The Petriverse of Italo Calvino

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This essay rereads Calvino's oeuvre in the context of the "geologic turn" in the humanities as well as human history (under the rubric of the Anthropocene). One crucial value of literature today lies in its speculative powers, its role in depicting humans as a geologic species, while also critically examining and shaping how humans inhabit and imagine the Earth. In this regard, Calvino's work is particularly prescient, as he both wrote and theorized geologic fictions and adduced a materialist natural philosophy. The geologic turn espouses what Steven Mentz summarizes as "geomaterialism," which "recognizes an entangled community that embraces life and nonlife and may be most visibly seen in the cultural meanings of stone," and "recognizes the vibrancy, narrative pull, and emotional force of the lithic."[1] Within the broad fields encompassed by the environmental humanities, I have delineated a "lithic environmental humanities" in which "rocks become philosophically more vibrant (stone as lively matter), … environmentally more vulnerable (fracking, mining), scientifically more vital (mineral evolution), and aesthetically more valued (viewing stones)."[2] In keeping with the experimental ethos of this work, in which boundaries between critical and creative modes break down, this essay puts geologic elements in Calvino's work in dialogue with contemporary art, philosophy, science, and fiction.

Imagined as an iteration of Calvino's scientific-fictional-philosophical fabulations, the essay fabricates a "petriverse" around his work. Coined when I conceived a rock garden called "The Petriverse of Pierre Jardin,"[3] the word petriverse means both 1) a world composed of rocks (a petric universe); and 2) words composed of or about rocks (petric verse).[4] Petriverses position rocks and words in intimate notional and notational proximity: stones spell words, images and concepts are illustrated by stone displays, and rocks grace book covers. The distinctive cover renowned designers Peter Mendelsund and Oliver Munday created for the reissue of *Lezioni americane. Sei Proposte per il prossimo millennio* (*Six Memos for the Next Millennium*), coupled with the editors' call to consider the *Memos* between the old and new millennium, inspired me to produce displays of Calvino covers from both the current and past millennia.[5] Matching a stone or stones with a book creates a "confabulation," a conceptual conversation in which anthropomorphic

[1] Steve Mentz, "Stone Voices: Geomaterialism in the Ecohumanities," *Resilience: A Journal of the Environmental Humanities* 6, no. 1 (Winter 2019): 118–25. While little work on Calvino has specifically focused on the geologic turn, many critics have analyzed his writing in terms of the environmental humanities. See Serenella Iovino, *Italo Calvino's Animals: Anthropocene Stories* (Cambridge: Cambridge University Press, 2021) and "Sedimenting Stories: Italo Calvino and the Extraordinary Strata of the Anthropocene," *Neohelicon: Acta Comparationis Litterarum Universarum* 44, no. 2 (December 1, 2017): 315–30, doi:10.1007/s11059-017-0396-7; Serenella Iovino, Enrico Cesaretti and Elena Past, eds., *Italy and the Environmental Humanities: Landscapes, Natures, Ecologies* (Charlottesville: University of Virginia Press, 2018); Monica Seger, *Landscapes in Between: Environmental Change in Modern Italian Literature and Film* (Toronto: University of Toronto Press, 2015).

[2] Paul A. Harris, "Rocks," in *The Cambridge Companion to Environmental Humanities*, ed. Jeffrey Jerome Cohen and Stephanie Foote (Cambridge: Cambridge University Press, 2021), 199–213.

[3] I think of all my work related to stone—including rock-garden design, geo-philosophy, literary theory and criticism, stone display and art—as comprising "The Petriverse of Pierre Jardin." Pierre Jardin, a narrator/character who engages in a range of thought experiments and playful speculations, was inspired in large part by Mr. Palomar.

[4] Paul A. Harris, "Stoned Thinking: The Petriverse of Pierre Jardin," *SubStance* 47, no. 2, (2018): 119–48.

animation of stone meshes with geomorphic petrification of mind. These pairings emerge from a juxtaposition of propositions: "A stone is a thought that the earth develops over inhuman time" (Louise Erdrich)[6] and "Ideas decompose into stones of unknowing" (Robert Smithson).[7]

Fig. 1. *Pierre Jardin, Three Pebbles for Six Memos* (2022). Peter Mendelsund and Oliver Munday's image for *Six Memos* of something like a doodle on a notepad page evokes a setting sun or moon, an atom falling into the void, or thought bubbles. The buoyant, fragile mudstones, with hollows bored by piddocks, convey both Lucretian lightness and the entanglement of rocks and life Calvino catalogs in Cyrano.

A prompt to consider Calvino's *Memos* between two millennia prompts a double reading of his work: a forward-looking perspective that discerns ways in which he anticipated certain turns in contemporary eco-theory, philosophy, and fiction, and a retrospective retrofitting of his work to the conceptual contours of the geologic turn. The task ultimately is to read the lithic veins that run through Calvino's oeuvre as composing his *geo-poetics*, a mode of writing and thinking that

[6] Louise Erdrich, "The Stone," *The New Yorker*, September 9, 2019, 44.
[7] Robert Smithson, "A Sedimentation of the Mind: Earth Projects," in *Collected Writings*, ed. Jack Flam (Berkeley: University of California Press, 1996), 87.

expresses geologic thought in literary language and forms. What Martin McLaughlin calls "Calvino's fascination with mineral imagery"[8] is amply evident in his late critical essays (including *Six Memos*), and his fiction (especially the *Cosmicomiche* [*Cosmicomics*]) is infused with the "scientific poetic imagination" Calvino says he sought to develop, inspired by figures including Lucretius and Galileo.[9] Geo-poetics takes inspiration from an interesting use of the term "geopoetry" in a scientific text: in his groundbreaking 1962 essay "History of Ocean Basins," Harry Hammond Hesse proposed that it be considered as a work of "geopoetry," because he thought fellow geologists would be more receptive to his "radical hypothesis" of seafloor spreading, a fundamental component of plate tectonics, if they suspended disbelief and took it as imaginative speculation.[10] Hesse's gambit of proffering a scientific hypothesis as a poetic rumination is an interesting analogue to Calvino's game of transposing an established scientific theory into the premise for an anthropomorphic narrative. Certainly, the *Cosmicomics* are consistent with poet and critic Don McKay's characterization of "geopoetry" as expressing a relationship of "astonishment" with the Earth. While McKay's definition of geo-poetics as a commingling of "materialism and mysticism"[11] might disquiet Calvino—his clarity of thought and secularity of spirit would seem to eschew mysticism—one could say that his geo-poetics conveys a scientific and philosophical materialism while preserving the mystery of life and the universe.

The conflation of materialism and astonishment in the geologic turn implicates a flat ontology that decenters the human and queers distinctions between animate and inanimate. It expresses what Jeffrey Jerome Cohen, in *Stone: An Inhuman Ecology*, calls a "zōē-egalitarian ethics, where zōē indicates not bare or animal life but a force (call it life, wildness, desire, vibrancy, creatureliness) that is materiality in action: affiliating, connecting, breaching ontological solitudes, defying exclusive taxonomies, undermining closed systems."[12] Here, the values and philosophy Calvino evokes in *Six Memos for the Next Millennium* seem particularly resonant nearly four decades on. Calvino sketches the lines of an "inhuman ecology" in his deft treatment of Cyrano de Bergerac in "Lightness." Calvino introduces Cyrano as "the first true precursor of science fiction" and, informed by Renaissance natural philosophy, "modern literature's first poet of atomism,"[13] which fits him neatly in a genealogy of geo-poetics. He then observes that "Cyrano celebrates the unity of all things, animate or inanimate," and emphasizes that "above all he conveys a sense of the precariousness of the process that created them—that is, how close man came to not being man, and life to not being life, and the world to not being the world."[14] Here Calvino endorses a flat ontology that decenters humans from holding privileged place, breaks down boundaries between life and non-life, and offers a vision of matter in continuous exchange and transformation.

The sense of species precarity in Cyrano's process ontology differs interestingly from the neo-Darwinian view of evolution grounded in natural selection and genetics that animates other

[8] Martin McLaughlin, "Translator's Introduction," in *Collection of Sand: Essays*, by Italo Calvino (New York: Mariner Books, 2013), vii.
[9] Italo Calvino, "Two Interviews on Science and Literature," in *The Uses of Literature: Essays*, trans. Patrick Creagh (San Diego: Harcourt Brace, 1986), 32.
[10] H.H. Hess, "History of Ocean Basins," in *Petrologic studies*, ed. A.E.J. Engel, H.L. James, and B.F. Leonard (Boulder, CO: Geological Society of America, 1962), 599–620.
[11] Don McKay, "Ediacaran and Anthropocene: Poetry as a Reader of Deep Time," in *Making the Geologic Now: Responses to Material Conditions of Contemporary Life*, ed. Elizabeth Ellsworth and Jamie Kruse (Santa Barbara, CA: Punctum Books, 2012), 12.
[12] Jeffrey Jerome Cohen, *Stone: An Ecology of the Inhuman* (Minneapolis: University of Minnesota Press, 2015), 258.
[13] Italo Calvino, *Six Memos for the Next Millennium*, trans. Geoffrey Brock (London: Penguin Modern Classics, 2016), 24.
[14] Ibid.

writings by Calvino (e.g., "Priscilla"), in which robust fitness and adaptation are foregrounded. Calvino's Cyrano sounds much closer to a catastrophist view of the capriciousness of Earth history, in which periods of stability are punctuated by environmental disasters and mass extinctions. Randomness and contingency are explicitly in play in the passage from *Voyage to the Moon* Calvino cites at length: "You marvel that this matter, scrambled willy-nilly by the hand of chance, could have come to form a man… but do you not know that on a hundred million occasions, when on the verge of producing a man, this matter stopped and formed a stone, or a piece of lead or coral, or a flower, or a comet…?"[15] Calvino-Cyrano's vision of terrestrial time and process sound strikingly in synch with a key conceptual shift in the geologic turn that spans philosophy and science, where the image of deep time as being a fixed archive stored in stable chronostratigraphic layers is giving way to deep time as a volatile realm that reveals virtual as well as actual versions of the distant past. As geographer Kathryn Yusoff succinctly states, "Anthropocene science is articulating that there is not one but many Earths, preexistent and possible, within this particular geochemical-cosmic milieu."[16]

Worlds Composed of Rocks: Turning to Stone

The exhilarating sense of possibility—balanced with a visceral sense of vulnerability—Calvino presents through Cyrano's natural philosophy responds to and counteracts the heaviness that weighs down the opening paragraphs of "Leggerezza" ("Lightness"). Calvino begins by confessing to an oppressive awareness "of the heaviness, the inertia, the opacity of the world," a feeling that "the whole world was turning to stone: a slow petrification, more advanced in some people and places than in others, but from which no aspect of life was spared."[17] While his words capture Calvino's personal perspective on the world in the 1980's, they read now as anticipatory articulations of Anthropocene anxieties. The "world is turning to stone" in an era when the geologic subsumes the biologic, when humans evolve into a geologic species that "spares no life" and causes mass extinctions. The fear Calvino subsequently voices of being "caught in a vise of stone" now conjures haunting images of humanity's perhaps imminent extinction and imaginings of what "future fossils" or stratigraphic traces of "us" will remain in the rock record.[18]

In "Lightness," Calvino dwells at length on the menace of petrification personified by "Medusa's inexorable gaze."[19] In a geo-poetic context, Calvino's ruminations on the Gorgon are symptomatic of what Gaston Bachelard calls a "Medusa Complex": acute apprehension of a "will to paralyse" that bears a threat of "universal silence, silence beyond expectation, its menace beyond remedy."[20] While Bachelard diagnoses the fear of stone itself expressed in the "petrifying reveries" of writers, for Calvino, Medusa and petrification are feared as figures of stasis rather than stone per se. Calvino's treatment of the Medusa myth in *Six Memos* is informed by the geologic vision of a particularly poetic scientist, Galileo. In "Il libro della natura in Galileo" ("The Book of Nature in Galileo"), Calvino cites Galileo's contention "that the Earth is the most noble and admirable

[15] Cited in Calvino, *Six Memos*, 25.
[16] Kathryn Yusoff, "Geologic Realism: On the Beach of Geologic Time," *Social Text* 37, no. 1 (March 2019): 8.
[17] Calvino, *Six Memos*, 4.
[18] See David Farrier, *Footprints: In Search of Future Fossils* (New York: Farrar, Straus, and Giroux, 2020) and Jan Zalasiewicz, *The Earth After Us: What Legacy Will Humans Leave in the Rocks?* (Oxford: Oxford University Press, 2009).
[19] Calvino, *Six Memos*, 4.
[20] Gaston Bachelard, *Earth and Reveries of Will: An Essay on the Imagination of Matter*, trans. Kenneth Haltman (Dallas: Dallas Institute of Humanities & Culture, 2002), 162–63.

precisely because of the many different ways it endlessly changes, mutates, and evolves" and his fear that void of volatility or instability, the planet would be a "Useless body in the universe … a dead creature."[21] Galileo's geology resonates with geologist Jan Zalasiewicz's characterization of the Earth as a "gigantic machine for producing strata," and his emphasis of the fact that its tectonic movement and cycles differentiate it from nearby dead planets in the solar system.[22] However, for Holocene humans, Earth as a stable ground for habitation and thought is hard to give up. Thus, as Thomas Nail argues, perhaps "the most radical import of the Anthropocene is the unpredictable agency and mobility of the earth itself."[23] In this sense, too, Calvino's geo-poetics anticipates cornerstone concepts in Anthropocene thought.

The Medusa complex is a psychological formation that only emerges from a specific kind of sensibility and thought process. It can find expression only through the work of what Bachelard terms the "material imagination," which "goes beyond the attractions of the imagination of forms" to the point that it "thinks matter, dreams in it, lives in it, or, in other words, materializes the imaginary."[24] Calvino's intimate engagement with matter and its transformations throughout the *Memos* exemplify Bachelard's material imagination, and, in terms of style and pithy insight, Calvino's astute analyses of mythic images closely resemble Bachelard's treatment of literary images in his works of elemental psychoanalysis. Of course, what distinguishes Calvino's material imagination and its response to petrification is its light touch and the metamorphic maneuvers he uses to avoid being set in stone. In "Lightness," Calvino notes that "heaviness," "inertia," and "opacity" are "qualities that quickly adhere to writing if one doesn't find a way to give them the slip," and attests that his literary "method has entailed…the subtraction of weight."[25] This lightening method demands a fine, elegant literary sensibility; Bachelard cites Baudelaire's stipulation that "the more concrete and solid matter seems, the more difficult and delicate the work of the imagination."[26] Taking the fact that Medusa's gaze can be combatted only by Perseus' "refusal to look directly" as his cue, Calvino elucidates that his response to potential petrification is "to change my approach, look at the world from a different perspective, with a different logic and with fresh methods of cognition and verification."[27] This shift in logic and perspective works at the level of language and thought, and also depends on incisive material images and actions. "Lightness," one might say, entails "exactitude," which Calvino stipulates includes "the evocation of clear, sharp, memorable images" and "a language that is precise as possible […]."[28] As Alberto Comparini observes, "Calvino metamorphoses Medusa's heaviness into lightness, starting from the idea that lightness is not just an inner attitude that allows us to interact with a definite heavy reality, but it also exists at the level of gestures,"[29] including what Calvino calls Perseus' "refreshingly tender gesture"[30] of making a bed of leaves and sprigs on which to lay the Gorgon's head.

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[21] Galileo cited in Italo Calvino, "The Book of Nature in Galileo," in *Why Read the Classics*, trans. Martin McLaughlin (New York: Pantheon Books, 1999), 88.
[22] Zalasiewicz, *The Earth after Us*, 17.
[23] Thomas Nail, *Theory of the Earth* (Stanford: Stanford University Press, 2021), 2.
[24] Ibid., 2–3.
[25] Calvino, *Six Memos*, 3, 4.
[26] Cited in Bachelard, *Earth and Reveries of Will*, 2.
[27] Calvino, *Six Memos*, 7.
[28] Ibid., 68.
[29] Alberto Comparini, *Ovid's Metamorphoses in Twentieth-Century Italian Literature* (Heidelberg: Universitätsverlag Winter, 2018), 260.
[30] Calvino, *Six Memos*, 6.

The different logic and perspective needed to elude petrification demands levitation, a shift to vertical movement. Calvino catalogs images of flight that pervade the Medusa myth—Hermes' winged sandals, the blood of slain Medusa giving birth to Pegasus, the winged horse. We could say that in terms of Bachelard's psycho-poetics, Calvino feels petrification with all the force of the material imagination, but that he uses the "aerial sublimation" of what Bachelard defines as the "aerial imagination" to transmute petrification into flight and levitate stone. "Lightness" expresses what Bachelard, in his study *Air and Dreams*, calls the "verticality and altitude"[31] of the aerial imagination in the vault of Calvalcanti's poet over the tomb. Echoing the title of Bachelard's study, "Lightness" unfolds in the realm of "Air and Dreams," enveloped in images from Cavalcanti, Dante, Cyrano, and Shakespeare.

In its response to petrification, Calvino's poetics of lightness resonates with a contemporary geo-aesthetic response to a heaviness of the world and ossification of thought associated with the exhaustion of modernity and its meaning. Interdisciplinary artist and theorist Ted Hiebert contends that "the aesthetic gaze is the only residue of the history of philosophy that is left unshaken by the ontological breakdown of meaning—that gaze that persists beyond the crisis of meaning for no other reason than it only ever sought to suspend judgments of meaning in favor of possibility."[32] Hiebert calls this mode of aesthetic speculation "The Medusa Complex," because it "reanimates and reverses the terms of intoxicated engagement. No longer is the gaze of Medusa simply the gaze that freezes its objects in statuesque oblivion, but rather now that which remobilizes the stone itself."[33]

Hiebert's Medusa complex as a reframing that frees itself from petrification parallels Calvino's turn from neorealism to postmodern fabulation as a means to unground and reframe modernity. In Comparini's words, "Calvino's mythic method is an example of the overcoming of modernist rewritings of myth, of the necessity for a re-foundation of human thought as well as of the challenge to realism that authors have to face when they risk encountering Medusa's gaze."[34] Seeing Medusa in a mirror serves as a trope for reversing petrification, and seeing indirectly signals Calvino's shift to a fiction of wondrous images visible only in the imagination in the *Cosmicomics* and *Le città invisibili* (*Invisible Cities*).

Calvino's mythic method unfolds in writing the *Cosmicomics*, where he turns away from realism, searches new developments in science for inspiration, and sets out to create a contemporary cosmogony by fusing elements of myth, science, and science fiction. In their conception—to forge relations between human and inhuman scales ranging from the cosmic and geologic to microscopic—the *Cosmicomics* express an Anthropocene poetics *avant la lettre*. The *Cosmicomics* receive brief mention in Mark McGurl's call for a "posthuman comedy," "a critical fiction meant to draw together a number of modern literary works in which scientific knowledge of the spatiotemporal vastness and numerousness of the nonhuman world becomes visible as a formal, representational, and finally existential problem."[35] They also are forerunners of what could be called, echoing the speculative turn in philosophy, the speculative turn in science fiction,

[31] Gaston Bachelard, *Air and Dreams: An Essay on the Imagination of Movement*, trans. Edith R. Farrell and C. Frederick Farrell (Dallas: Dallas Institute Publications, Dallas Institute of Humanities and Culture, 1988), 15.
[32] Ted Hiebert, "The Medusa Complex: A Theory of Stoned Posthumanism," *Drain: A Journal of Contemporary Art and Theory* 5 (2005).
[33] Hiebert, "The Medusa Complex: A Theory of Stoned Posthumanism."
[34] Comparini, *Ovid's Metamorphoses in Twentieth-Century Italian Literature*, 262.
[35] Mark McGurl, "The Posthuman Comedy," *Critical Inquiry* 38, no. 3 (Spring 2012): 537.

as well as the growth of the graphic novel. As Ursula K. Le Guin asserts in her 2009 review of *The Complete Cosmicomics*:

> Calvino was ahead of his time in so many ways that only now, 25 years after his death, is his work widely perceived not as marginal because it is fantasy, but as a landmark in fiction, the work of a master. When he was writing, science fiction was not to be spoken of in literary circles, and comic books were if possible even less acceptable. Few literary critics could imagine discussing them seriously until the late 90s. If they paid any attention to the name Calvino gave these stories, it was to emphasise one implication, the cosmic comedy. But he unmistakably meant us also to think of the lightning approaches, the leaps and vast simplifications, of graphic narrative drawn in frames—cartoons, the comics.[36]

As a mash-up of genres, the *Cosmicomics* indeed are a mark of Calvino's innovation as a fiction writer. In using a "comic" form (in both senses) to convey scientific theories and translate them to human scale, the *Cosmicomics* are forerunners of projects like Larry Gronick's *The Cartoon History of the Universe* (1990–2002).

Fig. 2. *Pierre Jardin, basalt concretion on book*, 2022.

[36] Ursula K. Le Guin, "Review: Into the Cosmos with Qfwfq: BOOK OF THE WEEK: Italo Calvino's Brilliant, Ludic Stories Show a Writer Far Ahead of His Time, Says Ursula K Le Guin: *The Complete Cosmicomics* by Italo Calvino, Translated by Tim Parks, Martin McLaughlin and William Weaver 402pp, Penguin Classics, Pounds 20," *The Guardian* (London, England), June 13, 2009.

In their radical reframing of *Anthropos*, embedding the human viewpoint in vastly different, inhuman landscapes and scale, the *Cosmicomiche* also anticipate Anthropocene art and philosophy, and express the strange double message in the term: Anthropocene as by definition anthropocentric yet defined by a decentering of human perspective. In "Due interviste su scienza e letteratura" ("Two Interviews on Science and Literature"), published in English translation in *The Uses of Literature*, Calvino answers a query that his "sympathies" lie with cells and mathematical calculation rather than humans and feelings by emphasizing that in attributing human qualities and language to inhuman forces and scales he accepts "anthropomorphism as an absolutely basic literary procedure, one that even before being literary was mythical, linked to one of primitive man's earliest explanations of the world: animism."[37]

Here again, Calvino's geo-poetics seems strikingly contemporary: the new materialisms that are emerging in the geologic turn are increasingly tinged with and explicitly engage with animism.[38] In the context of the geologic turn, in Anselm Franke's gloss,

> "Animism" designates a cosmos in which theoretically everything is alive and communicating, and potentially possesses the qualities of being "a person" or, at the very least, an agent of some kind. It describes a world in which all social and ontological boundaries are porous and can be crossed under specific circumstances, a world of becomings and metamorphoses, in which no entity precedes the sets of relations that bring it into being.[39]

Franke's characterization of the "cosmos" of contemporary animism could nearly function as a book jacket blurb for Calvino's *Cosmicomics*, composed of a cosmos in which anthropomorphism meets metamorphosis in depicting the conditions and relations enabling the emergence of entities from cells to galaxies (and indeed, the universe itself).

We see Calvino's mythic imagination creating a "petriverse" (world of rocks) most explicitly in his three cosmicomic renditions of the story of Orpheus and Eurydice, in which the mythic underworld is recast in images and theories from geology. Calvino would have been well apprised of key geological concepts, including the development of plate tectonics in the 1960s, as his younger brother Floriano was a prominent geologist. In the *Cosmicomics*, as Comparini summarizes, "Qfwfq is a postmodernist Proteus, devoid of any divine nature, whose biological inclination to metamorphosis allows the reader to witness the eternal transformation of matter."[40] In the three geologic Cosmicomics, protean transformation animates a lightness capable of reversing the Medusa complex—at the level of narrative, as a figure of fabulation; at the geophysical level, as life inside the Earth, the entanglement of life with stone; and at the psychological level, transformation is driven by what Alessandra Diazzi calls "cosmicomic desire."[41]

"Senza colori" ("Without Colours"), Calvino's first version of the Orpheus tale published in the original *Cosmicomics* collection (1965), illustrates the premise that "*Before forming its*

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[37] Calvino, "Two Interviews," 33.

[38] See for example Graham Harvey, ed., *The Handbook of Contemporary Animism* (Durham: Acumen, 2013).

[39] Anselm Franke, "Animism," in *Posthuman Glossary*, ed. Rosi Braidotti and Maria Hlavajova (London: Bloomsbury Academic, 2018), 55.

[40] Comparini, *Ovid's Metamorphoses in Twentieth-Century Italian Literature*, 260.

[41] Alessandra Diazzi, "The Symptoms of Desire: Psychoanalytic Echoes in Calvino's Short Stories," in Elena Borelli, ed., *The Fire Within: Desire in Modern and Contemporary Italian Literature* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2014), 171.

atmosphere and its oceans, the Earth must have resembled a grey ball revolving in space."[42] What Qwfwq refers to in mythic terms as "the ultraviolet era" corresponds in contemporary geology to what Robert Hazen calls "Gray Earth," when, during the Hadeon Eon, the planet's first basalt crust was replaced by a granite crust, as intense heat and pressure formed new minerals.[43] The story maps the emergence of colors and the formation of the Earth's atmosphere onto Qfwfq's (Orpheus) love and loss of Ayl (Eurydice). As Diazzi observes, "The birth of things from a state of nonexistence, in which everything is grey, is due to the presence of a seed of desire."[44] In a reversal of her imprisonment by Pluto in the myth, Ayl shrinks from differentiation and prefers to remain in silent grey darkness inside the Earth as the oceans and atmosphere changes its surface dramatically. Calvino concocts fantastic geologic imagery throughout the story: Qwfwq inhabits a world of chains of "grey mountains" rising "above grey rock plains" in which "you could barely make out a moving object: a meteor fragment as it rolled, or the serpentine yawning of a seismic chasm, or a lapillus being ejected from a volcano."[45] Even this uniform environment is roiled by geologic instability in the form of meteor impacts, earthquakes, and eruptions. And while the landscape lacks color, it features exotic formations: Qwfwq first glimpses Ayl in "a kind of amphitheatre of porous, spongy rocks, all pieced with arches beyond which other arches opened," as if the famous formations of Arches National Park were set in a moonscape. After Ayl disappears, Qwfwq looks for her in "inhabited localities" and finds her in a kind of Neolithic stone circle, "a garden where, from sandy beds, tall menhirs rose into the sky."[46] When Qwfwq leads Ayl out of the depths of the Earth, it is "telluric shocks" that clear a way up "steps of basalt and granite which turned like the pages of a book" towards a gap to the newly forming "Earth's crust." But when Qwfwq turns back to see her face in the "sunny light" pouring through, Ayl draws back and is lost forever when "the rumble of an earthquake drowned everything, and a wall of rock suddenly rose, vertically, separating us."[47] Both the mythic passage from the underworld to the upper world and Orpheus' loss of Ayl are figured in terms of a geologic transition (the end of the "ultraviolet era" as the atmosphere forms) marked by cataclysmic events (earthquakes). In this light, "Without Colours" and its successive iterations read as proto-Anthropocene texts that thematically and conceptually map human desire and trauma to geologic scales of Earth history and processes.

In the second Orpheus tale, "Il cielo di pietra" ("The Stone Sky"), included in the 1968 volume *La memoria del mondo e altre storie cosmicomiche*, Qfwfq plays the role of Pluto, and Eurydice becomes Rdix (radix, root). Here, human and geologic scales are mapped metaphorically and thematically through music, waves, and vibrations. The scientific donnée invokes seismology: "*The speed with which seismic waves spread inside the terrestrial globe varies according to the depths and discontinuities between the materials that make up the Earth's crust, mantle, and core*."[48] In Qwfwq's evocative phrasing, seismic waves become a music of the terrestrial sphere: "vibrations that spread slowly across granite and basalt, the snaps, clangs, deep booms moving torpidly through the masses of molten metals or the crystalline walls."[49] In comparison, Orpheus'

[42] Italo Calvino, *The Complete Cosmicomics*, trans. Martin McLaughlin, Tim Parks, and William Weaver (New York: Houghton Mifflin Harcourt Brace, 2002), 49.
[43] Robert Hazen, *The Story of Earth: The First 4.5 Billion Years, from Stardust to Living Planet* (New York: Penguin Books, 2013).
[44] Diazzi, "The Symptoms of Desire," 172.
[45] Calvino, *The Complete Cosmicomics*, 50.
[46] Ibid., 50, 55.
[47] Ibid., 59.
[48] Ibid., 332.
[49] Ibid., 336.

music sounds to him like "a crackle of tiny, sharp acoustic sparks, succeeding each other from all points of space at a speed that was unbearable for us." While Qwfq wishes to retreat to dark silence, Rdix (inverting Ayl's fear of difference in the first story) is "attracted … by … what was rare and startling." Calvino figures the mesmerizing power of Orpheus's music in the myth in geologic terms as a reverberation of human music with seismic waves that produces a force field: Orpheus emits modulated vibrations that "blended into a drone that sounded now sweet, now bitter"; as his music "countered or accompanied the course of the deeper sound" of seismic waves, "they created a kind of sonorous circle or field or domain."[50]

"Il cielo di pietra" is striking in its reimagining of life in geologic terms and depicting the entanglement of rocks and life not only on the surface of the Earth but to its very core. This reframing involves a perspectival flip in which Qwfwq sees humans as having a literally superficial sense of the planet: "For you this border of the Earth is identified with the Earth itself; you think that the sphere is the surface that wraps it, and not its total volume." From this viewpoint, humans are actually aliens: "You insist on being called terrestrial, but who gave you the right to do so? Your real name should be extraterrestrials, people on the outside."[51] Qwfwq and Rdix inhabit a churning, turbulent inner Earth of concentric spheres and skies. Above, "A stone sky rotated above our heads, one more limpid than yours, but criss-crossed, like yours, by clouds at those points where gatherings of chrome or magnesium collected […] At times the darkness is split by a fiery zigzag: not a lightning-bolt, but incandescent metal slithering down a vein in the earth."[52] The perspectival flip of inside and outside in the opening becomes a conceptual destabilization distinctions between lithosphere and atmosphere, container and contained: "in our world, such distinctions were always provisional, arbitrary, since the consistency of the elements changed continuously, and at a certain point we would notice that our sky was hard and compact, a boulder crushing us, whereas our earth was a sticky glue, churned up by whirlpools, pullulating with bursting bubbles." In a remarkable image of dwelling in the geologic, Calvino depicts Qwfwq and Rdix surfing magma within the restless upwellings and burials that drive the rock cycle: "every seepage that headed towards the core undermined other material and forced it to rise up towards the surface: at times as we plunged down we would be caught up in the wave that spurted towards the upper layers, curling around itself as it did so."[53] Calvino's cosmicomic narrative bodies forth what Cohen calls a "geophilic Long Ecology" characterized by "an ethics of relation and scale" that "mandate[s] a cautious *living with* that looks deep into time" and situates humans as environmental actors "coextensive with […] carbon, glaciers, aerial and marine currents, geographical strata, expansive biomes."[54] In calling out the limited view humans have of the Earth while depicting lives rooted in geologic processes, Calvino also evokes a geologic genealogy of humanity. As Jane Grant succinctly puts it, "In narrating a life below the earth, in the deep interstices of the body of our planet, amongst the crystal groves and striated structure of soils, rocks and roots," "The Stone Sky" reminds us that "We are deeply entangled with the body of the earth and not only the surface, the atmosphere, the air, but the weighty body of dense matter."[55]

In the context of the geologic turn, the perspectival flip of prioritizing Qwfwq's viewpoint of human life from within the Earth figures a reframing of homo sapiens as a geologic species,

[50] Ibid., 336.
[51] Ibid., 336, 332.
[52] Ibid., 333.
[53] Ibid., 333.
[54] Cohen, *Stone*, 41.
[55] Jane Grant, "'The Stone Sky': Dwelling and habitation in other worlds," *Technoetic Arts: A Journal of Speculative Research* 12, nos. 2–3 (2014): 331–32.

granting temporal and logical priority to the geological over the biological. Calvino's story may be read as expressing a key tenet of what Elizabeth Provinelli calls "geo-ontologies": namely, that "Nonlife created what it is radically not, Life, and will in time fold this extension of itself back into itself…. Life is merely a moment in the greater dynamic unfolding of Nonlife."[56] In the story, reversing the nonlife-life relation is figured as Qwfwq's desire to reach the center of the Earth, in order to seed a geologic re-birth of life:

> We were the progenitors of life on Earth and for this reason we had to make it liveable from its core outwards, gradually extending our condition to the rest of the globe. We were headed towards *earthly* life, that is to say life of the Earth and on the Earth; not towards what pops up from its surface and which you call life on Earth but which is just a mould spreading its spores over apple's wrinkled skin.[57]

Calvino's geologic reframing of the descent into the underworld finds a resonant comparison in Michel Serres' reading of Jules Verne's *Journey to the Center of the Earth*. Serres calls Verne a "master of Mythology" and portrays the text as "an *Orphic* narrative" in which "it is no longer a question of interrogating the shadow of shadows, or the goddesses of Death, but of contemplating original, proto-historical life, guilelessly displayed in front of you, like a book of lived paleontology."[58] In terms of contemporary science, Calvino's motif of "*earthly* life" adumbrates a turn in geology to studying the permeable borders between life and nonlife, visible in interdisciplinary fields such as geobiology, or Robert Hazen's theory of mineral evolution, which traces how "rock begets life, life begets rocks" in contexts including "the great global-scale process of plate tectonics, by which wet crustal rocks are recycled into the mantle by subduction," which creates conditions culminating in "increased mineral diversity to perhaps 1500 species formed by purely physical and chemical processes."[59]

"The Stone Sky" creates a complex temporal mesh of history, myth, and geology that may be read as an early avatar of what David Farrier terms an "Anthropocene poetics." Calvino's depiction of Qwfwq and Rdix inhabiting unstable strata and negotiating the rock cycle provide almost hilariously literal metaphors for Farrier's marking the Anthropocene in terms of "how humanity has radically intruded in deep time, the vast time-scales that shape the Earth system and all the life forms that it supports."[60] In the conclusion of the story, Calvino creates a temporal and generic mash-up when he conflates retelling the Orpheus myth with recounting the 79 AD eruption of Vesuvius from a geologic point of view. In Calvino's inversion of the myth, where Qwfwq-Pluto wants to rescue Rdix-Eurydice from the upper world, Qwfwq finds an opportunity to gain access to the planet's surface ("invade the external with the internal") when he sees "lava gathering the volcanic caverns, the way it pressed up the vertical conduits of the Earth's crust."[61] After the eruption produces a "decapitated Vesuvius," Qwfwq rides the pyroclastic flow as lava engulfs Herculaneum and delivers him to a house with an "architrave" identifying it as the home of

[56] Elizabeth Provinelli, *Geontologies: A Requiem to Late Liberalism* (Durham : Duke University Press, 2016), 172.
[57] Calvino, *Complete Cosmicomics*, 334.
[58] Michel Serres, "Loxodromes of Extraordinary Journeys," in *Hermes I: Communication* (Paris: Éditions Critique, 1968), 178. Original emphasis, my translation.
[59] Robert Hazen et al., "Mineral Evolution," *American Mineralogist* 93 (2008): 1702–03.
[60] David Farrier, *Anthropocene Poetics: Deep Time, Sacrifice Zones, and Extinction* (Minneapolis: University of Minnesota Press, 2019), 6.
[61] Calvino, *Complete Cosmicomics*, 338.

Orpheos, a "hollow" architectural "shell" "deliberately made to gather music."[62] When he enters and finds Rdix, she opens a heavy curtain, exposing the isolated inner sphere of Orphic music to an outer sphere, and "a carapace of noise extended from there outwards over the surface of the globe." In an image of embedded timescales, the inner mythic sphere is enveloped within the noise-polluted atmosphere of contemporary Naples:

> with aerials hoisted on roofs transforming the invisible and inaudible waves that pervade space, transistors stuck to your ears filling them at every second with the acoustic glue without which you don't know whether you are alive or dead, jukeboxes that store and spew out sounds, and the endless siren of the ambulance collecting hour by hour those injured in your endless carnage.[63]

The "acoustic glue" and chaotic cityscape underscore Calvino's resistance to the frenetic pace of urban modernity, and also herald an Anthropocene atmosphere permeated—one should rather say mediated—by sounds, signals, and technology, in which, as Parag Khanna writes, "the skies are cluttered with airplanes, satellites, and increasingly drones, layered with CO2 emissions and pollution, and permeated by radar and telecommunications."[64] The abrupt seismic shifts in the closing pages of "Stone Sky" inscribe a queer stratigraphy in the timeless mythic world, sandwiching together geologic processes and eruption, an animated archaeological excavation of classical history, and the modern city. Calvino's text epitomizes the Anthropocene as an epoch in which, as Farrier writes, deep time has become "both an astonishing and disorienting—and a familiar—element in the everyday."[65]

In imagining narrative embodiments of a thawing and mobilization of stone, entanglement of rocks and life, and a lively, volatile Earth, Calvino's postmodern geo-mythologies resonate with the posthuman geologic turn and may be seen as precursors of geologic speculative fiction. Here titular coincidence invites comparison of Calvino's story to N.K. Jemisin's *The Stone Sky*, the concluding work in her *Broken Earth Trilogy* (2015–2017). Like Calvino, Jemisin depicts a volatile, heaving Earth, populated by creatures in varying forms of petrification who forge various relations with seismic forces. However, important contrasts emerge between the writers' textual universes. While Calvino's characters are mythic avatars of humans, able to inhabit interstitial realms within the Earth but subject to being tossed about in the rock cycle, Jemisin's characters include lithic hybrids who have the ability to manipulate telluric forces and travel through the lithosphere. Orogenes are humans who have "the ability to manipulate thermal, kinetic, and related forms of energy to address seismic events," including causing or stopping earthquakes, while Stone Eaters are "a rarely seen sentient humanoid species whose flesh, hair, etc., resembles stone,"[66] and who subsist on rocks and can tunnel instantaneously solid rock as if it were air. In what we might term Calvino's pre-Anthropocene world, a clear separation remains between human and geologic scales: humans live on the Earth oblivious to the geologic forces and epochal events within its depths, which are narrated and navigated by Qwfwq, a character who is in Comparini's words, a disembodied "character […] reduced to the degree of personae or linguistic signs."[67] In Jemisin's

[62] Ibid.
[63] Ibid.
[64] Parag Khanna, *Connectography: Mapping the Future of Global Civilization* (New York: Random House, 2016), 15.
[65] Farrier, *Anthropocene Poetics*, 6.
[66] N.K. Jemisin, *The Stone Sky* (New York: Orbit, 2017), 410, 413.
[67] Comparini, *Ovid's Metamorphoses in Twentieth-Century Italian Literature*, 262.

post-Anthropocene world, no such separation exists: life and humans were a "strange emergence" on the surface of "Father Earth," who nurtured them with temperate climate and regular seasons, until "people began to do horrible things" to him including poisoning waters, killing other life, drilling his crust, and "destroyed his only child," the moon.[68] Father Earth responds by initiating a "Shattering Season," and the trilogy unfolds in a threatening world where earthquakes, volcanic eruptions, and acid rains occur regularly. While geologic cataclysms intervene in and affect the course of the lives of the cosmicomic avatars of mythic characters in Calvino's stories, humanity remains relatively unaffected on the planetary surface. In contrast, in Jemisin's texts a vengeful Father Earth unleashes geologic catastrophes on the peoples who have damaged him, enacting what Isabelle Stengers calls "the intrusion of Gaia" in the material conditions that shape the human condition.[69]

It is only in his final version of the Orpheus myth, "L'altra Euridice" ("The Other Eurydice," (published in 1980), that Calvino exposes what could be considered the full Promethean aspiration of Anthropocene humanity. A rewrite of "The Stone Sky," the most substantial change in this iteration is Qwfwq's voicing what could be called a will to geologic power. Right after a passage expressing Qwfwq and Rdix's goal to irradiate terrestrial life from the center of the Earth nearly identical to the one in "Stone Sky," Qwfwq reveals a vision of "plutonic cities we meant to found rising under basalt skies."[70] Rather than seed terrestrial life in a kind of terraforming of Earth, the pair aspire to transform the planet completely: "What we wanted was a living-body-city-machine that would grow and grow until it filled the whole globe, a telluric machine that would use its boundless energy in ceaseless self-construction, combining and transforming all substances and shapes, performing, with the speed of a seismic shock, the work that you without have had to pay for with centuries of sweat."[71] Like all transformations, this one would be fueled by cosmicomic desire: the "living-body-city-machine" would be inhabited by "beings like ourselves, giants stretching out their powerful arms across wheeling skies to embrace giantesses, who, with the rotating of concentric earths, would expose themselves in ever new attitudes giving rise to ever new couplings."[72] Calvino's geologic couplings are a literary embodiment of *geophilia*, which Cohen defines as "an affective interspace where the agency of stone and human ardor meet in mutual relation, in cross-ontological embrace."[73]

If Calvino presents a very Anthropocene-sounding ambition here, he does so in a celebratory rather than critical fashion. Qwfwq imagines the "living-body-city-machine" as a kind of melodic dynamo, which will yield a "ceaseless music of the world, harmonizing the deep voices of the elements," and fulfill a utopian desire to show humans "how mistaken your way is, your life where work and pleasure are at odds, where music and noise are two different things."[74] In *The Stone Sky*, Jemisin depicts something very similar to Calvino's "living-body-city-machine" in the form of the lost civilization of Syl Anagist, which was to be fueled by a "Plutonic Engine," an instrument designed to channel the power of the Earth and "establish an energetic cycle of infinite efficiency."[75] In contrast to Calvino's celebratory tone, Jemisin demonstrates how the will to

[68] N.K. Jemisin, *The Fifth Season* (New York: Orbit, 2015), 379–80.
[69] Isabelle Stengers, *In Catastrophic Times: Resisting the Coming Barbarism*, trans. Andrew Goffey (London: Open Humanities Press), 2015.
[70] Calvino, *The Complete Cosmicomics*, 396.
[71] Ibid.
[72] Ibid.
[73] Cohen, *Stone*, 252.
[74] Calvino, *The Complete Cosmicomics*, 396.
[75] Jemisin, *Stone Sky*, 97.

geologic power depends on technological hubris and racial subjugation: as the history of Syl Anagist unfolds, it is revealed that Orogenes descend from a group of genetically modified beings created for the sole exploitative purpose of tuning the Plutonic Engine; in other parts, Orogenes, referred to with racist contempt as "Roggas," are shown to be subjugated, mutilated, and raped, even as their physical powers are instrumentalized to quiet seismic quakes.

Critics conventionally have divided Calvino's career between neorealist and fabulist phases, and in the context of the geologic turn, we would note that there is a scale difference between his early social critique and later mytho-cosmic narratological experiments. The latter unfold on a decidedly planetary scale and decenter anthropocentric figurations of life through a mythic lens. Interestingly though, the case can be made that Calvino's most critical writings about social and environmental developments that would become known as the Anthropocene actually occur in his early works.[76] By contrast, the separations between human versus geologic scales on the one hand, and exposure of social and racial inequalities versus planetary narratives on the other, simply do not exist in Jemisin's trilogy. Jemisin, the first African-American writer to win a Hugo Award for Best Science Fiction Novel (all three works in the trilogy won the award in consecutive years, another first), demonstrates the deep structural affinities between racial and environmental injustice. As María Ferrández San Miguel succinctly summarizes, "rather than simply extending the ethos of humanism, the [*Broken Earth* trilogy] embraces and brings to the fore the liberating potential of the posthuman figuration, disrupts the nature/culture divide and promotes a posthuman form of ethics as the path towards regeneration."[77]

It is interesting to consider whether Calvino's geologic writings espouse a posthuman ethics. As we have seen, the *Cosmicomics* clearly operate on posthuman scales and disrupt the divide between nature and culture. In terms of ethics, Kathryn Hume argues that these stories induce an experience of wonder in readers that carries inherent ethical value: "For all that Calvino may not be thinking explicitly in terms of alternatives to power, he has produced one" in the *Cosmicomics.* For Hume, Calvino's text demonstrates that, "Pleasure comes from emotional response to one's surrounds, to the universe, not from amassing wealth or the ability to force others to do what one orders. One derives one's pleasures from sensations and experiences that belong to everyone and to no one. These experiences are free, if only we would learn to value them."[78] Following Hume, we could conclude that Calvino's geo-poetic worlds, in eliciting wonder, express a Stoic ethics that decenters the human and invites the individual to reframe their desires within a cosmic perspective. While they do not propose a posthuman politics, they also do not remain rooted in traditional humanism.

Calvino's worlds composed of rocks, the petriverse he figures forth in "Lightness" in the *Six Memos*, and the Orpheus tales in the *Cosmicomics* display all the complexity and ambivalence of his work. His desire to elude petrification by the world conveys mixed feelings about the social realities of human life, an ambivalence that plays out in his balancing airy abstraction and concrete images, a love of lightness and dread of the weight of the world. If Calvino's petriverse in the sense of *worlds* composed of rocks at times reveals an opposition between narrative lightness and

[76] See Serenella Iovino, "Sedimenting Stories: Italo Calvino and the Extraordinary Strata of the Anthropocene," *Neohelicon: Acta Comparationis Litterarum Universarum* 44, no. 2 (December 1, 2017): 315, doi:10.1007/s11059-017-0396-7.

[77] María Ferrández San Miguel, "Ethics in the Anthropocene: Traumatic Exhaustion and Posthuman Regeneration in N. K. Jemisin's *Broken Earth* Trilogy," *English Studies*,101, no, 4 (2020): 471–86.

[78] Kathryn Hume, *The Metamorphoses of Myth in Fiction Since 1960* (London: Bloomsbury, 2020), ebook.

material heaviness, Calvino's petriverse in the sense of *words* composed of rocks often conflates language and matter.

Words Composed of Rocks: Stones and Signs

We have seen how Calvino evokes a flat ontology in the *Six Memos* consistent with many "new materialisms." When these materialisms mesh with the vitalist sense of matter Calvino conveys in his reading of Cyrano in "Lightness" and the biological tales in *Cosmicomics*, they yield an ontology that could be conceptualized as a hybrid "animaterialism" in which strands of animism and panpsychism converge.[79] Calvino's animate cosmos, his imagining of awareness in matter and attribution of living qualities to things, is of course composed of language. Calvino's ontology, one might say, posits a vibrant, living language full of creative power, and senses the world in bio-semiotic terms. The *Six Memos* conclude with Calvino wondering, "what if it were possible for a work to be conceived beyond the self, a work that allowed us to escape the limited perspective of the individual ego, not only in order to enter other similar selves but to give voice to that which cannot speak—the bird perched on the gutter, the tree in spring and the tree in autumn, stone, cement, plastic."[80] Here Calvino's words implicitly reference the work of his friend Francis Ponge, the poet who gave voice to things, who brought out the words they had within, including "The Pebble," a geo-poetic tour-de-force. The desire Calvino expresses to "go beyond the self" has become part of the decentering of the human so central to the geologic turn, and the notion of "giving voice to" nonhuman agencies pervades environmental humanities and literature.

In his acute observation of natural forms and sense of ceaseless transformation, Calvino also anticipated a deep sense for what environmental humanities scholar Serpil Opperman terms "Storied Matter," which, as Opperman notes, "basically underlines the idea that matter is not only lively, agentic and generative, as it is theorized in the new materialist paradigm, but also densely storied. It describes the idea that from its deepest lithic and aquatic recesses to the atmospheric expanses, and from subatomic to cosmic realms, matter is capable of bringing forth a display of eloquence."[81] A wonderful example of Calvino's "bringing forth a display of eloquence" from matter occurs in *Inivisible Cities*: Kublai Khan's attempt to use the chessboard as an abstract generative model of his Empire ultimately is "reduced to a square of planed wood: nothingness." In contrast to Khan's reduction of the chessboard square to a semiotic cipher, Marco Polo reads it as storied matter: "Then Marco Polo spoke: 'Your chessboard, sire, is inlaid with two woods: ebony and maple. The square on which your enlightened gaze is fixed was cut from the ring of a trunk that grew in the year of a drought: you see how its fibres are arranged? Here a barely hinted knot can be made out: a bud tried to burgeon on a premature spring day, but the night's frost forced it to desist.'"[82]

This lyrical close reading of the chess square expresses Calvino's acute study of the natural world, including his love of trees. His bio-semiotic disposition fits well with Gilles Deleuze's notion of apprenticeship as an apprenticeship to signs, in which "to learn is first of all to consider a substance…as if it emitted signs to be deciphered, interpreted…. One becomes a carpenter only

[79] Harris, "Stoned Thinking," 139–40.
[80] Calvino, *Six Memos*, 151–52.
[81] Serpil Opperman, "Storied Matter," in *Posthuman Glossary*, ed. Rosi Braidotti and Maria Hlavajova (London: Bloomsbury Academic, 2018), 394–419.
[82] Italo Calvino, *Invisible Cities*, trans. William Weaver (New York: Harcourt Brace, 1972), 131.

by becoming sensitive to the signs of wood."[83] The apprentice's relation to material—one of humility, excitement and expectation—aligns clearly with an animistic ontology. The passage from *Invisible Cities* demonstrates the link between Calvino's meta-fictional semiotic side and the animistic sense of a world composed of storied matter.

We may examine how these strands coalesce in a geo-poetic essay in *Collezione di sabbia* (1984, *Collection of Sand*), "I mille giardini" ("The Thousand Gardens"). Here, the link between stones and language is made from the outset. Calvino begins by describing "a path made of irregular stone slabs" that is "*the raison d'être* of the garden, the main theme of its discourse, the sentence that gives meaning to its every word." "But," he asks, "what meanings?"[84] Calvino then both describes and enacts—in elegant, deliberate, incremental sentence segments—a central element in Japanese garden design: how each stone, each step, provides a new perspective; how, at each step, a new landscape takes shape; and how "each scenario in turn is broken down into views that take shape as soon as one moves," culminating in the realization and experience that "the garden multiplies into endless gardens."[85]

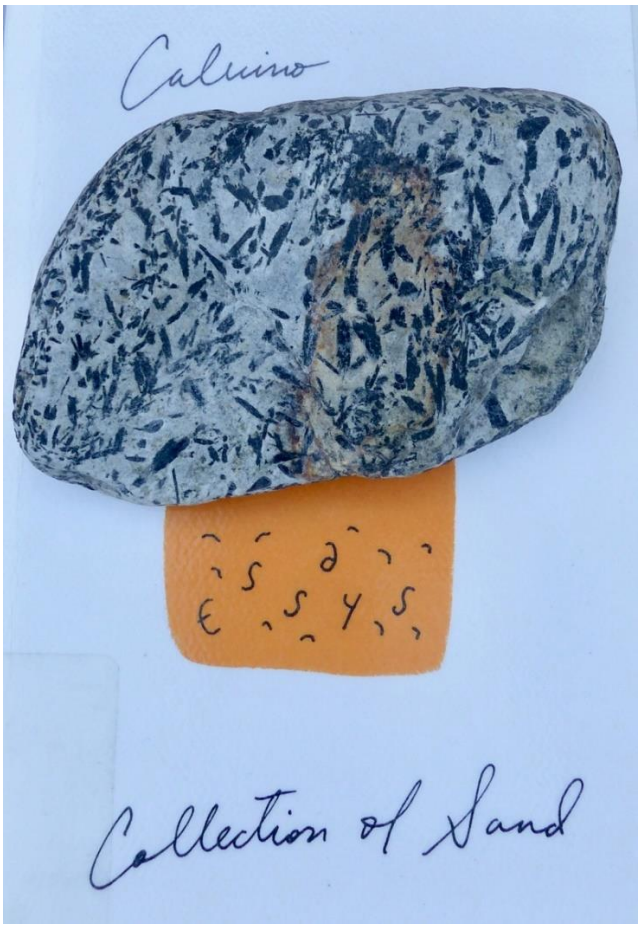

Fig. 3. *Pierre Jardin, Collection of Sand and Asemic Stone*, 2022.

[83] Gilles Deleuze, *Proust and Signs*, trans. Richard Howard (London: Athlone Press, 2000), 4.
[84] Calvino, *Collection of Sand*, 169.
[85] Ibid., 170.

The garden is a fractal, a whole that cannot ever be seen all at once, a whole in which each part composes its own whole, a world in which perspective performs abrupt scale shifts—zoom in on a part, and it magnifies into its own whole. Having evoked the garden that "multiplies into endless gardens," Calvino then effects a brilliant scale shift in the next paragraph, from the path of stones to each individual stone. The same multiplicative potential resides in each stone: "the human mind has a mysterious mechanism whereby we are convinced that that particular stone is always the same stone, even though its image—at the slightest movement of our gaze—changes shape, dimensions, colour, outlines." In Calvino's petriverse (words composed of rocks), the potentially infinite transformations of a stone correspond to the endless permutations of letter-atoms: "The polymorphic visions of the eyes and the spirit find themselves embodied in uniform lines of lower- and uppercase letters, of periods and commas and parentheses. These pages of signs, as dense as grains of sand, represent the variegated spectacle of the world upon a surface that is always the same and always different, like dunes driven by the desert wind."[86]

The potentially endless permutations of signs and infinite multiplication of gardens are only brought to a halt by mortality and the weight of the world. In "The Thousand Gardens," Calvino arrests the "endless" multiplying of gardens in a fascinating fashion: by noting that there are precisely 1,716 stones on the path. In a final, meta-conceptual reversal, the stones are seen as "a device for multiplying the garden, but also for removing it from the vertigo of the infinite."[87] He concludes the essay and this line of thought by recounting a story about the great tea master Senno Rikyu, who deliberately obscured a view of the sea with hedges so that the visitor could only see it when they bent down to take water from a pond. Calvino imagines that "Rikyu's idea was probably this: bending down over the pond and seeing his own image shrunk in that narrow stretch of water, the man would consider his own smallness; then as soon as he raised his face to drink from his hand he would be dazzled by the immensity of the sea and would become aware that he was part of an infinite universe." "But," Calvino acknowledges, "these are things that are ruined if you try to explain them too much. To the person who asked him about why he had built the hedge, Rikyu would simply quote the lines of the poet Sogi: 'Here, just some water, / There amidst the trees / The sea!'"[88]

In a similar vein, while rocks and sand stand for potentially endless transformation, the erosion of rocks to sand and stone as such both epitomize for Calvino the weight of the world, as noted at the outset of this essay. Calvino's sense of a world in decline at this time is figured as geologic erosion via the titles of the essay collections *Una pietra sopra* (1980, *The Uses of Literature* [literally "a stone on top"]) and *Collezione di sabbia*: in his introduction to the latter volume, Martin McLaughlin observes that "the image of rocks eventually turning to sand, emblematic of the slow passing of geological eras, is a cosmic theme apparent in the writer's other works," and points out that "The unitary stone of the first title has given way to the granules of sand in the second, the latter image reflecting the author's own fragmentation and perplexity in the face of an ever more rapidly changing world."[89] Geologic erosion in fact embodies mortality in a singular manner captured acutely by Ponge, who, at the end of "The Pebble," proposes that "contrary to

[86] Calvino, *Six Memos*, 121.
[87] Calvino, *Collection of Sand*, 171.
[88] Ibid., 172.
[89] McLaughlin, "Translator's Introduction," vii–viii.

[the] customary view of it as a symbol of duration and impassability, we may say that since stone does not recreate itself in nature it is the only thing that is constantly dying."[90]

Calvino concludes the titular essay in *Collection of Sand* with a rumination on mortality and writing. In a reflection on sand and signs that stands in stark contrast to the passage from the *Six Memos* celebrating the expression of "the polymorphic visions of the eyes and the spirit" expressed in "pages of signs, as dense as grains of sand," Calvino asks himself "what is expressed in that sand of written words which I have strung together throughout my life, that sand that now seems to me to be so far away from the beaches and deserts of living?" He manages to strike a characteristically poignant, delicate balance: "Perhaps by staring at the sand as sand, words as words, we can come close to understanding how and to what extent the world that has been ground down and eroded can still find in sand a foundation and model."[91] In the context of the geologic turn, this passage provides perhaps Calvino's most apposite memo from the old millennium to the new. The fixed gaze has shifted from stone and the Medusa to sand and language. Calvino's sobering call to pause, to recalibrate and rethink how to rebuild a ruined world from the bottom-up, provides an emblematic figure for the writer today.

The Petriverse of Italo Calvino concludes with a note of hope in the wake of this subtle speculation. Having crumbled completely, reduced to considering grains of sand as a possible "foundation" or "model," Calvino implicitly holds out hope for the next turn in the rock cycle. The entropic breakdown and decay of stone to sand has finished; what negentropic process or act can reverse this course, and assemble grains of grit into new forms? While in "Lightness" a pessimistic Calvino evokes a world in the process of petrification, in "Quickness" he imagines a way both to counter his disconsolate disposition and to transform formless rock into functional stone. Acknowledging that he is "a saturnine man who wants to be mercurial." Calvino portrays two opposing sides of his writing self in terms of Mercury's "mobility and swiftness" that "imbue meaning" and Vulcan's "concentration and craftmanship" that sustain his "endless labors" with "shapeless mineral gangue."[92] Calvino's stipulation that "A writer's labor involves keeping track of […] Mercury's time and Vulcan's time" translates today as the Anthropocene writer's work to relate human and geologic scales.[93]

Calvino concludes "Rapidità" by describing how these temporal dimensions of the writer's labors resolve and come to fruition: "a message of spontaneity obtained by means of patient, meticulous adjustments; a flash of insight that immediately takes on the finality of that which was inevitable." He then offers as exemplary story Zhuang Zhou demanding ten years of preparatory time, at the end of which "he took his brush and in an instant, with a single flourish, drew a crab, the most perfect crab anyone had ever seen,"[94] If this geologic juncture in human history issues Calvino's call to "find in sand a foundation and model," and "a flash of insight" is needed to find meaning and give shape to the shapeless, perhaps a fitting final petric image may be found in this display of fulgurite.

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[90] Francis Ponge, "The Pebble," in *Selected Poems*, trans. C.K. Williams, John Montague, and Margaret Guiton (Winston-Salem, NC: Wake Forest University Press, 2003), 99.
[91] Calvino, *Collection of Sand*, 9.
[92] Calvino, *Six Memos*, 63, 64–65.
[93] See for example Marco Caracciolo, et al. *Narrating Nonhuman Spaces : Form, Story, and Experience Beyond Anthropocentrism*. Routledge, 2021.
[94] *Invisible Cities*, 65.

Fig. 4. Pierre Jardin, *A Lightning Flash of Insight*, 2022. Pierre Jardin found this fulgurite in the Yuha desert. Popularly called "lightning glass," it is created when silica is vitrified (heated and melted) by a lightning strike. Jardin found it shocking to think of a rock formed by a lightning bolt. Picturing the rock's creation, Jardin realized that the rock formed in the brief, dreadful silence after a rumble of thunder and before a flash of lightning, in this case striking the desert sand. In tribute, he mounted the fulgurite on a small rock found nearby, with a white mineral streak that neatly conjures a lightning bolt.