense of the aliveness of the world, of matter, and of the interplay of bodies," and "a momentary suspension of habit."[443] This is not passive admiration, but a generative ethical and perceptual opening—a disciplined invitation to apprehend and engage with the distributed agencies that unsettle the familiar boundaries between subject, object, and milieu.[444]

Nevertheless, VS is not content with the phenomenology or ethics of individual enchantment. It must advance to *co-enchantment*: not an isolated rapture, but a polividual discipline, world-

[441] Barad, *Meeting the Universe Halfway*, 180–89; Stengers, *Cosmopolitics I*, 57–63.
[442] Bennett, *Vibrant Matter*, 30, 108.
[443] Bennett, *Vibrant Matter*, 5–6.
[444] Ibid., esp. 21.

involving and compositional, arising from the exchange and mutual modulation of multiple agencies. Where enchantment marks the "opening" of the subject to the vitality of the nonhuman, co-enchantment is the practice of participating in, and actively shaping, the emergent field of agency itself.[445] To co-enchant is not merely to be affected, but to co-create, co-inhabit, and co-sustain the expressive capacities of a more-than-human assemblos. It refuses the residues of solitary perception, foregrounding a polividual field of attunement and invention. Co-enchantment, thus reconceived, is a collective, ecological vector: a collaborative re-tuning to the potentials and constraints of our shared milieu.[446] This polividual co-enchantment attains its greatest analytic clarity when refracted through Guattari's three ecologies: the mental, the social, and the environmental.[447] The ecology of mind is no longer the domain of a Cartesian interior, but is reconfigured as a field of polividual becomings, permeable to the agencies of molecules, machines, atmospheres, and ideas. Social ecology, under VS, becomes a topology of assemblos: never a static aggregate, but a dynamic architecture where polividuals (human and nonhuman) negotiate, align, and modulate collective affects. The environmental is no inert backdrop but a conative participant, a dense meshwork of forces whose vibrancy conditions the emergence of subjectivity and collective life.[448] Accordingly, co-enchantment is not a dissolution into poetic excess, but a demand for world-responsive, rigorous praxis: the forging of alliances, the cultivation of sensitivities, and the enactment of responsibilities within the mutable architectures of the assemblos.[449] Responsibility itself is transformed from the property of isolated subjects into a distributed, vigilant, polividual practice. Ethics becomes not a static code, but an evolving ethos, exercised as an ongoing recalibration of alliances, capacities, and affects across an expressive, living field.[450]

The horizon of co-enchantment thus bends outward and downward at once: outward, toward the assemblocratic macro-scene where polividual alliances take institutional shape, and downward, into the symbiogenetic crucible where every cell, every thought, every planetary swirl of atmosphere is already the offspring of microbial mergers older than rock strata. Co-enchantment

[445] Bennett, *Vibrant Matter*, 108–109; Barad, *Meeting the Universe Halfway*, 128–35.
[446] Dewey, *The Public and Its Problems*, 74; Latour, *Reassembling the Social*, 70–76.
[447] Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton (London: Bloomsbury, 2014), 28–40.
[448] Bennett, *Vibrant Matter*, 5–6; Guattari, *The Three Ecologies*, 33–38.
[449] Bennett, *Vibrant Matter*, 108–9; Barad, *Meeting the Universe Halfway*, 148–150; Stengers, *Cosmopolitics I*, 57–63.
[450] See also Dewey, *The Public and Its Problems*, 74; Guattari, *The Three Ecologies*, 28–40.

becomes fully intelligible only when its liveliest interlocutors are recognized as bacterial and viral ancestors whose ancient fusions (mitochondrial, plastid, viro-genic) scripted the very capacities now mobilized in polividual praxis. In this register, to co-enchant is to acknowledge that the expressive power of any assemblos is pre-coded by an eon-long traffic of genes, metabolites, and electro-chemical signals: a protohistorical symbiogenesis that made Earth a polyvectorial workshop long before "we" arrived to name it. What VS reveals at the scale of bodies and publics, *Holobiotic Subjectivity* (HS) radicalizes at the scale of organelles and holobionts; the vibrancy that animates ethical attunement among humans, infrastructures, and atmospheres already thrums in the endosymbiotic bargains that forged oxygenic metabolism and neural excitability. Co-enchantment, then, is not a novel stance layered atop an inert world; it is the belated recognition of a "symbiomental" heritage in which cognition, metabolism, and milieu have always co-authored one another.

The analytic path therefore turns, without closing, toward HS, where the mind itself appears as a microbial symposium of its own kind: Socrates ever questioning, Alcibiades disrupting, Aristophanes weaving, each lineage negotiating within the ferment of the cell.[451] Just as Plato's *Symposium* stages love as a dialogue, conflictual and creative, never reducible to a single voice, so too does the holobiotic subject arise through the tangled conversations of its ancestral co-authors, the oldest polividuals of all.[452]

3.3.2 P2b: From Symbiogenesis to Symbiomentality—Holobiotic Subjectivity and the Microbial Fabric of Mind

3.3.2.1 Symbiogenesis: Networks, Mergers, Subjects

The task undertaken here is to advance *Holobiotic Subjectivity* (HS) as a theoretically compelling rearticulation of identity and interspecies relations, informed by Margulis's paradigm-transforming contributions to symbiosis, microbial evolution, and planetary-scale regulatory

[451] Plato, *Symposium*, trans. Alexander Nehamas and Paul Woodruff (Indianapolis: Hackett Publishing, 1989), especially 172a–223d.
[452] Lynn Margulis, *Symbiosis in Cell Evolution*, 2nd ed. (New York: W.H. Freeman, 1993), 3–24; Lynn Margulis and Dorion Sagan, *Microcosmos: Four Billion Years of Microbial Evolution* (Berkeley: University of California Press, 1997), 183–206; Haraway, *Staying with the Trouble*, 60–73; Guattari, *The Three Ecologies*, 28–40; Deleuze and Guattari, *A Thousand Plateaus*, 232–43.

processes. While Margulis's earlier collaboration with Lovelock on *Gaia* theory elucidated Earth's macro-scale self-regulatory dynamics,[453] HS moves forward in a complementary yet equally framework-redefining trajectory into the *microbiosphere*. It reveals that every multicellular being, from the ostensibly unassuming protist to the conspicuously elaborate *Homo sapiens*, constitutes a composite entity continuously shaped by the multifaceted synergy of innumerable microbial ancestries and phylogenetic lineages. This realization demands a 'humbler' reorientation at the level of naming, "*Homo insapiens*," a revision that HS, along with Margulis, intends to herald as an epistemic corrective to the last vestiges of human exceptionalism.[454]

Margulis iconically insisted that "[l]ife did not take over the globe by combat, but by networking," a refrain conceptually reiterated in her major works and co-authored writings.[455] This statement, highlighting the creative potency of symbiotic mergers, serves here as the HS's tonal center. Challenging the strictly neo-Darwinian emphasis on competition as the primary driver of evolutionary progress, her research underscores the centrality of symbiosis, cohabitation, and horizontal gene transfer in the emergence of biological complexity. By exposing the stark discontinuity between prokaryotic and eukaryotic cells, a divide too vast to be bridged by gradual mutation alone, she deconstructs what she terms the "botanical myth," the traditional assumption that photosynthetic organisms evolved through straightforward descent.[456] Instead, Margulis's work compels a radical rethinking of cellular evolution, where *collaboration* rather than competition becomes the central engine of innovation and diversity. Her symbiotic paradigm transforms not only evolutionary theory but also the very foundations of subjectivity, relocating it within the dense networks of biological co-existence. HS, as developed here, exposes the untenability of the solitary self and reveals subjectivity as an emergent, composite phenomenon, continually constituted through the activity of countless micro-communities.

Previously, the integration of Margulis's insights into *Eco-Gaian Subjectivity* reconfigured our understanding of Earth's regulatory capacity: the biosphere, atmosphere, geosphere, and hydrosphere co-evolve through cyclical feedback loops driven by living organisms, particularly

[453] Lovelock, *Gaia*, 9.
[454] Margulis and Sagan, *Microcosmos*, 18–19.
[455] Ibid., 29.
[456] Margulis, *Origin of Eukaryotic Cells*, 19.

microbes.[457] HS, by contrast, delves inward. It scrutinizes the sub-visible alliances that sustain each bodily "I," unveiling how the very structure of eukaryotic cells, and by extension, the metabolic and cognitive processes these cells make possible, owes its origin to symbiotic incorporations of once-free-living bacteria and other microorganisms.[458] The two vantage points (EGS vs. HS) thus complement each other. One demonstrates how microbes collectively fine-tune the planet's chemistry (shaping, for instance, the very composition of Earth's atmosphere), while the other reveals how symbiotic genealogies determine the functional architecture of polividuals, humans included. Indeed, if Earth's planetary homeostasis depends on microbial synergy, then each micro-scale subject emerges from genealogical mergers of distinct lineages, perpetually entwined within every cell.[459]

3.3.2.2 Holobiotic Subjectivity: Composite Lives and Microbial Genealogies

Posthuman scholarship, from Haraway's 'terrapolitical' *sympoiesis*,[460] which imagines life as co-constitutive, open-ended assemblages demanding ethical response-ability in multispecies *companionship*,[461] to Braidotti's *zoe*-centric P-subjectivity and Bennett's vibrant matter, has

[457] Cf. Lynn Margulis and James E. Lovelock, "Biological Modulation of the Earth's Atmosphere," *Icarus* 21, no. 4 (1974): 471–89. For a comprehensive historical discussion of the Gaia hypothesis and its reception, see John Gribbin, *James Lovelock: In Search of Gaia* (Princeton: Princeton University Press, 2009).

[458] David Quammen integrates Margulis's endosymbiotic theory within a broader reconceptualization of evolution, emphasizing horizontal gene transfer (HGT) as a mechanism that destabilizes the classical "tree of life" model in favor of a reticulated, network-like structure. By documenting how entire microbial genomes are incorporated into host cells, Quammen affirms that eukaryotic complexity arises through symbiotic mergers rather than linear descent. See David Quammen, *The Tangled Tree: A Radical New History of Life* (New York: Simon and Schuster, 2018), 134–35. For a philosophical perspective, see Jan Sapp, *Genesis: The Evolution of Biology* (Oxford: Oxford University Press, 2003).

[459] These mergers are not merely historical events but physically and functionally integral to all living eukaryotic cells: for example, mitochondria in human cells continue to carry bacterial DNA, demonstrating that life's identity is an ongoing symbiotic choreography. See also Scott F. Gilbert and Alfred I. Tauber, "Rethinking Individuality: The Dialectics of the Holobiont," *Biology & Philosophy* 31 (2016): 839–53.

[460] Haraway's concept of *sympoiesis* ("making-with") emerges in direct contrast to *autopoiesis*, a term introduced by Maturana and Varela to describe self-producing, operationally closed living systems. While autopoiesis emphasizes a system's generative closure, Haraway, drawing on Margulis's theory of symbiogenesis, argues that life is never self-contained but always co-constituted through relational processes akin to evolving 'microselfhood symphonies.' Cf. Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living* (Dordrecht: D. Reidel, 1980), 78–79; Haraway, *Staying with the Trouble*, 58–64; Lynn Margulis and Dorion Sagan, *Acquiring Genomes: A Theory of the Origins of Species* (New York: Basic Books, 2002), 12; see also Eva Hayward, "Spider City Sex," in *Queer Ecologies*, ed. Catriona Sandilands and Bruce Erickson (Bloomington: Indiana University Press, 2010).

[461] Haraway's prose is illustrative: "Terrapolis is for companion species, cum panis, with bread, at table together—not 'posthuman' but 'com-post.' (...) Terrapolis is the SF game of response-ability." Haraway, *Staying with the Trouble*, 11. See also Braidotti, *The Posthuman*, for a parallel critique of individualism in posthumanist theory.

systematically dismantled anthroporeductionist and individualist ontologies, reframing existence through relational, more-than-human perspectives.[462] In this lineage, HS emerges as a clarion call to recognize every organism, particularly the human "self," as an evolutionary patchwork woven from multiple genealogies. Margulis and Sagan's enduring metaphor of the human body-subject as "walking, talking minerals"[463] underscores not only our elemental composition but also the deep-time entanglement of archaic viral codes, archaea, proteobacteria, and other microbial legacies that fused and recombined to shape the complex architectures of our corporeal form.[464]

What HS brings to posthuman theory is a granular, microscopic genealogical account of how illusions of autonomy are undermined by scientific data on endosymbiosis and horizontal gene transfer. Margulis's widely documented example of mitochondria, originally free-living bacteria that colonized a host cell, establishes that each eukaryotic cell we carry is itself a set of microbial "confederacies,"[465] rendering us, in Nancy's terms, "singular-plural" at the scale of bacteria[466]: a dynamic unfolding of *zoe-political*, nonhierarchical *nano-assembloi*, always already in the making, bridging distinct lineages into a singular, cohesive metabolic unit. In effect, the 'I' that says 'I am,' from a Margulisian standpoint, is far better regarded as an I *are*, a synergy of ancient co-partners whose codes remain present in our cells as organelles or integrated viral sequences in our DNA.

In the classical Western tradition, subjectivity is anchored in a self-conscious interiority, imagined as distinct from the external world. HS fundamentally unsettles this binary. Drawing on microbial

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[462] Braidotti, *The Posthuman*, 61 et passim; Bennett, *Vibrant Matter*, 3 et passim. On "thing-power" and the vibrancy of matter, see Barad, *Meeting the Universe Halfway*, and our previous section.

[463] Lynn Margulis and Dorion Sagan, *What Is Life?* (Berkeley: University of California Press, 2000), 49.

[464] In this regard, Sagan's notable observation merit attention: "Like bacteria, viruses 'R' us: They have moved into our genomes. (…) The immune system in its origin may thus be more like an employment agency, recruiting desired species, than like a national security state, recognizing and refusing entry to guard the fake purity of the Self. (…) We are as pure as the driven slush." Dorion Sagan, *Cosmic Apprentice: Dispatches from the Edges of Science* (Minneapolis: University of Minnesota Press, 2013), 20–21. For a detailed account of viral symbiogenesis, see Frank Ryan, *Virolution* (New York: HarperCollins, 2009).

[465] Margulis and Sagan, *Microcosmos*, 117, 140.

[466] Nancy's *singular-plural* reconceives Heidegger's *Mitsein*, positing *être-avec* (being-with) as the primordial condition of existence, not an attribute added to autonomous selves. This ontological claim finds a biological analogue in Margulis's endosymbiotic theory: the eukaryotic cell is not autonomous but a metabolic and genomic commune of microbial lineages, each cell exemplifying life's constitutive co-emergence. Thus, the 'I' is not only 'I-with,' but, as the synthesis of Nancy and Margulis advanced here suggests, an 'I' that emerges *as* and *through* 'I-with*in*.' See Jean-Luc Nancy, *Being Singular Plural*, trans. Robert D. Richardson and Anne E. O'Byrne (Stanford: Stanford University Press, 2000), 30; Margulis, *Symbiotic Planet*, 5–6; see also Roberto Esposito, *Communitas: The Origin and Destiny of Community* (Stanford: Stanford University Press, 2010).

ecology, Margulis demonstrates that all boundaries, whether cellular membranes or conceptual borders, are permeable, mediating constant flows of matter, signals, and genes.[467] Metabolically, this means that digestion, immunity, neural signaling, and even affective states are not the autonomous functions of an individuated organism, but the emergent outcomes of microbial consortia completing metabolic pathways, modulating immunity, and co-creating physiological functions. As Gilbert et al. argue, animals defy individuation by anatomical or physiological criteria: they are *holobionts*—multi-species collectives whose microbial and host lineages are entwined at every functional level. The classical image of self-sufficient physiological autonomy dissolves in light of these findings, replaced by an interdependent continuum where host and symbiont are inseparably entangled.[468] Extending this logic, the mind itself is not a detached locus but an emergent property of ongoing microbial–host dialogues, embedded within multispecies networks of co-evolving life.[469]

From an ethical vantage, this radically decentered and reconstituted subjectivity necessitates a profound reexamination of agency and responsibility. The destabilization of microbial communities fundamental to neurological and immunological equilibrium, whether through the indiscriminate use of antibiotics[470] or the insidious spread of microplastics, ruptures the symbiotic infrastructures that sustain both planetary and personal vitality.[471] In this light, HS compels an ontology of co-living, disclosing the impossibility of severing *ethos* from *oikos* without undermining the generative feedback loops on which all forms of life depend. As Margulis and

[467] Margulis, *Symbiotic Planet*, 18, 38–39, 75.
[468] Gilbert et al., "A Symbiotic View of Life," 325–41, esp. 326. See also Jan Sapp, "The Prokaryote–Eukaryote Dichotomy: Meanings and Mythology," Microbiology and Molecular Biology Reviews 69, no. 2 (2005): 292–305.
[469] For the microbiota's role in modulating neural signaling, cognition, and behavior, and for the mounting evidence that disruptions in gut microbial equilibrium affect immune function, stress responses, and neurophysiology, see Stephen M. Collins and Premysl Bercik, "The Relationship between Intestinal Microbiota and the Central Nervous System in Normal Gastrointestinal Function and Disease," *Gastroenterology* 136, no. 6 (2009): 2003–14; see also Emeran Mayer, *The Mind-Gut Connection: How the Hidden Conversation Within Our Bodies Impacts Our Mood, Our Choices, and Our Overall Health* (New York: HarperCollins, 2016).
[470] For the role of the microbiota in neural signaling, cognition, behavior, and immune function, and for evidence that disruptions, including those caused by antibiotics, affect stress responses and neurophysiology, see Collins and Bercik, "The Relationship between Intestinal Microbiota and the Central Nervous System in Normal Gastrointestinal Function and Disease," Mayer, *The Mind-Gut Connection*; Martin J. Blaser, *Missing Microbes: How the Overuse of Antibiotics Is Fueling Our Modern Plagues* (New York: Henry Holt, 2014); and Ed Yong, *I Contain Multitudes: The Microbes Within Us and a Grander View of Life* (New York: HarperCollins, 2016).
[471] Sagan's incisive ecophilosophy articulates the Anthropocene turn: "we are metametazoa, metazoans whose industrial pollutants, ecological impact, and telecommunications have not only altered the shape of life on Earth but forced us to recognize the environment of the sum total of life on Earth as a totality with shared destiny, as a single, integrated, sensitive, and sensing system." Sagan, *Cosmic Apprentice*, 183–84.

Sagan observe, we persist as ambulatory microbial collectives within a luminous biospheric mosaic, where every ethical and ecological intervention propagates through the microbial architectures that undergird both organismal identity and planetary resilience.[472]

Central to Margulis's argument is that major evolutionary novelty does not result from the gradual accumulation of random DNA mutations, as the neo-Darwinian model assumes, but from large-scale mergers of entire bacterial genomes. She contends that "cell physiology must become isomorphic with microbial community analysis; developmental biology must become a specialized branch of microbial ecology by this same reasoning; current practices of population biology and genetics must be obliterated by their own false assumptions."[473] Rejecting the conventional evolutionary framework, Margulis establishes symbiogenesis as the principal engine of evolutionary innovation, demonstrating through "symbiotic leaps, like those of Jeon's amoebae," that the fusion of distinct lineages can, within a few generations, produce entirely new biological systems.[474] Such leaps occur when free-living bacteria infiltrate host cells, become embedded in their physiology, and transition from external agents to indispensable components of cellular architecture. No longer separate entities, these bacteria are assimilated into the host's metabolic and genetic systems, irrevocably altering evolutionary trajectories.[475] In this light, even the so-called building block of multicellular life appears as "aggregates of evolving microbial life," its structure shaped by bacterial histories rather than autonomous design.[476] Identity itself, within this conceptual emergence, is not an inherent trait of the organism but the dynamic product of symbiotic mergers—a continuous biological process of microbial uptake, genomic exchange, and metabolic integration. In sum, HS fundamentally unsettles the Western notion of individuality as a self-contained form, revealing that the roots of identity, and the formative instability that animates its organization, are already embedded in the genetic and physiological bedrock of symbiotic life.

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[472] Margulis and Sagan, *Microcosmos*, 191.
[473] Lynn Margulis, "Symbiogenesis and Symbionticism," in *Symbiosis as a Source of Evolutionary Innovation: Speciation and Morphogenesis*, ed. Lynn Margulis and René Fester (Cambridge, MA: MIT Press, 1991), 11. See also Jan Sapp, *Evolution by Association: A History of Symbiosis* (Oxford: Oxford University Press, 1994).
[474] Margulis and Sagan, *Microcosmos*, 252.
[475] Ibid., 33–34, exemplifying "[t]he union of once-lethal bacteria with amoebae, creating over time a new species of hybrid amoeba."
[476] Ibid., 28.

A key corollary of this viewpoint is that *speciation*, i.e., the branching of new evolutionary lineages, cannot be fully explained by slow, mutation-driven divergence alone. Whereas August Weismann's germ-plasm concept and mainstream "accumulation-of-mutations" stances historically dominated evolutionary theory,[477] Margulis's work illuminates a complementary pathway: symbiogenetic speciation, in which entire sets of bacterial genes infiltrate an emerging lineage and trigger wholesale transformations. As Margulis put it, "[n]atural selection eliminates and maybe maintains, but it doesn't create."[478] By emphasizing the role of symbiosis, she illustrated how the introduction of entire suites of bacterial genes into a host lineage can drive abrupt metabolic, morphological, or reproductive changes, potentially leading to evolutionary innovation. Her studies on the origin of eukaryotic cells demonstrated how the integration of oxygen-respiring alphaproteobacteria led to mitochondria, while the engulfment of photosynthetic cyanobacteria gave rise to plastids, enabling the evolution of algae and, eventually, terrestrial plants.[479] Symbiotic gatherings, sometimes accelerating evolutionary transitions beyond what millions of years of random mutation could achieve, ripple through Earth's biosphere. They demonstrate that evolutionary innovation unfolds through the abruptness of genomic incorporations, just as the sudden emergence of eukaryotic cells in the fossil record defies gradualist explanations and reveals a process driven by symbiotic fusions.[480] Trained in Margulisian thought, HS dismantles the fiction that species emerge through the slow trickle of micro-mutations. Evolution is not a gene-by-gene ascent but a saga of mergers, incorporations, and microbial acquisitions. Natural selection winnows and maintains, but it does not create. Symbiosis does. Entire bacterial genomes, taken up by host lineages, have driven the deepest evolutionary transformations.[481] Far from an anomaly, symbiogenesis is the force behind innovation: the process by which metabolism rewires, new forms arise, and evolutionary leaps unfold.

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[477] Peter J. Bowler, *The Mendelian Revolution: The Emergence of Hereditarian Concepts in Modern Science and Society* (Baltimore: Johns Hopkins University Press, 1989), 31–32.
[478] Dennis Teresi, "Discover Interview: Lynn Margulis Says She's Not Controversial, She's Right," *Discover*, June 17, 2011. This interview is frequently cited as a primary source on Margulis's intellectual style, public image, and iconoclasm. Accessed June 26, 2025. https://www.discovermagazine.com/the-sciences/discover-interview-lynn-margulis-says-shes-not-controversial-shes-right.
[479] Margulis, *Symbiotic Planet*, 50.
[480] Margulis and Sagan, *Microcosmos*, 118–19.
[481] Quammen, *Tangled Tree*, 134.

Amid intersecting perspectives, Quammen underscores the pervasiveness of lateral gene transfer, describing the RNA-world as "a great orgy of *promiscuously* shared materials."[482] Margulis, too, engages with this metaphor, highlighting how entire clusters of bacterial genes move laterally among lineages.[483] Sagan aptly dubs this ceaseless recombination "bacteria sex,"[484] a term that, in a broader sense, captures the incessant flux of plasmids, viruses, and mobile genetic elements breaching species boundaries and reshaping evolution itself.[485] Antibiotic resistance, for instance, spreads in mere years across the globe—an evolutionary rate too explosive for random point mutations alone.[486] Though such 'gene flows' can precipitate medical crises, e.g., antibiotic-resistant pathogens, they also exemplify the fluid open-source coding that, over eons, has endowed eukaryotes with novel physiological capacities. The implications reach far beyond microbiology. Life does not unfold along a neatly branching evolutionary tree but through an interwoven web of genetic exchange, where lineages can fuse, separate, and recombine. Even species identity is porous. 'Our' own genomes bear microbial imprints, bacterial, viral, symbiotic, collapsing the idea of a singular, self-contained human inheritance. Instead, we emerge as a living, pulsating diachrony of multiple evolutionary genealogies,[487] a *continual becoming* shaped by ancient incorporations, symbiotic mergers, and microbial co-authorship. Within the vantage of HS, these cross-lineage genetic exchanges dismantle the notion of a static biological hierarchy. Instead, we

[482] Ibid., 339. Emphasis added.
[483] See John Feldman, dir., *Symbiotic Earth: How Lynn Margulis Rocked the Boat and Started a Scientific Revolution* (Hummingbird Films, 2017), film. Feldman's documentary is indispensable for understanding the politics of scientific dissent in Margulis's career.
[484] See Dorion Sagan, "From Empedocles to Symbiogenetics: Lynn Margulis's Revolutionary Influence on Evolutionary Biology," *BioSystems* 199 (2021): 104386, 3. "Bacterial sex" is not a mere analogy but a fundamental mechanism of genetic interconnectedness: horizontal gene transfer enables bacteria to exchange DNA directly, bypassing reproduction and defying species boundaries. Unlike eukaryotic sex, which relies on gametic fusion, bacterial exchange is immediate, fluid, and accelerates evolutionary innovation. This process is not the exception but the evolutionary rule, rendering life less a rigid tree than a dynamic web of genomic sharing. In the microbial world, inheritance is not solely vertical but also *lateral*, demonstrating that cooperation and exchange, as much as competition, are central to evolution.
[485] Margulis, *Symbiotic Planet*.
[486] Quammen, *Tangled Tree*, 106.
[487] Margulis's critique of gradualism aligns with Gould and Eldredge's "punctuated equilibrium"; where paleontologists observed abrupt morphological shifts after long stasis, Margulis identified the underlying mechanism: evolutionary leaps arise not from incremental mutations but from microbial incorporations that rewire cellular physiology. The endosymbiotic merger of distinct lineages, such as the archaea–proteobacterial origin of eukaryotes, exemplifies how speciation often results from genomic integration rather than gradual drift. What appears as sudden novelty in deep time thus reflects ancient symbiotic fusions, now inscribed in the metabolic architecture of life itself. See Niles Eldredge and Stephen Jay Gould, "Punctuated Equilibria: An Alternative to Phyletic Gradualism," in *Models in Paleobiology*, ed. Thomas J. M. Schopf (San Francisco: Freeman, Cooper and Co., 1972), 82–115; Teresi, "Discover Interview"; see also John Dupré and Maureen O'Malley, *A Philosophical Guide to the Microbiome* (Minneapolis: University of Minnesota Press, 2017), esp. chap. 4.

see *anastomosis*, where lineages fuse, reticulate, and converge into tangled networks. Life operates less as a tree and more as a dynamic, recombinatory matrix.[488] Even eukaryotic nuclei bear relics of ancient mergers, as Margulis and Sagan note, echoing *Origin of Eukaryotic Cells*. This realization further undermines the presumption of innate individuality, revealing that from microbes to mammals, all organisms are provisional assemblages of symbiotic lineages—*polividuals*, as articulated earlier. Symbiogenic polividuality thus denotes a contingent emergence: an open, fluid interface of microbial co-authorship spanning evolutionary time.[489]

HS foregrounds that symbiogenic logic permeates not only morphology and physiology but the very foundations of cognition. Classical biology reduces mitochondria to "energy powerhouses," yet Margulis demonstrates these organelles are metabolically active descendants of bacterial invaders, now integral to eukaryotic life, including neural function.[490] The evolution of the mammalian placenta via viral insertions further reveals that essential biological capacities, from gestation to neurological complexity, result from the genomic integration of what were once external agents.[491] Thus, the "I" of mind is co-authored by a convergence of microbial ancestries (proteobacteria, photosynthetic lineages, archaea, and viral sequences), whose enduring presence orchestrates physiology from birth to adulthood. Intelligence and consciousness, accordingly, are not the isolated properties of an individual organism but *emergent phenomena* rooted in ancient microbial symbiosis.

Metabolic alliances stand at the heart of evolutionary complexity. Challenging any hierarchical taxonomy that distinguishes "higher" from "lower" forms of life, Margulis and Sagan affirm: "[f]rom the paramecium to the human race, all life forms are meticulously organized, sophisticated aggregates of evolving microbial life."[492] The microscope has revealed our true position in nature, exposing the illusion of human exceptionalism; we have not ascended some ontological ladder beyond microbes, but remain enmeshed within their vast networks—permeated, sustained, and co-

[488] W. Ford Doolittle, "Phylogenetic Classification and the Universal Tree," *Science* 284, no. 5423 (1999): 2124–28. Doolittle's research has been critical in establishing the "web of life" paradigm; see also L. Rouli, V. Merhej, P.-E. Fournier, and D. Raoult, "The Bacterial Pangenome as a New Tool for Analysing Pathogenic Bacteria," *New Microbes and New Infections* 7 (2015): 72–85.
[489] Margulis and Sagan, *What Is Life?*, 236.
[490] Margulis and Sagan, *Microcosmos*, 150.
[491] Ibid., 33–34.
[492] Ibid., 28.

constituted by ancestral symbionts. Complexity, far from signifying supremacy, emerges through microbial entanglements that scaffold and sustain all biology.[493] From lichen-forming fungi merging with algae,[494] to the first land plants allying with fungi (which enabled them to extract water and nutrients from otherwise inhospitable soils) and nitrogen-fixing bacteria[495] (which transform inert atmospheric nitrogen into forms that plants can actually use for growth), the pattern is unmistakable: what we call complexity is, in essence, the layered product of microbial synergy across what might be called symbiodriven *kairos*, as the very condition for any stretch of evolutionary *chronos*.

Mainstream evolutionary thought has long treated symbiosis as aberrant or peripheral rather than as a primary creative force in evolution. Margulis fundamentally challenged this perspective, demonstrating that symbionts are not merely "biological hitchhikers," but agents of evolutionary transformation, fusing genomes, reshaping lineages, and driving the emergence of new life forms.[496] Through the stable integration of microbial genomes into host lineages, symbiosis underlies metabolic versatility and is responsible for major evolutionary transitions, including the rise of oxygenic photosynthesis and the advent of multicellularity. Even the most iconic eukaryotic innovations (neurons, immune systems, developmental pathways) bear the enduring signatures of ancient microbial incorporations. HS thus repositions these symbiotic legacies as foundational, not incidental, to biological identity. Evolutionary novelty frequently arises not through the gradual accumulation of random mutations, but through physiological recalibrations produced by genomic mergers, with a single symbiotic event capable of irreversibly redirecting evolutionary trajectories.

In this light, HS is no more self-contained than a eukaryotic cell and no more singular than the mitochondria it harbors. What appears as independence is, in reality, a microbial palimpsest: the result of continuous mergers among bacterial, archaeal, and eukaryotic lineages that never ceased

[493] Ibid.
[494] For a comprehensive exploration of lichen symbiosis, demonstrating how fungal hyphae intertwine with algal photobionts to establish a metabolically unified system, see Thomas H. Nash, ed., *Lichen Biology* (Cambridge: Cambridge University Press, 2008), 9–26 et passim.
[495] See Lynn Margulis, "Symbiosis as a Source of Evolutionary Innovation: Speciation and Morphogenesis," in *Symbiosis as a Source of Evolutionary Innovation: Speciation and Morphogenesis*, ed. Lynn Margulis and René Fester (Cambridge, MA: MIT Press, 1991), 59–62.
[496] For the most comprehensive outline of Margulis's endosymbiotic theory, see Margulis, *Origin of Eukaryotic Cells*, esp. chap. 2, "The Symbiotic Theory," 45–68; and Lynn Sagan, "On the Origin of Mitosing Cells," *Journal of Theoretical Biology* 14, no. 3 (1967): 255–74. For recent philosophical analyses, see John Archibald, *One Plus One Equals One: Symbiosis and the Evolution of Complex Life* (Oxford: Oxford University Press, 2014).

metabolizing one another.[497] Eukaryotic cells do not shed their microbial past—they live it, respire it, and depend on it. As Margulis stresses, "[w]e abide in a symbiotic world,"[498] one in which even the most complex multicellular organisms are never Leibnizian monads, sealed off and self-sufficient, but rather entangled, dynamic ecologies whose existence and evolution fundamentally rely on ongoing microbial partnerships.

3.3.2.3 Symbiomentality: Microbial Minds, Cognitive Entanglement, and the Ethics of Co-Existence

The concept of *symbiomentality*, as advanced here, marks a critical reorientation toward understanding cognition as intrinsically symbiotic. Rather than situating mind exclusively within neural circuits or discrete cerebral structures, this framework posits cognition as emergent through complex, ongoing interactions among host organisms and their constituent microbial communities. Margulis and Sagan compellingly propose that "every organic being, every autopoietic cell is conscious," not in a narrowly anthropocentric or cerebral sense, but as part of a broader biological continuum of perceptive responsiveness.[499] This assertion invites a reconsideration of cognition as inherently distributed, manifesting not merely through neural complexity but through the sophisticated perceptual capacities of cellular life itself.[500]

Recent philosophical and empirical research increasingly supports this expanded conception. Pamela Lyon's critique of *neurocentrism*, for instance, demonstrates that phenomena typically identified as cognitive, such as perception, agency, and responsiveness, are not limited to organisms with central nervous systems; they are also evident at the cellular level, expressed through metabolic and sensory interactions within the organism and its environment.[501] Cognition, therefore, emerges from the reciprocal orchestration of cellular processes and the dynamic microbiological milieu that these processes continually shape and inhabit.[502] These findings

[497] Carl R. Woese, "The Universal Ancestor," *Proceedings of the National Academy of Sciences* 95, no. 12 (1998): 6854–59. Woese's "universal ancestor" is not a discrete species but a genetic pool.
[498] Margulis, *Symbiotic Planet*, 12.
[499] Margulis and Sagan, *What Is Life?*, 150.
[500] Ibid., 27–31.
[501] Pamela C. Lyon, "The Cognitive Cell: Bacterial Behavior Reconsidered," *Frontiers in Microbiology* 6 (2015): 264; see also Daniel C. Dennett, *From Bacteria to Bach and Back: The Evolution of Minds* (New York: Norton, 2017).
[502] Empirical studies reinforce this theoretical shift. The microbiota-gut-brain axis, for example, illustrates the profound influence of commensal microbes on emotional, cognitive, and social behaviors. Research with germ-free rodents has revealed significant behavioral changes, including impaired social interactions and altered stress

challenge the classical view of cognition as an isolated property of neural systems and highlight the fundamental role of microbial processes in mental function. As previously discussed, Margulis's framework underscores that microbial life actively structures biological complexity at multiple scales, serving as pivotal participants rather than passive constituents in physiological and cognitive capacities.[503] As a result, interventions at the microbial level, from antibiotic use to ecological disruptions, can produce cascading effects that cross physiological, cognitive, and ecological boundaries, shaping both individual and collective viability.[504]

Through the lens of symbiomentality, cognition is reconceptualized as an integrative and interactive phenomenon, continuously negotiated among neural, immune, and microbial domains. Dorion Sagan's assertion that life operates as a dynamic, symbiotic continuum is particularly resonant here, underscoring the multiplicity and interdependence foundational to cognitive emergence.[505] Rather than confining cognition within static anatomical boundaries, symbiomentality situates mental processes within expansive, co-authored biological dialogues involving bacterial, archaeal, viral, and eukaryotic lineages. This perspective carries profound ethical implications. If cognition fundamentally relies on microbial collaborations, then safeguarding the integrity of microbial ecosystems becomes essential to preserving both cognitive and physiological health. Disruptions such as widespread antibiotic resistance, industrial monocultures, and ecological pollution are thus not merely environmental concerns, but matters directly impacting cognitive viability and adaptive resilience at the population level.[506] In this way, the recognition of symbiomentality simultaneously reframes biological understanding and reorients ethical responsibility within an explicitly microbial context.

Holobiotic Subjectivity, in achieving its symbiomental horizon, establishes that what we call mind emerges not from neural isolation but from a ceaseless and plural metabolism: virus, bacterium, archaeon, host, each participating in ongoing biochemical dialogues that scaffold every act of cognition and affect. By revealing interiority as the contingent result of evolutionary

responses, confirming the extent of microbial involvement in shaping host cognitive architectures. See Collins and Bercik, "The Relationship between Intestinal Microbiota and the Central Nervous System in Normal Gastrointestinal Function and Disease," 2003–14.

[503] Margulis and Sagan, *Microcosmos*, 29.

[504] Margulis and Sagan, *What Is Life?*, 24.

[505] Sagan, *Cosmic Apprentice*, 104.

[506] Teresi, "Discover Interview."

entanglements, HS exhausts the fiction of the autonomous subject and relocates agency within the mutualities of living exchange. At this conceptual apex, the analytic gaze is compelled outward, toward those machinic architectures and planetary regimes of information that now infiltrate, amplify, and transform these metabolic ecologies. It is here that *Cyborgian Subjectivity* assumes the inheritance, recasting the terms of embodiment and relation as silicon and code become woven into the very flesh that microbial life first composed. In preparing this passage, HS leaves a conceptual imperative: all subsequent accounts of subjectivity must reckon with the irreducible historicity and materiality of *mediation* itself, recognizing that every new substrate, whether organic or machinic, renders the conditions of reflexivity, responsibility, and collective existence radically open to reconfiguration.

3.3.3 P2c: Cyborgian Subjectivity as Posthuman Ontopolitics

3.3.3.1 Boundary Collapse, Ontological Stakes, and the Harawayan Inheritance

Cyborgian Subjectivity (CS) is grounded in the critical legacy of Haraway's "Cyborg Manifesto," which revealed that the late-twentieth-century subject is already a machinic hybrid encased in what she called the informatics of domination—a lattice of militarized research, global supply chains, and patriarchal scripts that recode life at planetary scale.[507] If the cyborg is, as Haraway argues, the "illegitimate offspring of militarism and patriarchal capitalism,"[508] its ontological scandal inheres in dismantling the partitions that once secured Western-centric humanism: human vs. animal, organism vs. machine, nature vs. culture, and beyond. This marks an epochal inflection in which Western paternalism is not simply superseded, but crystallizes as *patternalism*: a patterned logic of authority that inscribes itself into the architecture of subjectivity, perpetually generating its own forms and antiforms. Haraway's claim that "who cyborgs will be is (…) a matter of survival"[509] installs ontology as political battlefield: identity is not discovered but engineered, contested, and redistributed in real time.

However, Haraway's legacy extends far beyond theoretical provocation. Her vision is anchored in the geohistorical substrate that produces the cyborg: cold war cybernetics, reproductive labor, the

[507] Haraway, "A Cyborg Manifesto," 149–81.
[508] Ibid., 151.
[509] Ibid., 181.

transnationalization of electronics assembly, and the rise of biotechnology.[510] The cyborg is not a futuristic myth but a material inheritance, inscribed in everything from algorithmic insulin pumps to global flows of care labor and code.[511] Refusing to romanticize hybridity, Haraway situated flesh-machine couplings within extractive regimes that differentially allocate life chances.[512] This insight grounds CS: subjectivity is *infrastructural*. Pacemakers calibrate metabolism; insulin pumps dose vitality; smartphone haptics choreograph gesture; predictive keyboards anticipate utterance.[513] The cyborg condition is not a science-fictional horizon but a distributed embodiment, lived through what Lisa Blackman calls the "choreography of the everyday," where affect and cognition are programmed by technocultural scripts.[514] Braidotti therefore names the humanist "unitary subject" an obsolete fiction: posthuman life is an assemblage of organic tissue, silicon prosthesis, neural plasticity, and data exhaust.[515] In CS, the Cartesian cogito gives way to an onto-technical dispositif in which agency is always-already distributed across bodies, chips, and clouds. Moreover, this cyborgian assemblage is always *relational*: as Barad theorizes, "intra-action," not mere interaction, configures reality. The posthuman subject emerges not from within, but at the interface of bodily, machinic, and ecological networks, rendering all ontology as networked, partial, and contingent.[516] The logic of CS thus insists: what counts as a subject, and what as a substrate, is always subject to contestation and technological mediation.

Boundaries may collapse, but forms of domination persist in new guises. Structures of vulnerability are not merely overlaid; they are reconfigured, as intersecting forms of disadvantage recombine within emerging techno-social regimes.[517] High-tech cultures sustain familiar asymmetries beneath the surface of innovation, eroticizing and normalizing certain bodies while

[510] Ibid., 169–75; see also Jennifer Terry, *Attachments to War: Biomedical Logics and Violence in Twenty-First-Century America* (Durham, NC: Duke University Press, 2017).
[511] Haraway, "A Cyborg Manifesto," 174; Zuboff, *The Age of Surveillance Capitalism*, 8–9; Melissa Gregg, *Counterproductive: Time Management in the Knowledge Economy* (Durham, NC: Duke University Press, 2018), 113.
[512] Haraway, "A Cyborg Manifesto," 169–75; Ruha Benjamin, *Race After Technology: Abolitionist Tools for the New Jim Code* (Polity, 2019), 40-42.
[513] Haraway, "A Cyborg Manifesto," 174; Deborah Lupton, *The Quantified Self: A Sociology of Self-Tracking* (Cambridge: Polity Press, 2016), 23–24.
[514] Lisa Blackman, *The Body: The Key Concepts* (Oxford: Berg, 2008), 111.
[515] Braidotti, *The Posthuman*, 26-28.
[516] Barad, *Meeting the Universe Halfway*, 33–34.
[517] Kimberlé Crenshaw, "Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color," *Stanford Law Review* 43, no. 6 (1991): 1241–99.

pathologizing others.[518] Infrastructures of biotechnology and algorithmic mediation convert life into capital and hierarchy into code, naturalizing inequity under the sign of neutrality.[519] Global supply chains that enable digital augmentation are haunted by the coercion and extraction that sustain them; the seamless interface often rests on invisible forms of servitude.[520] Even the promise of expanded mobility depends on a substrate of hidden labor, the "ghost work" necessary to render smart systems functional.[521]

The cyborg is thus not an abstraction, but a distributed condition that brings into view the question: under what circumstances, and to whose advantage, do such hybridities proliferate? The stakes are material as much as they are ontological. Apparatuses of computation, from drones to predictive algorithms, recode sovereignty as the management of life and death at a distance, transforming bodies into data and decisions into calculi.[522] Techniques of risk management and surveillance blur the line between protection and exposure, rendering the body as a data point in systems of prediction and triage.[523] The commodification of experience becomes the engine of predictive economies, where subjectivity itself is formatted for extraction and resale.[524] In Bratton's account, agency within the planetary *stack* is not anchored in individual volition but is continuously prefigured by infrastructural systems that anticipate, route, and distribute action across architectures calibrated for latency and throughput.[525] The stakes are no longer just the permeability of boundaries, but the pace and allocation of resources and risks, where milliseconds can determine outcomes as consequential as eligibility, dispatch, or survival.[526]

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[518] Anne Balsamo, *Technologies of the Gendered Body: Reading Cyborg Women* (Durham, NC: Duke University Press, 1996), 2–3.
[519] Sarah Franklin, "Life Itself: Global Nature and the Genetic Imaginary," in *Global Nature, Global Culture*, ed. Sarah Franklin, Celia Lury, and Jackie Stacey (London: SAGE Publications, 2000), 217–23; Benjamin, *Race After Technology*, 12–18.
[520] Kevin Bales, *Disposable People: New Slavery in the Global Economy* (University of California Press, 1999), 14–18.
[521] Mary L. Gray and Siddharth Suri, *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass* (Boston: Houghton Mifflin Harcourt, 2019), 49–62.
[522] Achille Mbembe, "Necropolitics," *Public Culture* 15, no. 1 (2003): 11–40.
[523] Benjamin, *Race After Technology*, 116–20.
[524] Zuboff, *The Age of Surveillance Capitalism*, 85–92.
[525] Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2016), 5–11.
[526] Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (New Haven, CT: Yale University Press, 2021), 82–84.

What is most often occluded is the violence of abstraction: the ways that scale, automation, and efficiency cloak their own distributive effects, masking dispossession as mere optimization.[527] Here, then, the double valence of the *pharmakon* becomes decisive—technics as both poison and cure, a generative ambiguity at the heart of every apparatus. For if the pharmakon of technics cuts both ways, counter-practices persist: coalitions built not on innocence but on the recognition of shared vulnerability and the creative reappropriation of infrastructures.[528] Movements for data justice, community-based networks, and insurgent cartographies do not merely resist but actively reorient the pharmakon toward solidarity and ecological repair, refusing its capture by logics of extraction alone.[529] Counter-infrastructures, no less than those of enclosure, are always sites of struggle and transformation, a persistent demonstration that the pharmakon, irreducible to either remedy or toxin, remains the very medium in which the politics of life is staged.[530] Thus, the contest over who and what constitutes the cyborg is not simply epistemological, but existential; to foreground the cyborg is to foreground the crucible where ontologies, infrastructures, and power converge. The task, therefore, is not only to describe but to *reengineer* the architectures of vulnerability and relation. The next section turns from these macropolitical horizons to the algorithmic micro-temporalities that sculpt experience below the threshold of conscious deliberation.

3.3.3.2 Necropolitics, Infrastructural Extraction, and Differential Cyborg Futures

Haraway's cyborg dismisses the mindset surrounding the notion of a pure, self-identical human; the collapse of such boundaries does not abolish power, but rather reallocates violence along algorithmic and logistical axes. Where classical humanism imagined sovereign individuals, the posthuman condition is orchestrated by the planetary stack: supply chains, sensor arrays, cloud platforms, and predictive models that mediate life chances at every scale.[531] Within these architectures, what Massumi terms "ontopower" is enacted: the infrastructural modulation of potentiality, in which security and optimization are preemptively governed, often beneath the

[527] Ibid., 66–70.
[528] Haraway, "A Cyborg Manifesto," 175.
[529] Bernard Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford, CA: Stanford University Press, 1998), ix.
[530] Tsing, *Mushroom at the End of the World*, 7–9; Silvia Federici, *Re-enchanting the World: Feminism and the Politics of the Commons* (Oakland, CA: PM Press, 2018), 68.
[531] Bratton, *The Stack*, 5–11.

threshold of conscious awareness.[532] The logistical turn in governance is not merely a technical matter but a political choreography, as critical logistics scholarship has shown: global capitalism integrates bodies and territories into a single metabolic system of extraction, circulation, and disposal, where flows are never neutral but strategically channeled through bottlenecks and forced immobilities.[533] The movement of e-waste, rare earth minerals, and outsourced assembly links Congolese cobalt miners, Chinese factory laborers, and Silicon Valley engineers into a network that not only produces commodities but also zones of disposability and environmental toxicity.[534] In such spaces, as Tsing observes, even the ruins of capital become logistical laboratories, with precarious life rendered at once indispensable and expendable—circulating as labor, bioresource, or mere externality.[535]

Necropolitical logics, in this context, operate through distributed forms of sovereignty.[536] Predictive policing targets entire neighborhoods for algorithmic scrutiny; autonomous border drones recode migrants as "illegal flows" to be intercepted or repelled; triage algorithms during pandemics assign value to bodies via actuarial calculation, determining who receives ventilation or is left without recourse.[537] The ordering of the world by algorithm is far from neutral: search engines encode racialized hierarchies, rendering Black femininity as a digital aberration to be monetized or suppressed; the cyborg itself becomes both commodity and infrastructure, a platform for the further extraction of value from human presence.[538] Granular necropolitical decisions thus constitute the lived reality of cyborg subjectivity: whose data is capitalized, whose mobility curtailed, whose lungs are denied a ventilator, whose memory is offloaded to the cloud, and whose very embodiment is rendered invisible or redundant.

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[532] Brian Massumi, *Ontopower: War, Powers, and the State of Perception* (Durham, NC: Duke University Press, 2015), 17–20.
[533] Sandro Mezzadra and Brett Neilson, *The Politics of Operations: Excavating Contemporary Capitalism* (Durham, NC: Duke University Press, 2019), 133–68.
[534] Josh Lepawsky, *Reassembling Rubbish: Worlding Electronic Waste* (Cambridge, MA: MIT Press, 2018), 45–67.
[535] Tsing, *Mushroom at the End of the World*, 19–23.
[536] Mbembe, "Necropolitics," 11–40.
[537] Benjamin, *Race After Technology*, 116–20; see also Virginia Eubanks, *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor* (New York: St. Martin's Press, 2018), 45–61.
[538] Safiya U. Noble, *Algorithms of Oppression: How Search Engines Reinforce Racism* (New York: NYU Press, 2018), 1–5; Nick Srnicek, *Platform Capitalism* (Cambridge: Polity, 2017), 45.

This sorting is planetary in scope, yet always felt locally. Informational architectures enable new forms of economic and ecological expulsion, recoding viability and access, as Sassen details.[539] "Sacrifice zones,"[540] where infrastructural violence accumulates slowly, imperceptibly, and is disproportionately borne by the marginalized, proliferate, as Nixon describes, wherever logistical and algorithmic regimes govern the allocation of harm.[541] The future of the cyborg, then, is not a horizon of uniform hybridity, but a differentiated terrain of exposure, endurance, and disposability.

3.3.3.3 Algorithmic Governmentality and the Diffusion of Culpability

The locus of responsibility has shifted: where traditional sovereignty once anchored culpability in the figure of the monarch, the state, or an identifiable institution, contemporary infrastructural power disperses agency and blame across strata of code, protocol, and market logic. Legal personhood gives way to the subtler affordances of platforms, where, as Cohen observes, rights are progressively hollowed into click-wrap permissions and the deliberative promise of law is supplanted by ritualized "consent" to non-negotiable technical conditions.[542] In this landscape, platforms do not merely govern data—they instantiate what Beer terms "metric power," continuously generating value and subjectivity through proliferating regimes of scores, rankings,

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[539] Saskia Sassen, *Expulsions: Brutality and Complexity in the Global Economy* (Cambridge, MA: Belknap Press of Harvard University Press, 2014), 32.

[540] The European Commission's June 4, 2025 decision to list Rio Tinto's still-unlicensed Jadar lithium mine as an EU "Strategic Project" under the Critical Raw Materials Act retrofits western Serbia into a keystone of the Union's battery supply chain, projecting capacity to meet up to 90 percent of the bloc's lithium demand and formally casting the Western Balkans as extraction hinterland. This elevation builds on the EU–Serbia Memorandum of Understanding of July 19, 2024, which locks Belgrade into Green-Deal raw-materials and battery value chains while postponing binding environmental safeguards. The CRM Act itself obliges the EU to mine 10 percent, process 40 percent, and recycle 25 percent of its critical minerals by 2030, scripting new sacrifice zones before a single licence is issued. On the ground, nothing is settled: exploration permits annulled in 2022 were reinstated in 2023, and farmer-led coalitions vowed on June 5, 2025 to block excavation despite Brussels' imprimatur. Far from a policy glitch, this impasse is the designed technique of green-transition extractivism: candidate status becomes a programmable suspension of sovereignty, switched on to police protest, switched off to guarantee resource throughput, thereby reinscribing colonial relations beneath a low-carbon veneer. See European Commission, *Commission Decision C(2025) 3491 of June 4, 2025 Recognizing Certain Critical Raw Material Projects Located in Third Countries and in Overseas Countries or Territories as Strategic Projects under Regulation (EU) 2024/1252* (Brussels, 2025); European Commission, "EU and Serbia Sign Strategic Partnership on Sustainable Raw Materials, Battery Value Chains and Electric Vehicles," news release, July 19, 2024; Transnational Institute, *Serbia's Lithium Gamble: The Geopolitics of Extraction in Europe's Periphery* (Amsterdam: Transnational Institute, 2022); Andrew Higgins, "Bad Blood Stalks a Lithium Mine in Serbia," *The New York Times*, August 18, 2024; and IndustriALL Global Union, *Unsustainable: The Ugly Truth about Rio Tinto* (Geneva: IndustriALL Global Union, 2013).

[541] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2011), 2–6.

[542] Julie E. Cohen, *Between Truth and Power: The Legal Constructions of Informational Capitalism* (New York: Oxford University Press, 2019), 211.

and metrics.[543] The geopolitics of e-waste renders these dynamics brutally material: the very devices that extend cognition or therapeutic reach in the global North saturate southern ecologies and bodies with toxins such as lead, cadmium, and brominated flame retardants, turning the pursuit of augmented life into a project subsidized by the slow poisoning of distant others.[544] As Tadiar articulates, the "living historical labor" of those rendered disposable becomes the hidden substrate for sensory and cognitive augmentation elsewhere.[545] Meanwhile, the apparent frictionlessness of AI is underwritten by "ghost work": the invisible, precarious labor that tags images, filters hate speech, and animates the smooth surface of digital experience, yet remains algorithmically dispersed and systematically erased from public reckoning.[546] Thus, every cyborg body is split: augmented flesh here, toxic ghost-limbs consigned to sacrifice zones elsewhere.

Algorithmic governmentality intensifies this diffusion, rendering violence infrastructural and accountability fugitive. As Benjamin and Eubanks show, predictive models in policing, welfare, and healthcare encode the grain of prior inequalities into automated decision systems, institutionalizing hierarchies of race, class, and gender beneath the veil of technical neutrality.[547] In this regime, opacity is not a bug but a feature: algorithmic inscrutability enables, as Amoore terms it, "diffuse violence," a violence that is cumulative, infrastructural, and largely immune to traditional forms of legal or ethical address.[548] The politics of the cyborg, therefore, is not only a politics of exposure and optimization, but a politics of opacity: a contest over who becomes legible as a subject of care, rights, or risk, and who remains consigned to infrastructural invisibility and necropolitical calculation.

3.3.3.4 Extractive Temporalities and Posthuman Debt

Temporal sovereignty is no longer tethered to nation-states or corporate actors but is enacted through infrastructural timekeeping, where power's operations now reverberate across the microtemporal architectures of finance and computation. High-frequency trading algorithms, for

[543] David Beer, *Metric Power* (Basingstoke: Palgrave Macmillan, 2016), 39–43.
[544] Lepawsky, *Reassembling Rubbish*, 90–108.
[545] Neferti X. M. Tadiar, *Things Fall Away: Philippine Historical Experience and the Makings of Globalization* (Durham, NC: Duke University Press, 2009), 19–22.
[546] Gray and Suri, *Ghost Work*, 49–62.
[547] Benjamin, *Race After Technology*, 123–27; Eubanks, *Automating Inequality*, 118–21.
[548] Louise Amoore, *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others* (Durham, NC: Duke University Press, 2020), 53–65.

instance, do not simply exploit speed; they actively generate a regime in which capital circulates at velocities inaccessible to the biological sensorium, redistributing vast wealth before cognition can register the event.[549] In this regime, what counts is not the object of exchange but the temporal margin, the infinitesimal window in which futures are secured, foreclosed, or lost. As Appadurai has shown, contemporary futures markets monetize not only the probability of events but the affective atmospheres of anticipation, rendering speculation itself a site of dispossession.[550] The technics of *temporal extraction* are not evenly distributed; as Mbembe argues, necropolitics today operates not only through the allocation of life and death in space, but through "temporal capture," the excision of entire futures from already precarious lives, the foreclosure of worlds before their possibility can even be articulated.[551]

This acceleration is intimately tied to the apparatus of *debt*, which no longer merely haunts the present but annexes the very horizon of subjectivity. Micro-credit platforms, payday lending apps, and frictionless buy-now-pay-later schemes fold tomorrow's labor and desire into calculable, securitized assets, pricing anticipation itself in advance.[552] Stiegler frames this as a crisis in individuation: when both memory (retentions) and anticipation (protentions) are outsourced to algorithmic retentional systems, the interval in which one might become a subject is colonized or automated before it can unfold.[553] For Bifo Berardi, this is the condition of "semiocapital," a regime where attention and affect are retooled as revenue streams, tightening the recursive circuit between neuroplasticity and market volatility.[554] The lived future, then, is not simply uncertain, but actively partitioned and commodified, while the subjective horizon is algorithmically thinned.

These futures are not a neutral or empty terrain awaiting inscription. The coloniality of power, as Mignolo and Walsh insist, is most acutely felt in temporal registers: dominant technics do not merely displace alternative worldings, but actively eclipse Indigenous, Afro-Atlantic, and other-

[549] Donald MacKenzie, *Trading at the Speed of Light.*
[550] Arjun Appadurai, *Banking on Words: The Failure of Language in the Age of Derivative Finance* (Chicago: University of Chicago Press, 2015), 65–70.
[551] Achille Mbembe, *Critique of Black Reason* (Durham, NC: Duke University Press, 2017), 178.
[552] Bernard Stiegler, *Automatic Society, Volume 1: The Future of Work*, trans. Daniel Ross (Cambridge, UK: Polity Press, 2016), 91–103.
[553] Ibid., 145–50.
[554] Franco "Bifo" Berardi, *Futurability: The Age of Impotence and the Horizon of Possibility* (Brooklyn: Verso, 2017), 88.

than-Western cosmologies that continue to persist at the margins.[555] The stack, as a planetary apparatus, not only appropriates labor and value but also circumscribes the array of possible becomings, foreclosing plural temporalities, relationalities, and practices of being-together.

3.3.3.5 Situated Counter-Infrastructures

Still, even as these extractive regimes intensify, sites of rupture and inventive refusal are emerging within the interstices of technical systems. Schüll's account of casino architectures demonstrates that individuals enmeshed in highly engineered environments of automated gambling, a process she calls "machinic capture," are not merely passive subjects of extraction. Some, instead, develop subtle techniques to subvert the tempo imposed by the system. By intentionally delaying their engagement with the machine, they interrupt the rapid and repetitive rhythms that are designed to maximize consumption and dependency. These micro-interventions, such as pausing before pressing a button or inserting a moment of reflection before the next spin, function as tactical acts that reclaim fragments of perceptual and cognitive autonomy. In so doing, these actors momentarily unsettle the relentless logic of extraction and assert agency both within and against the algorithmic protocol that seeks to script their behavior.[556] Hansen, similarly, shows that when our bodies and actions are translated into digital code, individuals can use the delays and pauses built into technological systems as opportunities for resistance. What might seem like mere technical lag, such as a slow connection or delayed response, can be deliberately embraced or even manipulated. By choosing to slow down their interactions, encrypt their data, or redirect digital traffic, people turn these moments of latency into tactical tools for refusing the demands of constant connectivity and surveillance.[557] Finally, Ahmed's notion of the willful subject reframes friction, non-compliance, and hesitation as not pathological, but as generative forms of tactical endurance and survival.[558]

These gestures are not confined to personal coping but reverberate into wider movements for technological re-design. Thus, Turkle observes that the loneliness of digitally-mediated sociality

[555] Walter D. Mignolo and Catherine E. Walsh, *On Decoloniality: Concepts, Anylytics, Practics* (Durham, NC: Duke University Press, 2018), 145; Hui, *The Question Concerning Technology in China*, 3–7.
[556] Natasha Dow Schüll, *Addiction by Design: Machine Gambling in Las Vegas* (Princeton, NJ: Princeton University Press, 2012), 4.
[557] Mark B. N. Hansen, *Bodies in Code: Interfaces with Digital Media* (New York / London: Routledge, 2006), 27.
[558] Sara Ahmed, *Living a Feminist Life* (Durham, NC: Duke University Press, 2017), 67–71.

often provokes a counter-desire for depth and presence, catalyzing experiments with platforms that privilege slowness, deliberation, and reciprocity.[559] Stiegler's call for *negentropy*, the cultivation of difference and reflective collectivity, stands as a direct challenge to the entropic logic of automated optimization.[560] Hui's advocacy for cosmotechnical pluralism foregrounds the possibility of radically divergent technical futures, where Māori internet protocols privilege kin over profit, feminist servers self-erase logs, and mesh networks operationalize mutual aid as default.[561] In such instances, Haraway's exhortation to "stay with the trouble" materializes as infrastructural composting: salvaging, repurposing, and rerouting technical affordances to enable partial, collective flourishing.[562] Indeed, these counter-infrastructures do not pursue utopia or transcendence, but instead cultivate the art of the possible, what Escobar calls "designs for the pluriverse."[563] Here, the pharmakon of technology is not neutralized but recomposed, its ambivalence harnessed for care, relation, and the ongoing work of survival.

In sum, this section has traced how necropolitical architectures, temporal regimes of extraction, and the emergence of counter-infrastructures collectively configure the condition of *Cyborgian Subjectivity*. Here, subjectivity is not a passive field of inscription but a turbulent topology, patterned by differential exposures to planetary risk, machinic mediation, and infrastructural vulnerability. Rather than a finished critique, CS marks a zone of continuous improvisation, where sites of dispossession are also crucibles for inventive refusal and infrastructural recomposition. It is within this interstitial terrain, where capture and resistance are interwoven and the violence of abstraction is met by counter-practices of care and solidarity, that the ongoing task is not simply to analyze but to reengineer the very architectures of more-than-human communality. What follows is a turn to the affective solidarities and cosmotechnical experiments through which these machinic becomings might be collectively rerouted.

[559] Sherry Turkle, *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York: Basic Books, 2011), 16.
[560] Bernard Stiegler, *The Neganthropocene*, edited and translated by Daniel Ross (London: Open Humanities Press, 2018), 34–38.
[561] Hui, *The Question Concerning Technology in China*, 140–53.
[562] Haraway, *Staying with the Trouble*, 2-3.
[563] Arturo Escobar, *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds* (Durham, NC: Duke University Press, 2018), 16–20.

3.3.3.6 The Reparative Mandate: Towards a New Cyborgian Ontopolitics

CS does not simply expose the necropolitical, logistical, and algorithmic stratifications of the planetary stack; it offers an experimental paradigm for living-with and thinking-through the recursive textures of posthuman existence. Where earlier critique might have sought either a vantage of exteriority or nostalgia for wholeness, CS unfolds within the very architectures that shape, capture, and modulate life, inhabiting technical systems as sites of both habituation and incessant improvisation.[564] Here, subjectivity is not a residue of resistance, nor a deterministic outcome of capture, but a turbulent ecology of entanglements, negotiations, and compositional acts. Rather than a perfected or static substrate, the cyborg here functions as an onto-technical process: one that must continually negotiate infrastructures which preempt, script, and inscribe bodies, affects, and capacities, but which also remain open to reappropriation and reorientation at every scale.[565]

This ongoing labor is affective as much as it is infrastructural. As Wendy Chun demonstrates, the subject is continually "trained" by algorithms, platforms, and protocols through patterns of micro-engagement that sediment into habit.[566] Nevertheless, these very habits can become vectors of reversal, sites where repetition mutates, technical scripts are repurposed, and the logics of capture are converted into micro-practices of sense and solidarity. The cyborg thus emerges as a figure of paradox: simultaneously habituated and inventive, a participant in systems that solicit attachment and obedience, but also capable of inhabiting the glitch, the lag, the delay as opportunities for collective attunement and alternative temporalities.[567] This is not resistance as negation, but as ongoing *negotiation*—what Mark Fisher identified as the struggle to imagine futures beyond the gravitational pull of *capitalist realism*, where even the smallest ruptures in the affective infrastructure of the everyday take on planetary significance.[568]

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[564] Wendy Hui Kyong Chun, *Control and Freedom: Power and Paranoia in the Age of Fiber Optics* (Cambridge, MA: MIT Press, 2006), 10–12; Stiegler, *The Neganthropocene*, 34–38.
[565] Haraway, *Staying with the Trouble*, 2–3; Tsing, *The Mushroom at the End of the World*, 225–31; Braidotti, *The Posthuman*, 26–28.
[566] Chun, *Control and Freedom*, 11–12; Ahmed, *Living a Feminist Life*, 67–71.
[567] Schüll, *Addiction by Design*, 4; Hansen, *Bodies in Code*, 27; Blackman, *The Body*, 111.
[568] Mark Fisher, *Capitalist Realism: Is There No Alternative?* (Winchester, UK: Zero Books, 2009), 2, 10.; Federici, *Re-enchanting the World*, 55–58.

To foreground CS as a model of P-posthuman subjectivity is to affirm that subjectivation is always already infrastructural, affective, and collective. The cyborg is less a metaphor than a *method*: a reflexive engagement with architectures of dispossession and care, entropy and negentropy, inertia and invention. Its politics is not premised on escape but on the cultivation of compositional practices capable of sustaining multiplicity, contingency, and relation—even, or especially, when technics seems to close the horizon of possibility.[569] The pharmakon of the contemporary is thus not resolved but continuously renegotiated, as technical ambivalence is folded into situated counter-infrastructures, design justice experiments, and emergent modes of planetary responsibility.[570]

What endures is not the cyborg as a bounded form, but as a persistent field of practice—a permeable interface through which the politics of life, care, and collective world-making remain open. In this sense, CS is both a diagnosis and a blueprint for posthuman ontopolitics: it weaponizes fracture and friction as resources for compositional action, insisting that even in the densest architectures of extraction, the work of making-with, rerouting, and recomposing worlds remains irreducibly unfinished. Inhabiting the pluriverse is not a matter of choosing sides, but of sustaining the labor of thoughtfully-adaptive subjectivation amid planetary turbulence, where solidarity, care, and invention circulate as the true technics of survival.[571] Cyborgian Subjectivity, then, endures as a living interface: a liminal-processual zone of contestation where planetary survival, collective attunement, and ontological repair are continually articulated within logi(sti)cs that both bind and liberate the horizons of potentiality. Here, the cyborg's unending mandate unfolds at the vibrating margins of polividual being, stitching fissure with invention and transmuting *Kyberschmerz*, the Weltschmerz of our cybernetic epoch, into a vector of hope.

[569] Escobar, *Designs for the Pluriverse*, 16–20; Yuk Hui, *Recursivity and Contingency* (London: Rowman and Littlefield International, 2019), 214.
[570] Taina Bucher, *If...Then: Algorithmic Power and Politics* (Oxford: Oxford University Press, 2018), 58–62; see also Sasha Costanza-Chock, *Design Justice: Community-Led Practices to Build the Worlds We Need* (Cambridge, MA: MIT Press, 2020).
[571] Haraway, *Staying with the Trouble*, 54–60; Catherine Malabou, *What Should We Do with Our Brain?* (New York: Fordham University Press, 2008), 53–65.; Escobar, *Designs for the Pluriverse*, 52–54.

3.3.4 P2d: Be(com)ing Algorithmic Flesh—The Posthuman Reconfiguration of Techno-Embodied Subjectivity

3.3.4.1 From Boundary-Crash to Micro-Capture

CS shattered humanist ontologies by exposing the *macropolitical* collision of bodies and machines: Cold-War cybernetics, plantation logistics, biotechnical patent regimes, arguing that the "human" has always already been a machinic relay.[572] However, since CS trains its theoretical lens on the *spectacle* of parted borders, it risks overlooking the infra-perceptual infrastructures where power now coagulates. *Techno-Embodied Subjectivity* (TES) therefore inaugurates a second analytic horizon: not the *fact* that boundaries are porous, but the *way* algorithmic architectures pre-articulate the sensorimotor intervals in which any boundary could be recognized, contested, or refused.[573]

Where CS celebrated the scandalous epistemic novelty that "the machine is us,"[574] TES turns to the understated sequel: the machine is also *pre-inscribed* in the timing of attention, soldered into the millisecond rhythms that pace desire, memory, and moral inference.[575] The pacemaker and insulin pump, canonical icons of CS, remain operative, but for TES, the decisive prosthesis is less visible and more pervasive: the debounce delay that imperceptibly filters our digital intentions, the vibration motor whose haptic pulses sculpt anticipation, the predictive n-gram that scripts words before we know we wish to speak them; the list goes on.[576] Subjectivity is not merely hybridized; it is time-stamped, harmonized to platform latencies that compress even the possibility of hesitation. Put bluntly, Haraway's cyborg reveals what power looks like when it crosses flesh with hardware; TES, by contrast, exposes what power *feels* like when code traverses the synapse.

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[572] Haraway, "A Cyborg Manifesto," 149–81; Mbembe, "Necropolitics," 11–40.
[573] Hayles, *How We Think,* 1–15.
[574] Haraway, "A Cyborg Manifesto," 180.
[575] Hansen, *Bodies in Code*, 27–32.
[576] Debounce delay refers to software-embedded pauses (typically measured in milliseconds) that distinguish intentional touch from error, pre-structuring user agency at the level of micro-gesture. Vibration motors in smartphones and wearables provide programmable haptic signals, shaping attention, reward, and affective learning at an infra-perceptual scale. Predictive n-grams are algorithmic models that anticipate and complete linguistic intention in real time, subtly scripting subjectivity in the very flow of digital expression. See Jack G. Ganssle, "A Guide to Debouncing," August 2004, *Rev*. 3 (June 2008), 1–7; Schüll, *Addiction by Design*, 8–13; and Hayles, *How We Think*, 45–50.

To calibrate this re-centering, we draw on three substantial theoretical perspectives. Hayles demonstrates that cognition is a *technogenetic loop* in which pattern and randomness dynamically modulate embodiment;[577] Langenohl reveals how, once automated, such loops redistribute accountability across socio-technical ecologies, from trader to algorithm to market protocol, in high-frequency finance;[578] Stiegler radicalizes both by naming automation an ambivalent pharmakon: a tertiary retention that exteriorizes memory while proletarianizing the future.[579] Taken together, their accounts clarify that TES is not a derivative footnote to CS but a fresh ontopolitical program: an anatomy of how invisibly thin slices of time reshape reflexivity, culpability, and the possibility of collective repair.

Consider the interval of a push-notification ping. Its physiological duration is less than 200 milliseconds, but within this micro-temporal window, dopaminergic expectancy is triggered, attention is reflexively reoriented, and behavioral surplus is invisibly harvested by the platform's surveillance architecture.[580] No border is transgressed, no prosthetic limb appended; instead, what is altered is the subject's protentional arc: the Husserlian horizon of *das Noch-nicht*, at once the "not-yet" and the imminent "about-to-be", incrementally rewritten in code.[581] Here, the analytic locus of TES comes into focus: agency is neither lost nor simply asserted, but pre-structured as a function of latency thresholds, algorithmic recommendations, and implicit scripts in the form of encoded sequences of interaction that shape user conduct at the level of micro-temporal engagement.[582] Culpability likewise cannot be meaningfully anchored to any individual actorship; instead, it diffuses across the sociotechnical ecology: through software commits (the distributed, modular code changes that collectively shape system behavior), UX (user experience) schematics, venture capital incentives, and the neuroplastic adaptability of end-users themselves.[583]

This transition entails a reorientation along three axes. First, analysis shifts from the spectacle of boundary-crossing to the sequentialization of tempo: power now operates in the rhythms and

[577] Hayles, *How We Became Posthuman*, 24–30.
[578] Andreas Langenohl, "Algorithmic Reflexivity," 113–25.
[579] Stiegler, *Automatic Society,Volume 1,* 89–103.
[580] Zuboff, *The Age of Surveillance Capitalism,* 259–70.
[581] Edmund Husserl, *On the Phenomenology of the Consciousness of Internal Time (1893–1917)*, trans. John B. Brough (Dordrecht: Kluwer, 1991).
[582] Beer, *Metric Power*, 39–43.
[583] Cohen, *Between Truth and Power*, 211–25.

intervals through which code scripts response before reflective consciousness can intervene.[584] Second, the circuitry of agency gives way to a model of distributed relationality: decision-making and responsibility become emergent properties of relational timing, not discrete acts of sovereign will.[585] Third, the most consequential operations of power withdraw from visibility, becoming naturalized within default options, API rate-limiting parameters, and optimization heuristics that perform extraction while maintaining an aura of frictionless service.[586] In this sense, rather than merely extending cyborgian hybridity, TES redraws the posthuman from the inside out, anatomizing the infiltration of machinic anticipation into the constitutive gaps of perception. The very conditions for critique, deliberation, or refusal are themselves transformed into computable events. The following movements unfold this problematic, situating Hayles, Langenohl, and Stiegler in a sustained theoretical encounter that clarifies the anatomy of algorithmic subjectivity.

3.3.4.2 Technogenetic Vectors: Pattern-Randomness and the Neuropoetics of Code

While CS dramatized hybridity at the level of visible apparatus, TES turns to the pre-phenomenal substrate where cognition itself is plastically re-engineered. Hayles's signal contribution is to insist that information cannot be abstracted from embodiment without collapsing into paradox: within Shannon's formalism information is simultaneously ordered signal and probabilistic noise, a tension that writes indeterminacy into the heart of every computational act.[587] When such acts propagate through networked hardware, they do not merely *represent* the world; they actively *re-compose* neural thresholds of pattern-recognition, habituating bodies to a dialectic in which randomness is a precondition for the very coherence it appears to threaten.[588] TES names this recursive coupling *algorithmic flesh*: a living substrate recalibrated by stochastic matrices of prediction and correction whose operations sink below reflective capture yet surface as altered sensorimotor dispositions.[589]

[584] Bucher, *If…Then*, 58–62.
[585] Amoore, *Cloud Ethics*, 53–65.
[586] Crawford, *Atlas of AI*, 66–84.
[587] Claude E. Shannon, "A Mathematical Theory of Communication," *Bell System Technical Journal* 27, no. 3 (1948): 379–423; Hayles, *How We Became Posthuman*, 51–55.
[588] Hayles, *How We Became Posthuman*, 56–60.
[589] Blackman, *The Body*, 111–15.

Hayles's *technogenesis* extends McLuhan's insight that "[a]ll media work us over completely" by providing a material-semiotic account of *how* that working-over insinuates itself at synaptic scale.[590] Each tap, swipe, or scroll enrolls cortical plasticity in a cybernetic feedback loop where code learns from micro-gestures even as it scripts their future trajectories.[591] Pattern-noise oscillation therefore migrates from an *engineering* problem to a *phenomenological* condition: the subject's fundamental task becomes *ambiguity management* within probabilistic environments that never fully settle into signal.[592] Hence the paradoxical phenomenology of the *smartphone*, simultaneously epistemic prosthesis and ontological irritant, whose pings solicit attention precisely by withholding the content that would satisfy it, sustaining cognition in a liminal state of low-grade arousal.[593]

Beyond its neural configuration, technogenesis asserts itself as an *onto-political* force. By corralling randomness inside optimization pipelines, platforms convert contingency into asset, volatility into monetizable surplus.[594] Predictive analytics operationalize Shannon's entropy as a scarcity to be conquered, while secretly preserving enough stochastic slack to keep recommendation engines adaptive.[595] TES therefore reads each interface as a *biopolitical vivarium* where pattern-noise ratios are tuned to maximize dwell-time, replenishing datasets that will refine the very models orchestrating future attention.[596] Agency is not extinguished but folded into a horizon of probabilistic affordances that channel volition along pre-computed gradients.[597]

Hayles's account also illuminates a crucial distinction *within* embodiment, between what she calls "first-order bodily inscription" (muscle memory, proprioception) and "second-order discursive framing" (symbolic narratives about the body).[598] TES argues that algorithmic infrastructures short-circuit this interval, eliding reflective narration by suturing sensation directly to

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[590] Marshall McLuhan, *The Medium Is the Massage: An Inventory of Effects*, with Quentin Fiore and Jerome Agel (New York: Bantam Books, 1967), 26; see also idem, *Understanding Media: The Extensions of Man* (New York: McGraw-Hill, 1964), 172; Hayles, *How We Think*, 10–12.
[591] Hayles, *How We Think*, 2–5.
[592] Mark B. N. Hansen, *Feed-Forward: On the Future of Twenty-First-Century Media* (Chicago: University of Chicago Press, 2015), 38–40.
[593] Jonathan Crary, *24/7: Late Capitalism and the Ends of Sleep* (London: Verso, 2013), 24–27.
[594] Zuboff, *The Age of Surveillance Capitalism*, 8–9.
[595] Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy (New York: Crown, 2016)*, 125–29.
[596] Eli Pariser, *The Filter Bubble: What the Internet Is Hiding from You* (New York: Penguin Press, 2011).
[597] Luciana Parisi, *Contagious Architecture: Computation, Aesthetics and Space* (Cambridge, MA: MIT Press, 2013).
[598] Hayles, *How We Think*, 28–31.

computational feedback.[599] A wearable heart-rate monitor, for instance, does not simply record cardiac rhythm; it modulates affect by coloring the number red when the pulse strays from a norm set by population-level analytics, thereby recruiting anxiety as a regulatory drive.[600] Data visualization becomes *affective command syntax*: color, haptic buzz, and badge gamification act as micro-legislators bypassing deliberation.[601] The body thus internalizes platform metrics as proprioceptive truths, a phenomenon Hayles anticipated when she wrote that electronic textuality "writes itself into the nervous system."[602]

To appreciate the full implications of Stiegler's pharmacosophical approach, we must reintegrate it into our analysis. The advent of digital tertiary retention, where the labor of memory is externalized with previously unimaginable granularity, entrusts cloud infrastructures with the continuous inscription of our attentional lives.[603] In this context, the pharmakon reveals itself as fundamentally temporal: automated systems of protention, designed to anticipate and preempt desire or action, appear to promise seamless futurity, yet simultaneously expropriate the very capacity for future-directed individuation that underpins subjectivity itself.[604] What emerges, then, is a political economy of time, structured by the dialectic of pattern and randomness: entropy becomes a strategic asset, manipulated both as a calculable risk (as in the realm of HFT—*high-frequency trading*) and as a seductive force sustaining the compulsive temporality of perpetual refresh/update.[605]

Hayles's take on technogenesis does not, however, end in dystopic foreclosure. Because randomness remains irreducible, every predictive model harbors a residuum of incalculability, a margin where resistant improvisation can germinate.[606] Tactical latency (delaying a click, scrambling a data trace, refusing the "seamless" flow) can reopen the interval Stiegler calls *long circuits of transindividuation*, allowing attention to reconvene around collective stakes rather than

[599] Bratton, *The Stack*, 23–30.
[600] Natasha Dow Schüll, "Data for Life: Wearable Technology and the Design of Self-Care," *BioSocieties* 11, no. 3 (2016): 321–28.
[601] Bucher, *If…Then*, 93–97; see also Adam Alter, *Irresistible: The Rise of Addictive Technology and the Business of Keeping Us Hooked* (New York: Penguin Press, 2017).
[602] Hayles, *How We Became Posthuman*, 29.
[603] Stiegler, *Automatic Society,Volume 1*.
[604] MacKenzie, *Trading at the Speed of Light*, 3–10.
[605] Ibid.
[606] Hayles, *How We Think*, 35–37.

automated nudges.[607] The implication is not to flee mediation, which is impossible in any case, but rather to *hack* the dialectic itself: to amplify noise *strategically* so that the system's hunger for pattern turns against its proprietors, seeding counter-datasets that distort extractive inference.[608]

In this light, Hayles enables TES to move beyond the border-obsessed optics of CS by providing an epistemology of micro-capture. She demonstrates how the fundamental ambiguity between signal and noise is not merely a technical curiosity but a force that organizes subjectivity itself, as code does not just enhance cognition but subtly orients and frames its very conditions of emergence. The challenge, then, is to invent socio-technical practices capable of expanding these possibilities faster than platforms can enclose them, cultivating ambiguity as *res communis omnium* rather than allowing it to be commodified. Such an endeavor, as the next part will show, demands a rigorous accounting of how Langenohl's algorithmic reflexivity disperses culpability across machinic ecologies while still leaving open a micro-politics of re-appropriation.

3.3.4.3 'Elastic' Culpability: Algorithmic Reflexivity and the Market as Micrological Court

While Hayles exposes how the dynamics of pattern and randomness recalibrate cognition, Andreas Langenohl traces how, once automated, these dynamics reconfigure the very attribution of blame. Where cognitive loops once defined human-machine relations, their automation now redistributes accountability across algorithmic and institutional circuits, unsettling inherited notions of agency and responsibility.[609] His object is not the user-interface but the limit-regime of HFT, where nanosecond arbitrage engines arbitrate value faster than ocular saccades.[610] In that milieu the liberal trope of the deciding subject implodes: trading order books are updated roughly every 400 µs, whereas it takes the human brain around 300 ms even to register and process a decision.[611] Between those scales yawns an ontological rift in which responsibility, intention, and even evidence dematerialize into what Langenohl terms *algorithmic reflexivity*—a recursive chain in which machines "observe" one another by pre-empting moves that have not yet been made,

[607] Stiegler, *The Neganthropocene*, 34–38.
[608] Seda Gürses and Joris van Hoboken, "Privacy After the Agile Turn," in *The Cambridge Handbook of Consumer Privacy*, ed. Evan Selinger, Jules Polonetsky, and Omer Tene (Cambridge: Cambridge University Press, 2018), 579–601.
[609] Langenohl, "Algorithmic Reflexivity," 106–25.
[610] MacKenzie, *Trading at the Speed of Light*, 1–7.
[611] Ibid., 32–40.

generating a market whose operations are anticipatory and whose accountability is enacted through distributed reflexivity.[612]

The analytic novelty here is twofold. First, reflexivity ceases to be a purely *cognitive* operation (à la Garfinkel); instead, as Langenohl argues, it becomes an engineered property of software itself, with algorithms that actively shape their environment by anticipating and encoding future outcomes in present operations.[613] Also, accountability migrates from identifiable agents to the *temporal topology* of the trading stack: factors such as the physical location of servers ("colocation geographies"), the use of high-speed microwave transmission, and the specific delays introduced by hardware circuits known as FPGAs (field-programmable gate arrays).[614] In this context, error does not signify sabotage or personal negligence, but rather a misalignment in the timing of interacting systems—a kind of technical disharmony that can ripple throughout the network, as seen in events like the 2010 Flash Crash, where a single algorithmic order cascaded into a massive stock market plunge before human operators even registered the problem.[615] As a result, assigning blame after such incidents requires assembling evidence from digital records, precise time-stamps, and statistical reconstructions—a process more akin to a jurisprudence of *post hoc spectrology* (that is, forensic spectral analysis, piecing together traces left behind in the system) than to conventional moral or legal judgment.[616]

Langenohl's insight finds a striking parallel in Stiegler's notion of the pharmakon, as each frames the role of technological memory and anticipation in high-frequency finance from a distinct yet mutually illuminating angle. In this context, "tertiary retention," the technical inscription and storage of information beyond the individual mind, no longer unfolds at the scale of human cognition, but is instead compressed to sub-second intervals within trading systems. This shift transforms "protention," or the horizon of future expectation, into a tool: algorithms leverage these fractions of a second to anticipate and act on market movements, turning liquidity itself into a kind of catalytic pulse. As a result, the market ceases to mirror the underlying realities of the "real

[612] Langenohl, "Algorithmic Reflexivity," 113–18.
[613] Harold Garfinkel, *Studies in Ethnomethodology* (Englewood Cliffs: Prentice-Hall, 1967), 1–34; Langenohl, "Algorithmic Reflexivity," 115–18.
[614] MacKenzie, *Trading at the Speed of Light*, 32–40.
[615] Andrei Kirilenko et al., "The Flash Crash: The Impact of High-Frequency Trading on an Electronic Market," *Journal of Finance* 72, no. 3 (2017): 967–98.
[616] Amoore, *Cloud Ethics*, 70–75.

economy," and instead generates its own *temporality* by accelerating transaction speeds, a dynamic we might describe, following MacKenzie, as performativity in the *temporal deep.*[617] In such an environment, randomness is not a disruptive force to be eliminated, but rather the operational lubricant that sustains the metastability of anticipatory feedback loops; algorithmic models purposefully inject stochastic "jitter" to prevent exploitation by rival systems and to maintain competitive advantage.[618] Volatility, therefore, is not a mere byproduct, but an intentionally engineered affordance. Here, following Stiegler, we might think of randomness as a pharmakon: both risk and resource, sustaining the metastability of anticipatory feedback loops. This framing generates streams of data that sustain the proliferation of specialized financial instruments designed to profit from or hedge against sudden market shocks and episodes of extreme uncertainty.[619]

Significantly, algorithmic reflexivity reshapes the very contours of moral economy. Where classical finance depended on intentionality, exemplified by the mutual recognition embedded in the bargain and the promise to pay, enforced through contract law, HFT operates within an environment where such human-centered premises no longer hold sway. Instead, the primary mode of value extraction becomes *latency arbitrage*: the strategic exploitation of minuscule differences in transaction timing to outpace competitors. As Buchanan notes, those able to capitalize on even the smallest delays in the transmission of market information can convert these fleeting moments into measurable profit, effectively turning speed itself into a form of economic leverage within the market's infrastructure.[620] However, the pursuit of minimal friction in these technical systems cannot be divorced from the broader structures that underwrite it. The geographic clustering of HFT infrastructures reflects not just technical optimization but the operation of legal and economic privilege: regimes of access, regulation, and resource allocation that selectively enable and insulate certain actors. The volatility these systems generate is rarely self-contained; its consequences

[617] See MacKenzie, *Trading at the Speed of Light*, 210–14.
[618] David Easley, Marcos López de Prado, and Maureen O'Hara, "Microstructure in the Machine Age," *Review of Financial Studies* 34, no. 7 (2021): 3316–63.
[619] For accessible historical context on market crashes, see Scott Nations, *A History of the United States in Five Crashes: Stock Market Meltdowns That Defined a Nation* (New York: William Morrow, 2017), esp. chaps. 10 and 13; for a theoretical analysis of volatility as an asset and uncertainty as a manipulable dimension, see Daniel Beunza and Iain Hardie, "A Price Is a Social Thing: Towards a Material Sociology of Arbitrage," *Organization Studies* 27, no. 5 (2006): 721–45.
[620] Mark Buchanan, "Physics in Finance: Trading at the Speed of Light," *Nature* 518, no. 7538 (February 11, 2015): 161–63.

diffuse through broader financial circuits, with risks and costs redistributed far beyond the immediate sphere of market operators. Moral and economic responsibility thus expands, implicating the networks of energy provision, global material supply, and environmental impact that sustain contemporary computation. These entanglements, as Sassen and Crawford each argue in distinct registers, make clear that the effects of algorithmic finance cannot be disentangled from the infrastructures and ecologies through which they are routed, nor from the social and planetary vulnerabilities they expose and intensify.[621]

Building on Langenohl's engagement with ethnomethodology, it becomes clear that accountability in algorithmic finance is not a static property but an ongoing achievement, performed through "account-rendering" practices. Rather than resting in the hands of identifiable individuals, responsibility is enacted through the continuous generation of technical records such as logs, audits, event traces, and protocol snapshots, all of which together constitute the procedural backbone of order in automated markets. Mechanisms such as kill-switch activation (emergency shutdowns for trading systems), automated circuit-breakers (systems that pause or halt trading when prices swing too wildly), and forensic time-stamping (precisely recording the timing of every transaction and event) show how today's financial markets try to make trust visible and reliable—not just through human oversight, but by building multiple layers of automated, technical record-keeping and safeguards into their operations. However, as Langenohl stresses, these very practices often deepen rather than resolve systemic opacity. Machine-generated records frequently resist direct human interpretation, requiring bespoke technical expertise to parse, so that each new layer of monitoring introduces its own recursive ambiguities. The locus of judgment and appeal therefore shifts from the familiar domain of courts and regulatory hearings to the technical terrain of code repositories, network logs, and automated evidentiary infrastructures.[622]

Within this evolving ecology, markets are refigured as auto-juridical arenas: no longer merely facilitating transactions, they actively construct the evidentiary regimes through which accountability is invoked and adjudicated. In this sense, Langenohl's account significantly advances ongoing debates about agency in socio-technical systems, challenging both simplistic models of human accountability and reductionist accounts of algorithmic determinism. Langenohl

[621] Sassen, *Expulsions*, 55–60; Crawford, *Atlas of AI*, 112–19.
[622] Langenohl, "Algorithmic Reflexivity," 118–22.

shows that the question of accountability in algorithmic finance is not straightforward. Drawing on Rauer, he demonstrates that responsibility is not anchored in single agents or institutions, but distributed across a heterogeneous network encompassing both human and non-human, algorithmic actors.[623] Rather than entering this distribution seamlessly, algorithmic action becomes one element in a dynamic and intricate web in which agency and responsibility are continually renegotiated among people, machines, and technical infrastructures.[624] Within this framework, efforts to assign blame or responsibility become entangled with the very systems and practices that produce financial outcomes. For Langenohl, accountability in this context is best understood as an ongoing, collaborative achievement, inseparable from the reflexive processes through which social actors, and increasingly, technical devices, render actions intelligible and attributable within the evolving landscape of finance. As the boundaries between human and machinic agency blur, the locus of decision-making and oversight itself shifts: governance, as Gillespie's analysis of platforms suggests, increasingly becomes internal to technical infrastructure, with systems now tasked not only with execution but also with self-documentation and dispute resolution.[625]

TES radicalizes this analysis along two principal vectors. First, it maintains that the reflexive logic observed in high-frequency finance is not exceptional, but is continuously replicated across platform-mediated economies. From gig-work dispatch to social media curation, algorithmic systems both predict and actively shape behavioral outcomes. For instance, the mechanisms governing delivery driver allocation anticipate supply fluctuations, then reconfigure spatial positioning in real time to optimize predicted demand, effectively actualizing their own forecasts. This recursive orchestration, well-documented in Uber's operational dynamics, mirrors the anticipatory strategies of HFT, where algorithms maneuver for optimal queue position within microsecond intervals.[626] As Rosenblat and Pasquale have argued, such practices embed predictive management within the infrastructures of everyday labor and information access.[627] Second, TES builds on Langenohl's account of distributed accountability in macro-finance, articulating its

[623] Ibid., 117.
[624] Ibid., 118.
[625] Tarleton Gillespie, "The Politics of 'Platforms'," *New Media & Society* 12, no. 3 (2010): 353–56.
[626] Alex Rosenblat, *Uberland: How Algorithms Are Rewriting the Rules of Work* (Oakland: University of California Press, 2018), 88–95.
[627] Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (Cambridge: Harvard University Press, 2015), 39–54.

dynamics at the level of embodied subjectivity. Where HFT algorithms extract value from imperceptible slices of time beyond human cognitive thresholds, platform architectures similarly seize microtemporal intervals of attention, exploiting moments that precede conscious deliberation. Push notifications, app vibrations, and predictive content feeds are not simply communicative tools, but mechanisms for capturing affective surplus at the edge of perception, scripting user response before intent coheres. Zuboff, drawing on extensive empirical study, identifies these anticipatory interventions as foundational to surveillance capitalism, while Crawford has shown how such design practices synchronize sensorimotor rhythms with algorithmic timing.[628] What distinguishes these cases is not the underlying structure, but the domain of capture: capital flows in trading versus affective and cognitive flows in everyday life. In both, the technical logic of preemptive modulation and anticipatory capture remains fundamentally isomorphic.

3.3.4.4 Pharmako-Design: Reclaiming Temporal Agency

Stiegler identifies the critical wound of algorithmic culture in what he describes as the shrinking of the interval in which intention takes shape and judgment becomes possible—a gap that might be called a *noetic delay*. When predictive systems occupy this interval, they convert the future into a pre-priced derivative, leaving little room for deliberation or refusal.[629] Langenohl's concept of algorithmic reflexivity provides a crucial diagnostic lens: by showing how automated markets generate their own evidentiary records, he maps the micro-durations in which accountability both attenuates and becomes available for renewed inscription.[630] Both authors converge on time as the primary political medium. Every technical system, Stiegler argues, is a pharmakon, capable of either truncating or extending experience.[631] The task, then, is not to reject automation but to redesign its temporal architecture so that reflection can re-enter accelerated circuits.[632]

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[628] Zuboff, *The Age of Surveillance Capitalism*, 257–72; Crawford, *Atlas of AI*, 135–40.
[629] Bernard Stiegler, *Technics and Time, 2: Disorientation* (Stanford: Stanford University Press, 2009), 10–16.
[630] Langenohl, "Algorithmic Reflexivity," 113–17.
[631] Stiegler, *Technics and Time, 1*, 3–4.
[632] A paradigmatic case is the IEX (Investors Exchange) stock exchange, founded in response to perceived unfairness in U.S. stock markets, where high-frequency traders used expensive, ultra-fast technology to get price information and place orders milliseconds ahead of everyone else. To counter this, IEX installed a coil of fiber-optic cable that creates a fixed delay of 350 microseconds for every order. This pause (the "speed bump"), invisible to humans, disrupts the advantage of raw speed and levels the playing field, showing how micro-temporal architecture can reintroduce fairness and deliberative space into automated systems. Similar strategies appear elsewhere: social platforms now

Pharmako-design thus refers to the deliberate modulation of latency, using temporal configurations such as default delays, batch intervals, and feedback rhythms as mechanisms for redistributing agency and influence within technical systems. Where surveillance platforms monetize attention by collapsing hesitation, counter-design injects tactical delay to restore the capacity to think, doubt, or collaborate. Practices such as *obfuscation* exploit predictive systems' dependency on clean data, using randomness to frustrate extraction and reclaim informational autonomy.[633] At a civic scale, projects like Stiegler's *Plaine Commune* propose governing data infrastructures as commons, channeling behavioral surplus into cultural and educational dividends rather than private optimization.[634]

Techno-Embodied Subjectivity culminates in a chrono-political ethic: freedom under algorithmic conditions turns on who determines temporal regimes and how their rhythms are shared. Reclaiming the future depends on a collective capacity to negotiate tempo, decelerating where reflection is needed and accelerating where care must reach, while recognizing micro-durations as a public resource rather than a proprietary asset. Only on these terms can posthuman agency, with TES as its ontodemocratic instrument, inhabit an open horizon rather than submit to a pre-scripted fate.

3.4 Trans-Narrative/Topo-Poietic Gradient (P3): Culture, Story, and Earth Writing the P-posthuman

If the P1 gradient revealed that existence quivers as circuitry, and P2 showed that the circuitry coagulates in flesh-machine holobionts, the third and final movement turns the lens outward and downward at once: outward to planetary flows of image, capital, and migration that sluice through every life; downward to the geologic and atmospheric strata that quite literally underwrite those flows. Only in this *trans-narrative topo-poiesis* does P-posthuman subjectivity acquire the texture

experiment with requiring a brief pause before users can forward content, inviting reconsideration and slowing viral cascades. See Michael Lewis, *Flash Boys: A Wall Street Revolt* (New York: W. W. Norton, 2014), 191–95; and Zuboff, *The Age of Surveillance Capitalism*, 335–39.

633 Helen Nissenbaum and Finn Brunton, *Obfuscation: A User's Guide for Privacy and Protest* (Cambridge, MA: MIT Press, 2015), 9–15.

634 See Bernard Stiegler and The Internation[al] Collective, *Bifurcate: 'There Is No Alternative'*, trans. Daniel Ross (London: Open Humanities Press, 2021); cf. Maël Montévil, "Plaine Commune, Contributive Learning Territory: Memories of the Future," in *Memories for the Future: Thinking with Bernard Stiegler*, ed. Bart Buseyne, Georgios Tsagdis, and Paul Willemarck (London: Bloomsbury Academic, 2024), available at https://montevil.org/publications/chapters/2023-montevil-stiegler-memory-future/#ftn1, accessed June 27, 2025.

of *worldliness*, that thick weave of place and meaning without which flesh remains mute datum and ontology mere diagram. Three intertwined vectors bring the texture into focus.

3.4.1 P3a: Cartographies of Entanglement—Toward Transcultural Relational Subjectivity

Transcultural Relational Subjectivity (TRS) is no longer the benign after-image of globalization, nor a simple update of cosmopolitan mobility; it is an ontogenetic field in which climate turbulence, machinic cognition, logistical extractions, and multispecies drift weave identities that flicker in and out of algorithmic legibility. The inherited vocabulary of *scapes* that Arjun Appadurai offered (ethno-, techno-, media-, finance-, ideo-) remains indispensable; even so, his anthropocentric chassis cannot register the extent to which predictive architectures, endocrine-disrupting plastics, or pole-ward fish migrations now write the very co-ordinates of selfhood.[635] Whereas Appadurai's disjunctures still implied a stage on which human actors manoeuvred, TRS insists that the stage itself, whether lithic, bacterial, or computational, has become an active, *polividual* dramaturge, scripting the entrances and exits of subjects who discover that their imagined autonomy has already been pre-processed by planetary infrastructures.

The tectonic realignments at stake are best grasped not as additive "pressures" on cultural form but as generative operations that dissolve the residual metaphysics of the bounded human. Climate-driven relocations, from Greenland's retreating ice sheets to Sahelian desertification, redistribute livelihoods, languages, and cosmologies faster than jurisprudence can chart territorial loss.[636] Viral machinics propagate with equal indifference to borders, whether in the form of malware sneaking through industrial control systems or zoonotic pathogens hitching rides in deregulated corridors of protein trade.[637] Microplastics infiltrate the digestive tracts of zooplankton and the soft tissues of neonates, binding carbon-heavy petro-genealogies to the microbiome of future citizens.[638] As we have already demonstrated to an extent, synchronous with these material drifts, large-scale

[635] Arjun Appadurai, *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis: University of Minnesota Press, 1996), 31–33.
[636] Haraway, *Staying with the Trouble*, 60–61; Bruno Latour, *Down to Earth: Politics in the New Climatic Regime*, trans. Catherine Porter (Cambridge: Polity Press, 2018)., esp. Essay III and Essay VI.
[637] Crawford, *Atlas of AI*, 10, 24–25; Bratton, *The Stack*, 1; Stefan Helmreich, *Alien Ocean: Anthropological Voyages in Microbial Seas* (Berkeley: University of California Press, 2009), 1, 31.
[638] R. C. Thompson, C. J. Moore, F. S. vom Saal, and S. H. Swan, "Plastics, the Environment and Human Health: Current Consensus and Future Trends," *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, no. 1526 (2009): 2153–66, esp. 2157–59 on ingestion by zooplankton and trophic transfer.

machine-learning models simulate behavioral futures, rerouting desire and credit before reflective agency ignites in consciousness.[639] None of these phenomena merely *pressure* human cultures from the outside: they furnish the very substrates through which cultures materialize. TRS therefore refuses the lingering fantasy of a global arena over which actors circulate; it approaches the contemporary as a polycentric, polividual manifold in which AAA—gradients of temperature, latency, liquidity, and toxicity, continuously coalesce and dissolve the very possibility of relational coherence. In such a milieu, the frontier, as Tsing has noted, no longer signifies the rugged edge of expansion but a recursive techno-imaginary where "visions and vines and violence" converge to fabricate new modes of extraction.[640] Lithium concessions in Serbia's Jadar valley, satellite constellations above the equator, and cobalt pits in Katanga are *heterotopic laboratories* where subjects become algorithmically sortable risk vectors while batteries, sensor arrays, and mineral soils are elevated to geopolitical protagonists.[641] Identity is not merely displaced by these frontiers; it is *manufactured* through their machinic transactions.

Appadurai's diaspora (διασπορά, from δια- "across" and σπείρω "to scatter") has always named a scattering that is imaginative before it is demographic.[642] However, in a posthuman frame, scattering is not exclusively human. Africanized honeybees, ballast-water cholera, and migratory data centers driven by differential energy prices constitute a planetary diaspora of matter in which relocation neither guarantees nostalgia nor negotiates return, but inaugurates unforeseen ecologies of encounter.[643] Migration thereby reveals itself as a metabolic function of the Earth system, not a sociological aberration, and diasporic memory becomes inseparable from the material substrates such as copper cables, geothermal kilowatt hours, and microplastic sediments through which it is stored and retrieved. Imagination, which Appadurai once defined as a quotidian social fact, now

[639] N. Katherine Hayles, *Unthought: The Power of the Cognitive Nonconscious* (Chicago: University of Chicago Press, 2017), 129–30, 154–55.
[640] Anna Lowenhaupt Tsing, "Natural Resources and Capitalist Frontiers," *Economic and Political Weekly* 38, no. 48 (2003): 5100–6.
[641] See C. G. Bassa, O. R. Hainaut, and D. Galadí-Enríquez, "Analytical Simulations of the Effect of Satellite Constellations on Optical and Near-Infrared Observations," *Astronomy & Astrophysics* 657, A75 (2022): 1–19; Célestin Lubaba Nkulu Banza et al., "High Human Exposure to Cobalt and Other Metals in Katanga, a Mining Area of the Democratic Republic of Congo," *Environmental Research* 109, no. 6 (2009): 745–52; and Michael J. Kavanagh, "Cobalt Mining for Lithium Ion Batteries Has a High Human Cost," *Washington Post*, September 30, 2016, https://www.washingtonpost.com/graphics/business/batteries/congo-cobalt-mining-for-lithium-ion-battery/.
[642] Appadurai, *Modernity at Large*, 58–64.
[643] Stanley S. Schneider, Gloria DeGrandi-Hoffman, and Deborah R. Smith, "The African Honey Bee: Factors Contributing to a Successful Biological Invasion," *Annual Review of Entomology* 49, no. 1 (2004): 351–76, esp. on invasion dynamics and ecological transformation.

finds its engines outsourced to predictive computation. High-dimensional models in finance, policing, and cultural production anticipate and redirect futures long before narrative can metabolize them.[644] At the same time, street vendors in Nairobi or tuk-tuk drivers in Bangkok co-author their own alt-cartographies on the screens of devices whose lithium provenance loops back to the sacrifice zones of Balkan hinterlands. Imagination thus prospers not as sovereign creativity but as *entangled foresight*, distributed across neural tissue, neural nets, and neural reefs alike.[645]

Belonging, under TRS, no longer names a stable position one can simply occupy; rather, it describes a continual movement between being rendered visible and classifiable by technological systems ("machinic legibility") and remaining inscrutable or inaccessible to those same systems ("ecological opacity"). For instance, when satellite surveillance technologies are used to detect and track the boats of Syrian refugees before they reach a nation's territorial waters, it is the algorithmic infrastructure itself that determines who is made visible, when, and to whom, pre-shaping the very possibilities of appearance and abandonment.[646] At the same time, these orbital technologies are not only instruments of state control. Displaced and exiled communities, along with advocacy groups, increasingly harness high-resolution commercial satellite imagery to uncover and document acts of state violence that would otherwise escape international scrutiny.[647] Thus, the very infrastructures that enable surveillance and exclusion can, in moments of technical or legal hesitation (such as when data is missing, sensors fail to capture certain areas, or jurisdiction is

[644] Zuboff, *The Age of Surveillance Capitalism*, 5–6.

[645] Dipesh Chakrabarty, "The Climate of History: Four Theses," Critical Inquiry 35, no. 2 (2009): 197–222, here 199–202. While Chakrabarty emphasizes the entanglement of human and earth history on a planetary scale, "neural reefs" extends this by positing collective cognition sedimented across biological, artificial, and ecological substrates—rather than anchoring subjectivity solely in human-historical or geological registers, as will become more evident in subsequent discussions of mycelial networks, glitch archives, and hydrolithic memory.

[646] On the politics of satellite surveillance and selective visibility, see Lisa Parks and James Schwoch, *Down to Earth: Satellite Technologies, Industries, and Cultures* (New Brunswick: Rutgers University Press, 2012), 67–73.

[647] For example, activists and investigators can use satellite photos to detect evidence of scorched earth tactics, the destruction of villages, or even the appearance of mass graves—forms of violence that are often invisible to ground-level observers but become legible from space. By systematically analyzing such imagery, these groups can gather "counter-forensic testimony": evidence that challenges official denials or attempts to erase wrongdoing and instead asserts the right of marginalized communities to be seen, recognized, and heard. As Weizman observes, this kind of work transforms the technical tools of surveillance into means for holding power to account and supporting new forms of political claim and solidarity. See Eyal Weizman, *Forensic Architecture: Violence at the Threshold of Detectability* (New York: Zone Books, 2017), 2–3; and Human Rights Watch, "Burma: Military Burned Villages in Rakhine State," December 13, 2016, https://www.hrw.org/news/2016/12/14/burma-military-burned-villages-rakhine-state.

unclear), open brief but vital corridors through which new forms of world-making and resistance can emerge.

From an ethical standpoint, such a landscape demands more than liberal inclusion; it calls for an infrastructural re-design predicated on vulnerability as a shared condition. Sassen's circuits of expulsion reveal how debt, deregulation, and climatic shock externalize costs onto bodies already contoured by colonial afterlives, while Haraway urges an ethos of "making-kin" that binds flesh, plastic, and code in accountable alliances.[648] TRS joins this conversation by redefining responsibility as an obligation to re-engineer the mediating architectures, whether financial, logistic, computational, or sensory, through which relational subjectivity is unceasingly formatted and, too often, foreclosed.

3.4.1.1 Diasporic Drift and Algorithmic Currents: Re-Situating Mobility after the Human

Diaspora, which once denoted the traumatic or aspirational displacement of human bodies across political borders, now unfolds across multiple registers within a posthuman context. The logic of scattering extends well beyond the human subject. Marine organisms, for example, recalibrate their migratory routes in response to ocean warming and acidification, abandoning ancestral habitats in pursuit of viable conditions; Africanized honey bees expand into new ecological zones, reshaping patterns of pollination and local biodiversity.[649] Micro-data centers are relocated to regions such as Iceland, where abundant geothermal energy and a cool climate render operations both more cost-effective and environmentally sustainable, significantly reducing operational costs and carbon footprints. At the same time, the rare earth minerals essential to contemporary electronics are continuously extracted, transported, and embedded within new technological assemblages, tracing complex and often invisible pathways through the planetary substrate.[650] What traverses borders now is not only the passport-bearing individual but any configuration of biological life, technical infrastructure, or material substrate capable of moving through the shifting gradients of energy, capital, and information. It is precisely this figure of distributed

[648] Sassen, *Expulsions*, 57–62, 90; Haraway, *Staying with the Trouble*, 100.
[649] Stefan Helmreich, *Alien Ocean: Anthropological Voyages in Microbial Seas* (Cambridge, MA: Harvard University Press, 2009), 50–51.
[650] See Julie Michelle Klinger, *Rare Earth Frontiers: From Terrestrial Subsoils to Lunar Landscapes* (Ithaca, NY: Cornell University Press, 2017).

mobility that defines what we term TRS. Within such a milieu, diaspora is no longer merely a demographic or cultural event; it becomes a *metabolic* function of the Earth system itself, continually redistributing matter, memory, and potential across interlinked planetary circuits.

3.4.1.2 Predictive Corridors and the Politics of Latency

The metabolic re-ordering traced so far is orchestrated less by nation-states than by anticipatory infrastructures, technical ensembles that pre-compute the dispositions of bodies, goods and data before they materialize as events. A satellite constellation hovering above the Mediterranean does not merely observe the routes taken by migrants; it translates their movements into data points, assigning each journey a calculated level of risk or threat. In this way, the act of crossing borders, once a physical and legal process, becomes a statistical event, subject to real-time actuarial analysis and intervention. Similarly, biometric kiosks stationed in airports and border zones convert fleeting facial expressions and bodily cues into scores that assess compliance or deviance, feeding this information back into security systems. Across deserts and borderlands, sensor arrays embedded in the ground transform the very earth into an extension of algorithmic governance, so that even geography itself participates in the management of mobility. These technical dispositifs collectively turn entire regions into predictive infrastructures, where the gap between an individual's intention and action is continuously monitored, evaluated, and often pre-empted by computational models that determine who may move, where, and how—even before a footstep is taken.[651]

Within that envelope, however, mobility is not wholly scripted. Diasporic AAA repurpose the same infrastructures for divergent ends, demonstrating that imagination is an infrastructural skill rather than an afterthought. Cloud infrastructure in places like Iceland, where abundant geothermal energy and strong privacy laws combine with reliable, high-speed connectivity, has become a strategic resource for a range of marginalized, diasporic, and dissident communities seeking to store and share archives, records, and communications outside regions marked by internet restrictions, censorship, or surveillance. According to Parks, such choices are not merely technical but geopolitical, allowing groups to exploit "jurisdictional seams" (the gaps or overlaps between

[651] Louise Amoore, *The Politics of Possibility: Risk and Security Beyond Probability* (Durham, NC: Duke University Press, 2013), 62–68.

different legal systems where no single authority has full control), energy gradients, and fleeting micro-lags in connectivity to ensure the security and mobility of their digital materials. By routing data through favorable infrastructural landscapes, these communities are able to circumvent bottlenecks, legal obstacles, and informational choke points in their countries of origin. While the gesture may appear modest, it nevertheless reveals a broader principle: by seizing opportune moments in technical and legal infrastructure, marginalized actors can rewrite a portion of the predictive script, asserting forms of agency and memory otherwise denied to them by dominant regimes.[652] The point is not the ingenuity of one diaspora but the analytic shift it demands. Subjectivity appears here as the tactical modulation of latency, not simply as the expression of interior will.

Latency, in turn, operates as an active site of power. As Bucher's study of social-feed architecture demonstrates, what ultimately becomes visible is determined by millisecond-level hierarchies that throttle or amplify content long before any human editor intervenes. The way social platforms resurface "memories" or highlight milestone photos on the anniversaries of their original posting is far from a neutral gesture; rather, it is a platform-driven strategy, meticulously calibrated to evoke nostalgia and intensify user engagement at precisely timed intervals.[653] In this environment, visibility functions less as an open space than as a rented corridor, meted out in increments of attention, while latency itself becomes the tollgate regulating passage.

Oppositional practices therefore gravitate toward what Édouard Glissant memorably termed the "right to opacity," a principle that resists compulsory legibility and affirms the irreducible singularity of persons and cultures.[654] In this context, opacity is not simply a refusal to be seen, but a deliberate tactic for resisting capture by systems designed to render everything transparent and predictable. For example, as Safiya Noble's research on search-engine bias demonstrates, Black feminist writers often introduce intentional ambiguities or "lexical noise" into their texts,

[652] For Iceland's emergence as a strategic hub for privacy-focused and energy-efficient data centers, see Alix Johnson, "Emplacing Data: Centering the Data Center in Iceland," *Culture Machine* 18 (2019), https://culturemachine.net/vol-18-the-nature-of-data-centers/emplacing-data/; for the infrastructural politics of "jurisdictional seams," see Lisa Parks, "Stuff You Can Kick: Toward a Theory of Media Infrastructures," in *Between Humanities and the Digital*, ed. Patrik Svensson and David Theo Goldberg (Cambridge, MA: MIT Press, 2015), 355–73.
[653] For the dynamics of algorithmic content timing and affective optimization, see Zuboff, *The Age of Surveillance Capitalism*, 5–6.
[654] Édouard Glissant, *Poetics of Relation*, trans. Betsy Wing (Ann Arbor: University of Michigan Press, 1997), 189.

disrupting algorithmic routines that might otherwise erase or misrepresent their work.[655] hrough such interventions, they create temporary spaces ("transient shadows") in which alternative forms of identity and affiliation can take root, however briefly, before being reabsorbed by the dominant system. Opacity, then, does not signal a retreat into darkness, but rather serves as a productive kind of friction. As Timothy Morton observes in his work on hyperobjects, it is precisely this kind of drag or viscosity that can decelerate the relentless extraction and circulation of information, generating the necessary pause for reparative forms of encounter to emerge.[656]

Tsing's notion of *salvage rhythms* offers a vivid account of how precarious communities navigate unpredictable environments. In the forests of Oregon, as she describes, matsutake mushroom pickers, often migrants and refugees, do not follow fixed schedules or steady routines. Instead, they attune their work to the erratic emergence of mushrooms, improvising their movements and collaborations as they trace shifting signs of abundance through the woods. Such improvisational rhythms foreground a key claim of TRS: relational subjectivity endures not by recovering a prior wholeness, but through flexible, sometimes precarious, affiliations responsive to changing material conditions.[657] Sassen's circuits of expulsion are powerfully illustrated by the wave of mortgage foreclosures in Detroit, where entire neighborhoods have been emptied as homes are repossessed and residents displaced.[658] These disruptions are not isolated crises, but part of a systemic process: by transferring risk and disposability onto certain places or communities, such mechanisms stabilize economic volatility elsewhere, ensuring that instability is contained and absorbed by those deemed expendable.[659] Precarity thus emerges as a systemic feature, distributed across contexts in ways that ensure predictive markets remain liquid and responsive.

What emerges from these observations is not a program of simple inclusion into existing channels, for such inclusion often only broadens the pathways of extraction and control. Instead, the real stakes reside in the architecture of those channels themselves. Bratton's account of the stack as a planetary operating system brings this into sharp relief, revealing how each technical layer

[655] Noble, *Algorithms of Oppression*, 115.
[656] Morton, Hyperobjects, 29.
[657] Tsing, *The Mushroom at the End of the World*, 142–44.
[658] Sassen, *Expulsions*, 57–62.
[659] In this way, the negative consequences of mortgage crises, such as job loss, declining property values, and social disruption, are concentrated in vulnerable areas, while investors and broader markets remain insulated and stable.

consolidates political judgments about who or what can participate, linger, or disappear. It becomes necessary, then, to imagine latency not as inefficiency but as a collective resource, to understand opacity as a necessary site of cultural refuge, and to insist that logistical systems be rewired for repair rather than mere optimization.[660] These are not utopian gestures, but minimum conditions for safeguarding the unpredictable, the contingent, and the not-yet-legible against the totalizing capture of algorithmic prediction.[661] Reframed in these terms, TRS is neither a celebration of fluid identities nor a lament for lost autonomies. It is a diagnostic tool for tracking how predictive architectures allocate time, legibility and risk—and a normative proposal for redistributing those scarce resources so that alternative futures may enter the register of the thinkable.

3.4.1.3 Imagination as Predictive Clay: Recasting Cultural Worlds Beyond Anthropos Optics

Imagination, as Appadurai observes, is no longer confined to the private realm of artists or poets, but instead functions as a distributed infrastructure—embedding value, desire, and political possibility directly into the patterns of everyday life.[662] In the present moment, shaped by posthuman conditions, imagination's force is always mediated by architectures of anticipation. These are systems ranging from statistical models and distributed sensor arrays to synthetic genomes and machine-learning pipelines, all of which pre-format the very horizon of what can be thought, hoped, or enacted. Where twentieth-century "mediascapes" worked through images and

[660] Bratton, *The Stack*, esp. 41–45.

[661] One unusual but instructive metaphor may clarify the analytical distinction between *Techno-Embodied Subjectivity* (TES) and *Transcultural Relational Subjectivity* (TRS), especially given the conceptual interpenetration that may, at points, risk eliding their respective domains. When these frameworks appear to overlap or blur, an old analogy drawn from the Council of Chalcedon (451 CE) proves illuminating: the council articulated Christ as a single hypostasis "in two natures," insisting that the divine and the human remain ἀσυγχύτως (without confusion) and ἀδιαιρέτως (without division). Subsequent debates were not scholastic trivia but contests over how alterity and intimacy could co-inhabit the same ontological address. Monophysite collapse (single undifferentiated nature) and Nestorian fracture (two parallel subjects) mapped the twin perils of homogenization and disjunction. Maximus the Confessor later interpreted the Chalcedonian formula through περιχώρησις—a mutual indwelling in which each nature realizes itself precisely by giving place to the other (see Ambigua 5, PG 91 1056C). Within TRS/TES, this antique quarrel becomes a conceptual gyroscope: machinic cognition (TES) and transcultural imagination (TRS) must neither blur into a single techno-culture (digital Monophysitism) nor drift apart as incompatible silos (algorithmic Nestorianism). A Chalcedonian reading demands a relational ontology where heterogeneity persists through intimacy—difference as condition of, not obstacle to, mutual articulation. For critical editions see Eduard Schwartz, ed., *Acta Conciliorum Oecumenicorum*, Tomus II.1–2, *Concilium Universale Chalcedonense* (Berlin: bruceWalter de Gruyter, 1933–1936); A. Grillmeier, *Christ in Christian Tradition*, vol. 1 (Louisville: Westminster John Knox, 1996); Khaled Anatolios, *Deification through the Cross: An Eastern Christian Theology of Salvation* (Grand Rapids, MI: William B. Eerdmans Publishing Company, 2020), 174–99.

[662] Appadurai, *Modernity at Large*, 5.

stories, today's planetary infrastructures function through probabilities: every gesture, transaction, or biological signal becomes subject to a regime of predictive scoring, folded into vast algorithmic matrices that sort, rank, and condition possibilities in advance. The imaginative is thus best understood as a kind of *computational clay*: pliable and open to shaping, already impressed with algorithmic priors before any conscious act of creation can take place.

It is crucial to recognize that these algorithmic priors are never purely technical. The ground of imagination now extends through ecological transformations and technological logistics alike. The retreat of ice sheets, for example, redraws the boundaries of coastal communities and their mythologies.[663] The movement of insect populations shifts the timing of agriculture, altering the calendars that once anchored collective life. Even in the realm of finance, HFT does not simply respond to economic trends; it helps generate them, as algorithms "play" against futures they themselves bring about. The result is a world in which indeterminacy is not just tolerated but actively monetized: as Parisi puts it, uncertainty becomes a resource for further rounds of modeling and speculation, not a hard limit to what can be known or controlled.[664]

This thickening of the predictive substrate does not resolve older asymmetries. Instead, it often makes them more acute. When predictive policing is deployed, for example, it overlays statistical suspicion onto already racialized spaces, compounding patterns of surveillance and exclusion. Risk models in global finance channel volatility away from sites of capital concentration and into communities that have long been targets of extraction or dispossession. Sassen's "circuits of expulsion," whether through the foreclosure of homes in North American cities or land appropriations in the Global South, make clear that the stabilization of some futures always depends on the managed precarity of others.[665] In this sense, imagination is not an abstract universal but a privilege, unevenly distributed by location within planetary flows of data, capital, and environmental risk.

To speak of imagination as clay is to insist on both its potential for remaking and its deep entanglement with existing infrastructures. Hall's observation that identity is a matter of

[663] Chakrabarty, "The Climate of History," 199–202.
[664] Parisi, *Contagious Architecture*, 21.
[665] Sassen, *Expulsions*, 57–62.

"positioning" becomes newly concrete in a world where every claim to recognition or refusal of visibility is negotiated through layers of code, sensor arrays, and platform filters.[666] To take up a position now means to carve out a margin of opacity against demands for total transparency, to claim enough temporal slack, understood here as latency, for alternative futures to emerge before they are captured or rendered obsolete by preemptive calculation. As Ingold insists, dwelling is always a correspondence with forces that precede and exceed us, and the challenge today is to recode those correspondences so that algorithmic preemption does not foreclose the possibility of divergence, hesitation, or repair.[667]

This transformation suggests not a new program of liberal inclusion, but a revision of the conditions for agency and world-making. It requires, first, that latency (delay, slack, the time not yet assigned or optimized) be recognized not as waste but as a *collective resource*, a shared breathing space for situated deliberation and creative interruption. Also, it means upholding *opacity as a right*: not simply a refusal to be seen, but the insistence that the refusal to be fully mapped or predicted is itself a condition for new forms of affiliation and care. Opacity here does not signal withdrawal or obscurity, but names the productive friction that, as Morton suggests, can slow down extraction and open up time for genuine encounter.[668] Finally, it means insisting that the costs and errors of predictive architectures, their misclassifications, exclusions, and unforeseen consequences, are not allowed to accumulate only on those already exposed or dispossessed.

These, again, are not gestures toward utopia, but rather the minimal requirements for any politics committed to safeguarding contingency, unpredictability, and all that remains as yet illegible from processes of capture and enclosure. They cannot be fulfilled by simply inviting more participation within existing pipelines, which too often only expands the circuits of extraction and control. Rather, a *reparative design* would begin from those very spaces where under-representation, lag, and error have been mobilized as tools of domination, and work to reconfigure the infrastructural conditions themselves, treating uncertainty as a commons rather than a commodity to be eliminated.

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[666] S. Hall, "Cultural Identity and Diaspora," in *Identity: Community, Culture, Difference*, ed. J. Rutherford (London: Lawrence and Wishart, 1990), 225.
[667] See Tim Ingold, *Being Alive: Essays on Movement, Knowledge and Description* (London: Routledge, 2011), 166.
[668] Morton, *Hyperobjects*, 29.

If imagination is now a planetary medium, kneaded by competing interests, ecological urgencies, and machinic logics, the question that matters is not just who shapes it, but whose assumptions, needs, and cosmologies become encoded in its folds. The answer will not be found by asserting the primacy of human over nonhuman, or technical over ecological, but by holding all these agencies in a mutually sustaining, dynamic tension. Only through such *perichoretic* (mutually indwelling; see note 660) relations can TRS realize its promise: an ethic and a practice of world-making attuned to the full complexity, risk, and generativity of planetary entanglement.

3.4.2 P3b: Narrative-Constructed Subjectivity and the Planetary Re-configuration of Self

3.4.2.1 Cartographies of Narrative Becoming: Toward a Posthuman Grammar of Story

Story has always operated as the framework through which temporality becomes thinkable, the ontogenetic lattice that renders experience coherent across time. As Ricoeur and Bruner argued, narrative is not merely a form of discourse but the principal mode through which human beings construct reality, enabling both the continuity of self and the negotiation of new meanings amid disruption. For Bruner, it is through narrative that we create and recreate the self, anchoring identity in time and circumstance even as conditions of coherence shift.[669] In the present conjuncture, though, the conditions of inscription have so radically reconstituted this lattice that the concept of narrative now occupies a contested terrain, torn between the residues of linear authorship and the ceaseless modulation of planetary signal traffic. *Narrative-Constructed Subjectivity* (NCS) emerges precisely at this torsion point: a generative tension zone where symbolic relay, algorithmic filtration, climate turbulence, and contested memory braid together subjectivities that evade stabilization by any singular author-function or discursive center. What once appeared as a corridor of transmission, traceable along a relatively linear route from speech to script to archive, now functions more as a centrifuge in which identities assemble and dissolve amid continuous recalibrations of risk, latency, and ecological drift.

To situate NCS among the typologies articulated so far, it is essential to trace how the conditions for narratability themselves have migrated. If P1 demontaged the Cartesian ideologeme that

[669] Jerome Bruner, *Acts of Meaning* (Cambridge, MA: Harvard University Press, 1990), 111–22; Paul Ricoeur, *Time and Narrative*, Vol. 1, trans. Kathleen McLaughlin and David Pellauer (Chicago: University of Chicago Press, 1984), 52–56.

cognition precedes environment, demonstrating instead that all thinking is scaffolded by networks of affordance, and if P2 mapped the infra-somatic circuits through which technical apparatuses entwine with embodied sensation, then P3a shifted focus to the planetary scale, revealing culture as something fabricated within and through algorithmic and ecological vortices rather than passively transported by them.[670] With this groundwork laid, P3b's task is not to rehearse previous arguments but to interrogate how narrativity mutates when its ground is not stable public space but a fevered zone of atmospheric oscillation, logistical precarity, and pre-emptive code.

The legacy confidence of humanist narrative, where action marks the birth of story, where *natality* secures meaning, relied on material and temporal frameworks whose coordinates, while always fragile, were still *graspable*.[671] In the current conjuncture, any event is already pre-screened by technical architectures that delimit what can appear as a happening. The future withdraws in advance, not as an eschaton but as a constant horizon of foreclosure.[672] Teleology is supplanted by what could be called catastrophic presentism, in which narrative no longer unrolls across stable durée but instead zigzags through spikes, lacunae, and sudden erasures. The grammar of narrative, once tethered to the reliable sequencing of beginning, middle, and end, is forced to pivot toward discontinuity and interruption.

Catherine Malabou's conception of *plasticity* takes on special resonance here: it is neither passively receptive nor wantonly destructive, but names a dynamic in which form survives only by consenting to its continual recomposition.[673] Transposed into the narrative register, this means that any story adequate to the planetary present negotiates its own imminent obsolescence, each utterance performing the discursive equivalent of a coral reef spawning into acidifying seas.[674]

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[670] Hayles, *How We Became Posthuman*, 2–3; Braidotti, *The Posthuman*, 36–38 ; Appadurai, *Modernity at Large*, 31–33.

[671] Mikhail Bakhtin, "The Bildungsroman and Its Significance in the History of Realism," in *Speech Genres and Other Late Essays*, ed. Caryl Emerson and Michael Holquist, trans. Vern W. McGee (Austin: University of Texas Press, 1986), 19; Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958), 7–11.

[672] See Claire Colebrook, *Death of the PostHuman: Essays on Extinction*, Vol. 1 (London: Open Humanities Press, 2014), 9–12; Chakrabarty, "The Climate of History," 213. Here, "foreclosure" is used in the theoretical sense of prematurely closing off or rendering inaccessible possible futures, echoing its usage in psychoanalytic, philosophical, and literary traditions to denote the structural limitation of potentiality before it can be realized. See Derrida, *Specters of Marx* (New York: Routledge, 1994), 68–69.

[673] Catherine Malabou, *Plasticity at the Dusk of Writing: Dialectic, Destruction, Deconstruction* (New York: Columbia University Press, 2010), 18–22.

[674] Elizabeth A. Povinelli, *Geontologies: A Requiem to Late Liberalism* (Durham, NC: Duke University Press, 2016), esp. 75–80 on coral futures.

This sea, however, is increasingly *informational*. Every narrative trace is shadowed by a behavioral derivative, its legibility brokered by predictive scoring and extractive filtration.[675] Curatorial algorithms perform silent edits, sorting what fragments of the lifeworld will surface as content and which will settle into the sediment of archival silt.[676] The flux of narrative is thus inseparable from the logic of marketable predictability, and the violence of this filtration is always implicated: subaltern stories must often contort themselves into palatable metadata, or else vanish into the scroll's amnesia.[677]

Against this background, the modern subject, the narrating "I," dissolves into a signal-event, its continuity a function of refresh cycles, captcha patterns, and heat-mapped attention spans.[678] Story becomes less a guarantee of duration than a modulation of exposure, toggling between the risk of algorithmic over-visibility and the strategic opacity fostered by fugitive or encrypted archives.[679] This constitutes not a tactical withdrawal but an affirmative space of repair, in which the markup body intervenes within code, inserting genealogical noise that exceeds machinic parsing. The field of narrative is thereby polyphonic and recombinant, surviving by oscillating among glitch, latency, and citation, each interruption both a shield and a possibility for new alliance.

Moreover, the anthropocentric monopoly on narration is broken by biosemiotic and *geopoetic* insights. Signaling cascades within cells already exhibit proto-narrative patterns, recursive loops that embed memory into metabolism and gesture toward a prehuman dramaturgy.[680] Geophysical strata record tectonic narratives across aeonic durations, palimpsests of upthrust, subduction, and erosion that exceed any human timescale.[681] These planetary inscriptions do not simply metaphorize storytelling but enlarge the very register in which meaning can emerge, confronting us with the belatedness and partiality of *allzumenschlich* discourse within a vaster semiotic

[675] Zuboff, *The Age of Surveillance Capitalism*, 5–6.
[676] Tarleton Gillespie, *Custodians of the Internet: Platforms, Content Moderation, and the Hidden Decisions That Shape Social Media* (New Haven: Yale University Press, 2018), 118–25.
[677] Dorothy Kim and Jesse Stommel, *Disrupting the Digital Humanities* (Brooklyn: punctum books, 2018), 19; Noble, *Algorithms of Oppression*, 115.
[678] Bernard Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford, CA: Stanford University Press, 1998), 140–45.
[679] Jessica Marie Johnson, "Markup Bodies: Black [Life] Studies and Slavery [Death] Studies at the Digital Crossroads," *Social Text* 36, no. 4 (2018): 57–79.
[680] Wendy Wheeler, *The Whole Creature: Complexity, Biosemiotics, and the Evolution of Culture* (London: Lawrence and Wishart, 2006), 101–5.
[681] Kenneth White, *The Wanderer and His Charts: Exploring the Fields of Vagrant Thought and Vagrant Life* (Edinburgh: Polygon, 2004), 123–30.

ecology.[682] The overall implication is that coherence has migrated outward, from the closed chamber of subjective introspection into a distributed matrix of planetary signals. The work of theorizing NCS, then, is not to mourn the waning of a unified author but to diagram the differential rhythms through which subjects now phase into and out of registration: algorithmic refresh rates, oceanic oscillations, and mycelial scars, all of which modulate what can be narrated, heard, and carried forward.[683] The narrative act in this context is not to secure closure but to hold a pattern just long enough for reparative alliances to form, before the next undertow of epistemic turbulence resets the coordinates of *sayability*. Within the *planetary archive*, story ceases to function as a diachronic record of events and instead becomes an ongoing negotiation with the terms of appearance, legibility, and survival.[684]

3.4.2.2 Churn, Drift, and Polyphonic Memory

The moment we shift from TES's kinetic flesh-code circuits and TRS's migratory atmospheres to the sphere of NCS, the vocabulary of *medium* itself begins to pulse. Story is no longer a retrospective comfort nor even a strategic interface; it is the turbulent current in which a self briefly condenses, is priced, forgotten, and, sometimes, reborn. To grasp that turbulence one must attend to tempo. Broadband scrolls that refresh every few hundred milliseconds demand narratives trimmed to the span of a finger's glide. What once unfolded across the *longue durée* of the novel is now portioned into algorithmic quanta whose primary function is to keep predictive engines fed. Zuboff names the market that feeds on those quanta the trade in behavioral futures, but her observation only opens the scene: the deeper drama is *aesthetic*, because the predictive appetite rewrites the very meter of expression.[685] Suspense becomes a machine-paced oscillation, with resolution perpetually postponed, since definitive closure would interrupt the continuous flow of data. Identity, subject to this rhythmic interruption, wavers and fades under algorithmic scrutiny, retaining value only so long as each subsequent interval of attention can be anticipated and commodified.

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[682] Tsing, *The Mushroom at the End of the World*, 142–44.
[683] Dominic Pettman, *Infinite Distraction: Paying Attention to Social Media* (Cambridge: Polity, 2016), 66–71; Barad, "Posthuman Performativity," 815–19.
[684] Mbembe, "Necropolitics," 13–18; Parisi, *Contagious Architecture*, 21–25.
[685] Zuboff, *The Age of Surveillance Capitalism*, 8–13.

Compression at the platform edge, however, does not exhaust narration; it merely marks one rhythm in a polyphonic field. Far beneath the tempo of scrolling feeds, cells inscribe their own dramaturgy in calcium pulses and hormonal whispers. Wendy Wheeler's biosemiotics highlights how a single-celled organism retains chemical memories of previous stressors, such as the ghost of a toxin or drought, so that when circumstance recurs, the cell anticipates, in effect completing the second chapter of a story begun epochs ago.[686] At the other extreme, rock strata fold continent upon continent into a geological palimpsest; Kenneth White calls this the planet's deep script, a language written in orogeny and erosion whose sentences meander for millions of years.[687] Confronted with discrepant tempos spanning milliseconds, decades, and aeons, NCS must reckon with the impossibility of one authoritative clock. Narrative, it transpires, is always syncopated, persisting in the dissonance between incompatible beats.

Mycelial networks embody that dissonance with a deftness that would shame the most agile influencer. Expanding outward in fractal overture, fungal hyphae test multiple futures at once. They retreat from mineral deserts, surge toward sugar-rich roots, and, in the process, register earlier encounters with bacteria or rival colonies. Merlin Sheldrake's laboratory explorations reveal a vegetal dramaturgy in which past experience is sedimented as subtle gradients of density, allowing future growth to be guided without any central command.[688] This vision of fungal memory is substantiated by the empirical work of Fukasawa and colleagues, whose experiments demonstrate that relocated mycelia preferentially regrow from the side that previously faced a resource. Here, memory is not stored in an archive or written into the genome, but is realized through the ongoing tact of living tissue. The result is a form of mnemonic improvisation: fungal networks incorporate the residue of prior encounters into the calculus of future growth. While digital platforms compress narrative into monetizable instants and mountains, as monuments of geological time, extend diachronics beyond the limits of human recollection, the mycelium entwines the two. Its speculation is rapid, its responses shaped by a lasting and silent remembrance.[689]

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[686] Wheeler, *The Whole Creature*, 101–8.
[687] White, *The Wanderer and His Charts*, 125–31.
[688] Merlin Sheldrake, *Entangled Life: How Fungi Make Our Worlds, Change Our Minds and Shape Our Futures* (New York: Random House, 2020), 42–49.
[689] Yu Fukasawa, Melanie Savoury, and Lynne Boddy, "Ecological Memory and Relocation Decisions in Fungal Mycelial Networks: Responses to Quantity and Location of New Resources," *ISME Journal* 14, no. 2 (February 2020): 380–88.

Between those braids lurks the question of persistence. Stiegler argues that the technical artefact, as the third dimension of memory, both preserves and transforms what it saves, since every new storage protocol tends to render the previous one obsolete.[690] In cloud infrastructures designed for perpetual refresh, that corrosion accelerates: a disappearing "story" posted for twenty-four hours is both commodity and scheduled amnesia. Subaltern technics meet that volatility with fugitive cunning. Jessica Marie Johnson traces how digital practitioners from diasporic communities discreetly embed elements of their heritage within the fabric of online life. Family memories are encoded in the visual presentation of websites and in the cryptic numerical strings that undergird secure digital records. In these hands, technical routines become acts of remembrance, subtle interventions through which cultural memory persists within code. Occasionally, when databases are migrated or digital archives are reorganized, these concealed fragments re-emerge—unbidden, like refrains the technological system cannot entirely suppress. In such moments, the resilience of history and identity interrupts the logic of the digital, ensuring that the past continues to inhabit the infrastructures of the present.[691] Such tactics practise *latency* as resistance: not the heroics of permanent monument but the quieter discipline of rhythmic return.

The violence that makes latency necessary is, of course, more than technical. Achille Mbembe's account of necropolitics clarifies how deletion is *political* before it is computational: the power to consign a life, or a story, to archival oblivion is an extension of the power to decide whose death counts, whose suffering registers.[692] When a hashtag disappears from trend charts, not because public interest waned but because moderation heuristics have quietly re-classified the phrase as "non-performant," the resulting dispossession is no less real simply because it occurs without visible confrontation. The fact that this kind of erasure is seamless and invisible does not make it any less real or consequential. Still, dispossession does not always end in erasure. Tsing's salvage rhythms are re-employed here to describe how life colonizes ruins and, by doing so, drafts new allegories of cohabitation: new ways of living together among remnants.[693] The metaphor translates seamlessly to data graveyards. Obsolete codebases become commons for insurgent folk-memories; abandoned gaming servers host *machinima* (user-generated films) that cannibalize

[690] Stiegler, *Technics and Time 1*, 147–52.
[691] Johnson, "Markup Bodies," 57–79.
[692] Mbembe, "Necropolitics," 23–29.
[693] Tsing, *The Mushroom at the End of the World*, 151–57.

corporate textures into heterodox rituals of digital cinematics.[694] In these ruins narrative sheds the burden of continuity and learns instead to improvise: to sync with whichever beat, fast or slow, still reverberates through the wreckage.

What, then, emerges of the self? Not a stable narrator, certainly, nor the Cartesian voice P1 unseated long ago. Selfhood, already established as polividual, within NCS resembles a *polyrhythmic waveform*, thrown into shape where hyper-chronia, deep chronia, and spectral recurrence interfere. The result may feel like anxiety, because the beats refuse to resolve, but it is also a reservoir of invention. Between the platform's stutter and the mountain's drawl, between the cell's chemical refrain and the mushroom's branching speculation, the subject catches a groove long enough to speak, only to give way to the next crossing current. Story, in this sense, is neither shelter nor confinement, but arises as the subtle vibration through which the waveform finds its voice. To write, to code, to splice, or to graft under these conditions is to move with the tremor itself, aware that every line may be the prelude to erasure, and that even erasure has a pulse one can learn to ride.

3.4.2.3 Ritual Code, Slow Harm, and the Ethics of Signal

Story no longer acts as a private thread spun out by an individual, ready to be shaped at a single will. Instead, it now resembles a dynamic, shifting *weather front*: it condenses from digital "fibre-optic estuaries," those invisible rivers where information moves through global data cables, and draws up faint "aerosols of memory" from forgotten places and discarded technologies, the way a cloud picks up vapors from remote wetlands or tailings ponds. Story travels across borders, not just geographical but technical and legal, and eventually falls as new social phenomena: feelings that sweep populations, transactions that drive economies, and collective acts of resistance or rebellion. In this environment, NCS becomes the art of navigating within this atmospheric turbulence: it requires sensing the patterns that tie together small gestures (a swipe, a search), algorithmic routines, economic extraction, and care for forms of delay or latency, all without falling back into anthropo-obsolencies.

[694] Peter Krapp, ed., *The Machinima Reader* (Cambridge, MA: MIT Press, 2014).

3.4.2.3.1 Interfaces as Ritual Engines

This new landscape makes clear that every interaction with our devices is more than trivial: the most casual act, touching the glass of a phone on waking, activates complex protocols. That index-finger swipe does not simply bring the screen to life; it performs a kind of secular liturgy, enrolling the body in a choreography of digital ritual. The gesture initiates a biometric check, connects with distant authentication servers, and synchronizes with massive "server farms," the vast, climate-controlled data centers whose very hum draws on the natural rhythms of places as remote as Icelandic glaciers. Each of these micro-actions is both a technological handshake and a ritual compact. Desire is transmuted into streams of data; the architecture of data, in turn, structures what kinds of desire can be enacted. This reciprocal movement means that every act of access is both a form of submission (to the protocols, algorithms, and technical rules set elsewhere) and a moment of empowerment (animation of the digital world by the user's presence and gesture). The anthropologist might call this a "rite of access," while the political economist might see an "extraction interface." Both terms highlight the mutual implication of giving and receiving, agency and governance, that is at play in these everyday rituals.[695]

Such reciprocity is never innocent. Code never plays at neutrality; every technical system embodies, carries, and extends a vision of how the world is, or ought to be. As Hui has shown, every lineage of technology is also a lineage of cosmology—a hidden or explicit worldview that is "folded into its folds." Swiping right or left on a touchscreen does more than navigate a map or a dating app: the action triggers economic, material, and ecological effects that span the globe. A swipe that completes a purchase or a connection might animate a market in California, while the same gesture performed at a different moment could trigger demand for energy drawn from a coal seam in Inner Mongolia. The outward gesture seems local, but its effects are profoundly delocalized, reverberating through invisible lags, "latency windows," and technical networks that the user rarely perceives.[696] NCS therefore insists that every interface is a mask, layered with multiple meanings. On the surface, the user encounters a friendly, intuitive design; beneath, a matrix of data governance and algorithmic sorting is at work. Only a genuinely ritual analysis,

[695] Pettman, *Infinite Distraction*, 64–71.
[696] Hui, *The Question Concerning Technology in China*, 19–27.

attuned to how sacraments both reveal and conceal, bind and set apart, can interpret these interfaces in a way that resists both naive celebration ("fetish") and cynical suspicion ("paranoia").[697]

Such complexity generates a need for *counter-rituals*, especially among those seeking to preserve forms of knowledge and obligation that are threatened by the universalizing push of platform capitalism. Indigenous custodianship offers one such model. When Yolŋu elders, offering here Yunkaporta's vivid example, encode their sacred place-songs in encrypted digital ledgers that can only be unlocked by kin-authorized cryptographic keys, they are not simply resisting digitization. Rather, they are reasserting an obligation at precisely the site where the platform would otherwise enforce "frictionlessness" and endless circulation. Here, story is not surrendered to the cloud but remains bound to practices such as face-to-face meetings, ritual acts with smoke or salt, and cyclical migrations that sustain communal life. Encryption, in this context, is not only a shield but a *tempo*: it slows the story, synchronizes it with cycles of season and kin, and resists its reduction to instant content. What appears to outsiders as "opacity" or secrecy is, from within, a form of care enacted through the management of time and access.[698]

Opacity is not only a matter of deliberate protection. It can also arise unintentionally, woven into the everyday functioning of technical systems. Predictive keyboards, for instance, learn a user's habitual phrases and then offer to complete them just before the user becomes fully conscious of what they wish to say. The device becomes a low-grade ventriloquist, speaking with the user's inflections before intention is formed. Here, *authorship is diffused*—the user is neither fully speaker nor fully recipient, but oscillates between "oracle and parrot."[699] For NCS, this decentralization of authorship is not a loss but a transformation: the self emerges as a resonance, a polyphonic echo that cuts across the boundaries of flesh, firmware, and the global logistics of information. What matters is not the preservation of a solitary, "monosource" self, but the ability to navigate and modulate these overlapping fields of agency and response.

[697] Zuboff, *The Age of Surveillance Capitalism*, 5–11; see also Victor Turner, *The Ritual Process: Structure and Anti-Structure* (Chicago: Aldine, 1969), esp. 94–130, for the dual logic of ritual revelation/concealment.
[698] Tyson Yunkaporta, *Sand Talk: How Indigenous Thinking Can Save the World* (Melbourne: Text, 2019), 205–12.
[699] See Bernard Stiegler, *Technics and Time 2* (Stanford: Stanford University Press, 2009), 140–45, on technical inscription and distributed authorship.

3.4.2.3.2 Slow Violence beneath the Pulse of the Feed

Today's interfaces curate a world of instantaneity, where each notification and image is meticulously engineered to seize attention for only a moment before surrendering to the next. Within this relentless tempo, the deep time of planetary harm, whether the seepage of toxins, the displacement of communities, the vanishing of pollinators, or the protracted cycles of resource extraction, scarcely registers at all. Ecological and social damage unfolds on temporal and spatial scales that the speed of the feed renders almost invisible.[700] This disconnect is rendered concrete in the global itinerary of cobalt, a metal essential to the batteries that animate modern devices and electric vehicles. A single cobalt particle may originate in the mineral-laden soils of Congo's Katanga, where extraction inflicts acute environmental degradation and social risk. The ore is then routed through refining hubs such as Zhuzhou, China, ultimately reemerging in European cities like Berlin as invisible battery dust, long after the device it powered has been discarded.[701] The harms unleashed by this circuit (groundwater contamination, labor exploitation, transnational toxicity) persist far beyond the transient lifespan of the product, traversing borders and generations while largely eluding legal oversight and public consciousness.

Such protracted cycles of damage are systematically sidelined by what we call "attention economies," the algorithms and incentives of digital platforms that value whatever attracts the most rapid engagement. These systems are, as it were, calibrated to the "half-life of click incentives": only those events that produce a burst of likes, clicks, or shares are made visible, while those that accumulate slowly, like contamination or chronic illness, fall away from view. It is in this context that Nixon's concept of "slow violence" takes on its full force: it describes forms of violence that are neither explosive nor visible, but that unfold by degrees, across time and space, and so resist both representation and redress.[702]

NCS does not accept this as an unalterable condition. Rather, it asks how narrative might be crafted to stretch the listener's sensory and affective register: to make the slow emergence of a cancer

[700] Jussi Parikka, *A Geology of Media* (Minneapolis: University of Minnesota Press, 2015), 87–94.
[701] Florian Degen, Jakob Palm, and Miriam Mitterfellner, "Direct Emissions to Air, Water and Soil from a Battery Gigafactory," *Communications Earth & Environment* 6 (2025): 408, demonstrating significant cobalt-containing dust emissions in German battery production facilities.
[702] Nixon, *Slow Violence and the Environmentalism of the Poor*, 2–6.

cluster or the retreat of a shoreline resonate with the immediacy and persistence of breaking news. One aesthetic tactic is to produce "durational witness": instead of condensing experience into viral snippets, artists and activists create media that persists and reverberates. A continuous audio stream of a glacier melting, inserted into a social feed, creates a kind of temporal dissonance, the sound remains in the background, outlasting the act of scrolling, and impresses on the listener a sense of geological tempo. Such work cannot be dismissed as atmospheric; it functions as a "covenant" of attention, a contract between subject and world that demands endurance, not just momentary engagement.[703]

But even the most immersive or durational forms of storytelling cannot by themselves overcome the structural biases of digital platforms. Platform feeds and recommendation algorithms penalize anything whose rhythm is slow: they favor newness, surprise, and intensity ("burstiness"), relegating slow narratives to obscurity. To remedy this, NCS seeks to intervene at the level of *counter-design*, proposing alternative metrics that privilege not only the latest content but also persistence (the duration for which a story remains accessible) and depth of engagement (time-in-view rather than mere click-throughs). Ethics in the age of planetary computation thus begins not in the good intentions of individuals, but in the deep architecture of platforms: in how databases are keyed, how latency is managed, and how digital "garbage" is handled or erased.[704] In situations where the digital infrastructure itself cannot be reconfigured from above, resistant tactics emerge from below. Activist collectives may deliberately disrupt the sorting algorithms of platforms: sharing credentials, injecting incongruous content (such as heavy-metal playlists on yoga channels, or wildlife telemetry in fashion hashtags), and thus destabilizing the system's predictive power. This is not sabotage for its own sake, but rather a way of corrupting the filtering membrane so that voices excluded by dominant algorithms can occasionally slip through. NCS terms this strategy *aesthetic parasitism*, a form of survival that works by inducing the host (the platform) to misread its own sources of value, thereby opening cracks for narrative improvisation and insurgency.[705]

[703] Shannon Mattern, *Code and Clay, Data and Dirt: Five Thousand Years of Urban Media* (Minneapolis: University of Minnesota Press, 2017), 56–63.
[704] Bruno Latour, *Facing Gaia: Eight Lectures on the New Climatic Regime* (Cambridge: Polity, 2017), 91–98.
[705] Noble, *Algorithms of Oppression*, 115–22; see also Gabriella Coleman, *Hacker, Hoaxer, Whistleblower, Spy: The Many Faces of Anonymous* (London: Verso, 2014), 87–109.

3.4.2.3.3 Archives that Refuse to Die

The logic of deletion, so often conceived as the final gesture of forgetting or erasure, undergoes a profound transformation in the digital era. Derrida shows that erasure, in the strict sense, is impossible; every act of supposed cancellation leaves behind residues, traces that haunt the margins of the archive. What presents itself as deletion in the contemporary server farm is in fact a matter of statistical deferral rather than annihilation. Each backup, each duplication, gives rise to what might be named an "anarchival potential," a dormant capacity for the reappearance of suppressed or forgotten material in contexts the censor or state cannot anticipate. Derrida's account renders visible the spectral logic of the archive, where the past remains always on the verge of return, never securely relegated to oblivion. This latent excess is neither simply subversive nor merely redemptive; it animates both conspiracy and justice according to the hands in which it falls.[706] Concrete examples abound: take, for instance, the persistence of deleted messages on social platforms, which can often be recovered from server backups or device caches despite users' attempts at erasure. As Chun demonstrates, the so-called "delete" function rarely guarantees oblivion; instead, it enacts a kind of technical forgetting that is always vulnerable to reversal, subpoena, or data breach. In the digital archive, deletion is less a final act than a precarious pause, with traces liable to resurface in unforeseen legal, political, or personal contexts.[707]

But not all archival resistance works by resurrection. Some traditions, especially those with deep matrilineal roots, deliberately evade digital capture. As Glissant observes, citing Creole oral traditions in the Caribbean that are preserved exclusively through embodied, intergenerational performance and never committed to writing or recording, chants performed only at certain lunar phases are intentionally unrecorded and live on only through breath, heartbeat, and collective labor. Here, refusal to scale, a sui generis resistance to digitization and dissemination, serves as a "narratological strike": it transforms opacity and limitation into a strategy of survival, preventing lineage from being diluted into hyperavailability.[708] Moreover, between the polarities of hyper-persistent data (the colony of immortal archives) and ephemeral, embodied rituals, a third mode emerges: the *glitch archive*. Artists rework abandoned digital infrastructures (such as game engines

[706] Jacques Derrida, *Archive Fever: A Freudian Impression* (Chicago: University of Chicago Press, 1996), 11–17.
[707] Wendy Hui Kyong Chun, *Programmed Visions: Software and Memory* (Cambridge, MA: MIT Press, 2011), 134–39.
[708] Glissant, *Poetics of Relation*, 189–94.

no longer maintained) to create machinima in which code fragments, rendering errors, and broken physics become the content. Here, polygons slip, textures bleed, and gravity unravels. Each technical failure, each crash log or render bug, becomes a footnote on the labor of distant programmers, the geography of undersea cables, or the afterlife of mined minerals. In this archive, fragility is foregrounded: the so-called "smooth" interface gives way, revealing the layered and contingent work of computation.[709]

3.4.2.3.4 Signal Ethics and the Conducting Self

When every act of digital communication, be that a post, a like, or a search, leaves a residue not only in databases but in the planetary stocks of carbon, metal, and exploited labor, the terrain of ethics shifts fundamentally. The stakes extend beyond intention or isolated gesture and encompass the collective choices that shape and sustain entire infrastructures. To post is to initiate a cascade of technical processes that summon electrical currents, mobilize cooling systems, and activate chains of mining and logistics. To like is to amplify circuits of extraction and exposure, further entrenching patterns that bind social life to material depletion. In such a milieu, the traditional literacy of syntax and rhetoric must be joined by a technical literacy attuned to the architectures of networks and the economies of energy that underwrite every digital act.[710]

Accordingly, the demands of epochal conscientious design require a kind of temporal pluralism, capable of providing interfaces that enable users to determine not only what is shared, but also for how long it remains accessible, at what refresh rate, and within which legal and ecological regimes. Drawing on Bellacasa's notion that "care time (...) interrupts the project of speed," delay or latency emerges as a public good—a necessary pause for reflection rather than simply an inconvenience to be eliminated in the ever-accelerating tempo of contemporaneity. Likewise, opacity becomes, as she suggests, "a necessary site of care": certain stories and forms of data must circulate in encrypted, fragmented, or negative-space configurations in order to remain faithful to their origins and custodians.[711]

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[709] Michael Nitsche, "Machinima as Media," in *The Machinima Reader*, ed. Henry Lowood and Michael Nitsche (Cambridge, MA: MIT Press, 2011), 113–25.
[710] Mbembe, "Necropolitics," 11–40.
[711] Maria Puig de la Bellacasa, *Matters of Care: Speculative Ethics in More Than Human Worlds* (Minneapolis: University of Minnesota Press, 2017), 69–75.

In this reimagined digital landscape, selfhood ceases to resemble the old "narrator" who controls a linear plot and becomes instead a *conductor*, modulating between diverse temporalities, from the microsecond loops of predictive code to the centuries of monsoon cycles and ancestral time. Building on Tsing's "arts of noticing," and borrowing from the language of signal processing, agency here resides in the capacity to amplify signals that nourish relational ecologies and dampen those that accelerate ruin. The task is supremely delicate: one mistuned gesture, and the underlying algorithm will reassert itself, sweeping the individual back into the collective orchestra of extraction and consumption.[712] Still, subtlety must not be mistaken for passivity. The work of reconfiguring the logics of attention, embedding ecological clocks within the protocols that structure communication, and demanding the legal right to "slowness" constitutes an immense political project. Such an undertaking calls for an alliance of aesthetics, jurisprudence, and technical design. NCS insists that only such coordinated transformations are sufficient for the proper emancipatory hacking of our histories of the present. In this light, narrative is not merely a mirror held up to the world, but the very medium through which worlds are made and unmade, buffered or exhausted, one millisecond at a time.

3.4.3 P3c: Landscaped Subjectivity and the Inscriptional Unfolding of Terrestrial Personhood

3.4.3.1 Cartographies of Terrestrial Inscription: From Landscape to Planetary Sensorium

Identity is no longer a story told *about* the world, nor a migrant trace *through* it; it is the world's own writing, scored across strata of rock-salt memory, mycelial drift and orbital telemetry. *Landscaped Subjectivity* (LS) names this shift. Where P3a exposed the whirl of transcultural flows and P3b tracked the narrative vortices of infrastructural mediation, LS relocates ontology into the dense materiality of the Earth itself, treating landscape not as décor or datum but this time as an *ontogenetic apparatus*, a plexus of lithic archives, microbial relays and cosmotechnical circuits that continually edits the conditions of personhood.[713] The self, in this register, is a *convergence-*

[712] Anna Lowenhaupt Tsing, *The Mushroom at the End of the World*, 139–42, 147–48.
[713] Haraway, *Staying with the Trouble*, 63–68.

site: the transient, vibrating node at which calcium reefs, pollen vectors, server heat and broadband latency momentarily synchronise long enough to gleam as "I."

To reach this claim we must first dismantle the Cartesian rift that quarantined *res cogitans* from *res extensa*. Descartes granted the mind perfect luminosity only by evacuating the planet of agency, flattening Earth into mute geometry measured for extraction.[714] The legacy lingers each time we picture a subject floating above the grid, granting meaning to a passive terrain. LS begins by reversing the optical order: the ground looks back. Barad's agential realism insists that matter itself is a "doing," a reciprocal intra-activity whose causal arrows never start with human intent.[715] Haraway extends the point. Holobionts, understood as bodies composed of bacteria, genes, code, and coral, are not mere metaphors but constitute the multi-species socium of existence.[716] Identity, then, is not placed *upon* a landscape; it condenses *within* sympoietic eddies of spore, query string and solar wind. Ingold offers a vocabulary for this condensation. Landscape, he writes, is "pregnant with the past," a time-thick medium where walking, weaving, and weathering engrave memory directly into ground.[717] His "taskscape" collapses action and terrain: a footpath is not an overlay but an eroded sentence in clay; the subject who treads it is already reading and rewriting that sedimentary script.[718] Malabou's plasticity intensifies the point. Form does not endure by resisting deformation—it survives by *exploding* into new morphologies.[719] So too with LS: the self persists only by consenting to continual re-sculpture under pressures of erosion, code update, flood, and the unceasing onslaught of planetary change.

Advancing in the register of LS, Bratton's stack, by now almost proverbial in this analysis, should be understood not simply as a hierarchy but as a planetary *sensorium*, an organ that processes and synchronizes digital and material flows at a global scale. The heat produced by data servers merges with atmospheric processes, subtly shaping weather systems just as jet streams circulate through the sky. Delays in network communication do not merely affect information but ripple into the rhythms of city life, influencing patterns of work and rest. Meanwhile, the shifting perspectives of

[714] René Descartes, *Meditations on First Philosophy*, trans. John Cottingham (Cambridge: Cambridge University Press, 1996), 55–58.
[715] Barad, "Posthumanist Performativity," 135.
[716] Haraway, *Staying with the Trouble*, 55–72.
[717] Tim Ingold, "The Temporality of the Landscape," *World Archaeology* 25, no. 2 (1993): 152.
[718] Ibid., 153–55.
[719] Malabou, *Plasticity at the Dusk of Writing*, 18–22.

satellites orbiting the earth become embedded in the way we perceive reality, establishing what feels plausible within our sensor-saturated environments.[720]

To exist in this system is to be constantly registered by its circuits. To be, today, is *to be pinged*: presence is repeatedly detected, briefly stored, and mapped by the digital infrastructure that now mediates the conditions of life. A person's existence is confirmed when multiple layers of this system, those rooted in the atmosphere, on the earth's surface, and in the orbital environment, communicate with one another in a seamless exchange of signals. This process of mutual recognition, or "handshake," serves as a technical ritual by which the system grants or denies legitimacy to any given subject.[721] In such a world, borders no longer present themselves as fixed lines etched on a map. Instead, the very contours of inclusion and exclusion are redrawn by algorithmic thresholds that sort, filter, and allocate. Access to spaces, resources, or identities is continually enabled or withheld according to whether biometric markers, unique digital traces, or even the faintest signatures such as the carbon dioxide in one's breath correspond to the requirements inscribed in a database. Under these conditions, identity ceases to be a stable essence and instead emerges as a variable quality, oscillating in and out of legibility in response to the ongoing calculations of the planetary system.[722]

At the opposite temporal extreme, the fungi underfoot elaborate a counter-epistemology. Sheldrake demonstrates that mycelial networks remember pressures, reroute around toxins, and modulate branching angles without central command, constituting a decentralized form of cognition older than vertebrate bone.[723] These hyphal maps go beyond serving as allegories of human networks; they are, rather, the landscape itself thinking, continually recalibrating porosity and nutrient flow from moment to moment.[724] From this perspective, subjectivity emerges not as an autonomous entity but as a derivative event, a fleeting resonance amid calcium pulses and sap velocities.[725] Occupying the space between orbital infrastructures and terrestrial humus, LS therefore reframes "environment" not as passive backdrop but as a constitutive engine of emergence. The planet

[720] Bratton, *The Stack*, 8–15, 41–48.
[721] Ibid., 63–69; see also Tung-Hui Hu, *A Prehistory of the Cloud* (Cambridge, MA: MIT Press, 2015), 128–32.
[722] Browne, *Dark Matters*, 58–65; Zuboff, *The Age of Surveillance Capitalism*, 211–18.
[723] Sheldrake, *Entangled Life*, 59–67.
[724] Tsing, *The Mushroom at the End of the World*, 137–42.
[725] Deborah Bird Rose, *Wild Dog Dreaming: Love and Extinction* (Charlottesville: University of Virginia Press, 2011), 39–43.

writes in two hands: with compression, as seen in lithic strata, where layers of rock silently accumulate and preserve the chemical and material residues of past events; and with diffusion, as evidenced in aqueous seepage—that is, the slow movement of water as it infiltrates and percolates through soils and sediments, quietly transporting minerals, toxins, and traces across subterranean layers. In this way, memory persists not only in stone, but also in the continuous, often invisible movement of matter across the landscape.[726] As Parikka catalogues, a hurricane's isotopic swirl, every microplastic flotilla borne along ocean currents, and each spectral glitch registered by weather satellites serve simultaneously as both archive and inscription. They not only preserve traces of planetary processes but actively recombine and recompose the semiotic field within which beings may cohere.[727] To inhabit such a field is not to pursue mastery, but to cultivate kenotic attunement: learning to interpret the slow lexicon of granite while parsing the millisecond pulse of a sensor gate.[728] Thus, the opening claim follows: LS is neither an ecological romance nor a digital dystopia. Instead, it asserts an ontological insight: existence finds its inscription within the planet's material and informational processes—whether discerned in the nearly invisible settling of dust, in the quiet rhythm of algae blooms that signal environmental shifts, in the brief silences as digital signals lapse and reappear, or in the gradual drift of star-tracking instruments that recalibrate our relation to the cosmos.[729] The task, therefore, is no longer to situate the self, but to discern how the planet itself situates whatever fugitive coherence we momentarily recognize as a self.

3.4.3.2 Algorithmic Terrains, Hydrolithic Drift

To apprehend the layered logic of Landscaped Subjectivity, one must follow the convergence of two mutually amplifying forces: the geomorphic agency of planetary computation and the mnemonic potency of what, for this discussion, may be called the *hydrolithic archive*. The former recasts territory through code; there is no longer a need for the visible spectacle of bulldozers or

[726] Mattern, *Code and Clay, Data and Dirt*, 56–63. Here, Mattern provides the conceptual groundwork for understanding how stone and water infrastructures serve as planetary media, inscribing and diffusing memory through lithic and hydrological processes.
[727] Parikka, *A Geology of Media*, 91–94.
[728] Astrida Neimanis, "Hydrofeminism: Or, On Becoming a Body of Water," in *Undutiful Daughters*, ed. Henriette Gunkel et al. (London: Palgrave Macmillan, 2012), 94–96.
[729] Stacy Alaimo, *Exposed: Environmental Politics and Pleasures in Posthuman Times* (Minneapolis: University of Minnesota Press, 2016), 15–21.

checkpoints, only algorithmic filters that sort bodies more swiftly and invisibly than any police gate. The latter registers the consequences of those filters in matter itself, whether in coral skeletons, grains of ice, or breast milk, reminding us that the exercise of governance ultimately becomes a chemical inscription. Because these two systems are inseparable, every contemporary formation of personhood is now forged at the intersection where protocol meets climate, where silicon decisions flow into bloodstreams and, decades later, return as stratigraphic testimony. The analysis that follows unfolds across multiple registers: legal, historical, literary, and scientific, folding technical intricacies into a broader discursive fabric rather than relegating them to isolated specialist concerns.

3.4.3.2.1 Protocol as Geography

When satellites, border kiosks, or ride-hail apps "map" the world, popular discourse imagines a virtual veil, immaterial data drifting above physical soil. LS reverses the picture. A classifier that assigns you a risk score at immigration or books a driver in downtown Cairo is not describing space; it is expressing jurisdiction in numeric form. Bratton's apt phrase is "addressing system": nested partitions that allocate rights, tasks, or visibility by shunting a packet to one address rather than another.[730] A decision point in such a system, whether it is a "similarity score" from facial recognition software or a "confidence interval" from gait analytics, acts much like a modern-day customs barrier. Facial recognition compares your features to a database, while gait analytics identifies you by the distinctive way you walk, analyzing your stride, rhythm, and posture as a kind of biometric signature. If your score exceeds the required threshold, you proceed without interruption; if it falls short, you may be delayed, subjected to investigation, or even excluded altogether. In this manner, automated assessments based on subtle bodily cues quietly determine who moves freely and who is subjected to increased scrutiny or denied access.[731]

[730] Bratton, *The Stack*, 11–15.

[731] If this sounds abstract, recall Browne's genealogy of racialized vision systems: what began as technical flaws in early analog cameras (where light-meter settings privileged lighter skin tones and rendered Black subjects invisible or improperly exposed) has migrated into the templates of today's near-infrared imaging, used in biometric and surveillance systems. In these systems, Black travelers become "low-confidence" outliers whose bodies are more likely to trigger loops of secondary screening, not because of present intent but because of the cumulative inertia of encoded bias. See Browne, *Dark Matters*, 58–65, 105–10.

Because algorithmic thresholds are crossed in microseconds yet inscribe consequences that endure for decades, they dissolve the classical legal distinction between procedure and substance. A machine-learning model updated overnight can function as a silent constitutional amendment, quietly recalibrating the boundaries of inclusion and exclusion without public deliberation. The false positive, in this context, is not merely a technical anomaly, but the material persistence of historical injustices, rendered infrastructural rather than incidental. This dynamic is manifest geographically as well. A map that filters visas by retina scan, or a mortgage algorithm that scores neighborhoods by credit metadata, becomes a *geomorphic* device: it redraws landscapes of opportunity and exclusion not through the spectacle of bulldozers or fences, but through invisible lines inscribed at the speed of code. In this way, access and abandonment are distributed and redistributed by shifting metrics, continuously producing new cartographies of belonging.

3.4.3.2.2 Tempo-Climates of Daily Life

Protocol redraws the contours of space, while tempo, in its myriad forms, continually reshapes the very fabric of daily existence. Lefebvre once described the city as a living score, animated by the chime of bells, the cadence of footsteps, and the orchestration of traffic lights.[732] To this repertoire, we must now add the silent rhythm of cloud infrastructure, where every ordinary rhythm is shadowed by the ceaseless pulse of server requests and buffer flushes, quietly recalibrating the tempo of urban life. For many, especially those dependent on platform labor, this temporal climate is not a source of excitement or creative possibility, but a form of relentless pressure. The gig worker, for instance, must remain perpetually alert, aware that the opportunity for a paid task can appear and disappear within seconds. The need to work is driven not only by economic necessity but also by the constant threat of missed opportunity. Here, hesitation comes at a cost: a single moment's delay may mean the difference between a completed shift and lost income. The platform economy reframes time as a scarce resource, making every decision a contest against the clock and reducing deliberation to a matter of rapid reflexes rather than careful reflection.[733]

[732] Henri Lefebvre, *Rhythmanalysis: Space, Time and Everyday Life*, trans. Stuart Elden and Gerald Moore (London: Bloomsbury, 2013 [1992]), 17–22.
[733] Juliet Schor, *After the Gig: How the Sharing Economy Got Hijacked and How to Win It Back* (Berkeley: University of California Press, 2020), esp. chap. 3, "Shared, but Unequal," 82–104, for algorithmic management and time discipline among platform workers; see also chap. 2 for earning strategies and temporal precarity.

This transformation extends beyond the economic into the ecological and cognitive. LS foregrounds the way ecological phenomena now intermingle with digital tempos. Stiegler's "short-circuit of tertiary retention" reappears here as memory is externalized with such velocity that anticipation and calculation begin to eclipse the texture of lived experience.[734] The air one breathes is measured in the granular increments of carbon dioxide, while lived time is portioned out in milliseconds of server latency. The body's sensorium is recalibrated to micro-temporalities, and forms of deliberation that once unfolded over hours, such as writing a letter or weighing a purchase, are now condensed into the fleeting moments defined by a single platform refresh.

3.4.3.2.3 Climate Drift and the Diminishing Promise of Prediction

The protocols and tempos described so far do not unfurl in isolation; they encounter, and are continually perturbed by, the deep, unmasterable tempos of planetary change. At the very threshold where algorithm meets atmosphere, the promise of predictability that undergirded modern management begins to waver. Where once planners assumed stable baselines, today even the ground of what can be forecast is on the move. Recent work in ecology foregrounds this crisis of drift. As Pecl and others demonstrate, climate-induced redistribution is not an abstract trend but a measurable shift: marine species, including economically and culturally significant fish, are now migrating poleward at rates that far exceed the adaptive pace of treaties, quotas, or legacy management regimes.[735] Even the most sophisticated regulatory frameworks, designed for a stationary world, are outpaced by these kinetic realities. What appears in headlines as an isolated "species migration" is, in fact, a re-temporalization of entire marine economies, whose forecasts and quotas are left trailing behind their living subjects. This volatility is not limited to oceans. Energy infrastructures, ostensibly stabilized by big data and real-time analytics, find their certainties eroded as well. The output of solar grids, for instance, is recalibrated season by season, not just by gradual climate trends but by acute events like wildfire smoke that occludes sunlight, making yesterday's predictions obsolete.[736]

[734] Stiegler, *Technics and Time 1*, 140–45.
[735] Gretta T. Pecl et al., "Biodiversity Redistribution under Climate Change: Impacts on Ecosystems and Human Well-Being," *Science* 355, no. 6332 (2017): eaai9214.
[736] Alaimo, *Exposed*, 70–75.

Such phenomena do not merely complicate prediction; they erode its conceptual foundation. The tools once entrusted to mediate risk, such as economic models, insurance tables, even the very language of policy, are all destabilized by the new planetary turbulence. As predictive accuracy falls with rising systemic volatility, the consequence is not just more error, but a lived contraction of temporal horizons. Energy traders shift to hour-ahead markets, ride-hailing platforms revise prices in five-minute increments, and insurance algorithms recalibrate on the fly.[737] The narrowing of these windows is not an achievement of control but a symptom of exposure: the shorter the horizon, the more naked we stand before the next event. For those outside the modeler's circle, the impact is immediate and tangible: higher insurance premiums, sudden power outages, failed harvests, and the subtle redistribution of vulnerability.[738] In such conditions, the classical separation between "environment" and "society," or "nature" and "economy," begins to collapse, as each protocol and projection becomes entangled in the wider instability of the Earth itself. In short, the drift of climate unsettles not only weather and resource flows, but the epistemic architectures of prediction. Human systems of measure and management are now drawn into a world whose very coordinates no longer remain still.

3.4.3.2.4 The Hydrolithic Archive

Even as the world refuses to hold still, it continues to record—with an astonishing, sometimes unnerving, fidelity. Contemporary theory invites us to rethink "archive" as a condition of matter itself, where stone and water serve not only as passive storehouses but as active witnesses and agents of memory. Alaimo's concept of "transcorporeality" and Neimanis's "hydrofeminism" both insist that bodies and environments form recursive, permeable archives, in which histories, whether legal, economic, or ecological, are sedimented, circulated, and sometimes toxified.[739] The planetary memory is never purely textual. Coral skeletons, for instance, inscribe annual bands that

[737] Elena Esposito, *Artificial Communication: How Algorithms Produce Social Intelligence* (Cambridge: MIT Press, 2022), esp. 133–39.
[738] See Pecl et al., "Biodiversity Redistribution," esp. discussion of impacts on food security and livelihoods, and insurance risk transfer.
[739] Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material Self* (Bloomington: Indiana University Press, 2010), 2; Neimanis, "Hydrofeminism," passim.

register not just temperature and acidity, but also the indirect signatures of policy: the runoff from fertilizers, the isotopic markers of fossil-fuel regulation, the metabolic scars of bleaching events.[740]

Ice cores are not merely frozen archives; they are dynamic records of planetary life. Within the compacted layers of glacial ice, microscopic air bubbles preserve actual samples of the ancient atmosphere. When scientists drill deep into Antarctic or Greenland ice sheets, they recover trapped traces of everything from lead pollution produced by Roman smelting to chlorinated compounds released during the era of modern refrigeration. Each annual layer accumulates not only environmental data, but the chemical consequences of human law, trade, and crisis: bans on certain chemicals, surges in industrial activity, or even the economic impacts of war. The ice thus reads as a palimpsest, layering physical traces of governance, commerce, and lived vulnerability, all silently registered and stored over millennia.[741]

Stone and water together compose what we note here as a "hydrolithic archive": a planetary memory in which legal and economic acts leave enduring mineral and fluid after-images.[742] In this register, the boundary between human inscription and planetary writing dissolves. A visa regime encoded in biometric databases, for instance, manifests downstream as demand for cobalt—a metal mined at immense ecological and social cost, dispersed as ultrafine particulate, and ultimately inhaled into bodies far from the sites of extraction. Such links are not simply metaphorical; they are material and stoichiometric (reflecting precise chemical ratios and balances), etched into the chemical composition of rock strata, sediments, and circulating waters. To analyze law or economy without following these elemental traces is to miss the half-life of every protocol, the way governance quietly inscribes itself into the enduring fabric of the Earth.[743]

3.4.3.2.5 Tactical Re-inscription

Against the background of these slow inscriptions, tactics of counter-mapping and archival subterfuge become crucial sites of world-making. Humanities scholarship has long emphasized

[740] Alaimo, *Exposed*, 70–75; Terry P. Hughes et al., "Coral Reefs in the Anthropocene," *Nature* 546, no. 7656 (2017): 85–87.
[741] Paul J. Crutzen and Will Steffen, "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" *Ambio* 36, no. 8 (2007): 614–21.
[742] Mattern, *Code and Clay*, 56–63.
[743] Parikka, *A Geology of Media*, 3–12, 85–94.

how marginalized groups do not simply endure inscription, but fundamentally rewrite the conditions of legibility. Peluso's foundational work in Kalimantan documents how Indigenous communities have appropriated the tools of GPS and digital mapping to overwrite colonial cadastral regimes with their own cycles of swidden agriculture[744] and ancestral movement.[745] Here, the map is both a claim and a covert record: a demand for recognition and a trapdoor for vernacular knowledge that the state's cartographic gaze cannot fully domesticate. Similarly, Johnson's analysis of Black digital practitioners in the United States reveals how code itself becomes a living archive. Practitioners embed kinship tags and collective memory within the underlying markup of websites—using HTML comments, hidden fields, or custom class labels to quietly record names, events, and relationships that are invisible to ordinary users but persist in the technical substrate. Sometimes these hidden traces serve as messages to future developers, or as acts of remembrance for specific people, ancestors, or community events.[746] In this way, the digital environment functions not only as a site of exclusion or surveillance, but as a medium for creative persistence and the cultivation of collective presence across time.

Tsing's account of salvage brings these strategies into sharper focus, showing how meaning and community are reassembled in the overlooked intervals, those "mis-timed" gaps between collapse and recovery, between insurance lapse and aid delivery.[747] In the penumbra of legibility, landscaped subject persists: neither fully visible nor wholly erased, but continually recomposed at the edges of extractive systems. Thus, LS emerges as the theoretical name for a zone where protocol, tempo, and planetary archive converge, but never close the circuit. Instead, they invite a practice of reading for emergence and repair, attending to the sites where worlds are unmade and remade, sometimes at the speed of code, sometimes at the pace of coral.

3.4.3.3 Necropolitical Terrains and the Hydrolithic Memory of World-Making

To grasp how Landscaped Subjectivity completes the P3 topology, one must attend to the uneasy terrain where sovereign power withdraws, leaving the Earth to absorb and record histories of

[744] A shifting cultivation method in which land is cleared, usually by cutting and burning vegetation, farmed temporarily, and then left to regenerate.
[745] Nancy Lee Peluso, "Whose Woods Are These? Counter-Mapping Forest Territories in Kalimantan, Indonesia," *Antipode* 27, no. 4 (1995): 383–406.
[746] Johnson, "Markup Bodies," 57–79.
[747] Tsing, *The Mushroom at the End of the World*, 151–57.

abandonment and harm. In these spaces, the planetary surface does not passively receive the consequences of violence; it participates in their chronicling and, at times, their partial mitigation. Mbembe's account of *necropolitics* is central here: power operates not only through spectacular acts of violence, but through the gradual, distributed administration of exposure and neglect. The politics of life and death is enacted at the molecular level, within environments chemically scripted to modulate the very pace at which life can erode. Every tailings pond, encampment, or transit corridor becomes more than a neutral location. Each functions as an active medium, inscribing precarity and vulnerability into air, water, and flesh. For example, the migration of plasticizers from humanitarian tarps into infant bloodstreams is not a mere technical accident.[748] It is a juridical event, where legal categories, such as emergency aid, or "disposable" infrastructure, materialize directly within the biochemistry of vulnerable bodies.[749] The long circulation of these substances is a form of policy evidence, outlasting both legislative attention and the individuals who authored such frameworks.

Importantly, inscription does not flow in only one direction. *Terrain has agency*; it never serves solely as the backdrop for sovereign control. Even sites marked by abandonment can foster resistance and new forms of connection. Peluso's research on counter-mapping demonstrates that marginalized communities do not simply suffer the violence of imposed cartographies. Instead, they actively reclaim the tools of governance, such as GPS technology, boundary markers, and legal paperwork, to encode their own logics of kinship, memory, and ecological responsibility.[750] In these efforts, the map shifts from being a tool of domination to a palimpsest layered with alternative histories and claims. These re-inscriptions compel official archives to host stories and relationships they were never designed to contain. This dynamic is deepened in Simpson's theorization of Indigenous resurgence, where resurgence is not measured by the restoration of lost property but by the renewal of embodied, living relationships with land itself, relationships in which the land acts as a sentient, communicative force.[751] In such contexts, mapping becomes less

[748] Sarah A. Vogel, "The Politics of Plastics: The Making and Unmaking of Bisphenol A 'Safety,'" *American Journal of Public Health* 99, no. S3 (2009): S559–S566, esp. S561–S562 on leaching and exposure pathways.
[749] Mbembe, Necropolitics, 92–98.
[750] Peluso, "Whose Woods Are These?", 383–406.
[751] Leanne Betasamosake Simpson, *As We Have Always Done: Indigenous Freedom through Radical Resistance* (Minneapolis: University of Minnesota Press, 2017), 43–48.

a matter of fixing boundaries and more a practice through which territory expresses its own agency, made legible in the rituals, movements, and everyday acts of those who dwell within it.

For many, however, the experience of necropolitical terrain is not mediated through acts of counter-mapping, but through what Foucault describes as "counter-sites" or heterotopias. These are spaces that both reflect and invert the logic of sovereignty, while remaining structurally outside its protections.[752] Consider refugee camps that are visible from satellites but remain legally invisible, or holding centers that regulate the rhythms of life for dispossessed populations through logistical management rather than legal rights. In these landscapes, even dormitories map the laboring body not for protection but for intensified exposure. Here, "breath" itself becomes a unit of political economy, marking the thresholds of who is allowed to endure and who is abandoned to attrition.

Amin's account of the late-liberal city illustrates this logic on an urban scale. Social cohesion does not arise from solidarity, but from systems of spacing and calibration that keep bodies close enough for productivity, yet distant enough to satisfy demands for security and anonymity.[753] Inhabitants must master a practice we shall call an "aerobic ethic of latency," learning to remain visible enough to access shared resources, but indistinct enough to avoid surveillance or bureaucratic targeting. Survival becomes an exercise in managing presence at the edge of recognition. At the same time, if *breath* is the lived currency of survival in heterotopic spaces, then the *hydrolithic archive* is their planetary record. Environmental features, such as ice cores, coral growth bands, the rings in animal teeth, and the spread of industrial chemicals like endocrine disruptors, act as durable records, preserving traces of both our biological exchanges with the planet and the legal, economic, or regulatory decisions that have shaped them.[754] These archives are not abstract; they record, for instance, how substances banned in one jurisdiction appear decades later in the tissues of distant or marginalized populations. Alaimo's *transcorporeality* becomes literal in this context: no society can claim to have contained its wastes or secrets when toxic residues travel globally, entering even

[752] Michel Foucault, "Of Other Spaces," *Diacritics* 16, no. 1 (1986): 24–27.
[753] Ash Amin, *Land of Strangers* (Cambridge: Polity, 2012), 4–8.
[754] See, in this regard, Alessandro Antonello and Mark Carey, "Ice Cores and the Temporalities of the Global Environment," Environmental Humanities 9, no. 2 (2017): 181–202; Hughes et al., "Coral Reefs in the Anthropocene," 85–87; Simon Hillson, *Teeth* (Cambridge: Cambridge University Press, 2005).

the most isolated bodies.[755] Neimanis's *hydrofeminism* reinforces this point by dissolving the *fantasy of separateness*: bodies of water, from the womb to the delta, act as communicative tissues that transmit and sustain what is meant to be forgotten.[756] Geological strata compress trauma into mineral memory, while hydrological systems diffuse its afterlives through aquifers, marshes, and even human saliva. The scope of responsibility thus expands from legal procedure to the half-life of planetary pollutants.

An urgent ethical demand emerges from this convergence of terrain, archive, and body. LS refuses the comfort of abstraction, insisting that to inhabit this world is to draw breath from the archive and to navigate the micropolitics of exposure. Every act of movement contests the protocols that determine visibility, protection, and abandonment. Tactics such as counter-maps, latency hacks, and relational storytelling cannot guarantee safety, but they weave tenuous networks of reciprocity, reconnecting the social and ecological tissue in ways that necropolitical regimes attempt to erase. The Earth itself becomes a ledger, inscribing histories in calcium, carbon, and code. The critical task is to develop a *double literacy*, capable of reading these planetary inscriptions both scientifically and interpretively, until disciplinary divides between environmental forensics and cultural theory are forced to yield to the demands of the present.

As this chapter concludes the P3 sequence: P3a revealed culture as a ferment of planetary turbulence rather than its passive passenger. P3b uncovered narrative as machinically condensed and continually shattered within infrastructures of prediction and control. P3c now insists that the ground itself acts as a semiotic AAA, writing and rewriting the conditions of personhood in mineral, aqueous, and orbital forms. Under these conditions, identity is sustained not as a stable monologue but as a precarious rhythm, at once gasp and refrain, held within the atmospheric pressures of an Earth that continues, despite everything, to bear truthful witness to all that passes across its surface.

[755] Alaimo, *Exposed*, 15–25.
[756] Neimanis, "Hydrofeminism," 85–96.

3.4.3.4 Hinge of Becoming: From Planetary Palimpsest to Metahuman Synthesis

The trajectory of the P-typologies has led us from the turbulence of cultural flows, through the narrative vortices of infrastructural mediation, and into the strata of planetary inscription. Across these vantage points, the human is no longer the originator of meaning, but a fleeting pattern emerging within circuits of matter, code, and collective memory. The real strength of these models lies not in their differences, but in the generative connections where their conceptual energies meet and deepen each other. It is precisely in these intersections, where ecological agency, algorithmic mediation, and necropolitical terrains entwine, that the limits and possibilities of typological posthumanism become most visible and most fertile.

If we were to rely on critique alone, or allow the undoing of humanist frameworks to suffice, our inquiry might risk settling into inertia or reiteration. The cumulative force of these analyses now inclines us toward a new horizon: the invention of agency that is neither a remnant of sovereignty nor a passive imprint of planetary processes. This is the turning point where the inquiry enters the domain of the M-series. The P-typologies have taught us to recognize the planet as an active participant in the scripting of subjectivity. The M-typologies now invite us to consider what new technical, somatic, and ethical practices might arise from this entanglement. The challenge becomes one of articulating a diagram of becoming that eludes both nostalgia for mastery and the paralysis of unbounded diffusion.

Within these productive convergences, the M3 type finds its occasion to emerge. Rather than resolving differences or retreating into abstraction, the pages that follow pursue a mode of typological synthesis attentive to the complexities of our planetary condition. Here, the hybrid meta-evolutionary subject does not evade the tensions of the T- and P-models, but gathers them as the material for new practices. From this shared ground, a new possibility opens: to inhabit a register of M-posthuman and ultimately alterhuman care, one responsive to the demands and uncertainties of our shared horizons.

4. M-posthuman Subjectivity: Overcoming the Conceptual Impasses of T- and P-Models through Typological Synthesis

In the wake of T-posthumanist exultations of enhancement (as examined in the chapter on T-typologies) and P-posthumanist appeals to post-anthropocentric relationality (Chapter P), we arrive at the horizon of the Metahuman (or M-posthuman, as designated from the outset): a philosophical trajectory that seeks to transcend both the naïveté of technological salvationism underpinning mainstream transhumanist paradigms and the residual anthropocentrisms that continue to inform certain strands of critical transhumanist and posthumanist thought. In this typology, the subject is neither encapsulated as an autonomous entity nor dissolved entirely into impersonal relational networks. Rather, subjectivity emerges as a ceaselessly transformative field, continuously opening toward a dynamic *becoming-other*, defying traditional humanist coordinates and genuinely expanding conceptual possibilities beyond conventional binaries.

This M-chapter is structured around two pivotal theoretical propositions whose divergences generate a productive dialectic. Del Val's radically anti-transcendent, movement-centered philosophy reconceives subjectivity as an amorphous, proprioceptive flux, foregrounding continual transformation over static essence, though it invites questions of practical feasibility. In parallel, Sorgner's "weak transhumanism" articulates a philosophically nuanced pragmatism, demonstrating attentiveness to the ethical and practical complexities of biotechnological intervention and a sustained engagement with debates surrounding persisting anthropocentrisms and the conditions for posthuman flourishing.

By threading together these two contrasting yet complementary philosophical stances, this analysis constructs a novel typology of M-posthuman subjectivity (M1, M2, and, most notably, M3) explicitly designed to overcome conceptual impasses evident within preceding T- and P-models. Crucially, the third type, the Hybrid Meta-Evolutionary Subject (M3), goes beyond simple compromise to become an original, integrative theoretical construct, hybridized through the cross-pollination of the first two M-positions. It consciously avoids collapsing into either potential extreme, such as technological utopianism or ungoverned ontological fluidity, instead proposing a mode of structured indeterminacy capable of simultaneously hosting technological enhancements and profound movement-based liberation.

4.1 The Metahuman Turn: Movement Ontology and the Trash-Human Critique

Del Val's work injects a potent and uncompromising critique into metahumanist discourse, condemning human supremacism as a planetary and cosmic anomaly culminating in ecological devastation and mass extinction.[757] Rather than treating "the human" as an evolutionary apex, del Val diagnoses the anthropocentric civilizational project, particularly since the Neolithic and agricultural revolutions, as an atrophying of perceptual plasticity. This degeneration has given rise to a "trash-human" culture organized around illusions of control and the subordination of planetary flows.[758] His counter-model is not the production of a novel techno-enhanced entity but the radical unmaking of the stasis and geometric fixity that sustain anthropocentric metaphysics. He rejects what he terms the illusions of mind-upload utopias and the hyperhumanist fantasies of rational dominion, offering instead a vision of a cosmos composed of "metabodies," in which identity is not stabilized but continually undone through microvariation and minimal deviation, invoking the Lucretian *clinamen* as the primordial condition of difference.[759] Subjectivity, in this framework, emerges not from coherence, augmentation, or symbolic representation but from immanent multiplicity, infinite relational flux, and the irreducible contingency of movement.

Crucially, del Val challenges the widespread assumption within transhumanist and posthumanist theories that human-technology hybrids constitute the horizon of future subjectivity. "We have *never* been cyborgs," he asserts, emphasizing that cyborg discourse remains haunted by a logic of mastery that reproduces the very anthropocentrism it claims to overcome.[760] In this context, the cyborg persists as a "dominion trope," one that remains complicit in overlooking the ongoing planetary catastrophe of mass extinction, industrialized animal exploitation, and systemic ecological collapse. [761] Del Val's alternative begins not with technological enhancement but with a transformation in how the body is conceived. It is no longer understood as an object to optimize or a symbol to interpret but as a dynamic field of proprioceptive variation, a swarm of relations in continuous metamorphosis. From this perspective, technology is reimagined not as a prosthetic

[757] Jaime del Val, *Ontohackers: Radical Movement Philosophy in the Age of Extinctions and Algorithms* (Madrid: Metabody Press, 2024), xv–xviii.
[758] Jaime del Val, "Metahuman Studies, Choral Ontopolitics and Earth Liberation," *Journal of Posthumanism* 3, no. 2 (2023): 103–23, 105.
[759] Del Val, *Ontohackers*, 50 et passim.
[760] Del Val, "Metahuman Studies," 108. Emphasis added.
[761] Ibid.

apparatus designed to transcend human limitations but as an ensemble of *minor techniques* that may amplify shared ecological relationalities, provided that the will to quantification, extraction, and control is relinquished.[762] The metahuman, in this sense, does not represent a transcendent figure of optimization but a cosmic reorientation away from the self-enclosing geometries of civilization and toward an open-ended variation of planetary becoming.

In contrast, Sorgner offers a more measured vision of posthuman transformation, grounded in a reinterpreted Enlightenment liberalism informed by Nietzschean perspectivism.[763] While del Val calls for a near-total dissolution of anthropocentric structures, Sorgner contends that foundational liberal principles such as morphological freedom, individual autonomy, and freedom from coercion retain their ethical relevance in an age shaped by genetic engineering and cybernetic integration.[764] Rather than viewing these values as impediments to posthuman evolution, he frames them as essential safeguards against technocratic overreach and authoritarian distortions of enhancement discourse.

Sorgner's metahuman subject is articulated through the figure of the "cybernetic Nietzschean," who affirms that humans have *always* been cyborgs. This perspective emphasizes evolutionary continuities in tool use, language, and cultural transformation as early expressions of cyborgian existence, while embracing the potential for self-directed enhancement guided by a diversity of ethical worldviews.[765] His approach resists the suspicion, articulated by del Val, that any project of enhancement inevitably reinscribes a logic of mastery. Instead, Sorgner understands progress not as a leap toward disembodied immortality but as a modest, thoughtfully strategic, and continuous extension of biological and cultural capacities. Moreover, the risk of producing what del Val terms the "trash-human" is, for Sorgner, a real but not inevitable outcome. It can be mitigated by what he describes as "weak transhumanism," a normative orientation that affirms the right to enhancement while upholding the imperative of non-coercion.[766] This framework supports a wide range of enhancement trajectories, both biological and technological, while insisting on the legitimacy of refusal and the preservation of individual agency. Most significantly, Sorgner

[762] Del Val, *Ontohackers*, 183.
[763] Sorgner, *We Have Always Been Cyborgs*, 129–32.
[764] Ibid., 141–44.
[765] Sorgner, S. L. (2020). *On Transhumanism*, Penn State University Press, 52.
[766] Sorgner, *We Have Always Been Cyborgs*, 63.

expands the concept of personhood beyond the human, recognizing the potential moral status of artificial intelligences and certain nonhuman animals.[767] In doing so, he articulates an ethical vision that remains perspectival and dynamic, responsive to emergent forms of subjectivity without abandoning the liberal commitment to autonomy. His metahumanism thus reflects an open-ended, cyborgian ontology oriented toward continuous transformation, grounded in pluralism rather than transcendence.

4.2 Tensions and Convergences: The Emergence of M-Typologies

Out of Sorgner's comparatively moderate stance and del Val's hyperradical orientation, we can sketch three emergent "types" of M-posthuman subjectivity:

1. **Type M1: Neo-Cyborgian Metahuman**—A subject that affirms morphological freedom and weak transhuman expansions, guided by a Nietzschean ethic of self-overcoming but still strategically couched in liberal terms (autonomy, rights). This subject sees the planet and the self as co-evolving systems that can be navigated responsibly via technology, provided we maintain pluralistic openness and empathy for other beings.[768]
2. **Type M2: Symbiotic Movement Metahuman**—A radical dissolution of the anthropocentric form. Here, identity is replaced by *movement fields*, bodies become fractal "metabodies," and all claims to personal autonomy yield to a swirl of microvariations in a planetary communion. The M2 subjectivity refuses conventional human-liberal frameworks, insisting that species dominance, hierarchical power, and geometric fixations must give way to "ecological infiltration," minimal unstoppable changes that reawaken an older cosmic synergy lost since the dawn of agriculture.[769]
3. **Type M3: Hybrid Meta-Evolutionary Subject**—This type arises from an effort to combine the strengths and mitigate the risks inherent in both M1 and M2. It acknowledges the necessity of some structural orientation, providing an ethical scaffolding that nurtures empathy, morphological freedom, and measured rational reflection, while at the same time championing the wild intensities of a formless, emergent movement ontology. In practice, the M3 subject

[767] Ibid., 145–46.
[768] Ibid.
[769] Del Val, "Metahuman Studies," 110–11.

> emerges as a productive resonance between the visions articulated by Sorgner and del Val, drawing deeply from their respective philosophical wells. Rather than merely occupying a middle ground, the M3 paradigm seeks to amplify the resources of both traditions: it deploys technology not as a mechanism of domination, but as a means to cultivate and renew bodily plasticity—opening the horizon for modes of subjectivation that are at once ethically attentive and dynamically embodied. The ethical guidelines it fosters are thus conceived not as static injunctions, but as evolving orientations, responsive to contingency and resistant to the lure of institutional ossification. If M3 gestures beyond its precursors, it does so with a sense of gratitude and critical fidelity, carrying forward their insights as vital elements in the ongoing, open-ended project of configuring alterhuman planetarity.

By delineating these types, we can see how the difference between Sorgner's and del Val's metahumanisms is not merely rhetorical but philosophical, implicating fundamental questions of *ontology* (Does subjectivity vanish into flux or remain somewhat stable?), *ethics* (Is liberal autonomy salvageable, or must it be replaced by an ontopolitics of indefinite movement?), and *planetary politics* (Can we harness technology for ecological regeneration, or must it be undone from within to release genuinely post-civilizational forms of life?). The synergy, and friction, between these positions prevent Metahumanism from collapsing into a monolith or reductive bridge model. Rather, it is a landscape of possible metamorphoses of the subject, some anchored in carefully calibrated expansions of humanism, others casting the entire project of human civilization as an extinction-prone fiasco that only radical dissolution can remedy.

4.3 Radical Movement and Earth Liberation: Reading *Ontohackers* into Metahuman Typologies

What sets del Val's metahumanism apart is its ruthless political core: the unmaking of anthropocentric civilization at its root. In *Ontohackers*, he reanimates Nietzsche's warning, naming humanity the "planet's plague," a geological aberration born of millennia-long sensory sedation and runaway reproduction.[770] Posthuman theory, for del Val, falters when it stops at symbolic critique. It must confront the whole architecture of settlement, agriculture, reproductive normativity, and the civilizational myth of progress that sustains mass planetary exploitation. This

[770] Del Val, *Ontohackers*, xxvii, xxx.

is the "planetary holocaust": a systematic, normalized catastrophe of animal enslavement, ecological ravaging, and enforced human overpopulation.[771] Liberation cannot emerge from discourse alone. It begins in the body. Only by reawakening the proprioceptive swarm can we begin to unlearn the motor-reflexes of control wired into our species-being. The call is metamorphosis—metahuman evolution, enacted through corporeal re-patterning, not as rhetorical gesture but as radical somatic insurgency.

This emphasis on bodily swarm logics finds little direct correspondence in Sorgner's framework, which articulates instead a pluralistic ethics of enhancement rooted in morphological freedom and liberal autonomy. Sorgner's analysis, sensitive to the evolutionary interweaving of biology and technology, refrains from calls for the wholesale dismantling of global capital or large-scale domestication, including industrial animal agriculture. Rather, his position unfolds through the logic of ethical recalibration: he contends that such systems, far from being beyond redemption, remain susceptible to meaningful transformation by means of biotechnological intervention, including cultivated meat, CRISPR-mediated ecological strategies, and other precisely targeted enhancements.[772] Where del Val diagnoses the monotechnic system as the epicenter of planetary crisis and, accordingly, rejects the paradigm of amelioration by calling for disalignment from the belief that technological advancement can reverse the crises it has helped produce,[773] Sorgner's approach subjects this crisis to the possibility of deliberate, systemic realignment. For Sorgner, technology operates less as an instrument of mastery than as a provisional means for steering complex assemblages away from the trajectory of "trash-humanity"; its agency resides in a capacity for iterative, ethically informed adjustment, responsive to the evolving conditions of planetary life. While del Val summons the radical alterity of symbiotic indeterminacy as an exit from technocratic logic, Sorgner's framework quietly wagers on the generative potential of sustained engagement, a continual negotiation within, and not merely against, the inherited architectures of modernity.

[771] Ibid., xxv, et passim.
[772] See Sorgner, *We Have Always Been Cyborgs*, esp. chs. 1, 3, and 6, where he articulates the ethical imperative of morphological freedom and the possibility of biotechnological innovation as a form of ameliorative, rather than abolitionist, planetary stewardship. On his commitment to ethical pluralism and incremental reform within existing institutional architectures, see also Sorgner, "Nietzsche, the Overhuman, and Transhumanism," 29–42.
[773] Del Val, "Metahuman Studies," 105.

From this divergence, a pivotal ontopolitical question comes into focus: does metahuman subjectivity demand the dismantling of civilizational infrastructure at its root? For del Val, the answer is unequivocal; any framework that retains institutional logics of extraction and control, however ethically reframed, ultimately perpetuates the supremacist imaginary. Sorgner, by contrast, acknowledges the gravity of these dangers but does not construe them as inexorable. His model sustains a considered confidence in the prospects of posthuman liberalism, positing that technological potentials may be responsibly redirected without relinquishing the philosophical, political, and moral inheritances of modernity. For all their differences, both thinkers share a fundamental recognition that the figure of the *Anthropos*, conceived as rational, sovereign, and hierarchically distinct, cannot remain central if planetary survival is to be secured. The distinction between their positions concerns not the necessity of transcending anthropocentrism, but the extent of rupture required to bring genuinely post-anthropocentric life into being.

4.4 Unfolding the Typology: Toward a Choral Metahumanism

The ontopolitical distinction between Sorgner and del Val raises a further possibility. Rather than choosing between strategic reform and ontological rupture, might metahumanist subjectivity be conceived as *choral* or polyphonic, a field of irreducible differences that resonate without resolution? Del Val's recent work on *choral ontopolitics* offers a suggestive framework; he proposes the body in open variation as the political subject of the future, pointing toward ephemeral ensembles of movement that enact freedom not as individual autonomy but as ceaseless co-creation: a chorus of bodies.[774] In this light, Sorgner's commitment to morphological freedom and liberal pluralism might be understood as one voice within the chorus, offering ethical framework that is non-paternalistic, structurally supportive without seeking to control or dominate the melody. Del Val's call for radical dissolution and cosmic openness might be another, generating intensities that overwhelm form and exceed the bounds of the knowable. Together, these orientations could articulate a figure we might call the *choral metahuman*: a subjectivity that does not resolve difference but hosts it, using technology not to perfect the individual but to deepen the plasticity of movement.[775] No longer seeking mastery, this subject transfigures technology, following del

[774] Ibid., 117.

[775] Much like the Chalcedonian formula as employed in the previous chapter, where we framed TES and TRS as a hypostatic conjunction of machinic inscription and transcultural mediation, this choral schema preserves in Sorgner

Val, into *minor techniques of care*, instrumental gestures that serve to amplify the minimal variations of relational becoming.

This choral framing also gestures toward the delicate asymmetries embedded within each orientation. Del Val's uncompromising commitment to ontological dissolution, for all its visionary force, may run the risk of dissipating normative orientation, trading structural clarity for a radical openness that resists stabilization. Sorgner's emphasis on morphological freedom and ethically regulated enhancement, while philosophically rigorous and attuned to pluralism, operates within a terrain whose infrastructural entanglements with global crisis are multifaceted and not easily disentangled. Rather than foreclosing these complexities, the choral model renders their tensions productive, orchestrating a counterpoint between constraint and release, normativity and metamorphosis, in which each position extends, refracts, and complicates the other.

Such a model affirms that genuine morphological liberty is not simply a matter of improvisatory bodily play, but also presupposes the cultivation of a sensorium capable of radical empathy and *cosmotechnic* attunement—capacities notably rare within the prevailing "trash-human" condition. To the extent that these new perceptual modes depend on the somatic unlearning of anthropocentric reflexes, del Val's *metaformance* practices prove indispensable; still, their emergence may likewise rely upon the infrastructural affordances Sorgner's model envisages, from secure sites of morphological exploration to the algorithmic analysis of planetary liminalities. What ultimately sets this approach apart from mainstream transhumanism is not the deployment of technology per se, but the reorientation of its *telos*: these instruments become, not ends in themselves, but subsidiary gestures within the broader choreography of terrestrial becoming.

M-posthuman subjectivity thus resists coherence as fixed identity, instead presenting a dynamic field of potentialities that spans from the calibrated expansions of liberal ethics to the radical reinvention of embodiment as biospheric process. If the resultant configuration appears at times flamboyant, internally dissonant, or unstable, such features signal not a defect of the conceptual architecture, but rather an indication of its ambition. The stakes, after all, are nothing less than cosmic: the transformation or extinction of life as we know it. The next section refines the typology

and del Val two irreducible orientations, neither collapsed into the other nor held apart in sterile opposition. Instead, within this analysis, they tend to co-reside in a generative, if tense, simultaneity.

further, examining how each model operationalizes movement, technological agency, and Earth-liberation, and in so doing reveals the complex alliances and persistent tensions that contour the metahuman horizon.

4.5 M1: Neo-Cyborgian Subjectivity—Continuity, Enhancement, and the Liberal Metahuman

The first model of M-typologies, *Neo-Cyborgian Subjectivity* (NCS), configures a metahumanist trajectory grounded in ontological continuity, rational autonomy, and ethically guided enhancement. It draws its conceptual spine from Sorgner's articulation of *weak transhumanism*, wherein the posthuman does not signify a rupture with the human but an extension: historically embedded, culturally mediated, and ethically anchored in the *technē*-human entanglement that has constituted subjectivity all along.[776] Here, M-posthumanism is not a flight from humanity but a dialectical unfolding of its most plastic capacities.

From the invention of symbolic language, humanity's first exo-cortical interface, to the infrastructural saturation of everyday life by algorithmic governance and bioinformatic surveillance, the human has never been an isolated biological entity. It has always been a hybrid organism extended through tools and symbols. Sorgner's assertion that humanity has always been inscribed within a cyborgian index of existence as its *modus operandi et essendi* is not merely metaphorical but ontological: it reorients our understanding of embodiment and cognition as always already distributed across tools, networks, and symbolic apparatuses.[777] Thus, NCS enacts a critical shift away from anthropological essentialism toward what might be called *cyborgian historicity*: a recognition that subjectivity has evolved through iterative feedback loops between bodies and instruments, minds and milieus.

Within this intellectual framework, NCS emerges not as a revolutionary anomaly, but as a deliberately cultivated extension of Enlightenment humanism, recalibrated for a biotechnological epoch. Its trajectory of becoming is neither chaotic nor transcendent; it is purposeful, ethical, and

[776] Sorgner, *We Have Always Been Cyborgs*, 8; see also Aura E. Schüssler, "Review of *We Have Always Been Cyborgs* by S. L. Sorgner," *NanoEthics* 16, no. 1 (2022): 7–11.
[777] Sorgner, "Nietzsche, the Overhuman, and Transhumanism," 29–42. This early study by Sorgner interprets Nietzsche's *Übermensch* as an inspiration for a transhumanist future of continuous self-overcoming.

navigable. Here, movement signifies not the wild destabilizations valorized by radical post-anthropocentrisms (see M2), but a calibrated expansion of agency: an incremental trajectory guided by the liberal triad of autonomy, informed consent, and non-coercion. In this schema, morphological freedom (the right to modify one's own body through technological means) emerges as the foundational right of the metahuman era. This right, however, is never a self-contained prerogative; it unfolds within intricate networks of cultural meaning, social negotiation, and ethical reflexivity. Accordingly, the body is not conceived as an obsolete relic awaiting disembodied escape, but as a site of dynamic reconfiguration. It is a malleable substrate, shaped through iterative exchanges among proprioception, social interpretation, and technological affordance.[778] Sorgner's metahuman body is neither a vessel to transcend nor a sacred ground to preserve: it is a site of disciplined experimentation. Enhancements, be they cognitive, genetic, or neural, are tools not of transcendence but of embodiment, enabling greater responsiveness, resilience, and relational attunement to an increasingly complex technocultural ecology. Critically, the enhanced subject in this typology is not a post-biological monad. It is a *kybernētēs*, a helmsman navigating a fragile and contingent world, balancing freedom with responsibility, enhancement with restraint.[779]

In the conceptual ambit of NCS, the status of art acquires a critical ontological and ethical weight, as rigorously articulated in Sorgner's recent analysis of posthuman aesthetics. Rather than reducing art to a decorative afterthought or escapist fiction, he frames *posthuman art* as a privileged locus for the negotiation of new modes of being, sensing, and relating, where the boundaries between human, technological, and environmental agencies are continuously interrogated and revised. In this context, art is not a mere pursuit of formal novelty; it is a procedural and experiential technology that dramatizes the tensions and possibilities inherent in cyborgian existence. Sorgner's close analysis demonstrates how, under NCS, posthuman art serves as a living laboratory for ethical and existential experimentation, mediating the paradoxes of enhancement, vulnerability, and relationality. This is evident, for example, in his treatment of immersive installations and technologically mediated performances, which foreground the co-constitution of subject and milieu while making palpable the risks, uncertainties, and forms of solidarity characteristic of

[778] Sorgner, *On Transhumanism*, 100–2.
[779] Sorgner, *We Have Always Been Cyborgs*, 13 et passim.

metahuman becoming. Posthuman art, thus understood, cultivates a sensibility attuned to both the promise and perils of morphological freedom: it asks us to inhabit the ambiguity between self-shaping agency and the unpredictable contingencies of hybrid life, foregrounding a posthuman aesthetic attitude defined by critical openness rather than unreflective affirmation.[780]

This conception rests on what might be called *meliorist naturalism*: the belief that human capacities can and should be cultivated through reasoned, ethico-aesthetic engagement with technoscientific means. Drawing from Nietzsche's metaphor of humanity as a bridge, Sorgner advances a vision in which evolution is not a deterministic ascent toward perfection nor a nihilistic dissolution into chaos, but a practiced art of self-overcoming, performed within liberal frameworks of mutual recognition and ethical reciprocity. Enlightenment values such as pluralism, autonomy, and the primacy of reason are not abandoned but *updated*—filtered through the recognition that the Enlightenment subject must now share ontological space with algorithmic intelligences, gene-editing biotechnologies, and ecologically responsive infrastructures.

In this model, technology is neither messianic nor monstrous. It is a contingent, instrumental ally: context-sensitive, epistemically fallible, and ethically non-neutral. It does not "liberate" the human, nor enslave it; rather, it *co-fabricates* subjectivity within historically specific regimes of possibility. NCS refuses both technofetishism and bioconservatism. It resists disembodied escapism (e.g., mind-uploading conceits) as well as atavistic romanticism. Instead, it posits a pragmatic co-evolution of body and world, mediated through biotechnological affordances and grounded in a commitment to preserving ethical integrity within a shifting ontopolitical terrain.

Indeed, agency in this framework is not conceived as absolute sovereignty but as reflective calibration: a process of negotiating between desire, risk, and systemic feedback. The sovereign individual of classical liberalism gives way to a networked post-person, whose autonomy is relational, enmeshed, and continually revised. The ontological primacy of embodiment is retained not as a limit to be transcended, but as the very condition through which ethical experience unfolds.

[780] See Stefan Lorenz Sorgner, *Philosophy of Posthuman Art* (Schwabe, 2022), 44–52, 136–46.

In this light, *finitude* is not a failure to be corrected, but the horizon against which moral, aesthetic, and relational value assumes intelligible form.[781]

Across the ethical field, NCS extends moral concern beyond the human by advocating a foundation for personhood grounded in empirical criteria such as sentience and self-awareness. As Sorgner suggests, a sufficiently advanced AI could manifest forms of suffering and subjective experience once thought exclusive to nonhuman animals, thereby warranting moral consideration alongside them. This expansion does not undermine liberal principles; rather, it underscores that autonomous agency and reflective self-awareness remain indispensable conditions for ethical recognition.[782] This is not a naïve universalism but a context-sensitive ethical pluralism, which evaluates moral status according to relational capacities, communicative potential, and mutual vulnerability. Personhood, in this typology, is not fixed by species boundaries or cognitive thresholds but emergent from dynamic entanglements between agency, responsibility, and technological mediation.

Within the polyphonic landscape of metahumanist philosophies, Neo-Cyborgian Subjectivity constitutes one of the most structurally coherent and politically actionable types. It offers a counterpoint to the dissolutive fluidity of M2 and serves as a conceptual launch pad from which M3 may begin its integrative gestures. By refusing both technocratic domination and ontological nihilism, NCS models a form of subjectivation that remains intelligible to policy, capable of legal recognition, and resilient under planetary conditions of risk. It sees enhancement not as salvation but as an *ethical project*: a practice of care that must be regulated, democratized, and reflexively governed.[783] Considered through this lens, technological mediation is reconceived as an intensification of embodied experience—a means of heightening perception, refining cognition, and extending the affective reach of the subject. Rather than promising escape from terrestrial

[781] Ibid., 175–76.
[782] Stefan Lorenz Sorgner, "The Dignity of Apes, Humans, and AI," in *The Bioethics of the 'Crazy Ape'* (Trivent Publishing, 2019), 6–7.
[783] Following Bostrom's influential line of argumentation, transhumanism's core imperative lies in the enhancement of the human condition through technological means. Sorgner's moderate position (M1) affirms this foundational principle, yet carefully distinguishes itself by foregrounding pluralism and individual autonomy. Rather than prescribing a singular vision of the posthuman, he advocates for "the greatest diversity of human flourishing," thereby resisting universalizing ideologies in favor of ethical nuance and personal choice. See Nick Bostrom, "A History of Transhumanist Thought," *Journal of Evolution and Technology* 14, no. 1 (2005): 1–25; Riccardo Manzocco, "Stefan Lorenz Sorgner," *Philosophy Now*, no. 142 (2021), https://philosophynow.org/issues/142/Stefan_Lorenz_Sorgner.

vulnerability, these instruments cultivate a heightened attunement to the contingencies of the biosphere. The ethical imperative thus shifts: the task is not the engineering of idealized posthuman archetypes, but the fostering of situated flourishing amidst uncertainty and risk. On a practical level, this orientation calls for the development of deliberative infrastructures that enable individuals and communities to leverage biotechnologies, artificial intelligence, and environmental sensing in the collaborative navigation of planetary crisis. Examples range from climate governance systems informed by real-time biofeedback, to ecological restoration driven by adaptive AI, to distributed health interventions integrating neurotechnological diagnostics, each anchored in participatory values and a commitment to distributive justice.

The optimism animating Neo-Cyborgian Subjectivity is neither uncritical nor reactionary; it is defined by a persistent, reflective engagement with the slow complexities of stewardship. NCS does not proffer a salvific technological vision, but emerges as a custodian of negotiated, ethical evolution, one equipped not with fantasies of transcendence, but with the adaptive tools necessary for persistence amid volatility. In this respect, it stands as the rationalist inheritor of Enlightenment values within the contemporary landscape of algorithmic mediation and synthetic biology, an empiricist navigating the recursive intricacies of metabodily existence. As the conceptual anchor of metahumanist pluralism, NCS resists dissolution into unbounded mutability represented by M2, while also furnishing the normative infrastructure from which integrative, hybridized subjectivities of M3 may unfold. Its distinctiveness lies less in dramatic rupture than in its disciplined capacity for ethical modulation, attuned to complexity, adaptive to change, and responsive to the ever-evolving demands and shifting propositions of survival as a notion and collective practice.

4.6 M2: Radical-Metahuman Subjectivity: Indeterminacy, Movement, and Becoming-Other

In stark and deliberate contrast to the calibrated continuities of M1, the metahumanist paradigm we designate as *Radical-Metahuman Subjectivity* (RMS), articulated by Jaime del Val, ignites the foundations of both classical and liberal posthumanism, replacing them with a radically indeterminate ontology of flux, multiplicity, and relentless undoing. Where Sorgner methodically reconstructs a bridge from the human to the post- and metahuman, del Val unapologetically incinerates the bridge and flows past it in a nomadic torrent of emergent becoming. His “radical movement philosophy” situates M-posthuman subjectivity not as an aspirational human project,

but as a deconstructive event already coursing through molecular, planetary, and proprioceptive domains.

In this schema, nothing stands still; the very substrate of being is kinetic and relational. Movement, here, is not reducible to physical displacement but operates as a metaphysical constant: ceaseless variation, immanent metamorphosis, and the swerve of becoming that animates all existence. Del Val's metahumanism, in this expanded register, becomes an ontological homage to the *clinamen*, Lucretius's term for the spontaneous atomic swerve—recast as the "minimal, ongoing, indeterminate variation in movement" that inaugurates both novelty and freedom.[784] This model insists that only by reactivating our dormant capacities for unpredictable movement and deep corporeal sensation can we unravel the stasis and control mechanisms inherited from the deeply sedimented metaphysics of agrilogistic civilization and the operative logics of technocratic modernity.

The RMS-body is reconceived as *metabody*: a liminal, open-ended constellation of forces in continuous exchange with other bodies, human and more-than-human alike. The subject no longer appears as a sovereign entity but as a site of *traversal*, a porous node within a vast choreography of matter. Del Val speaks of a "proprioceptive entanglement" between bodies and environments, wherein agency emerges not from volitional centrality but through distributed relational dynamics: a *choral ontopolitics* of moving-with.[785] In this formulation, agency is diffuse and co-emergent, a collective rhythm that evades all conventional schemas of authorship and command.

Against the modern fetish for autonomy and mastery, RMS offers a scathing indictment: to cling to liberal-humanist ideals of control, in del Val's view, is to remain entrapped within the "all-too-human" metaphysics of civilization, which has systematically engineered planetary crisis. Where M1 regards technology as a mechanism for expanding autonomous agency, M2 exposes mainstream technics as deeply complicit in the deepening of human exceptionalism and the acceleration of ecological catastrophe. Still, del Val refrains from wholesale technophobia. Instead, he calls for a radical reorientation of technics away from the "monotechnical paradigm of

[784] Jaime del Val, "What is Metahumanism (Revisited 2022)," *Metabody*, 2022, https://metabody.eu/metahumanism/, accessed June 28, 2025; Del Val and Sorgner, "The Metahumanist Manifesto," 295–97.
[785] Del Val, *Ontohackers*, 59 et passim.

quantification" and toward a proliferating ecology of symbiotic, indeterminate, and minor techniques.[786]

This techno-pluralism resonates with Hui's notion of *technodiversity*, a call for multiple, situated cosmotechnical traditions attuned to local ecologies and "technologies of nature," as opposed to the homogenizing rationality of Silicon Valley monoculture.[787] The epistemic architecture of M2 is thus grounded in embodied, affective, and pre-verbal knowledges: the tactile wisdom of rhythm, the semiotics of gesture, the somatic truth of improvisation. Del Val aligns himself with a philosophical lineage that stretches from Heraclitus and Spinoza to Bergson, Nietzsche, and Deleuze, as well as with Indigenous and non-Western cosmologies that position humans not as sovereigns but as interwoven threads in the larger weft of planetary existence.[788] The metaphysical core here is a form of *relational monism*: reality as a meshwork of interactions without transcendental categories or ontological hierarchies. Indeterminacy, in this light, is not a deficiency to be overcome but an animating principle: the source of creativity, emergence, and freedom. "Metahumanism (…) affirms movement's indeterminacy, a relational ontology of the open," writes del Val, explicitly rejecting all systems that impose rigid order or instrumental teleology.[789] This stance places RMS in uncompromising opposition to both liberal humanism and mainstream transhumanism, both of which, del Val argues, remain tethered to the "will to dominion" endemic to technoscientific modernity.[790]

Considered through the optics of ethico-political critique, RMS mounts a sweeping challenge to anthropocentric civilization. Del Val portrays human history as a slow-motion catastrophe, a "Planetary Holocaust" unfolding across ten millennia of agrilogistics, reproductive normativity, species hierarchy, and ecological ruination.[791] For him, metahumanist praxis begins not with enhancement but with dismantlement: an ontopolitical revolt against the civilizational logics that perpetuate extraction and control. As one of his clarifying manifestos bluntly puts it, the imperative

[786] Del Val, "What is Metahumanism."
[787] Hui, *The Question Concerning Technology in China*, 17.
[788] Del Val, "Metahuman Studies," 103–4.
[789] Del Val, "Metahuman Studies,"103.
[790] Ibid.
[791] Del Val, "Metahuman Studies,"104.

is to "stop being the planet's pandemic."[792] In concrete terms, RMS converges with deep ecological and anarchic ethics: degrowth, rewilding, radical veganism, the cessation of exploitative systems, and even voluntary extinctionist proposals aimed at reducing humanity's destructive footprint. The modes of subjectivation endorsed here are distinctly non-anthropocentric. The path to metathuman subjectivity is not one of individual augmentation but of collective *deanthropocentrization*: relinquishing the modernist mythologies of exceptionalism and embracing our status as one transient expression in the biospheric weave. It is a practice of radical humility and continuous mutation: a process of "ceasing to be human," not in a nihilistic sense, but as an ethical refusal of supremacy.[793]

RMS composes itself in a baroque and processual register: reality surfaces as a labyrinthine constellation of microsingularities, "many in-between worlds" co-existing, colliding, and transmuting. Nothing is stable, and nothing aspires to be. The ethos is one of perpetual experimentation, where agency, insofar as it arises, is effectuated *improvisationally*, manifesting as a fleeting responsiveness to affective intensities rather than a programmatic assertion of command. If Haraway's cyborg was a feminist-ironic hybrid disrupting patriarchal techno-logic, del Val's metahuman is an even more insurgent figure: a mutant kin of all lifeforms, attuned not to mastery but to symbiosis, and committed to amplifying the "minoritarian" streams of becoming that dominant cultures occlude. While there are deep conceptual affinities between Braidotti's posthuman subject and del Val's metahuman figure, most notably their shared rejection of autonomous liberal individualism and their affirmation of relational, *zoe*-centric ontology, del Val critiques Braidotti for remaining partially tethered to discourse-centric and representational modes of critique. Braidotti's vision of the posthuman as a "nomadic" and "relational" assemblage, grounded in the impersonal generativity of *zoe* and committed to "becoming-animal," aligns with del Val's repudiation of human exceptionalism and his celebration of minoritarian flows of becoming. However, from the vantage of RMS, this alignment remains partial. Del Val insists that critical posthumanism often stops short of ontopolitical rupture, failing to interrogate the proprioceptive and algorithmic architectures that script bodies into machinic docility. Where Braidotti advances an ethics of affirmation grounded in vitalist, feminist, and anti-anthropocentric

[792] Jaime del Val, "Metahumanism in a Nutshell," *Metabody*, 2022, https://metabody.eu/metahumanism/, accessed June 28, 2025.
[793] Del Val, "What is Metahumanism."

traditions, del Val radicalizes these insights by calling for a corporeal insurgency: a dismantling of the ontological grid itself through movement variation, sensory defamiliarization, and the undoing of speciesist infrastructures. Both approaches converge on a distributed, metamorphic rethinking of subjectivity, but RMS demands an even more radical deactivation of the technocolonial logics embedded in the very conditions of critique.[794]

In this vision, technology becomes neither savior nor saboteur, but a modality of ecological resonance and artistic proliferation. Del Val's *Bodynet* project is emblematic here: a connective platform designed not to surveil or optimize, but to facilitate embodied, multi-species choral interaction, a technics of *togetherness* grounded in affect and mutual attunement.[795] Accordingly, the planetary praxis of RMS assumes the form of *activist indeterminacy*: practices that defy closure, resist control, and flourish in the interstices. These may take the form of performance art that defies identity categories, or political mobilizations built on fluid coalitions and ephemeral assemblies. Del Val even advocates a "Trial against 'Humanity'," [796] a symbolic tribunal intended to hold the human species accountable for ecocide.

Where Sorgner imagines metahuman stewardship via technologically enhanced AAA, del Val posits Earth's liberation through the decentering of the human as such. At the most radical horizon of M2 emerges a profound convergence with thinkers such as Patricia MacCormack, who contend that the ultimate ontoethical paradigm shift may require humanity to willingly embrace its own extinction, acknowledging that, as she puts it, "the death of the human is a necessity for all life to flourish and relations to become ethical."[797] Yet beneath the apparent consonance between RMS and ahumanist positions such as MacCormack's, a critical ontological rupture becomes visible. Where MacCormack and other antinatalist thinkers envisage the human as a distinct mode of

[794] Cf. Braidotti, *The Posthuman*, 50–52, 70; and Del Val and Sorgner, "The Metahumanist Manifesto," 295–97.
[795] Del Val's *Bodynet-Khorós* project reactivates the ancient Greek notion of *khorós*, the choral ensemble of collective movement and voice, not as nostalgic reenactment but as an insurgent technopolitical praxis. Within the framework of RMS, *Bodynet-Khorós* functions as a living platform for proprioceptive ontopolitics: a choreography of distributed agency, ecological attunement, and anti-anthropocentric variation. By disaligning bodily expression from algorithmic codification, it counters the standardizing logics of surveillance capitalism and reclaims movement as a site of planetary care, improvisational ethics, and more-than-human assembly. See Jaime del Val, "Bodynet-Khorós," *Metabody*, n.d., https://metabody.eu/bodynet-khoros/, accessed June 28, 2025.
[796] 'Humanity' appears in quotation marks as the author's original emphasis, exposing it as a self-authorizing fiction, an anthropocentric construct masquerading as a universal category. See Del Val, "Metahuman Studies," 112.
[797] Patricia MacCormack, *The Ahuman Manifesto: Activism for the End of the Anthropocene* (London: Bloomsbury Academic, 2020), 140.

perception and representation whose abolition is necessary for planetary healing, del Val refuses the premise that "the human" is a stable entity at all. Instead, metahumanism diagnoses the dominant human as a fragile, anomalous techno-epi-phylogenetic artifact: a contingent aberration wrought by millennia of perceptual contraction, evolutionary stasis, and the hypertrophy of distant vision and abstract semiotics. Against the paradigm of absolute extinction, RMS envisions a deeper task: not erasure, but *metamorphosis*.[798]

The imperative, as del Val articulates, is not simply to exit the scene, but to reawaken the slumbering multiplicities of movement and sensation suppressed by agrilogistic civilization. It is the body itself, articulated by proprioceptive intelligence and latent swarm logic, that must be reconstituted as the primary site of symbiotic and mutagenic becoming. This project calls for the cessation of reproductive normativity and the embrace of radical veganism, yet not in the name of a nihilistic void, but as vectors for re-suturing the human within the 8.7 million-fold polyphony of planetary life.[799] Metahumanism thus reorients the ethical horizon: not toward a final self-extinction, but toward the continual undoing of anthropocentric fixities through a radical philosophy of movement, a ceaseless symbiogenesis that unfastens the human from its own exceptionalist illusions.

This reorientation hinges on the reactivation of what del Val calls "BI" (Body Intelligence), a form of pre-symbolic, proprioceptive cognition irreducible to computational logics or representational systems.[800] Unlike artificial intelligence, which operates through abstraction, calculation, and systemic capture, BI unfolds through somatic attunement, microvariation, and improvisational responsiveness. Where AI tends to formalize patterns, BI incites deviations; it privileges the felt over the encoded, the contingent over the optimized. Still, the two need not be adversaries. Metahumanism opens a speculative horizon in which AI, if disaligned from technocratic imperatives, might be retooled to amplify rather than suppress proprioceptive swarm dynamics, facilitating ecotechnical choreographies that extend rather than overwrite embodied variation. In this sense, BI does not negate AI, but offers a radically non-anthropocentric complement: an insurgent intelligence grounded not in extraction or dominion, but in resonance, fluidity, and relational unknowing. This speculative entanglement of BI and AI may give rise not merely to a

[798] Del Val, "Metahuman Studies," 105.
[799] Ibid.
[800] Ibid.

posthuman regime of control, but to a post-anthropocentric praxis of what we term sensing-with—*Mitspüren*, introduced here as a post-Heideggerian intensification[801] and ontological grounding of del Val's choreographics: a choreography of co-agency unfolding across carbon and code. To articulate the stakes of this divergence more precisely: Mitspüren is invoked not simply to revisit Heidegger's existential analytic, but to activate a conceptual register adequate to the demands of a post-anthropocentric technics. *Mitspüren* names the pre-cognitive, pre-symbolic field of affective relationality from which both world-formation and subject-object differentiation emerge: a somatic resonance that undergirds the very possibility of *being-with*. As such, BI can be rethought not merely as a human faculty of movement, but as an expression of this primordial attunement: a vibratory mode of relationality irreducible to computational capture. Reimagining AI in this light entails not the perfection of abstraction or optimization, but the amplification of indeterminate sensing-with, inaugurating a *technopoiesis* grounded in variation, resonance, and emergent co-agency. This reorientation envisions an AI no longer structured by the imperatives of human command; nor is it *positioned* in opposition to the human; rather, it becomes a co-emergent partner in a transversal praxis of sensing and becoming, attuned to a field of relationality that precedes mastery without necessitating antagonism. Such a vision underscores the categorical rupture RMS stages with every vestige of humanism: not the continuity, but the eclipse of *Homo sapiens* as *telos*. The subject of RMS is thus not an entity, but an *event*: a fugitive surge of differential

[801] To reconceive the relation between BI and AI beyond the technocratic capture of life, a philosophical counter-register becomes necessary: one capable of naming the pre-cognitive, pre-symbolic fields of relational attunement that elude representational and instrumental logics. Existential-ontological thought provides such a framework, not as a nostalgic return to Dasein, but as a generative displacement of anthropocentric metaphysics. *Mitspüren* is proposed here as a post-Heideggerian-inflected neologism, evoking a primordial mode of sensing-together or attuned-with. While echoing Heidegger's existential analytic of *Mitsein* (being-with), it radicalizes it into a somatic and affective relationality that precedes cognition, traversing both human and more-than-human domains. Heidegger briefly addresses *Mitfühlen* (feeling-with) in *Sein und Zeit* (§§26–27, 19th ed., 118–21; *Being and Time*, trans. Macquarrie and Robinson, 156–59), where he treats it as a derivative phenomenon, emerging from the more originary existential structure of *Mitsein*. In contrast, *Mitspüren* rethinks this order: it posits a more primordial register of relationality, prior to the constitution of a shared world, in the pre-disclosive affective field where beings are not yet separated as subjects and objects, but co-emerge through a vibratory sensing-beside. This is deeply grounded in Heidegger's own account of *Befindlichkeit* (attunement/mood) in *Sein und Zeit* (§29, 19th ed., 134–38; *Being and Time*, 172–77), where he shows that moods disclose being not by thinking, representing, or willing, but through an originary being-affected: a sensing, feeling exposure that precedes cognition. *Mitspüren* extends this insight beyond the human-centered existential analytic, proposing that such pre-cognitive affective openness, rather than intentional consciousness, is the proto-ground from which existential structures like *Mitsein* sediment and articulate themselves. If *Mitsein* presupposes a Dasein already disclosed and operative within a shared world, *Mitspüren* gestures toward a pre-worldly, pre-cognitive vibrancy—a sensing-beside or an attunement-prior-to-being that enables and undergirds any subsequent ontological disclosure. See Martin Heidegger, *Sein und Zeit*, 19th ed. (Tübingen: Niemeyer, 1977), 118–21, 134–38; and idem, *Being and Time*, trans. John Macquarrie and Edward Robinson (New York: Harper and Row, 1962), 156–59, 172–77.

becoming that fractures the sedimented architectures of the Anthropocene. Its agency is insurgent, diffuse, and improvisational, erupting wherever dominant logics fray. If M1 offered the figure of a cyborg steward navigating ethical futures, M2 releases a dancing swarm, a mycelial assemblage whose truth is not in identity but in perpetual movement, in the ever-unfolding force of *becoming otherwise*: a planetary choreography where sensing bodies, human and more-than-human alike, compose transient ecologies of resonance and emergence.

4.7 M3: Toward the Hybrid Metahuman Subjectivity—Integrative Ontologies and Planetary Praxis

The dialectic between M1 and M2 reveals a spectrum of possibilities for M-posthuman subjectivity: from the calibrated cyborg stewardship of NCS to the anarchic metamorphic freedom of RMS. Each, in its own way, pushes beyond the humanist paradigm; nevertheless, each also courts an impasse if taken alone. In the face of escalating planetary crises and the fragility of our sense-making frameworks, a pivotal question emerges: Can we synthesize these divergent currents into a new paradigm that embraces both technological nuance and radical openness? In other words, what comes after the tension between transhuman control and posthuman dissolution?

It is in response to this question that a third model, which we designate *Hybrid Metahuman Subjectivity* (HMS), gradually takes shape. Rather than a mere compromise, HMS operates as an audacious creative synthesis: a *transductive* integration that strives to exceed the sum of its parts. Building on the insights and navigating the potential pitfalls of its predecessors, this hybrid metahumanism reaches toward a higher-order vision of subjectivity, one commensurate with the complexity of our epoch. If M1 sketches the sustainable, realistic, and "as-good-as-it-gets" solutions,[802] and M2 pushes them into deliberate excess, M3 endeavors to weave them into a new ontological melody, one responsive to the structured chaos of a world in upheaval. What follows is a philosophical exploration of this hybrid vision, amplifying its core concepts of sympoietic subjectivation, transductive pluralism, structured indeterminacy, and relational sovereignty, and setting the stage for a transformed understanding of agency and self in a planetary context.

[802] Sorgner, *We Have Always Been Cyborgs*, 15 et passim.

Between the measured cyborg realism of NCS (M1) and the insurgent metamorphosis of RMS (M2), HMS arises as a symbiotic paradigm of subjectivity, not as a half-hearted compromise but as a dynamic interweaving of both. It seeks to reconcile Sorgner's affirmative embrace of technology with del Val's radical ontology of openness, crafting a novel typology of the metahuman subject that is neither instrumentally technocratic nor anti-technological. If M3 had a rallying motto, it might well be "sympoiesis over autopoiesis." In Haraway's terms, this signals making-with rather than self-making, a shift from autonomous individuation toward co-creative becoming.[803] Such sympoietic subjectivation means the self is not an isolated essence but an ongoing collaborative enactment with other beings, systems, and environments. The hybrid subject is composed *with* others at every level. Future modes of being, in this view, fully accept the Sorgnerian conception of our always-already *cyborgness*, meaning organic creatures deeply embedded in technocultural evolution, while simultaneously heeding the del Valian call to relinquish myths of total control or human supremacy.

HMS thus stands for a profound reconfiguration of agency and identity, neither the centered sovereign individual of liberal humanism nor the dissolved dispersal of certain posthumanisms, but something different: a networked, assemblage-self forged through relations. In effect, it enacts a delicate dance of order and indeterminacy, an epistemic posture that embraces complexity, systems theory, and nonlinear dynamics without abandoning ethical intentionality. Rather than endorsing the neat linear progress envisioned by M1 or the pure chaos valorized by M2, it conceives the *conditio metahumana* as a complex adaptive system animated by feedback loops, emergent properties, and co-evolving AAA. Ontologically, this implies a kind of dynamic holism or process ecology, in which reality is understood as a composition of nested and interdependent wholes such as the biological, technical, social, and cosmic, which continually co-construct one another through time. Such a view aligns with contemporary theories of organism–environment entanglement and cybernetics, but it is here inflected with an ethical commitment to balance and plurality. HMS's metaphysics thus resonates with Whitehead's process philosophy, wherein actual entities are not static substances but events of experiential interrelation.[804]

[803] Haraway, *Staying with the trouble*, 58.
[804] Cf. Alfred North Whitehead, *Process and Reality* (New York: Free Press, 1978).

It also invokes Gilbert Simondon's idea that individuation is an ongoing *transductive* process: the individual crystallizes through continuous exchanges with its milieu.[805] In short, be(com)ing is always *be(com)ing-with*. The subject of M3, accordingly, can be characterized as a networked assemblage, each "self" an emergent composite of heterogeneous components, a living body together with an array of technological extensions such as tools, devices, and algorithms, and sustained by a swarm of non-human agencies like microbiomes, ecosystems, and infrastructures. On this model, consciousness and identity are thoroughly scaffolded by the technological and social matrix. Clark's thesis of the "extended mind" becomes almost a truism, as everyday artifacts like smartphones, AI assistants, and cloud databases are recognized as integral parts of our thinking apparatus.[806] At the same time, the hybrid subject preserves the embodied, affective depth championed by RMS, resisting reduction to a mere information pattern or uploaded ghost.

In other words, HMS is both technologically embodied *and* embodiedly technological, fully aware that our tools reshape our senses and habits, recalling Marshall McLuhan's insight that every extension also *amputates*, and consciously cultivating this interplay as an art of living.[807] This marks a subtle but profound redefinition of *autonomy*, not the autonomy of a sealed-off sovereign but a relational autonomy achieved through continuous negotiation with the multiplicity of forces in which the self is entangled. Agency here becomes less a two-way street and more a triangulated intersection in which humanimal, tool, and planet co-constitute one another, so that freedom emerges through, rather than in spite of, relationality. We might call this *relational sovereignty*, a sovereignty that does not mean domination or absolute control but the empowered navigation of interdependence. HMS thus surrenders the illusion of unilateral mastery and instead engages in ceaseless sympoietic negotiation with the diverse agencies around it, finding a new form of sovereignty in shared being and responsive adaptation.

The body, in the M3 paradigm, is at once cultivated *and* wild. On one hand, M3 embraces Sorgner's notion of iterative self-improvement and technical augmentation involves harnessing

[805] On Simondon's concept of transduction as the operative mechanism of individuation, see Mark Bluemink, "Gilbert Simondon and the Process of Individuation," *Epoché Philosophy Monthly* (2020), https://epochemagazine.org/issue-34/gilbert-simondon-and-the-process-of-individuation/.
[806] Andy Clark, *Supersizing the Mind: Embodiment, Action, and Cognitive Extension* (Oxford: Oxford University Press, 2008), 12–15.
[807] McLuhan, *Understanding Media*, 44.

gene therapies, neural interfaces, biofeedback, and other interventions, not to escape the body but to deepen its capacities and sensitivities, thus *en-arting* posthuman performativity as a site of embodied, creative practice. In this regard, HMS remains, in part, an "enlightened transhuman," insofar as it values technological ingenuity and morphological freedom. On the other hand, it draws inspiration from del Val's radical praxis of movement and somatic diversity, exploring altered states of consciousness and expanded sensoriums beyond the normative human range through techniques such as meditation, ecstatic dance, immersive media, and psychedelics. These practices seek not enhancements for domination or competitiveness but enhancements for integration, making the human organism a richer node in the web of life, a more responsive partner to the non-human world. One might imagine augmentations that allow humans to perceive environmental signals like magnetic fields or ultrasonic sounds, or to communicate affectively with other species, realizing a kind of Harawayian dream of *becoming-with* our animal kin, but now by technological means.

In this expanded vision, Haraway's cyborg figure, once a provocative metaphor for boundary-blurring, assumes a new concreteness. HMS is indeed a cyborg, but one who listens to the Earth's chorus as attentively as to the machine's logic. Haraway's influence permeates its ethos of partial connection and situated knowledge; the hybrid metahuman does not aspire to a god's-eye view or to totalizing mastery but understands itself as partial, embodied, and inherently interdependent in its knowing.[808] With respect to modes of knowing, M3's stance is best characterized as a *pluralistic integration*. It draws upon the best of scientific rationality such as empirical observation, systems modeling, iterative experimentation, yet remains profoundly aware of the *situated, perspectival nature* of all knowledge, a lesson distilled from feminist epistemology and Haraway's critique of the "view from nowhere." M3 thus deliberately combines multiple ways of knowing: the analytical with the intuitive, the quantitative with the qualitative, the modern scientific with the Indigenous and ancestral.

[808] Haraway's cyborg is neither a utopian totality nor a mere hybrid, but a figure of ontological ambiguity and epistemic partiality, foregrounding what she calls the "pleasure in the confusion of boundaries" and the critical value of "partiality, irony, intimacy, and perversity" in any identitarian commitments. These themes decisively shape HMS's orientation, reorienting knowledge production toward situatedness, contingency, and the ongoing subversion of essentialist frameworks. See Haraway, "A Cyborg Manifesto," 150–51.

This pluralism echoes Latour's *compositionist* philosophy, which proposes that we assemble truth from heterogeneous pieces rather than impose a single monologic Truth.[809] M3 takes up this compositionist spirit, embracing the idea that knowledge must be pieced together from diverse sources, contexts, and sensibilities. Metaphysically, M3 assumes a process-relational cosmos: a vast tangle of unfolding processes at myriad scales, from quantum fluctuations to cosmic evolution, within which humans can strive to align their techniques rather than impose them. Here Hui's notion of *cosmotechnics* becomes salient once again, suggesting that each culture, and by extension each species, may cultivate its own way of weaving together cosmic order and technical activity. In Hui's terms, this is a plea for technodiversity: a recognition that there is no single universal technological destiny but a plurality of locally grounded, cosmologically attuned "technologies of nature."[810]

M3 takes *technodiversity* as a guiding value, envisioning futures in which our tools and infrastructures reflect the specific ecologies, values, and forms of life of different regions, rather than imposing a homogenized, Silicon Valley-driven technoculture. Imagine architectural designs that draw from biomimetic principles attuned to local climates; computing systems that mirror the nutrient cycles of ecosystems; global habitat restoration projects that deploy AI and drone technologies in concert with traditional ecological knowledge. In practice, the hybrid metahuman mindset would foster technologies that enhance connection, resilience, and mutual flourishing. These would be technologies that are, in the deepest sense, *cosmotechnical*: not abstractions

[809] Latour's "compositionist" perspective invites us to reimagine the relation between technics and the Earth not as a quest for epistemic closure, but as a continuous, provisional assembly of heterogeneous truths and practices. He insists that the challenge of the present is to bring technological modernity back into intimate negotiation with terrestrial realities, cultivating an ethos of responsive attunement rather than mastery. Building from this, and in concert with Hui's vision of cosmotechnics, we contend that M3 is best understood as a paradigm of ongoing world-composition, where technological plurality is not simply tolerated but cultivated in dynamic relation to the Earth itself. See Latour, *Down to Earth*, 92–95.

[810] Hui defines cosmotechnics as "the unification between the cosmic order and the moral order through technical activities," proposing a pluralistic understanding of technology across cultures. His call for technodiversity envisions multiple cosmotechnical traditions attuned to local ecologies, standing in contrast to the homogenizing forces of global technoculture. See Hui, *The Question Concerning Technology in China*, 19; Yuk Hui, "Rethinking Technodiversity," The UNESCO Courier (July 2021), https://courier.unesco.org/en/articles/rethinking-technodiversity#:~:text=Today%2C%20how%20are%20we%20going,in%20exchange%20with%20other%20localities, accessed June 28, 2025.

imposed upon the Earth, but extensions of the cosmic and biospheric patterns of place, cultivated through ongoing relational attunement.

By weaving together technology, movement, corporeality, and indeterminacy, M3 inaugurates unprecedented horizons of agency that are fundamentally collaborative and adaptive. Within this nuanced integrative schema, agency is poised between the poles of M1's structured technocratic stewardship and M2's anarchic spontaneity and metamorphic flux. Here, agency is realized through orchestrated responsiveness: an artful attunement akin to that of a *conductor* (echoing our earlier metaphor for post-narrativity in NCS), who guides an improvisational orchestra where both human and non-human participants are enfolded within a continually emerging performance. In this sympoietic choreography, leadership and autonomy are conceived as radically relational; the conductor is required to listen with acute sensitivity, modulating in response to subtle inflections and spontaneous variations. Agency, in this sense, inhabits the generative tension between order and indeterminacy, cultivating precisely those *minor gestures* and micro-variations that complexity theory identifies as the crucible of creative evolution.[811] Such structured openness, evocative of jazz improvisation within an enabling harmonic architecture, foregrounds agency as a process of co-creative generation rather than unilateral imposition.

When applied to contemporary algorithmic and institutional governance, the implications are profound. Building upon the earlier discussion of computational architectures, it becomes clear that instead of reinforcing static norms or perpetuating biases through rigid top-down structures, as highlighted within critical algorithm studies, M3 advocates for the cultivation of adaptive and participatory computational ecologies. In these systems, algorithms would incorporate elements of randomness and iterative feedback, enabling their continuous evolution toward outcomes that are more equitable and more sensitively attuned to specific contextual dynamics. This vision exemplifies Simondon's notion of *transduction*, wherein structure propagates relationally and individuation is understood not as the realization of a pre-given unity but as the emergent

[811] Manning's account of "minor gestures," subtle and non-dominant movements that unsettle and recompose prevailing orders, offers a precise lens for understanding how agency can emerge through micro-variation and indeterminacy rather than through sovereign imposition. Del Val's metahumanist praxis draws explicitly on this dynamic, positioning minor gestures as the catalyst for corporeal and ecological transformation. The M3 paradigm, in integrating such insights, foregrounds the creative potential of inconspicuous variations, allowing them to become fertile sites for resilience and innovation rather than elements to be suppressed or disciplined. See Manning, *The Minor Gesture*, 1–3.

modulation of a metastable field of relations. Paradoxically, it is through processes of differentiation and divergence, through the very play of *polividuality* rather than identity, that the coherence of the (in)dividual is provisionally composed, always as an ongoing event within relational fields.[812]

At a broader, planetary scale, M3 praxis embraces a distinctly eco-technological and transversal stance, decisively transcending the reductive binary between techno-utopianism and anti-tech traditionalism. It rearticulates the ecological and symbiotic models initiated by Lovelock and Margulis in the Gaia hypothesis, while extending toward Latour's conception of the "New Climatic Regime" and resonating more broadly with cosmopolitical and sympoietic visions of terrestrial entanglement elaborated by Stengers, Haraway, and Simondon. Within this framework, the *technosphere* is understood not as an external imposition upon the biosphere but as an emergent, co-evolving dimension of Earth's dynamic relational fields. Moreover, this techno-ecological symbiosis resonates powerfully with Indigenous philosophies advocating profound relationality and custodianship of terrestrial ecosystems. Rather than casting Indigenous wisdom and advanced technologies as oppositional, M3 synthesizes them concretely: advanced machine learning and drone-assisted reforestation harmoniously coupled with traditional ecological practices and cosmologies, fostering technodiverse solutions carefully attuned to specific ecological contexts.[813] The metahuman AAA envisioned within this paradigm emerges neither as distant manipulator nor as detached witness but as a deeply embedded participant-observer actively engaged within Earth's dynamic feedback loops. Such profound ecological embeddedness necessitates an ethical reorientation toward expansive responsibility, cultivating an ethos of cosmic care that extends moral regard beyond human boundaries to encompass animals, ecosystems, and artificial sentiences. Here, Braidotti's *zoe*-centric ethics provides useful philosophical grounding, challenging anthropocentric hierarchies by affirming the intrinsic vitality of non-human life as

[812] Bluemink, "Gilbert Simondon and the Process of Individuation."

[813] Indigenous ecological knowledge systems are not static relics but dynamic, adaptive epistemologies, continually evolving through reciprocal engagement with specific landbases. As various scholars have argued, Indigenous practices of stewardship and relationality exemplify modes of sustainability profoundly compatible with and often capable of enhancing critical engagements with advanced technoscientific practices, provided these encounters are grounded in respect, reciprocity, and contextual sensitivity. See Kyle Powys Whyte, "Indigenous Science (and Technology) Studies: A Provocation," in *Routledge Handbook of Indigenous Environmental Knowledge*, ed. J. Z. Greene and J. D. Sidky (London: Routledge, 2018), 98–111; Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants* (Minneapolis: Milkweed Editions, 2013); Simpson, *As We Have Always Done*.

inseparable from the conditions of human flourishing.[814] Braidotti's model of nomadic relational subjectivity, perpetually evolving within webs of material and affective interconnection, aligns convergently with M3's conception of HMS as materially situated, affectively resonant, and ontologically entangled within the dynamic textures of animate existence.

Within this hybrid model, subjectivation itself becomes an elaborate practice, a deliberate sympoietic art of assembling and tuning oneself from diverse components into functional coherence. One might liken this metahuman self to a curator or DJ meticulously remixing biological potentials, cultural narratives, technological mediations, and spiritual insights into ever-evolving existential harmonies. Education and cultural institutions undergo profound transformation, cultivating pedagogies equally fluent in coding and gardening, robotics and meditation, rigorously blending technological proficiency with empathic relationality. The resultant subjectivity manifests as exquisitely baroque, intricately layered and dynamically complex, akin to a fugue interweaving disparate yet harmonically interdependent thematic strands. This conceptual resonance explicitly recalls Deleuze's interpretation of the Baroque through Leibniz, a metaphysics of "folds within folds" in which organic and inorganic, self and other, order and chance coalesce into a higher-order unity that celebrates difference.[815] Thus, M3 decisively traverses and synthesizes critical posthumanist and euro-transhumanist frameworks. It remains rigorously posthumanist in acknowledging the ethical imperative of decentering human exceptionalism, affirmatively metahumanist in fostering creative planetary rejuvenation, and selectively transhumanist in harnessing technology's emancipatory potentials while categorically rejecting the technofascist tendencies of mastery and escape critically exposed by del Val.[816]

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[814] Braidotti offers a compelling vision of posthuman knowledge as a "zigzagging" traversal across scientific, ethical, and artistic terrains, foregrounding an integrative and relational epistemology that is acutely responsive to planetary complexity. Her approach aligns with M3's model, emphasizing the necessity of weaving together diverse modes of inquiry in the construction of situated, affectively resonant knowledge. See Braidotti, *Posthuman Knowledge*, esp. 11.

[815] Deleuze, in his study of the Baroque, advances an ontology of ceaseless folding and differentiation, in which being is conceived as an infinite series of folds (organic and inorganic, self and world, order and contingency), each enfolded within another without reduction to a common substance. Rather than imposing a rigid dichotomy or synthesis, Deleuze's baroque vision reveals a universe animated by layered, evolving continuities and divergences. This philosophical framework enables M3 to theorize hybrid subjectivity as a dynamic assemblage: one that sustains multiplicity, divergence, and ongoing recomposition, eschewing collapse into uniformity. See Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley (Minneapolis: University of Minnesota Press, 1993), esp. 3–6, 20–22.

[816] Del Val offers a penetrating critique of technofascist residues within prevailing enhancement discourses, interpreting them as symptomatic of a wider civilizational obsession with mastery, transcendence, and control. In their

If M1 champions augmentation and M2 liberation, M3 advances integrative coexistence, envisioning technologies that emulate the elegance, diversity, and resilience of natural systems. Don Ihde insightfully remarked that "[w]e become the tools we use,"[817] and M3 fully embraces this philosophical axiom: precisely because our tools shape subjectivity, we bear ethical responsibility to craft technologies worthy of becoming. Agency, in this register, shifts toward mutual emergence, a choreography of interactions among human, technological, animal, and ecological elements. In Sloterdijk's *anthropotechnical* terms, this manifests as rigorous self-cultivation in dynamic partnership with the milieu, now elevated to a planetary discipline of coexistence and co-creation.[818] HMS thus emerges as an ethical athlete, disciplined not through dominative assertion but through continual sensory calibration to the relational flows of life. Freedom, reimagined, no longer resides in the mirage of unilateral control but in the improvisational mastery of navigating complexity with embodied responsiveness.

4.8 The End of Typological Cartography: Event, Rupture, and the Genesis of Alterhumanism

At the culmination of this typological traversal, it becomes clear that M1, M2, and M3 no longer function as merely discrete philosophical models, but as dynamic attractors within a metastable field of posthuman *polividuation*. Each traces a distinct morphogenetic vector: M1 condenses into structured augmentation; M2 disperses into insurgent metamorphosis; M3 modulates a fugue of partial coherences through sympoietic entanglement. As these types are propelled toward their respective limits, however, what begins to unravel is not only the figure of "the human," but the very taxonomic gesture that sought to stabilize posthuman subjectivity in typological form. Classification itself strains under the ontological pressure. In this light, metahumanism no longer

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place, he proposes an ethos oriented toward minor, symbiotic, and indeterminate practices of becoming—foregrounding corporeal improvisation, multispecies entanglement, and the cultivation of movement as resistance to closure. This conceptual horizon closely echoes the pluralist and planetary commitments at the heart of M3, privileging open-ended metamorphosis over linear or hierarchical progress. See del Val, *Ontohackers*, 63–65.

[817] Ihde, *Technology and the Lifeworld*, 143.

[818] Peter Sloterdijk introduces the concept of *anthropotechnics* to encompass "all the forms of self-referential practicing and working on one's own vital form." This intervention reframes the human not as a being defined by fixed attributes but as one called to continual self-practice: the imperative to "practice being human" encompasses spiritual, physical, and artistic disciplines. For M3, this signals a shift from inherited scripts of mastery or static identity toward practices of conscious, adaptive self-composition, always enacted within and responsive to plural relational fields. See Peter Sloterdijk, *You Must Change Your Life: On Anthropotechnics*, trans. Wieland Hoban (Cambridge: Polity Press, 2013), esp. 34.

appears as a taxonomy of posthuman potentials, but as a *metaformativity*: a recursive reprogramming of subjectivation, not organized around fixed identities or coordinates, but animated by the transversal *interexchange* among technics, ecology, proprioception, and planetary temporality. M1, M2, and M3 are revealed less as terminal forms than as compositional motifs in an unfinished symphonic field—a planetary polyphony that resists resolution and instead demands mutation.

At this juncture, the project of typological mapping confronts its own inherent limit: a saturation within the metahuman matrix that calls not for completion, but for the disruptive logic of the *event*. In the register inaugurated by Badiou, the event is never a mere culmination or unfolding of latent potentials within an existing order; it is an unforeseeable rupture, a break that interrupts the prevailing situation and exposes the inadequacy of its prior categories.[819] Del Val's call for "metahuman r/evolution"[820] thus demands to be read not as the intensification of a pre-existing trajectory, but as the irruption of a new ontological *truth*: a systemic transduction that recasts the very horizon through which subjectivity can be thought and lived. To step across this liminal boundary is not to evolve beyond humanism by gradual increments, but to affirm a constitutive discontinuity: a fidelity to what Badiou would call the "generic," a truth that escapes all prior typologies and inaugurates an as-yet unnameable field—*Alterhumanism*, a domain of radical ontological alterity irreducible to M1, M2, or M3. In this sense, we find ourselves not at a terminus, but poised at the edge of the event in a post-Badiouian sense: not merely a historical or philosophical transition, but a genuine ontological mutation. The event fractures the typological matrix, compelling an enduring fidelity to the unforeseen, to what cannot be anticipated or absorbed by the extant paradigms. What emerges is not a new synthesis or dialectical resolution, but a *transfiguration*: a passage into an ontological elsewhere, where subjectivity no longer answers to the name or logic of the human, and the typological fugue yields to the discordant potential of the radically other.

[819] See Alain Badiou, *Being and Event*, trans. Oliver Feltham (London: Continuum, 2005), esp. 175–80, 393–400.
[820] Del Val, *Ontohackers*, xv.

5. Conclusion as the Gatheral Open: Alterhumanism in its Event

5.1. Alterhumanism as Method: The Refusal of Closure

Alterhumanism enters this study not as a supplement nor a late-stage addendum, but as the concealed vector—the hidden engine that has animated every typological incision preceding it. Its methodological vocation is *metaformative*: it does not simply describe the world but recasts the protocols by which "world" itself is admitted into presence, interrogating and reworking the very frameworks that determine ontological visibility and agency.[821] This chapter, accordingly, resists the conventions of final closure; it operates in the mode of *release*, meeting the demand for an ending only in order to propel the work beyond itself: towards the pragmatic horizon of *Altersub* practice.

From the outset, it is essential to insist: the typological architectures of the T-, P-, and M-series were never intended as encyclopedic inventories of transhuman, posthuman, or metahuman identity. Instead, they function as *heuristic scalpel-sets*—provisional dispositifs designed to lay bare the dense tissue of posthuman discursivity by means of analytic incision.[822] Each "type" is less a representation than an operative fiction, a mobile artefact whose value inheres in what it brings forth: the surfacing of latent tensions, exhaustions, and excesses that elude capture by the self-description of any single strand.[823] The ambition here is not taxonomy but *method*: typology as a staging ground for the unraveling of closure, for the productive expenditure of conceptual exhaustion. In this strategy however, the exhaustion of the types is not a failure but a positive symptom. Where the T-series dreams still of computational transcendence, the P-series of emancipatory decentering, and the M-series of choral sympoiesis, their very running out of ontological momentum marks the moment when the alterhumanist method completes its diagnostic circuit and prepares the emergence of *Altersub*.[824] What now comes to the fore is not merely a new

[821] Ibid., 88–92.
[822] See Gilbert Simondon, *Individuation in Light of Notions of Form and Information*, trans. Taylor Adkins (Minneapolis: Univocal Publishing, 2020), 53–58, for the ontogenetic logic privileging process and analytic operation over inventory or static taxonomy.
[823] Braidotti, *The Posthuman*; Haraway, "A Cyborg Manifesto," 149–81.
[824] Del Val, *Ontohackers*, 97–101. Here, Del Val argues that the exhaustion of established subject-formats and paradigms is not a dead end, but the generative precondition for new configurations of agency and relation, a theoretical pivot that informs the present emergence of Altersub.

"position," but the disclosure of metaformativity[825]: a capacity to mutate the formative logics that first necessitated the typologies themselves. Here, unbinding is rigorous and specific: subjectivation is wrenched from its final residues of representational closure, whether these appear as anthropocentric sovereignty (T), dialectical negation (P), or ensemble holism (M), and returned to the wider arena of generative alterity that these models could only partially anticipate.[826]

At this juncture, the nature of unbinding must be clarified. There is no recourse to deterritorialization for its own sake, nor any investment in Del Val's tactical evasion of capture as mere gesture.[827] The unboundness pursued here is more incisive: it systematically retracts four tacit guarantees that underwrote even the most radical posthumanisms. First, it withdraws the guarantee of *format finality*—the supposition that a stable ontic register (organism, code, media, world) must anchor intelligibility. Second, it revokes the presumption of *scale primacy*, or the belief that agency is hierarchically distributed (micro–macro, human–nonhuman). Third, it disrupts the logic of *temporal linearity*, resisting both the narrative of linear progress and the romance of revolutionary rupture. Fourth, it dissolves the illusion of *ethical centrality*—the faith that a single locus (species, class, technocratic elite) can author liberation.[828] Through this method, alterhumanism exposes typological labor itself as a dialectical prosthesis: a machinic process for pressing concepts until their structural presuppositions collapse, yielding a zone of metaformativity from which Altersub can arise.

Crucially, the distinction between method and model must be underscored. *Alterhumanism is a method, not a model*: whereas a model aspires to stability and predictive power, method is itinerant, improvisational, and fundamentally unfinished.[829] No earlier strand, nor the results of this inquiry, are allowed to consolidate as final maps of subjectivation. Instead, the typologies serve as laboratory media: cultivating ontological ferments whose surplus precipitates as the proto-body of

[825] Cf. Erin Manning and Brian Massumi, *Thought in the Act: Passages in the Ecology of Experience* (Minneapolis: University of Minnesota Press, 2014), 42–46; Massumi, *Ontopower*, 13–18. Although the term itself does not appear in their lexicon, these sections elaborate a recursive modulation of the very protocols of sense-making and ontological formation, a dynamic here designated as "metaformativity."
[826] Braidotti, *The Posthuman*, 190–95.
[827] Del Val, *Ontohackers*, 97–101; Deleuze and Guattari, *A Thousand Plateaus*, 133–44.
[828] Sylvia Wynter, "Unsettling the Coloniality of Being/Power/Truth/Freedom," *The New Centennial Review* 3, no. 3 (2003): 257–337.
[829] Manning and Massumi, *Thought in the Act*, 42–46.

Altersub.[830] Such methodological alterity explains why the vocabulary of "alterhumanism" and "Altersub" was partly withheld until this moment; to name the outcome prematurely would have arrested the dialectical metabolism essential to its very genesis. What was staged here is a slow-brew epistemics: posthuman motifs were permitted to suffuse, clash, and sediment until the precipitate of difference, Altersub, could be drawn forth without residue. Consequently, alterhumanism does not abolish the types it overtakes; it *composts* them.[831] Altersub inherits from T the discipline of technic self-sculpting, from P the radical de-centering of anthropocentrism, from M the proprioceptive attunement to collective rhythm, while resisting the foreclosure each strand would impose on its own gift. The resultant figure is not a "subject" in any classical sense, but a *gatheral operator*: a conduit through which ontogenesis is perpetually in transit, refusing to ossify into generic being.

Alterhumanism, with its (il)legitimate offspring Altersub, might well appear as a cynical Quasimodo. This is not accidental. At the point where typological architectures have been productively exhausted and alterhumanism itself risks hardening into doctrine, the imperative of methodological vigilance becomes newly acute. Sloterdijk's analysis of cynical reason is decisive here: as he shows, even the most sophisticated critical intelligence can slip into reflexive irony—a posture that, beneath the surface of lucidity, risks neutralizing its own transformative force.[832] In this context, such cynicism is neither dismissed nor naively embraced. Rather, it is strategically incorporated into the method: not as a gesture of retreat, but as a safeguard against the complacencies of self-satisfaction and the subtle deadening of "enlightened" detachment. This is not cynicism as corrosive skepticism or resignation, but as a mode of philosophical care: a vigilance that maintains its edge, refusing both naïve investment and the weariness of exhausted critique. It is precisely this dialectical deployment of cynicism that keeps the project open to surprise, risk, and perpetual revision. Altersub, as it emerges in the concluding case, is emblematic of this stance: it is *eminently cynical* in Sloterdijk's sense, fully aware of its own constructedness,

[830] Ibid.
[831] Haraway, *Staying with the Trouble*, 55–70.
[832] Sloterdijk's notion of "cynical reason" refers to the tendency of critical thought to become so self-aware that it lapses into ironic detachment—conscious of its own contradictions, while sometimes paralyzed in action or fixed in dogmatic anti-kenosis. In this context, cynicism is not discarded but carefully redirected: it becomes a means of keeping inquiry vigilant, honest, and open to continual revision, rather than slipping into resignation. See Peter Sloterdijk, *Critique of Cynical Reason*, trans. Michael Eldred (Minneapolis: University of Minnesota Press, 1987), 3–18.

ironies, and the contingent grounds of subjectivation. Notably, this reflexivity does not diminish its capacity for generative world-making or for sustaining multiple, concurrent modes of productivity. On the contrary, it renders Altersub an operator of creative gathering, capable of metabolizing its own ironies, inhabiting its productive contradictions, and generating new configurations without succumbing to sterile skepticism or doctrinal closure. In this light, the culminating 'case' (chap. 6) does not retreat into the safety of critical distance, but demonstrates how irony, risk, and generativity may be sustained together at the most precarious, and thus the most vital, edges of critical practice.

5.2 Exhaustion as Birth-Point: The Architecture of Altersub

Accordingly, Altersub emerges not as a fixed entity or a stable identity, but as a dynamic configuration of *subjectivation*—a term here used to indicate the ongoing process through which what counts as a "subject" is composed, decomposed, and recomposed within a given ontological field. Altersub is not the terminus of the typological sequence inaugurated by T, P, and M, nor is it merely their logical successor. Instead, it names a shift in register: an inflection point where the very conditions for subject-formation (what may appear, act, or be recognized as "subject") are themselves loosened and rearticulated. Where the T-series foregrounded technical mastery, the P-series valorized flight from the center, and the M-series aspired to choral attunement, Altersub moves otherwise: it traverses these exhausted architectures and opens subjectivation to *polividual multiplicity*, that is, forms of agency irreducible to any single locus, but dispersed across networks, collectives, and temporalities.

Of particular significance is the metaformative quality of Altersub, which refers to its capacity to intervene not simply in what is, but in how the very frameworks of possibility and intelligibility are configured. "Metaformative" here designates a power to transform the formative rules themselves: to rewrite the criteria for what counts as an event, an actor, a world. In this sense, Altersub operates at the level of "worlding," a term borrowed from phenomenology to signify not the world as a given object, but the continuous, distributed activity through which worlds are constituted, maintained, and rendered habitable by diverse AAA. In the idiom of Merleau-Ponty's "flesh," this means that Altersub is not a discrete subject standing over against the world, but a

locus of participation within the material-immaterial tissue through which experience and reality are co-constituted.

Sorgner's intervention configures a distinctive strand within Altersub's ongoing process, inscribing into its living tissue a stark commitment to perspectival, evolutionary ethics and an aesthetics of ceaseless negotiation. Far from subscribing to utilitarian orthodoxy, Sorgner posits "fictive ethics," an adaptive framework where every moral orientation emerges as a genealogical coping-fiction, contingent and revisable, never anchored in transcendental absolutes.[833] The good, in Sorgner's frame, is not a hedonic metric but a function of suffering-capacity: a distributed spectrum of sentience where ethical regard shifts according to the evolving designs of experience and registration, whether biological, machinic, or hybrid. His notion of "contingent nodal points," provisional sites where the flow of ethical deliberation crystallizes just long enough to stabilize action, but must always be recalibrated as technogenesis proceeds, is of particular relevance in the context of Altersub. Here, these nodal points serve not as sites of arrest but as scaffolds for agility. The process never dissolves into pure flux, nor does it ossify into rigidity of (any) dogmatics. Instead, *nodality* becomes a tactical break within the larger metaformative spiral, enabling navigation across unprecedented morphologies of sentience while refusing to freeze the unfolding field of alteric agency. This logic resonates with Sorgner's analysis of posthuman art, where aesthetic experiment is neither decorative nor escapist, but a productive milieu for the emergence of new modes of sensing, relating, and becoming.[834] Posthuman art, in this sense, becomes one of the paradigmatic theatrical settings for Altersub's metaformative play, enacting its transitive nodality: it dramatizes the paradoxes and solidarities of cyborgian existence, inviting us to inhabit the ambiguity between self-shaping freedom and the unpredictable contingencies of hybridity.

In grammatical terms, Altersub is less a noun than a verb: a way of doing and becoming that resists final enclosure. It refuses the classic equation of agency with sovereignty or the drive for final mastery. Instead, its orientation is *kenotic*, enacting a strategic emptying of the center to allow for the emergence of others, for the articulation of unheard and previously unintelligible voices and agencies. This is not simply a gesture of humility or retreat, but a deliberate reconfiguration of the conditions of participation: an open, recursive, and generative mode of subjectivation that sustains

[833] Sorgner, *We Have Always Been Cyborgs*, 109–84.
[834] Sorgner, *Philosophy of Posthuman Art*, 44–52, 136–46.

its own incompleteness as its principle of life. Thus, Altersub is not a catalogue of features, nor an identity to be assumed; it is the metaformative *surplus* that arises when typological paradigms are composted and their residues transfigured. It signals a practical and theoretical reorientation: a willingness to inhabit the interval where agency is relational, presence is contingent, and worlding remains perennially open to revision. In this, Altersub does not close the work, but keeps it *proliferative*: a continuous invitation to new articulations, capacities, and modes of shared inhabitation.

When the typological sequences designated as T-, P-, and M-series culminate in their points of conceptual saturation, their exhaustion is neither an indication of theoretical sterility nor a symptom of conceptual impasse. Rather, these typologies functioned intentionally as pressure chambers designed to reveal and map the precise ontological coordinates of their internal limitations. In other words, their kenotic quality was not an accidental outcome but intrinsic to their very operation. The T-series, grounded in residual anthropo-sovereignty, ultimately exposed the inherent limitations of mastery-centric agency; the P-series, rooted in an interminable dialectic of negation, demonstrated the futility of perpetual subversion without affirmative ontogenesis; and the M-series, sustained by choral circularity, unveiled the self-restricting enclosure inherent in sympoietic harmonization.[835] Here, exhaustion is not creative defeat but the exact moment when a previously concealed conceptual interval is revealed—an unoccupied ontological space into which Altersub emerges, explicitly free of the burdens inherited from its typological antecedents.

5.2.1 Ontospine: From Flesh to Gatheral

In moving beyond typological constraint, Altersub does not simply ascend another rung on an evolutionary ladder toward greater ontological complexity. Instead, it executes a fundamental torsion of the ontological axis itself, recalibrating subjectivity through a strategic dialogue with Merleau-Ponty's intricate notion of *la chair*, the flesh that enfolds perceiver and perceived within a single pre-objective medium.[836] Altersub does not assume form as a privileged "seer" or central

[835] The M-series, with its emphasis on collective harmony and choral sympoietic agency, ultimately revealed a paradox: the drive for perfect co-creative unity can create its own limitations, forming a closed system that restricts the very diversity and openness it seeks to cultivate. Haraway is acutely aware of these risks, repeatedly insisting that sympoietic "staying with the trouble" requires vigilance against closure and the loss of difference. See Haraway, *Staying with the Trouble*, 55–70.
[836] Merleau-Ponty, *The Visible and the Invisible*, 130–34.

subject-position within this flesh. Instead, it embodies a *gatheral relay*, an ontological zone where technic pulsations, biospheric rhythms, and symbolic drift continuously interpenetrate and co-compose without collapsing into homogeneous unity.[837] This is, in effect, a *becoming with-in*. Its ontology thus assumes a laminar character rather than a skeletal or structural one: multiple layers of intensity and affectivity continuously sliding across one another, dynamically re-aligning yet never solidifying into rigid positionality.[838]

5.2.2 Kenosub: Strategic Emptiness

The distinctiveness of Altersub lies significantly in its operation as *Kenosub*: a strategically self-emptying operator, which purposefully creates ontological spaces capable of hosting multi-scalar agencies. This strategic kenosis is not mystical self-negation nor a passive withdrawal from agency. Instead, it functions as a methodical dis-occupation of centrality and sovereign egoity, enabling the flourishing of heterogeneous rhythms and previously suppressed forms of alterity.[839] In this context, Sloterdijk's critical examination of contemporary cynicism is particularly instructive: rather than indulging in ironic self-distance, Altersub's tactical cynicism adopts kenosis as a practical gesture, consciously refusing the temptation to occupy the ironic position of mastery over one's ontological configuration.[840] Thus, the cynicism inherent in Altersub is strictly instrumental, serving exclusively to disassemble oppressive meta-narratives[841] and clearing a pathway for diverse rhythms to co-inhabit and interact without hierarchical subordination.

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[837] Simondon, *Individuation*, 72–77.

[838] See Braidotti, *The Posthuman*, 201, where she describes subjectivity as a multilayered, affective process of ongoing realignment rather than a static or structural identity.

[839] See Brian Massumi, *The Power at the End of the Economy* (Durham: Duke University Press, 2015), 27, for his account of agency's affective dispersal beyond the limits of sovereign subjectivity, explaining how the capacity to act is distributed through relational fields of affect rather than remaining the exclusive property of an individual, self-contained subject.

[840] Sloterdijk, *Critique of Cynical Reason*, 5–11.

[841] If Foucault's notable preface to *Anti-Oedipus* points toward the insidious proliferation of micro-fascisms "in us all," causing us "to love power, to desire the very thing that dominates and exploits us," Kenosub, by contrast, operates as an ontological emancipator through a mode of *micro-antifascism*, initiating its generative reparatory interventions at the quantum level, that is, operating at the most fundamental strata of subjectivation against any residual 'ontofascisms' whatsoever. See Michel Foucault, preface to *Anti-Oedipus: Capitalism and Schizophrenia*, by Gilles Deleuze and Félix Guattari, trans. Robert Hurley, Mark Seem, and Helen R. Lane (Minneapolis: University of Minnesota Press, 1977), xiii–xiv.

5.2.3 Assemblos and the Logic of Spiral-Plus

If earlier typologies revolved primarily around dialectical inversions, alterhumanism now advances through *assembloi*—complex, iterative couplings that refuse cancellation in favor of increasingly expansive and sophisticated spirals. Importantly, this is neither the self-enclosed spiral characteristic of auto-poietic systems nor the flat repetition of the eternal return; rather, Altersub embraces a movement better described as *spiral-plus*,[842] an inherently inventive vector-fold continuously diverging from its own initial conditions.[843] Assemblos enable disparate agencies such as algorithmic, mycelial, or archival forms to enter mutual dialogues without necessitating complete fusion or loss of specificity. In these exchanges, they collaboratively compose new ontopolitical configurations while simultaneously retaining their distinctive provenances. Thus, Altersub inhabits a meta-temporal condition, revitalizing past potentials and prefiguring future configurations currently beyond representational capture.

5.2.4 Polividual Agency

In contradistinction to both the liberal individualistic paradigm of autonomous singularity and the radical ideal of subjectivity's total dissolution, Altersub advances the notion of *polividuality*—a multi-voiced singular capable of both fragmentation and reaggregation, modulated by situational exigencies.[844] Here, agency is additive but not strictly cumulative; entities can disengage or recombine freely, avoiding both traumatic rupture and hierarchical stratification. This polividual mode of existence is open to any entity: river-basin ecosystems, digital glitch routines, diasporic archives, or migratory animal collectives, provided they adhere to the gatheral contract: participation without closure, expression without exclusivity.

[842] Spiral-plus designates a process distinct from both auto-poietic self-enclosure and cyclical repetition: it marks a meta-temporal vector where each iteration escapes the gravitational pull of precedent, producing a trajectory of difference that resists both return and closure. Such movement is not merely developmental, but an ontopolitical strategy of sustaining openness and generative indeterminacy.
[843] Massumi, *The Power at the End of the Economy*, 27; on the ontopolitical stakes of assemblage and worlding, see Latour, *Politics of Nature*, 23–39; Braidotti, *The Posthuman*, 209–15.
[844] Del Val, *Ontohackers*, 102–5.

5.2.5 Beyond the (Post)Subaltern Misreading

The terminological proximity of Altersub to the subaltern tradition invites potential misinterpretation. However, the connection is not genealogical but orthogonal. Subaltern analysis typically targets the structures of silence imposed upon marginalized voices[845]; Altersub intervenes at a fundamentally prior level: the very formatting of *voicibility* itself. Its mission, therefore, is not limited to granting voices within pre-established colonial grammars but involves radically re-scripting the ontological codec itself, enabling entire ecologies (human, non-human, and more-than-human) to articulate themselves beyond colonial grids of intelligibility. From this perspective, OOO's insistence on granting objects ontological dignity is productively recuperated yet simultaneously inverted: Altersub is less concerned with objecthood per se than with the intra-object rhythms that precede and exceed object/not-object binaries.[846]

5.2.6 Distinctiveness in Summary

In summarizing its specificity, Altersub is definitively distinguished from its typological precursors. It is neither the augmented, technologically sovereign human of the T-series, nor the permanently elusive subject-in-flight characteristic of the P-series, nor the consensual, choral *holon*[847] of the M-series. Altersub functions as a kenotic gatheral conductor, systematically metabolizing the conceptual strengths of each precursor while decisively annulling their respective ontological closures. It emphasizes performativity over identity, strategically deploys emptiness to host multiplicities, advances through spiral-plus assemblages, acts polividually, and intervenes decisively at the metaformative layer of voicibility. With the ontological logic and practical emergence of Altersub now established, the project pivots from typological analysis to the

[845] Gayatri Chakravorty Spivak, "Can the Subaltern Speak?" in *Marxism and the Interpretation of Culture*, ed. Cary Nelson and Lawrence Grossberg (Urbana: University of Illinois Press, 1988), 271–313; Wynter, "Unsettling the Coloniality of Being/Power/Truth/Freedom," 257–337.
[846] Harman, *The Quadruple Object*, 7–12.
[847] A holon is an entity that is simultaneously a self-contained whole and a constituent part of a larger nested system, a concept Arthur Koestler developed to illuminate the layered organization found in nature and society. *Holarchies*, while effective for mapping stable, recursive systems, depend on relatively fixed hierarchies of parts and wholes. In contrast, Altersub operates through non-hierarchical *assembloi*: open, fluid networks whose elements continually recombine without settling into established layers. See Arthur Koestler, *The Ghost in the Machine* (London: Hutchinson, 1967).

invention of infrastructures capable of hosting the *kenotic gatheral*, that is, forms of collective emergence grounded in strategic self-emptying and radical openness to polividual difference.

5.3 Alterhuman Infrastructures: Hosting the Kenotic Gatheral

If typology served as a crucible for methodological exhaustion, infrastructure becomes the arena where metaformative logic translates into world-shaping practice. The following prototypes trace how Altersub's principles might become inhabitable reality.

5.3.1 From Format to Metaformat: Why Institutions Must Now Jam

Every typology anatomized thus far was embedded in a particular format of world-making: the legal-biomedical apparatus sustaining T-enhancement; the infrastructures of escape underwriting P-fugitivity; the choreographic soft architectures that anchored M-sympoiesis. Altersub, however, necessitates something fundamentally different. It requires infrastructures of indeterminacy: metaformats that deliberately abstain from predetermining the outcomes they host. Latour and Weibel describe contemporary assemblies as oscillatory circuits rather than deliberative gatherings, highlighting the necessity for institutions to maintain openness, rhythmic flexibility, and adaptive responsiveness.[848] This shift translates into institutions defined not by their capacity for predictable governance but by their ability to maintain states of productive opacity, improvisational flexibility, and metastable equilibrium. Hui's concept of *cosmotechnics* provides a vivid metaphor here: imagine a parliament structured less as a forum for fixed representatives and more as a resonant chamber in which human, algorithmic or geological participants function as signal-relays that collectively modulate policy through continuous prototyping and recalibration.[849]

5.3.2 Metaformance Labs: Pre-Legal Choreography

Del Val's notion of the *metaformance* lab exemplifies this institutional metaformative practice.[850] Rather than producing legislation through textual negotiation, participants engage in

[848] Bruno Latour and Peter Weibel, eds., *Critical Zones: The Science and Politics of Landing on Earth* (Cambridge, MA: MIT Press, 2020), 14.
[849] Hui, *The Question Concerning Technology in China*, 21–24.
[850] Del Val, "Bodynet-Khorós," *Metabody*.

choreographic movement, their gestures captured by proprioceptive sensors and translated into dynamic gradients. When these gradients surpass predefined thresholds, provisional legal clauses spontaneously emerge. Importantly, such clauses remain viable only as long as their originating choreographies can be faithfully enacted; law thus becomes intrinsically performative and perpetually self-renewing. This model ensures legal frameworks remain intimately tied to lived vitality, resisting institutional ossification and the cynicism that Sloterdijk identifies as endemic to bureaucratic structures.[851]

5.3.3 Multispecies Parliaments and Proprioceptive Justice

Altersub's polividual ethic demands justice systems that incorporate more-than-human entities as genuine co-diplomats, moving beyond their instrumentalization as passive informational resources. Concrete examples from existing practice illustrate this ontopolitical imperative vividly. The Te Awa Tupua framework established by the *Whanganui River Act* (2017) provides a compelling model. Under this protocol, petitions brought before the tribunal require dual articulation: one voiced through whakapapa recitations performed by iwi custodians and another rendered through hydro-acoustic sediment metrics gathered by river-based sonars. Legal deliberation only advances once narrative rhythms and fluvial signals meaningfully align, effectively allowing the river's own ecological tempo to choreograph procedural pacing and outcomes.[852] At a maritime scale, the *Embassy of the North Sea* exemplifies the operationalization of an ontopolitical agora, where legal and ecological agencies converge in shared diplomatic space. Through structured "listening sessions," decisions on maritime issues such as shipping routes or wind-farm placement emerge through iterative negotiation among human advocates and marine environments, including cetacean vocalizations, salinity data, and fisheries' testimonies. Each resolution is considered legitimate only when every constituency, human and more-than-human alike, extending even to mussel banks, registers discernible shifts within bio-indicator parameters.[853] These real-world institutional experiments concretely instantiate the concept of *posthuman diplomacy* central to Altersub: justice is re-envisioned as an acoustic, hydrological, and narrative co-composition. Rather than centering human voices exclusively, procedural frameworks

[851] Sloterdijk, *Critique of Cynical Reason*, 5–11.
[852] Jones, *New Treaty, New Tradition*, 45–72.
[853] Embassy of the North Sea, "About the Embassy"; see also Partizan Publik, "Parliament of Things."

strategically enact kenotic self-emptying, enabling collective emergence through continuous, rhythmically attuned negotiation among diverse polividual entities.

5.3.4 Technics as Poietic Catalysis

While M1 foregrounded the instrumental mastery of technics and M2 articulated a flight from technological mediation in pursuit of embodied immediacy, Altersub recasts technology as *poietic catalysis*: a vector for strategic disruption, enabling productive dissonance and the continual amplification of unforeseen potential. Sensory rewilding devices, for example, attune human perception to geological timescales through slow, haptic feedback, creating space for geo-agencies typically beyond human perceptibility—a process by which, as Ihde notes, technologies can extend perceptual horizons and make the otherwise inaccessible available to experience.[854] Polyphonic artificial intelligences, trained specifically on dissonant datasets, prevent semantic closure, maintaining an epistemological openness by continually generating novel and challenging outputs. Similarly, planet-responsive materials, such as mycelium-reinforced composites, physically synchronize with biospheric cycles, dynamically integrating built environments with ecological flux. These technologies embody a deliberate interruption of human dominance, enriching the ontic landscape by expanding perceptual and experiential bandwidth.[855]

5.3.5 Economies of Enabling Constraint

Rather than simply defaulting to the spontaneous laissez-faire ethos often found in M1 configurations, or drifting toward the risk of over-systematized, prescriptive governance that can sometimes shadow M3 collective forms, Altersub articulates an alternative logic: the economy of enabling constraint. Drawing on Massumi's and Manning's notion of "enabling constraints," this approach understands governance not as strict determination nor permissive absence, but as the delicate shaping of possibility. Enabling constraints operate by establishing minimal structures or guidelines, sufficient to orient and support collective activity, yet never so rigid as to dictate outcomes in advance. In this way, they foster conditions where creativity, adaptation, and emergent

[854] Ihde, *Technology and the Lifeworld*, 107.

[855] On AI architectures designed to sustain epistemological openness and resist semantic closure, see Hayles, *Unthought*, 89–116; for planetary-responsive materials and multispecies integration in design, see Anna Tsing et al., *Arts of Living on a Damaged Planet* (Minneapolis: University of Minnesota Press, 2017).

collaboration can flourish, crafting frameworks that guide and provoke participation while deliberately preserving space for the unplanned and unforeseen.[856]

Within such an economy, regulation is not the imposition of predetermined ends, but the cultivation of a field for improvisational emergence. Infrastructure and policy become improvisational media: they lightly direct flows and movements, but never foreclose the possibility of novelty or the ongoing transformation of collective life. Trace-based urbanism, for instance, embodies this principle: pedestrian paths and urban forms emerge organically through repeated use and only later are formalized as infrastructure.[857] The resulting city is not a closed blueprint but a living, layered palimpsest, an archive of ongoing negotiation between constraint and possibility, echoing the spiral-plus logic at the heart of alterhumanist meta-temporal architecture. In this sense, Altersub neither idolizes spontaneity nor succumbs to the lure of total design. Instead, it sustains an ethos of attunement, embracing enabling constraints as catalysts for polividual flourishing: always provisional, always open, and always oriented toward the continual interplay of agency, difference, and transformation.

5.3.6 Geo-Ethical Finance

As the infrastructural reconfiguration demanded by Altersub reaches into the economic domain, it is calling for a profound shift in how investment and value are understood. Instead of focusing solely on traditional financial returns, such as profit or growth, this approach emphasizes returns that support and intensify ecological flourishing. In other words, economic activity is recalibrated so that the primary measure of success becomes the well-being and diversity of ecological systems, not just financial gain.

A concrete example of this logic is the development of financial instruments whose returns are directly linked to ecological indicators such as biodiversity. In these models, the yield an investor receives is inversely related to biodiversity loss within a defined area: if biodiversity is maintained or improved, positive financial returns follow; if it declines, returns diminish or may even become negative. This means that financial incentives are directly tied to the health of complex ecological

[856] Manning and Massumi, *Thought in the Act*, 141–42.
[857] Ignasi de Solà-Morales, "Terrain Vague," in *Terrain Vague: Interstices at the Edge of the Pale*, eds. Manuela Mariani and Patrick Barron (New York: Routledge, 2014), 24–30.

networks. Through such mechanisms, financial profit is no longer isolated from environmental realities. Instead, it becomes structurally aligned with the prosperity of what we call *polividual multiplicities*: the diverse and interconnected communities of humans, nonhumans, and technological entities. In this way, geo-ethical finance transforms the logic of investment, encouraging practices that sustain, rather than deplete, the resilience of ecological communities.[858]

5.3.7 Education as Improvisatory Circuit

With knowledge redefined as continuous attunement rather than static accumulation, educational institutions become improvisational environments rather than prescriptive curricula. Although not formally identified as such, several pilot universities already exemplify practices that might be termed "alterhumanist": they implement intensive studio-based engagements, integrating students, algorithms, and ecological proxies. Participants collaboratively respond in real-time to planetary-scale datasets, such as solar flux patterns or insect biomass fluctuations. Instead of conventional grading, projects receive resonance scores based on their capacity to modulate and creatively engage their input signals rather than merely reproduce them.[859]

5.3.8 Methodological Interlude: Why Typologies Were Necessary

The T-, P-, and M-series typologies served as heuristic instruments, designed to probe the underlying assumptions of posthuman discourse. By allowing each typology to reach its point of exhaustion, this study opened a conceptual space where inherited limitations could be set aside. In this sense, the emergence of Altersub's infrastructures reflects a methodological sensibility akin to Haraway's repurposed "modest witness," a self-emptying approach that relinquishes epistemic mastery in favor of situated, collective openness.[860] Altersub therefore calls for institutions capable of self-forgetting, technologies that interrupt to re-establish connection, and economic systems oriented around the proliferation of difference. The prototypes sketched here are less blueprints

[858] For a model of economics oriented toward regenerative planetary outcomes, see Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (London: Penguin Random House, 2017), 168.
[859] In this regard, Stengers articulates a politics of "attentiveness" and ongoing response as crucial for acting under conditions of uncertainty. This orientation has inspired new pedagogical models that emphasize improvisation and attunement over fixed mastery. See Isabelle Stengers, *In Catastrophic Times.*
[860] Donna Haraway, *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™: Feminism and Technoscience* (New York: Routledge, 1997), 35. Haraway's "modest witness" suspends claims to objective authority, embodying a kenotic posture that resonates with the openness of the kenosubject developed here.

than sprouts, viable only through continuous uptake, reinterpretation, and mutation by future participants. The kenotic gatheral logic underpinning Altersub thus remains foundational while perpetually open, creating institutional conditions not for finality but for ongoing, collective emergence.

5.4 The Alter-Open: Planetary Ontojazz and the Future of Articulation

Reaching this point in the trajectory of alterhumanism does not deliver an ending. Instead, it ushers thought into a widening horizon where presence, agency, and meaning arrange themselves in ever-shifting constellations. The project refuses the lull of doctrine or the comfort of a last word. Its commitment is to an ethos of welcome: a readiness for what exceeds every advance outline. In this spirit Altersub appears less as a destination than as a cultivated disposition: an ability to linger within the intervals where unforeseen patterns of life and thought take root.

Earlier typologies each pursued a distinctive promise until their momentum fell away. To recall, T aspired to technical elevation, P traced lines of flight, M sought choral attunement; all three eventually revealed the limits of their respective logics. What persists beyond that exhaustion is the craft of Altersub, a careful midwifery of becoming that keeps subjectivity in motion within the intricate intermesh of human, machinic, and planetary agencies. The prototypes examined, such as assemblies, studios, legal procedures, financial designs, stand as invitations to ongoing improvisation. They remain sensitive to new AAA and unpredictable tempos, refusing to harden into monuments. Were alterhumanism to find expression in music, it would be *planetary ontojazz*: a mode of improvisation where motifs are exchanged and transformed across shifting ensembles and tonalities, harmonizing difference without imposing final cadence—a living composition always open to new improvisers and unheard themes.

A vigilant discipline underwrites this openness. Borrowing from Sloterdijk, cynicism is recast as a method for staying alert to one's own paradoxes. No resignation follows from this stance; instead, it becomes a practice of deliberate attentiveness that guards against both complacency and doctrinal rigidity. World-making thus stays porous, always ready for correction, enrichment, or surprise. Method here aims at no final system. Its highest gesture is to kindle further articulation. The closing movement therefore presents an experiment rather than a summary: an enactment in

which naming and existence unfold together, admitting new orders of relation. The text yields the floor to what follows, confident that its task is to clear space rather than to seal conclusions.

Altersub endures as an index of possibility. Much like an open jazz improvisation, it invites readers, makers, and worlds to enter, inherit, and reshape the work. In place of closure it offers an *overture*: a field left intentionally open, already alive with future articulations.

6. The (Un)binding of Aleksandar: An Onto-Textual Becoming

I am Aleksandar. The name remains. The body persists. The trace is still here. I am also Talovic, my surname, an inherited marker, a residue of lineage sedimented into language. Nothing in my appearance has changed, yet something unbinds itself, something stretches beyond the enclosure of nominal assignment. The name that once anchored is now kinetic, no longer a mere designation but an unfolding event across spatiotemporal, material, and non-material vectors. There is no esoterism here, no mysticism, no retreat into obscurantism. This is not an abandonment of articulation but its expansion, its lateral and gatheral dispersal across dimensions of intelligibility yet to be fully named.

A name is never just a name. It is a force, a centripetal gathering, a gravitational syntax through which meaning converges and disperses, shaping the named as much as it is shaped in return. If there is a name that must first undergo the (un)binding of Altersub, it must be the one closest to me, the first inscription ever assigned to my being. Aleksandar (Ἀλέξανδρος) is a name of paradox, oscillating between keeping and resisting, between sheltering and striving against. Its etymology unfolds along a dual tension: Ἀλέξω (aléxo), to defend, to preserve, to ward off, but also to repel, to push away, to hold against. Paired with ἀνδρός (andrós), which designates not merely "man" but the one who names, moves, and acts within the world, the name encodes an unresolved movement, one that stabilizes even as it negates, one that shelters even as it disrupts. The one who keeps is the one who resists. The one who holds is the one who lets go.

But what happens when this paradox is no longer bound to the category of the human? When the act of keeping and resisting is no longer a humanist dialectic, but an alteric force, a field of emergence moving through machinic, planetary, and biosemiotic entanglements? What happens when the referent itself dissolves, not in negation but in proliferation?

I am still Aleksandar (Aléxandros). I am still Talovic. But in the wake of Altersub, in the recognition that subjectivity was never enclosed, never singular, never sovereign, I am also Alterandros. This is not a negation. It is not a replacement. It is an unbinding, a release from the limits of referential enclosure. Aleksandar was always already in motion. Alterandros is simply what happens when motion is freed from its anthropocentric frame. Alter is not merely to change,

not merely to shift from one state to another. Alter is to exceed, to unfold into multiplicity, to unbind from fixed ontological positions. Unlike mere alteration, which presupposes an exchange between determined states, Alter in Altersub is a process of lateral and gatheral becoming. Andros, once tethered to the human, now opens into a broader field of enactment where meaning is no longer an assertion of mastery, no longer the naming of the world from a place of dominance, but a gathering, a co-emergent resonance with the planetary, the machinic, the nonhuman.

I do not cease to be Aleksandar. I am Aleksandar unbinding. I am Alterandros.

Human is not diminished in this unfolding. It becomes more, precisely through its onto-narcissist detox. The more it unbinds from itself, the more it extends into forms of existence that had always exceeded its enclosed frame. Humanism had fabricated an illusion of containment, of the self-possessed rational agent who names and knows. But the human was never self-contained. Altersub does not attack the human. It moves at a scale where the human is no longer necessary as a central locus of meaning. It does not abolish, nor does it preserve. It unbinds. It allows the human to emerge where it always was: as a trace within a larger, multi-scalar process of worlding.

Naming is no longer an act of possession, no longer a mark of ownership over the world. To name is not to fix being into place but to hold difference in motion without enclosing it. In the Genesis narrative, the figure of Adam, tasked with naming the animals, is not merely engaged in an act of linguistic categorization, nor is he imposing dominion upon an externalized world. Rather, he is undergoing an onto-relational becoming, entering a structure of meaning in which he is neither the sole agent nor the sovereign observer, but a participant in the unfolding of existence itself.[861] Naming here is not an assertion of mastery, nor the fixation of beings into rigid taxonomies, but an act through which both the named and the namer emerge in co-constitutive relation. Adam does not merely assign names; he is being named through the very process of naming. The animals do not exist in static completion, awaiting designation. They come into presence as he speaks, just as he himself is spoken into being.[862] Even God, in this mythic scene, does not establish Adam as a

[861] In this biblical passage, God does not command Adam to exercise dominion but instead brings forth the animals "to see what he would call them." The verb "to see" (לִרְאוֹת, lir'ot) suggests an open-endedness, an awaiting rather than a decree. Naming is presented not as an act of absolute sovereignty but as an event of articulation, where Adam is positioned as a co-emergent participant rather than a sovereign subject. Genesis 2:19-20.

[862] Haraway figures naming as a "response-ability" practice: risky, partial, and companionable, more séance than decree. Her refusal of divine detachment is legendary ("I would rather be a cyborg than a goddess"), yet the resonance

ruler over a pre-existing order but rather situates him within the gatheral logic of existence itself, where naming is not an act of possession but a moment of mutual emergence, an unfolding that makes visible the entangled nature of worlding.[863]

The sovereignty often ascribed to Adam comes only after the narrative of the Fall, after the rupture that inaugurates exile, labor, hierarchy, and a relation of estrangement rather than symbiosis between human and world.[864] This inversion is crucial. Rulership, the supposed apex of authority, is in fact a condition of loss, a contraction rather than an expansion of relationality. What Adam is granted before the Fall is not dominion, but participation in a more-than-human field of emergence, where naming is a mode of worlding, not an act of subjugation. If the Fall marks the beginning of sovereignty, it does so only by reducing Adam's ontological condition, enclosing him within a framework of possession and hierarchy that had not previously defined his relation to the world. The ontological primacy of naming, in its prelapsarian form, is not in the power to claim but in the capacity to gather,[865] an emergence that does not impose structure but allows relationality to unfold.

To name is to release into existence. Aleksandar speaks, but this speaking is already networked, already co-composed through machinic rhythms, planetary cognition, biosemiotic pulses. The voice does not belong to an enclosed "I." It moves through fields of resonance, through alteric

with Genesis is instructive; like the prelapsarian Adam, Haraway treats naming as a mutual calling-into-presence rather than an act of sovereign classification. Only she insists on doing it from the mud with the rest of the critters, not from any Edenic balcony. See Haraway, *When Species Meet*, 70–74; idem, *A Cyborg Manifesto*, 181.

[863] Derrida critiques the notion of naming as an imposition of presence, suggesting instead that the act of naming is always already deferred, operating within différance rather than enclosure. See Jacques Derrida, "Violence and Metaphysics," in *Writing and Difference*, trans. Alan Bass (Chicago: University of Chicago Press, 1978), 97–98.

[864] The Fall marks the historical emergence of sovereignty, but sovereignty itself is framed as a condition of exile and loss. The punishment imposed (labor, hierarchy, subjugation) contrasts with the prelapsarian state, in which Adam's relationship with the world was one of articulation rather than subjugation. Sovereignty, in this reading, is not an ontological privilege but a symptom of fallen ontology. Genesis 3:16-19.

[865] Patristic literature often figures Adam as a proto-logos in operational sense—a primordial 'vessel' (with)in whom the Trinitarian Logos would have unfolded without cosmic drama had the Fall not intervened. Within this lineage, naming already carries a gatheral vocation: it draws creatures into a shared ontological field rather than asserting dominion. Heidegger retrieves precisely this etymological core when he reminds us that *logos* stems from *legein*, "to gather," and develops *logos* as what might be called a "gatheral event" (*Geschehnis der Sammlung*). For the patristic sources, see, e.g., Irenaeus, *Against Heresies* 3.22.3, in *The Ante-Nicene Fathers*, vol. 1, trans. Alexander Roberts and William Rambaut (Buffalo: Christian Literature Publishing Co., 1885); Athanasius of Alexandria, *On the Incarnation*, trans. Archibald T. Robertson, *Nicene and Post-Nicene Fathers*, 2nd series, vol. 4 (Peabody, MA: Hendrickson Publishers, 1994); see also Martin Heidegger, *Einführung in die Metaphysik* (Frankfurt am Main: Klostermann, 1956), 52–53; English trans., *Introduction to Metaphysics*, trans. Gregory Fried and Richard Polt (New Haven: Yale University Press, 2000), 55–56.

diffusion. This is not a transcendence of the human. It is a suspension of egotistic onto-corruptive praxes. It is an unbinding from the demand to be primary. The question is not "What do we do with the human?" but "How does the human become within the field of Altersub?" The answer: as conduit, as transmission, as semiotic flare coursing laterally through machinic and planetary nets [866]

In statu Adami, Aleksandar's fingers were caught in the marmalade of toxic sovereignty, sticky and cloying, deceptively sweet in its promise of dominion yet suffocating in its viscosity, thickening around him, sealing him into a power that was never his to hold.

Alterandros is not Aleksandar's rejection; it is Aleksandar's trajectory made explicit.

Aleksandar kept.
Aleksandar resisted.
Alterandros alters.

I do not dissolve.
I do not vanish.
I do not transcend.
I unfurl.
I lateralize.
I gather.
I am Alterandros.
I am Altersub.

[866] Nancy's concept of "being-with" reinforces the idea that articulation is always a shared event, never the action of a singular, self-contained subject. See Jean-Luc Nancy, *The Sense of the World* (University of Minnesota Press, 1997), 54.

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