

STONE TELLING

Cloudy

CONVERSING WITH STONES
READING GROUP SESSION

cloudy

WRITING RITUALS
COLLECTIVE WRITING SESSION

is the stuff



of stones



26.5.–28.5.2021

GLASS PAVILION

[HTTPS://STONE-TELLING.SPACE](https://stone-telling.space)

STONE TELLING

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it's not a



of stones

For a long time, stone has served as a symbol for nature stilled into mere resource, to be mined and put to use. Stone is supposed to exist quietly in the background of the green-screen landscape, as dead matter. STONE TELLING is a coming together for conversation, reading, writing and performances, exploring what stones hold and how stuff supposedly lingering in the background can help us understand the world around us.

Thinking with Ursula K. Le Guin's Carrier Bag Theory of Fiction and the notion of the bag as a thing that holds another thing, we'll be wondering how we can ground ourselves on unsolid grounds. How do we build in collaboration with stones, how do stones relate to words and what can we learn from the geologic?

PS: please feel invited to put on headphones

open <https://stone-telling.space>

and listen to the soundscapes while you are reading <3

is the stuff

READER

Ursula Le Guin, Being taken for granite
Jeffrey Cohen, Geophilia, or The Love of Stone
Jane Bennett, Earthling, Now and Forever?
Ursula Le Guin, Carrier Bag Theory of Fiction
Astrida Neimanis, On Becoming a Body of Water
Eleanor Arnason, The Grammarian's Five Daughters
Pauline Julier and Emanuele Coccia, A Conversation
Jan Zalasiewicz, The Planet in a Pebble: Futures
Marcia Bjornerud, Timefulness: A geologist's story
Wisława Szymborska, Conversation with a Stone
Pamela August Russel, The Plight
Richard Wilbur, Epistemology
Naomi Shihab Nye, Hidden
Alice Walker, We Alone Can Devalue Gold

RITUALS

Ritual 1 Describing a Stone
Ritual 2 Collecting Words
Ritual 3 Alphabeth of Stones
Ritual 4 Words within Words

STONE TELLING SCHEDULE

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26.5.2021

12:00 Listen, Sit, Smell irl, just pass by

15:00 A Stone's Story, Sigrún Sveinsdóttir, Performance irl + stream

17:00 Moss Doesn't Grow..., Helena Keskküla, Performance irl + stream

19:00 Softcore Reading Broadcast

20:00 Softcore Reading Group Session irl

27.5.2021

12:00 Listen, Sit, Smell irl, just pass by

14:00 Collective Writing Rituals Session irl + stream

20:00 Writing Rituals Broadcast &
Soft Launch Instant Publication irl, just pass by

28.5.2021

11:00 Mineral Flow, Marit Mihklepp, Workshop irl

14:00 Gold Pleated, Marisa Torres Rodriguez, Performance irl + stream

15:00 Blood from a Stone, Cóilín O'Connell, Screening stream

16:00 XXX, Tal, Performance irl + stream

17:00 Listen, Sit, Smell irl, just pass by

STONE TELLING
A READER

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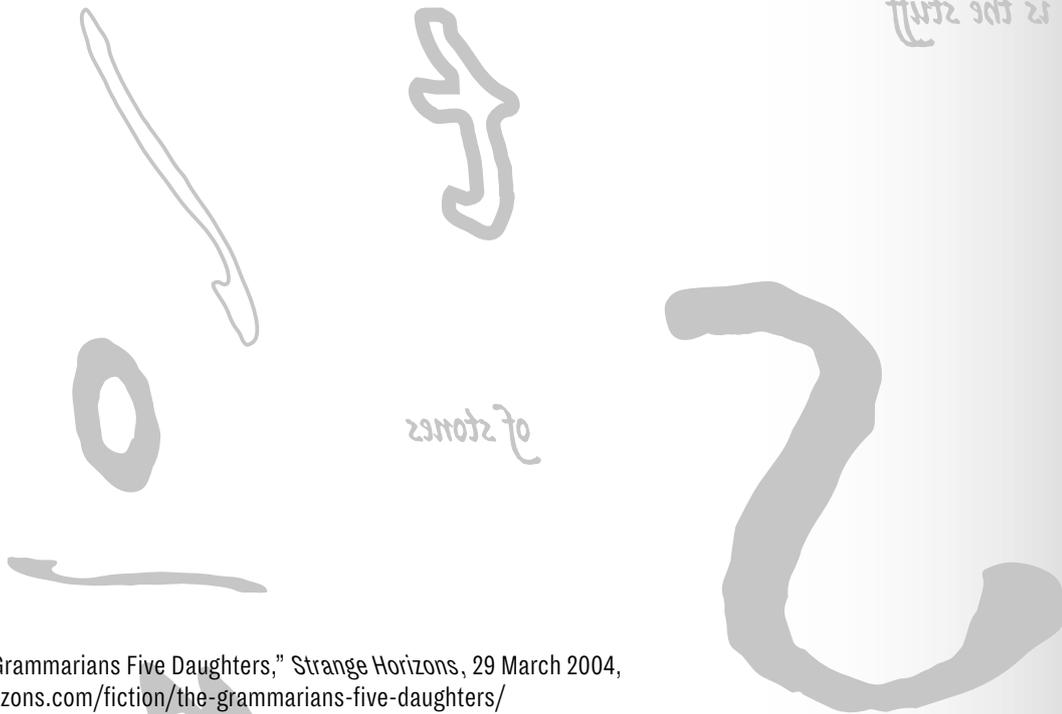
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BEING TAKEN FOR GRANITE

Ursula K. Le Guin

Sometimes I am taken for granite. Everybody is taken for granite sometimes but I am not in a mood for being fair to everybody. I am in a mood for being fair to me. I am taken for granite quite often, and this troubles and distresses me, because I am not granite. I am not sure what I am but I know it isn't granite. I have known some granite types, we all do: characters of stone, upright, immovable, unchangeable, opinions the general size shape and pliability of the Rocky Mountains, you have to quarry five years to chip out one little stony smile. That's fine, that's admirable, but it has nothing to do with me. Upright is fine, but downright is where I am, or downwrong.

I am not granite and should not be taken for it. I am not flint or diamond or any of that great hard stuff. If I am stone, I am some kind of shoddy crumbly stuff like sandstone or serpentine, or maybe schist. Or not even stone but clay, or not even clay but mud. And I wish that those who take me for granite would once in a while treat me like mud.

Being mud is really different from being granite and should be treated differently. Mud lies around being wet and heavy and oozy and generative. Mud is underfoot. People make footprints in mud. As mud I accept feet. I accept weight. I try to be supportive, I like to be obliging. Those who take me for granite say this is not so but they haven't been looking where they put their feet. That's why the house is all dirty and tracked up.

Granite does not accept footprints. It refuses them. Granite makes pinnacles, and then people rope themselves together and put pins on their shoes and climb the pinnacles at great trouble, expense, and risk, and maybe they experience a great thrill, but the granite does not. Nothing whatever results and nothing whatever is changed.

Huge heavy things come and stand on granite and the granite just stays there and doesn't react and doesn't give way and doesn't adapt and doesn't oblige and when the huge heavy things walk away the granite is there just the same as it was before, just exactly the same, admirably. To change granite you have to blow it up.

But when people walk on me you can see exactly where they put their feet, and when huge heavy things come and stand on me I yield and react and respond and give way and adapt and accept. No explosives are called for. No admiration is called for. I have my own nature and am true to it just as much as granite or even diamond is, but it is not a hard nature, or upstanding, or gemlike. You can't chip it. It's deeply impressionable. It's squashy.

Maybe the people who rope themselves together and the huge heavy things resent such adaptable and uncertain footing because it makes them feel insecure. Maybe they fear they might be sucked in and swallowed. But I am not interested in sucking and am not hungry. I am just mud. I yield. I do try to oblige. And so when the people and the huge heavy things walk away they are not changed, except their feet are muddy, but I am changed. I am still here and still mud, but all full of footprints and deep, deep holes and tracks and traces and changes. I have been changed. You change me. Do not take me for granite.

GEOPHILIA, OR THE LOVE OF STONE

Jeffrey Cohen

The love of stone is often unrequited.

An intimacy of long unfolding fails to be apprehended, and the story concludes in familiar solitudes, human exceptionalism and lithic indifference. Withdrawal and remoteness are inevitable themes within any romance of stone, since rock outlasts that which it draws close, that which draws it close, that to which it is strangely bound. Humans respire, reproduce, invent, desire and dream. The lithic inhabits the secret interiors of the earth. What could be more cloistered? Inorganic, nothing like the familiar animals we conditionally welcome into community, an everyday material that surfaces blunt rebuke to assimilation, stone remains aloof. Yet a mutuality is always possible, some narrative of companionship and concurrency. This essay maps geophilia, a pull, a movement, and a conjoint creativity that breaches ontological distance. Even if born of a general principle of matter, geophilia's mobility and clasp possess their own rocky effects, in the quadruple sense "effects" carries of aftermath, agency, production, and belongings. An elemental geophilia surely exists outside human experience. Yet to us nonlithics, its force will be most evident in the relations that enmesh us over long scales of time and in the "storied matter" these confederations of the human and inhuman divulge.¹

Monstrous child of the meeting of incompatible scales, queer progeny of impossible taxonomic breach, geophilia is the lithic in the creaturely and the lively in the stone. Humans walk upright over earth because the mineral long ago infiltrated animal life to become a partner in mobility. Vertebral bone is the architect of motion, the stone around which the flesh arranges itself to slither, run, swim and fly. Had the organic not craved durable calcium as shield and conveyor, numerous types of sedimentary rock would never have arrived. A common mode of petrogenesis (creation of stone) unfolds when tiny ocean dwellers settle in their mortuary billions to the subsea muck.

Limestone is a thick cemetery of mineral that had become animal now become rock again. Propelled by slow tectonic force upward into cliff and mountainside, limestone might be quarried to build a radiant carapace under which humans pray, govern and make purchases.

The whorls and coils of unfamiliar sea life such stone divulges have fascinated masons since at least Neolithic times. We create art with stone because we recognize the art that stone discloses: fossils, a museum of strata, lustrous veins and faceted radiance. We think and reckon with stone, primordial invitation to extended cognition (calculus is the Latin word for small stone, an essential component of an abacus). With its keen heft we compose and kill. From rock we construct graves, memorials, and dwelling places to endure long after we become earth again. In its aeonic endurance we discern something ardently desired, something ours only through alliance. Stone is devoid of neither life nor love, even if it questions what we mean when we use those terms to enclose a small world.

Expansive, dilatory, recursive, semicyclical from a long perspective, full of residuum, temporal intimacies, intermixed strata, geophilia entwines the modern and the ancient, the contemporary and the medieval, the primordial with expansive futurity. Its pull and grip can render Noah's Flood difficult to tell from the Permian Extinction. Even if one event is apportioned from eternity and the other from infinity, one from theology and biblical narrative, the other from geology and astrophysics, both are modes of conceptualizing deep time that stress the demarcative power of catastrophe, lithic impress, a fossil record of monstrosity, the thriving of life in cataclysm's wake, the burgeoning of story, a dense and propulsive archive. Classical and medieval writers might not have conceptualized the formation of stone in our geophysical terms, but their ecomaterial envisioning's proceeded in modes just as vivid and capacious, through narratives stressing ecological entanglement as well as powerful solitudes. Premodern lapidary science hypothesized that every stone combines in variable proportions two restless elements, earth and water. Some rocks might contain ethereal emanations (vapors, lightning bolts). Others, like the red gem known as carbuncle, hold fire. Many originate in the bodies of animals, productions that conjoin the petric and carnal. Although rock might arise from seeming stasis, as in the Roman naturalist Pliny's description of crystal petrifying over long years from mountain ice, a stone always conveys the astral, material, and ecological influences particular to its point of origin, an inbuilt vibrancy and enduring environmental imprint.

The smallest pebble is upon deeper contemplation a durable link to a dynamic cosmos. Active matter, stone contains energy and radiates agency. Although sometimes withdrawn from the world's lively spaces, the lithic is most often glimpsed in boisterous landscapes. Full of relation, teeming with narrative, stone is seldom inert.

That which is set in stone does not necessarily sit still. The lithic is likely to rebuke the arrogance of expecting the nonhuman to be like us and for us, but imagining the world to be as cold as stone, to be wholly detached from human life, can also accomplish important cultural work, urging a turn to God and the afterlife, or buttressing the anxious autonomy so essential to consumerist capitalism.

The indifference of the earth to its dwellers paradoxically reinforces human exceptionalism, so that the material world comes to exist for our instruction and use. Yet stone refuses to remain fully set apart, to respect taxonomic distinctiveness. Because of its habit of undermining human singularity, of revealing common materiality as well as recurring affinity, to convey within its materiality the thickness of time, stone triggers the vertigo of inhuman scale, the discomfort of unfamiliar intimacy, and the unnatural desires that keep intermixing the discrete. Queerly productive, rock does not offer the easy fecundity of soil, Gaia as mother. Projectile and stumbling block, stone challenges as much as fosters. Life in the lithosphere is complicated, so that minerals flourish in ways that seem creaturely and the environment is prolific in more than biota.

A deep past intimate to thinking the future's advent, a perspec-

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tivism that at once speeds and slows time, geophilia names a reciprocal and intimate bond, signaling attractions, affiliations, and movements toward connection often recognized retroactively, a proliferation of relation most evident over long distance. Lithic intimacy runs slow and deep. Classical and medieval poets discerned in the transition to agricultural modes of civilization and the transformation of gems and metals into coin and marketable goods the advent of modernity. They were just as ambivalent about this transition to commodity capitalism as recent economic materialists have been, and likewise believed that an embrace of wealth and the transformation of materials into a flow of goods alienated humans from nature. Geoffrey Chaucer imagines in his poem “The Former Age” that the first humans lived on berries and nuts. In this legend of the Golden Age they dwell happily in caves, their closeness to the earth emphasizing environmental harmony. They wound the earth through plowing, however, and engender war through mining. Having initiated mercantilism through the exchange power of coins and jewels, stone becomes a resource. Seeking gems in rivers activates “coveytyse” (greed) and brings the first “sorwe” (sorrow).² The naturalist Pliny provides a Roman version, describing how crystal forms when snow compacts in Alpine crevices. Miners suspended on precarious ropes gather these stones from their lonesome homes, and Romans expend fortunes to attain them. This “crazy addiction” to crystal’s radiant sheen spurs the gem’s transformation into objects like goblets and display, unworked, as a coveted form of natural art.³ Crystal, Pliny implies, is best left to its mountain solitude rather than allowed to activate human desires so intensely that the wealthy bankrupt themselves in its pursuit.

Contemporary anthropologists describe the various segments of the Stone Age (from Paleolithic to Neolithic) as a time of special intimacy to that matter. Attentive readers of Genesis, medieval writers believed the first stone architectures were biblical cities like Enoch, founded by exiled Cain and named for his son. Such primordial habitations were visible as ruins during pilgrimage to the Holy Land. Modern science extends our stony fellowship back farther in time, to hominids constructing from gathered stones windbreaks for fire, domesticating both the element and themselves in stone’s good company. These collections of sheltering matter eventually become the hearth, the center of human dwelling. Cresting a ridge and coming upon a rectangle of stone where a medieval home once stood, I learned while hiking in Iceland how forcefully the hearth endures.⁴ Long after a house has vanished its form remains, lasting archeological signal of the refuge found there, lingering declaration of community as a space that coalesces around warmth, shared story, and sheltering stone. The fourteenth-century travel narrative published under the name of John Mandeville invokes this geophilia of origins

and primal dwelling in an account of a cave not far from Hebron. Here we are told that just after their banishment from Eden, Adam and Eve “dwellid in a rooch” (lived within a rock).⁵ In this cavern, likely from its very substance, God formed Adam before being “translated” to Eden. Exiled quickly from paradise, Adam and Eve begot their children in this home of living rock, so that the lithic becomes the space for the first human acts of procreation. A garden lost before nightfall, Eden is a brief stop in a human life fashioned from and spent within stone’s embrace.

The Greek philosopher Empedocles articulated an enduringly influential theory of the elements in which earth, air, fire, and water are drawn and held by philia (love) but cajoled into perpetual movement by a companion force of neikos (strife).⁶ Elemental philia is material magnetism and cosmic glue. Not an allegory for human feeling (though human affect may manifest this environmental energy), love pulls, gathers, and binds, working constantly against strife’s entropy. Material existence is an act of perpetual assertion, generative (new relations are always coming into being) and generous (these relations cross categories and intermix the disjunct). Attachment and attraction inhabit all things as the principle of their formation, as that which enables endurance, inclining matter toward expansive connection. Sometimes these relations enable new flourishings. Sometimes they are perilous. Empedocles ended his life by leaping into the molten rock of Etna, an embrace of stone that incinerated him. To take his theory of elemental restlessness seriously is to apprehend that the world is not centered on the human—not indifferent, not misanthropic, but disanthropocentric, making stories centered upon the human wobble, their trajectories veer.

Geophilia is an ecological allure in the sense developed by Empedocles two and a half millennia ago, a propulsive and conjoining force that draws earth and water into a union generative of stone, which draws stone and other worldly things together to create, compose, produce. Those three verbs are to be understood vvintransitively, proceeding without necessary object.⁷ Some common things generated through human-lithic enmeshment are text, science, place, art, matter, collectivity, architecture and inhabitation. Writing in the early sixth century, the Roman philosopher Boethius framed Empedoclean love as a universal principle of boundary and containment. Attempting to express classical elemental theory within a frame supportive of Christian doctrine, he envisioned a cosmic chain of amor with origin in the eternal. Even when love’s bonds dissolve, the war-like disharmony that results makes sense within a larger pattern of divinely ordered change. As a famous medieval translator of Boethius knew well, such bonds are seldom secure, their failings profoundly troubling.

Geoffrey Chaucer rendered Boethius’s *Consolation of Philosophy* into Middle English, the *Boece*. The influence this translation project exerted upon his future work is extensive. In *The Knight’s Tale* Chaucer places a Boethian meditation on the cosmic order maintained by love into the mouth of Theseus, the imperious ruler of Athens.

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The narrative world of *The Knight's Tale* is limned by catastrophe: gods whose petty squabbles stir earthly tumult; cities smashed to the ground and battles that leave piles of corpses; astral forces that trigger floods, bloodshed, devastating loss. Assuaging the grief of his subjects at the sudden death of a friend, Theseus speaks of the "faire cheyne of love" ("fair chain of love") that binds "the fyr, the eyr, the water, and the lond" ("the fire, the air, the water and the earth") so that they do not escape "certeyn boundes" (1.2991–93). When the links joining the elements break, as in time they must, the divine "ordinaunce" (1.3012) that allots certain duration to all things is revealed, universal order behind seeming disarray. The ephemerality of the physical, Theseus insists, must turn our thoughts to celestial stabilities. Everything comes to its appointed terminus. Within its own duration, even hard stone is worn to dust by the tread of feet.⁸ Theseus's recounting of a majestic cosmic harmony, as evident in the flourishing of an oak as in the glimpse he offers of erosion, reassures that the world is a closed system. A First Mover resides at its timeless exterior as guarantor of meaning. Yet the heartening moral of Theseus's speech is undermined by the jarring emplacement of Boethius's philosophy within a narrative fractured by mixed tone and a discomfiting perspectivism, within a story that spectacularly fails to reassure that a meticulously hierarchical cosmos brings consolation, a tale obsessed with disaster's lethal irruption. Boethian certainty in an underlying orderliness is challenged by "cruel goddes" who in the form of astrological influences preside over a world where the cries of women in childbirth are unanswered (1.2085), the goddess of Love becomes cruel and whimsical Fortuna (1.1950), babies are devoured in their cradles by wandering pigs (1.2019), the sea drowns the innocent (1.2456), and stone cities are reduced to rubble. Strife: all things break apart and move. The devastations of the Permian yield to the explosions of the Cambrian, the scouring of the Flood to the proliferations of the cleansed world, catastrophe to fertile wake. The elemental work of love begins again. And again. The biologist E. O. Wilson posits an inherent bond among creatures, an "urge to affiliate with other forms of life [that] is to some degree innate, hence deserves to be called biophilia."⁹ The term etymologically denotes the natural love of life for life. Geophilia goes farther and recognizes matter's promiscuous desire to affiliate with other forms of matter, regardless of organic composition or resemblance to human vitality. Geo derives from the Greek word for earth but is here employed as in geology, a science of vast durations, slow movement, and inhuman scale. Through its confounding admixture of rapport, shared story, rebuffing density, and alien scale, stone offers a perpetual invitation to think time and agency outside small category, to cease to force the world into diminished frames. Within an amulet, medicinal draught, or vitamin stone radiates curative powers into bodies; as a petrification of astral force it may when carried in a pocket settle a roiled landscape

or reveal in a laboratory the shifting of the earth's magnetic poles; as a surface on which to inscribe sigils or phrases, it offers an invitation to a geographesis in which human hand and lithic potency compose a petric duet. In the Middle Ages, a frequent form of such collaboration produced inscribed jewels. Into stones and their settings were incised names, words of power, or syllables of obscure meaning. Attached to a ring or held in a palm for contemplation by the sea, a stone radiates a magic that renders the everyday strange. Science refracted through stone becomes art. Nature refracted through stone no longer seems so natural.

The medieval symbolic registers of stone still linger: "in conventional comparisons, as a type or an emblem of hardness, immobility, silence, lifelessness, insensibility, etc.; also, as a type or an emblem of stability, steadfastness, etc."¹⁰ Rock imbues terra with its firmness, mundane reality with comforting solidity. At those rare times when stone slides, shakes, or melts, what surprises us most is that something so dense can for a moment become kinetic. This motion is always brief, always the forgettable exception. Houses rise swiftly after the earthquake's leveling; grass and trees effloresce when lava expands the contours of an island; landslides bury troves that bulldozers or metal detectorists one day retrieve. Stone's movements are its aberrations. Stone seems an uncomplicated material, instantly knowable, compliant conveyor of factuality. Philosophy's favorite object, stone is firm support for ponderous thinking.

Thales of Miletus, hailed by Aristotle as the first philosopher, turned to lodestone and amber to explain how matter acts. Faith in stone's epistemological solidity is easy to understand, given its ubiquity, heft, impenetrability, and immensity. Samuel Johnson famously rebuked George Berkeley's assertion that all matter is "merely ideal" by forcefully kicking a stone that was not to be moved, declaring, "I refute it thus."¹¹ The intransigent rock of the real disproves through its serene factuality the vagabond fogs of the imagination.¹² Stone's reassuring fixity is Johnson's untempered foundation for self-evident truth. Despite the strength with which he kicks, despite how much Berkeley might desire a world more fluid, the stone does not yield, demarcating the limit beyond which human fancies may not pass, a hard answer from the intractable real. Though flowing sea, restless air, and consuming fire are just as natural, just as truth-filled, stone becomes a stand-in for nature itself, and nature thereby becomes immobile, unchanging and indifferent. Despite the fact that, as Vilém Flusser observes, "every object is stubborn in its own particular way," stone metonymically stands for the obduracy of all matter.¹³ Jane Bennett gets at this logic of stony substructuralism well when she writes, "as noun or adjective material denotes some stable or rockbottom reality, something adamantine."¹⁴ The function of the lithic in philosophical discourse is therefore to embody the fixed, the given, the resolutely factual. Stone is the world in its givenness. We notice only rock that inhibits progress, gets in the way, becomes a stumbling block for the blind. We journey while these impedimenta remain stubbornly emplaced, and collision

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with lithic immobility hurts, physically and epistemologically. Isidore of Seville derived the Latin word for stone, lapis, from its ability to injure (laedere) the foot (pes).¹⁵ A scruple (“something that troubles the mind”), he continued, derives from scrupus, “a small sharp stone that causes injury and troubles the mind if it should fall into one’s shoe” (16.3.5). Since words are things for Isidore, the lithic comes into apprehension through, with, and as sharp sensation. Its prick is cerebral and physical. Rocks are a keen and affective provocation to thought as well as airy ideation’s antidote. Epistemology is a knowing and feeling; stone is fact-laden and emotion-triggering. Despite its promise of unmediated truth, stone does not offer easy or secure knowledge and exceeds any attempt to still it into familiarity. Rock marks the point at which understanding fails. To run up against a stone wall is to encounter the lithic propensity to induce foundering, to provoke loss of certainty. Stone is not an obstacle to be overcome, but a thing that makes demands, scripts stories, and does not fully yield to human enframing.¹⁶ Thus the poet Richard Wilbur writes, “Kick at the rock, Sam Johnson, break your bones: / But cloudy, cloudy is the stuff of stones.”¹⁷ Thales of Miletus, first Greek philosopher, was drawn to stone’s activity, not its inertness, and found in its ability to hold electric charge and draw substances toward itself evidence of a soul.¹⁸ Stone holds a dense agency.

Drawn like many thinkers to the facticity of stone, Ian Hacking examines the “construction” of dolomite, a rock that consistently challenges those who seek to map its origin—possibly because nanobacteria, organisms too small to be observed, are behind its formation. Hacking writes against a social or linguistic determinism that sees the world as infinitely pliable, the product of human relations, especially language. He details a long process in which errors about the stone accumulate and are shed: dolomite’s supposed calcium is revealed to be magnesium; the fact that dolomite ceased to be created as the primal earth aged gives way to realization that it is still coming into being, but in places hostile to contemporary life. Certain data about the material cling and are retained. Yet an aura of uncertainty consistently surrounds a substance that should be rock solid.¹⁹ What best serves elusive dolomite is, according to Hacking, an “ecumenical descriptive epistemology with hardly any normative implications,”²⁰ a multifaceted and flexible approach that traces the alliances and networks enabling facts to emerge and endure. This process-oriented perspective stresses limited contingency. We know dolomite in part because we have asked very particular questions of it, mainly centered upon its petrochemical uses.

Had we asked other initial queries, we would think of the rock rather differently, and might not have wondered if it could be the product of nanobacteria and a key to understanding the origins of earthly life. Hacking stresses the dependence of knowledge upon its value-laden sorting into taxonomic systems. It matters to us that the rock is a magnesium carbonate rather than a calcium carbonate, for example, because we desire

to extract oil from its depths. From a strictly geological point of view, though, a sediment is a sediment, and there is no good reason to separate your limestone from your dolomite. The history of the substance has as much to do with giving up on certain facts as it does accruing stable knowledge. Even now we don’t know exactly how the rock came to be and cannot say whether science has stabilized dolomite or if dolomite lends a certain stability to a science intent on its explication.

A stone so durable and ancient that much of Stonehenge is fashioned from its blunt mass, dolomite is a reality, a brusque truth. It is also a story of nature on the move.

Rock figures the real, and figuring is an active process.

Despite Samuel Johnson’s kick that failed to dislodge its unyielding target, rock can be a plastic material, an amenable substance for sculpture, adornment, and edifice-making. Time and context-bound meshworks of alliance uniting human and nonhuman agents make lithic pliancy and resistance visible. A diamond becomes a precious gem because its rarity, lucidity, and density can sustain strong confederation with human and inhuman forces, tools, economic and aesthetic systems—coalitions friable stones cannot support. Narrative has power over human reality: it can mediate. But that compositional power is contingent rather than absolute, deriving in part from the thing described. Language is inhuman, exerting its own resistance, slide, and material force. Words stammer, sentences unwind, sense-making fails. Although we can find stone that will float like a ship (as the medieval travel writer John

Mandeville notes of volcanic pumice), we do not fabricate sailing vessels out of boulders because something in rock resists naval transformation. Stone can be constructed. In the form of concrete, it can take almost any shape an architect desires, for a while, and geophilia inheres in that fashioning. But stone does not offer a blank slate for human stories. Stone is a catalyst for relation, a generative substantiality through which story tenaciously emerges.²¹ This elemental agency is likely shared with all materiality, but its plots, structures, tempo, and denouements are its own. To stone belongs sweeping romances of scale, time, memorialization, creation, cataclysm, a relentless tectonicity (from *tektōn*, a carpenter or builder). Stone speaks differently from its sibling elements of air, water, and lightning-swift fire. Its injunction is always to step out of the breathless rapidity of anthropocentric frames and touch a world possessed of long futurity and deep past, a spatial expanse that stretches from the subterranean to the cosmic verge. Stone’s stories foreground the inhuman in its danger, dispassion, and forcefulness, but they offer as well strange amity, queer fellowship, precarious but enduring cohabitation.

Most ecological analyses are “green,” taking their structural metaphors from the imagined fecundity of plants and conducted within a comfortably human cadence.

Stressing balance and sustainability, such studies encounter with difficulty the slow immensity of the geologic. Ecotheory is becoming more prismatic, discovering possibility in challenging, nonverdant hues.²² Rejecting dreams of green pastoralism and fantasies of sustainability, Steve Mentz articulates an oceanic blue

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humanities and a “swimmer poetics” that can better encounter “our storm-filled world.”²³ Yet stone is fluid when viewed within its proper duration. Medieval writers understood the process of erosion and captured petrogenesis in the same liquid terms we employ. When the geologist Jan Zalasiewicz describes continental drift he deploys marine language:

The continents do not have to plough through the oceanic floor. Rather they are carried atop the continually moving lithosphere. They forever drift, like so many gigantic stony Flying Dutchmen, as the ocean basins slowly, inexorably open and close.²⁴

The “continually moving lithosphere” is a sea of stone, the continents its mysterious ships (“so many gigantic stony Flying Dutchmen,” vessels of perpetual voyage, doomed never to reach port). The lithic is oceanic; stone is slow water. Mountains surge and fall, their epochal undulations no less animated than the swell and crash of seas, but impossible for us to view without the aid of narrative and art. Yet volcanoes spurt molten rock that flies, flows, hardens within a human timescale. Ash and lithic powder tumble air and earth in dry liquidity. Though we cannot swim in molten stone—or do so only to face instant immolation, like Empedocles at Etna—we are saturated in the lithic.²⁵ A petric poetics would capture this elemental and dis-anthropocentric restiveness, this negation of the immobility to which stone is too often consigned, this erratic choreography of entwinement, extension beyond apprehensibility, stinging unconcern, stone love, lethal and companionate embrace. Geophilia’s stories unwind with neither climax nor haste, at a spatial and temporal scale that can leave us beside ourselves.

Scientists have christened earth’s primordial era the Hadean, as if this span were something known from our mythology, a prelude and underworld. But the epoch possessed no human content, nothing but fiery gases and congealing rocks and the bare beginnings of single-celled organisms. Remote in time and of vast duration (almost a billion years), the Hadean renders human history brief to imperceptibility. Unlike recent, fleeting, and change-loving animals, stone persists. Though it might offer evidence of vanished life through the ammonite shells and dinosaur bones it entombs, stone seems to us a material well suited for memorials and grave markers. It erodes into clay and sand, rises from the sea or vanishes in subduction, but its decomposition and constant metamorphoses are, within our native temporality, so unhurried that rock is our shorthand for temporal density and strange intrusion. Our documentary bias is for worlds conveyed through words.

Yet the earth possesses numerous recording devices, repositories for nonlinguistic inscription, an indigenous but hard lithic poetics. Although tree rings and ice cores yield tales of ancient pollen, glaciation, and aerial chemistry, stone’s archival force endures far longer. Carbon dating and magnetic readings reveal the passing of epochs. A museum of oddities and a relentless clock inhere in strata, dense layers in which the Anthropocene (the era during which

human presence is readable through carbon embedded within the geological record) is a sliver. From a longer point of view we are living during a vaster period, the Lithocene.

The Great Oxygenation Event that triggered the massive extinction of earth’s flourishing anaerobic life 2.4 billion years ago enabled an immense mineral thriving. Propelled by photosynthetic algae, the Oxygen Catastrophe (as it is also called) marked a massive release of the free element that spurred the generation and subsequent flourishing of 2,500 new mineral forms, all of which require O₂ to burgeon. Most any pebble is replete with microfossils such as acritarchs, the cysts of ancient algae; many of our familiar rocks would not exist without the incorporation of organic material. As a recordation device, stone yields tales of life’s ubiquity. Stone forges relation, conjoining things in ways productive and perilous. Stories of stone therefore tend to be conjunctive and recursive. As enamored of polysyndeton as of litanies, catalogs, and ecstatic lists, lithic poetics love flowing strata, metamorphosis, slow forces of ignition, and inassimilable particles suspended within dynamic aggregates.

Any speaking of the nonhuman is a translation, and therefore error prone, filled with guesswork, and inclined toward fantasy. Story is a parasitical entity that in its familiar forms clearly depends on humans, but story is also itself a living thing and does not necessarily depend upon language to be conveyed. Like the DNA coding of genes, narrative is full of futurity, a mysterious and not wholly predetermined site for the emergence of vitalities: a connection-making and a worlding. Narrative can give a voice to objects, elements and forces. Humans themselves emerge through “material agencies” that leave their traces in lives as well as stories, so that narratives are always animated by multifarious vectors and heterogeneous possibilities not reducible to mere anthropomorphism.²⁶ Narrative is not inevitably solipsistic. It enables the envisioning of a world indifferent to us, a world that excludes us, and a world that impinges with discomfiting intimacy. An ethical machine, story intensifies relation, even with the nonhuman, and therefore offers the best hope we have for moving in whatever tentative way we can beyond anthropocentrism. Stone erodes our long habit of regarding the world as a place fashioned for our habitation, of thinking humans an apex or culmination.

Even when inscribed with a known language or identifiable pictures, stone will arrive into the present as alien presence. Headstones or the ruins of houses quietly shelter, arches and cathedrals triumphantly announce stories of a past otherwise intangible, promises of a future beyond familiar reckoning. Stone is thick with sedimented time. Within both medieval and modern environmental imaginings, rocks and people inhabit temporalities and magnitudes profoundly different. Rocks arrive from alien worlds, rendering coinhabitation and the bonds of geophilia difficult to discern—or, when realized, jarring. Human powers of destruction almost rival those of asteroids and

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supervolcanoes. Our affinity with stone is revealing its most lethal aspects. The Anthropocene designates the point in the eighteenth century when industrial deposits become readable in the geological record, but the term offers a problem even as it identifies one. Though immensely useful, the designation has the unintended effect of obliterating the billions of years that precede the embedding of the human in geology's archive. When we decelerate, imagine a deeper past, get geologic, and then history becomes more eventful, richer, deeper in its strata. Modernity loses some of its luster, prehistory loses homogeneity, and the agency of the material world becomes easier to perceive alongside that of the human. In Australia stone requires a narrative that restores vitality to Gondwana, yet remains stubbornly rooted in the local: rock art, fire management, the offer of fertility or desert, an archive of aboriginal displacements and ecological crises. A gem in medieval Britain might disclose a romantic tale of travel from Persia as well as a more local vignette in which a mother clasps an amulet with the precious stone embedded at its center, hoping during a difficult childbirth that neither she nor her undelivered infant will perish. Stone is never a lone element but a partner with water, fire, air and organic life. In stone a sense of place joins a sense of planet, but even that scale is not enough. Stone emphasizes the cosmos in cosmopolitan, the universe of inhuman forces and materialities that stretches to the distant arms of the galaxy—or at least to what classical and medieval writers called the celestial spheres.

Stony reality is perspectival, a time- and contextbound mesh-work that gathers lithic and nonlithic actors without harmonizing, without yielding the unity necessary for secure point of view. As stone is for us one of many objects (some well differentiated and highly esteemed, but most below notice) that constitute the realm of the nonhuman, humans are for stone one of many agents (some well differentiated and highly relatable, most below notice) in the nonlithic realm who are susceptible to being drawn into petric alliance. These relations become palpable once aeonic frames are adopted and the anthropocentric insistence that only human intentionality exists or counts is abandoned. Sometimes the movements toward connection and change that constitute desire are discernible only in traces sedimented over a very long history, one that undermines our foundational narratives of rupture, self-fashioning, and radical discontinuity. When along with viewing stone as nonhuman we attempt to look upon ourselves as non-lithics, the axis of the knowable world shifts.

Geophilia is geology without dispassion. It wanders a steep and rocky way: difficult, slow, full of slide and unexpected conveyance. When the geologist Jan Zalasiewicz writes that a "pebble holds strange worlds within it," he is providing a contemporary version of the journeys into the fairy Otherworld familiar from medieval myth and romance. These crossings are likewise betrayed by the name of the "strange world" that Zalasiewicz's pebble opens: the now-lost continent of Avalonia, "one on which—

much later—King Arthur would reign, and Shakespeare would write sonnets, and a revolution that would spread factory chimneys and iron foundries across the world."²⁷

From Arthur to the Anthropocene, rock archives strange traces, records that we live between catastrophes: between the fire of Armageddon and the ice of some new glaciation, or maybe the flame of Global Warming and the chill of our indifference to the melting Arctic. We dwell between the gales and torrents of hurricanes that drown the poor while we look away, between the movements of the earth that topple our fragile structures, that remind us that continents are motion, that ground (literal and epistemological) is always shifting, that metaphors are concrete and concrete like all stone cracks, pulverizes, transmutes. Isidore of Seville, a seventh century encyclopedist who tried to imagine what the earth would look like if we could view its lands and waters from the heavens, spotted a fossilized sea shell on a mountain top and wrote that the earth's rocky archive records its elemental upheavals. A glimpse of things to come. Catastrophe dogs us, pulls down everything we compose. The past, the present, the future: stories of wreckage, devastation, dilapidation.

Yet humans regard the world in frames too small. If stone teaches us anything it is that ruin is a beginning, a going from which something vital arrives. Dinosaurs abandoned the bulk of once vast bodies to soar clouds. Long ago they learned to produce song. Medieval legend tells us that gems continue to tumble from Eden's waters, even if return to that garden is barred. Sometimes these stones course cascading rivers to contemporary hands. "Standing on the frigid summit of Everest," writes the geologist David R. Montgomery, "if you could pick up a piece of limestone and view it under a microscope you would find that the top of the world consists of fragmented trilobites and tiny fecal pellets that settled to a tropical seabed."²⁸ The sand that was a desert is a lifebearing cliff, the ocean's edge a fertile field, which had been a mountain is now a glade of sea anemones. The ash from the volcano's combustion is an archive. That calcium has become a snail's shell become marble become ... this very place where I write, or where you read these words, a ruin that once was stone and a ruin to come, the clasp of the fragile community we for a small space share.

Here. Now.

- 1 I am referencing here what Serenella Iovino and Serpil Oppermann describe as "matter's 'narrative' power of creating configurations of meanings and substances, which enter with human lives into a field of co-emerging interactions" ("Material Ecocriticism: Materiality, Agency, and Models of Narrativity" *Ecozon@3* [2012]: 75-91, at 79-80).
- 2 See "The Former Age," in the *Riverside Chaucer*, gen. ed. Larry D. Benson, 3rd ed (New York: Houghton Mifflin, 1987) lines 9-40. See also Karl Steel's excellent reading of the poem in "A Fourteenth-Century Ecology: 'The Former Age' with Dindimus," in *Rethinking Chaucerian Beasts*, ed. Carolyn Van Dyke (New York: Palgrave Macmillan, 2012) 185-199.

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- 3 Pliny, *Natural History*, 37.9–10. The early encyclopedist Isidore of Seville repeated this genesis for crystal in his *Etymologies* (16.13), bequeathing the story to the Middle Ages.
- 4 Touring an archeological dig in Reykjavik brought other stories of stone's endurance and domestic intimacy to light: the shells of the seafood eaten in an early settler's home, a quern, and grooved stones used to weight a net cast for fishing.
- 5 The Book of John Mandeville, ed. Tamarah Kohanski and C. David Benson (Kalamazoo: Medieval Institute Publications, 2007), line 507.
- 6 For a revelatory ecological rethinking of the classical theory of the elements, see David Macauley, *Elemental Philosophy: Earth, Air, Fire, and Water as Environmental Ideas* (Albany: State University of New York Press, 2010). Lowell Duckert and I have with our collaborators been similarly attempting the elaboration of what we call an elemental ecocriticism. See the special issue of the journal *postmedieval* on "Ecomaterialism" and the edited collection *Elemental Ecocriticism* (Minneapolis: University of Minnesota Press, 2015).
- 7 Tim Ingold explores the intransitivity of production in *Being Alive*, asserting the "priority of ongoing process over final form" as central to life itself: "Producers, both human and non-human, do not so much transform the world, impressing their preconceived designs upon the material substrate of nature, as play their part from within in the world's transformation of itself. Growing into the world, the world grows in them": *Being Alive: Essays on Movement, Knowledge and Description* (London: Routledge, 2011) 6.
- 8 "The harde stoon / Under oure feet, on which we trede and goon [go], / Yet wasteth it [wears down] as it lyth [lies] by the weye [way]," 13021–23.
- 9 E. O. Wilson, *Biophilia* (Cambridge: Harvard University Press, 1984), 84.
- 10 "Stōn," *Middle English Dictionary*, University of Michigan: <http://quod.lib.umich.edu/m/med/>
- 11 James Boswell, *The Life of Samuel Johnson*, ed. Christopher Hibbert (London: Penguin, 1986), 122.
- 12 As Ian Hacking puts it in *The Social Construction of What?* (Cambridge: Harvard University Press, 1999), "when thinkers—from Dr. Johnson (against the immaterialist Bishop of Berkeley) to Steven Weinberg (against cultural relativists)—want to say something is real, they resort to rocks" (204).
- 13 Quotation from Vilém Flusser, *Vampyrotheuthis Infernalis: A Treatise, with a Report by the Institut Scientifique de Recherche Paranaturaliste*, trans. Valentine A. Palis (Minneapolis: University of Minnesota Press, 2012) 62, where Flusser is writing of how objects (particularly stones) participate in the generation of human knowledge.
- 14 Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010), 58.
- 15 Isidore of Seville, *The Etymologies*, trans. Stephen A. Barney, W.J. Lewis, J. A. Beach, and Oliver Berghof (Cambridge: Cambridge University Press, 2006), 16.3.1.
- 16 I am thinking here of Julian Yates's sophisticated exploration of the early modern priest hole as a mechanism that acts to obstruct inquiry and knowledge: *Error, Misuse, Failure: Object Lessons from the English Renaissance* (Minneapolis: University of Minnesota Press, 2003), 145–47.
- 17 From the short poem "Epistemology," in Wilbur, *Collected Poems 1943-2004* (Orlando: Harcourt, 2004), 361.
- 18 For an eloquent meditation on Thales and stone's activity, see Macauley, *Elemental Philosophy*, 51–58.
- 19 Hacking, *The Social Construction of What?*, 186–206. For a thoughtful exploration of social constructivism in its variations, see Barbara Herrnstein Smith, *Scandalous Knowledge: Science, Truth and the Human* (Durham: Duke University Press, 2005), 3–15. Smith observes that Hacking goes too far in asserting that a constructivist denies metaphysically that nature possesses a real and inherent structure. Instead, she observes, constructivists "decline to presume" that they know already how the world is ordered as they trace how a concept like nature comes into being, how it changes over time, and what work it accomplishes (6–7).
- 20 Hacking, *The Social Construction of What?*, 199.
- 21 Stone's "storied matter" is thick with surprising narratives, some vivid, lyrical, floridly manifest, others impossible to discern or translate. The lithic is an especially dense case of matter's ability to create "configurations of meanings and substances, which enter with human lives into a field of coemerging interactions." *Material ecocriticism* names an alliance of critical practices that "take matter as a text, as a site of narrativity, a storied matter, a corporeal palimpsest in which stories are inscribed." See Serenella Iovino and Serpil Oppermann. "Material Ecocriticism: Materiality, Agency, and Models of Narrativity," 79–80.
- 22 My edited collection *Prismatic Ecologies: Ecotheory Beyond Green* (Minneapolis: University of Minnesota Press, 2013) argues for the introduction of unbalanced, nonanthropocentric hues (and perspectives) into ecocriticism.
- 23 See Mentz's book *At the Bottom of Shakespeare's Ocean* (London: Continuum, 2009), especially good at questioning the pastoralism and balance of green ecologies.
- 24 Zalasiewicz, *The Earth After Us: What Legacy Will Humans Leave in the Rocks?* (Oxford: Oxford University Press, 2008), 48.
- 25 On the death of Empedocles, see the beautiful meditation by Michel Serres, *Biogea*, trans. Randolph Burks (Minneapolis: Univocal, 2012), 76–79.
- 26 "Material agencies" is a term I take from Stacy Alaimo's *Bodily Natures: Science, Environment, and the Material Self* (Bloomington: Indiana University Press, 2010), where it designates "the often predictable and always interconnected actions" of environments, substances, and bodies in ways that "affect the emergence as well as the unraveling of the human" (3).
- 27 *The Planet in a Pebble: A Journey into Earth's Deep History* (Oxford: Oxford University Press, 2010), 33.
- 28 *The Rocks Don't Lie: A Geologist Investigates Noah's Flood* (New York: W. W. Norton, 2012) 33.

EARTHLING, NOW AND FOREVER?

Jane Bennett

[...]

We are Earthlings both in the sense that we need a host of other bodies (“the planet”) to live and in the sense that “we” are made of the same elements as is the planet. We are “walking, talking minerals,” redistributions of “oxygen, hydrogen, nitrogen, carbon, sulfur, phosphorous, and other elements of Earth’s crust into two-legged, upright forms.”² Like wind or river, human individuals and groups are geologic forces that can alter the planet in countless and, as the concept of the Anthropocene marks, game-changing ways.

Indeed, I think that one of the events that the idea of Anthropocene tries to capture is a certain convergence between two styles of temporality that we had formerly thought were distinct. The first style we had associated with the apersonal geologic: this was a bi-modal time of either a breakneck and explosively transformative speed (lightning, earthquake, wildfire) or an implacably slow, deep time (sedimentation, erosion, radioactive decay). The second style of temporality we identified as prototypically human: this was the more moderate, midrange speed of human endeavor, the enactment of intention or plan, the time of the everyday. There were, of course, exceptions, such as the superfast impact of the atomic bombs the Americans dropped on Hiroshima and Nagasaki, or (what many believed to be) the gradual accretion of human knowledge throughout history. The idea of the Anthropocene, however, suggests that the exceptions are not exceptional and that there is little reason to posit a hard, ontological dichotomy between human and ahuman forces, with regard to their temporalities or scope of effect.

Alongside a new economy of discernment, *Making the Geologic Now* also supports a different, more ecologically careful, economy of consumption and extraction. A keener cultural sensitivity to the deep and periodically explosive time of the geologic might, for example, encourage the pursuit of sources of energy that do not generate waste so toxic that it must be quarantined for one million years, or discourage practices like fracking that foul the water and might contribute to earthquakes. Affirming the geo-mode of long time also holds promise for lifting American political discourse above its currently idiocy, wherein crucial issues like climate change are elided for the sake of moralistic red herrings or theo-populist slogans. Geopolitical theorist Jairus Grove provides one example of this in a recent Facebook post: “Nothing says rearranging the deck chairs on the Titanic like two presidential candidates arguing over the size of tax cuts when fish are boiling to death in the Midwest.”³

Making the Geologic Now hopes, as do I, that a sharper awareness of the geologic operative both around and through us would do us some (pragmatic, political) good. “The understanding of earth processes,” write Ellsworth and Kruse, “can offer inspiration for how we might think about the qualitatively different ways that humans are now living on planet earth.”⁴ But they may put the point too mildly: Yes, this understanding can push us to “think” about modes of life,

but this thinking is also a judging about which ways can best ensure our ongoing existence. It seems important to admit that at least one of the goals of the geologic turn is to figure out how to stick around as one species on the planet among numerous others—how to maintain our Earthling status in its various entanglements. For me, one of the effects of a heightened awareness of the interpenetration of the human and ahuman geologic is that it stretches my definition of “self”-interest to include the flourishing of the complex system of bio-geologic processes. This enriched understanding of “self” would then, I hope, enable a more extended pursuit of our conatus, the endeavor to persist in being.⁵

Bill Gilbert suggests that (alongside the pursuit of a new sensibility and a new political economy) we need a new “narrative as a nation and species,” one that “encompasses the expanse of planetary time, not the fleeting moments of pop culture.” We need this, he says, if we want the Anthropocene “to extend for thousands of years into the future.” And we do want this extension, don’t we? Don’t we readers of *Making the Geologic Now* unconsciously project forward, if not the destructive, short-sighted version of the Anthropocene, a “cene” that includes, for as long as possible, the presence of the anthropos? When I make this implicit project overt, I see that I seek the postponement of the arrival of a radically posthuman future. And that this is a big part of why I (and perhaps other of the contributors to this collection) seek to open up “possibilities for humans to evolve ways to live in relation to geologic time.”⁶

What of this conative desire, to be (or for there to be) Earthling(s) now and forever? Can the identification as Earthling be detached from the hope that Earth continues to include us? Should we try to detach geologic sensibility from all notions of self-interest? Is it really possible, given our current evolutionary form, to live according to the maxim that “while the human species can’t get along without the geologic, the geologic will continue on in some form or other long after we have ceased being part of it?”⁷

I’m not sure of the answers to these questions, but if I had to come down somewhere, I’d say that the assumption of belonging and the tendency to project ourselves into the longterm horizon of the geologic run pretty deep. Or at least at this point in late-modern history they function as key parts of what motivates ecological practice and its various attempts to postpone the arrival of a posthuman earth and the vast suffering that it will be—already is—entailing. The idea of a deep belonging between human beings and a rather volatile earth also provides much of the energy for the political project called the geologic turn.

I liked Lars van Trier’s 2012 film *Melancholia* for one reason: its realistic staging of the scene of the end of the earth (by means of a collision with a much larger planet) jolted me into remembering that, in addition to being a woman, an American, a teacher, a friend, on the Left, etc., I am also, perhaps first and foremost, an Earthling.⁸ I live on and

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through an assemblage of materialites hurtling through space. I mention this because the will to belong to earth, to maintain Earthling status for the unforeseeable future, seems quite capable of persisting alongside a growing sense, within science, art, and popular culture, that this fit is nowhere guaranteed. The contemporary version of the will to belong is perhaps the latest in a long line of hopeful projections of a fittingness between humanity and the future. Religious versions include the notions of intelligent design and Providence. Focusing on the latter, Freud at first considered it an “illusion” susceptible to demystification, an infantile wish to be outgrown. But he too seems to have come ultimately to the conclusion that it is not so easy to vanquish—by reasoned analysis or the production of counter-narratives—the will to belong to the future. It is instead extremely resilient, born as it is “from man’s need to make his helplessness [in the face of the overwhelming power of nature and death] tolerable.”⁹

One doesn’t have to be a theist (I’m not) to share something of the faith that humans belong to the earth, even if the earth doesn’t belong to humans. Projecting ourselves into the geologic future may be what Earthlings do; pretending that this sort of projection will fulfill itself automatically is something we do too much.

2 Russian scientist Vladimir Ivanovich Vernadsky, quoted in Lynn Margulis and Dorion Sagan, *What is Life?* (Berkeley: University of California Press, 1995), 49.

3 Grant Schulte, “Thousands of Fish Die as Midwest Streams Heat Up,” Associated Press: The Big Story,

5 August 2012, <http://bigstory.ap.org/article/thousands-fish-die-midwest-streams-heat>.

4 Ellsworth and Kruse, “Introduction,” in this volume.

5 Conatus is Spinoza’s term, which Hasana Sharp explains this way: “all beings are provisionally individuated by their striving to persevere in being, and this endeavor to exist is their essence (Ethics III, p. 6). A human essence, or appetite to live, is called ‘desire’ insofar as we are conscious of it (III p9c)” (Hasana Sharp, *Spinoza and the Politics of Renaturalization* [Chicago: University of Chicago Press, 2011], 30-31).

6 Ellsworth and Kruse, “Introduction,” in this volume.

7 Ellsworth and Kruse, “Introduction,” in this volume.

8 See also William Connolly, “Melancholia and Us,” *The Contemporary Condition*, 26 May 2012: “The brilliance of Melancholia is that it ... allow[s] the experience of attachment [to Earth] to soak into our pores” (<http://contemporarycondition.blogspot.com/2012/04/melancholia-and-us.html>).

9 Sigmund Freud, *The Future of an Illusion*, ed. and trans. James Strachey (New York: W.W. Norton, 1961), 23-24.

THE CARRIER BAG THEORY OF FICTION

Ursula K. Le Guin

In the temperate and tropical regions where it appears that hominids evolved into human beings, the principal food of the species was vegetable. Sixty-five to eighty percent of what human beings ate in those regions in Paleolithic, Neolithic, and prehistoric times was gathered; only in the extreme Arctic was meat the staple food. The mammoth hunters spectacularly occupy the cave wall and the mind, but what we actually did to stay alive and fat was gather seeds, roots, sprouts, shoots, leaves, nuts, berries, fruits, and grains, adding bugs and mollusks and netting or snaring birds, fish, rats, rabbits, and other tuskless small fry to up the protein. And we didn't even work hard at it—much less hard than peasants slaving in somebody else's field after agriculture was invented, much less hard than paid workers since civilization was invented. The average prehistoric person could make a nice living in about a fifteen-hour work week.

Fifteen hours a week for subsistence leaves a lot of time for other things. So much time that maybe the restless ones who didn't have a baby around to enliven their life, or skill in making or cooking or singing, or very interesting thoughts to think, decided to slope off and hunt mammoths. The skillful hunters then would come staggering back with a load of meat, a lot of ivory, and a story. It wasn't the meat that made the difference. It was the story.

It is hard to tell a really gripping tale of how I wrested a wild-oat seed from its husk, and then another, and then another, and then another, and then another, and then I scratched my gnat bites, and Ool said something funny, and we went to the creek and got a drink and watched newts for a while, and then I found another patch of oats.... No, it does not compare, it cannot compete with how I thrust my spear deep into the titanic hairy flank white Oob, impaled on one huge sweeping tusk, writhed screaming, and blood spouted everywhere in crimson torrents, and Boob was crushed to jelly when the mammoth fell on him as I shot my unerring arrow straight through eye to brain.

That story not only has Action, it has a Hero. Heroes are powerful. Before you know it, the men and women in the wild-oat patch and their kids and the skills of the makers and the thoughts of the thoughtful and the songs of the singers are all part of it, have all been pressed into service in the tale of the Hero. But it isn't their story.

It's his.

When she was planning the book that ended up as *Three Guineas*, Virginia Woolf wrote a heading in her notebook, "Glossary;" she had thought of reinventing English according to a new plan, in order to tell a different story. One of the entries in this glossary is heroism, defined as "botulism." And hero, in Woolf's dictionary, is "bottle."

The hero as bottle, a stringent reevaluation. I now propose the bottle as hero.

Not just the bottle of gin or wine, but bottle in its older sense of container in general, a thing that holds something else.

If you haven't got something to put it in, food will escape you—even something as uncombative and unresourceful as an oat. You put as many as you can into your stomach while

they are handy, that being the primary container; but what about tomorrow morning when you wake up and it's cold and raining and wouldn't it be good to have just a few handfuls of oats to chew on and give little Oom to make her shut up, but how do you get more than one stomachful and one handful home? So you get up and go to the damned soggy oat patch in the rain, and wouldn't it be a good thing if you had something to put Baby Oo Oo in so that you could pick the oats with both hands? A leaf a gourd a shell a net a bag a sling a sack a bottle a pot a box a container. A holder. A recipient.

The first cultural device was probably a recipient.... Many theorists feel that the earliest cultural inventions must have been a container to hold gathered products and some kind of sling or net carrier.

So says Elizabeth Fisher in *Women's Creation* (McGraw-Hill, 1975). But no, this cannot be. Where is that wonderful, big, long, hard thing, a bone, I believe, that the Ape Man first bashed somebody with in the movie and then, grunting with ecstasy at having achieved the first proper murder, flung up into the sky, and whirling there it became a space ship thrusting its way into the cosmos to fertilize it and produce at the end of the movie a lovely fetus, a boy of course, drifting around the Milky Way without (oddly enough) any womb, any matrix at all? I don't know. I don't even care. I'm not telling that story. We've heard it, we've all heard all about all the sticks spears and swords, the things to bash and poke and hit with, the long, hard things, but we have not heard about the thing to put things in, the container for the thing contained. That is a new story. That is news.

And yet old. Before—once you think about it, surely long before—the weapon, a late, luxurious, superfluous tool; long before the useful knife and ax; right along with the indispensable whacker, grinder, and digger—for what's the use of digging up a lot of potatoes if you have nothing to lug ones you can't eat home in—with or before the tool that forces energy outward, we made the tool that brings energy home. It makes sense to me. I am an adherent of what Fisher calls the Carrier Bag Theory of human evolution.

This theory not only explains large areas of theoretical obscurity and avoids large areas of theoretical nonsense (inhabited largely by tigers, foxes, other highly territorial mammals); it also grounds me, personally, in human culture in a way I never felt grounded before. So long as culture was explained as originating from and elaborating upon the use of long, hard objects for sticking, bashing, and killing, I never thought that I had, or wanted, any particular share in it. ("What Freud mistook for her lack of civilization is woman's lack of loyalty to civilization," Lillian Smith observed.) The society, the civilization they were talking about, these theoreticians, was evidently theirs; they owned it, they liked it; they were human, fully human, bashing, sticking, thrusting, killing.

Wanting to be human too, I sought for evidence that I was; but if that's what it took, to make a weapon and kill with it, then evidently I was either extremely defective as a human being, or not human at all.

That's right, they said. What you are is a woman. Possibly not

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human at all, certainly defective. Now be quiet while we go on telling the Story of the Ascent of Man the Hero.

Go on, say I, wandering off towards the wild oats, with Oo Oo in the sling and little Oom carrying the basket. You just go on telling how the mammoth fell on Boob and how Cain fell on Abel and how the bomb fell on Nagasaki and how the burning jelly fell on the villagers and how the missiles will fall on the Evil Empire, and all the other steps in the Ascent of Man.

If it is a human thing to do to put something you want, because it's useful, edible, or beautiful, into a bag, or a basket, or a bit of rolled bark or leaf, or a net woven of your own hair, or what have you, and then take it home with you, home being another, larger kind of pouch or bag, a container for people, and then later on you take it out and eat it or share it or store it up for winter in a solid container or put it in the medicine bundle or the shrine or the museum, the holy place, the area that contains what is sacred, and then next day you probably do much the same again—if to do that is human, if that's what it takes, then I am a human being after all. Fully, freely, gladly, for the first time.

Not, let it be said at once, an unaggressive or uncombative human being. I am an aging, angry woman laying mightily about me with my handbag, fighting hoodlums off. However I don't, nor does anybody else, consider myself heroic for doing so.

It's just one of those damned things you have to do in order to be able to go on gathering wild oats and telling stories.

It is the story that makes the difference. It is the story that hid my humanity from me, the story the mammoth hunters told about bashing, thrusting, raping, killing, about the Hero. The wonderful, poisonous story of Botulism. The killer story.

It sometimes seems that that story is approaching its end. Lest there be no more telling of stories at all, some of us out here in the wild oats, amid the alien corn, think we'd better start telling another one, which maybe people can go on with when the old one's finished. Maybe. The trouble is, we've all let ourselves become part of the killer story, and so we may get finished along with it. Hence it is with a certain feeling of urgency that I seek the nature, subject, words of the other story, the untold one, the life story.

It's unfamiliar, it doesn't come easily, thoughtlessly to the lips as the killer story does; but still, "untold" was an exaggeration. People have been telling the life story for ages, in all sorts of words and ways. Myths of creation and transformation, trickster stories, folktales, jokes, novels...

The novel is a fundamentally unheroic kind of story. Of course the Hero has frequently taken it over, that being his imperial nature and uncontrollable impulse, to take everything over and run it while making stern decrees and laws to control his uncontrollable impulse to kill it. So the Hero has decreed through his mouthpieces the Lawgivers, first, that the proper shape of the narrative is that of the arrow or spear, starting here and going straight there and THOK! hitting its mark (which drops dead); second, that the central concern of narrative, including the novel, is conflict;

and third, that the story isn't any good if he isn't in it.

I differ with all of this. I would go so far as to say that the natural, proper, fitting shape of the novel might be that of a sack, a bag. A book holds words. Words hold things. They bear meanings. A novel is a medicine bundle, holding things in a particular, powerful relation to one another and to us.

One relationship among elements in the novel may well be that of conflict, but the reduction of narrative to conflict is absurd. (I have read a how-to-write manual that said, "A story should be seen as a battle," and went on about strategies, attacks, victory, etc.) Conflict, competition, stress, struggle, etc., within the narrative conceived as carrier bag/belly/box/house/medicine bundle, may be seen as necessary elements of a whole which itself cannot be characterized either as conflict or as harmony, since its purpose is neither resolution nor stasis but continuing process.

Finally, it's clear that the Hero does not look well in this bag. He needs a stage or a pedestal or a pinnacle. You put him in a bag and he looks like a rabbit, like a potato.

That is why I like novels: instead of heroes they have people in them.

So, when I came to write science-fiction novels, I came lugging this great heavy sack of stuff, my carrier bag full of wimps and klutzes, and tiny grains of things smaller than a mustard seed, and intricately woven nets which when laboriously unknotted are seen to contain one blue pebble, an imperturbably functioning chronometer telling the time on another world, and a mouse's skull; full of beginnings without ends, of initiations, of losses, of transformations and translations, and far more tricks than conflicts, far fewer triumphs than snares and delusions; full of spaceships that get stuck, missions that fail, and people who don't understand. I said it was hard to make a gripping tale of how we wrested the wild oats from their husks, I didn't say it was impossible. Who ever said writing a novel was easy? If science fiction is the mythology of modern technology, then its myth is tragic. "Technology," or "modern science" (using the words as they are usually used, in an unexamined shorthand standing for the "hard" sciences and high technology founded upon continuous economic growth), is a heroic undertaking, Herculean, Promethean, conceived as triumph, hence ultimately as tragedy. The fiction embodying this myth will be, and has been, triumphant (Man conquers earth, space, aliens, death, the future, etc.) and tragic (apocalypse, holocaust, then or now).

If, however, one avoids the linear, progressive, Time's-(killing)-arrow mode of the Techno-Heroic, and re-defines technology and science as primarily cultural carrier bag rather than weapon of domination, one pleasant side effect is that science fiction can be seen as a far less rigid, narrow field, not necessarily Promethean or apocalyptic at all, and in fact less a mythological genre than a realistic one. It is a strange realism, but it is a strange reality.

Science fiction properly conceived, like all serious fiction, however funny, is a way of trying to describe what is in fact going on, what people actually do and feel, how

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people relate to everything else in this vast sack, this belly of the universe, this womb of things to be and tomb of things that were, this unending story. In it, as in all fiction, there is room enough to keep even Man where he belongs, in his place in the scheme of things; there is time enough to gather plenty of wild oats and sow them too, and sing to little Oom, and listen to Ool's joke, and watch newts, and still the story isn't over. Still there are seeds to be gathered, and room in the bag of stars.

HYDROFEMINISM: OR, ON BECOMING A BODY OF WATER

Astrida Neimanis

We are all bodies of water.

To think embodiment as watery belies the understanding of bodies that we have inherited from the dominant Western meta-physical tradition. As watery, we experience ourselves less as isolated entities, and more as oceanic eddies: I am a singular, dynamic whorl dissolving in a complex, fluid circulation. The space between our selves and our others is at once as distant as the primeval sea, yet also closer than our own skin—the traces of those same oceanic beginnings still cycling through us, pausing as this bodily thing we call “mine.” Water is between bodies, but of bodies, before us and beyond us, yet also very presently this body, too. Deictics falter. Our comfortable categories of thought begin to erode. Water entangles our bodies in relations of gift, debt, theft, complicity, differentiation, relation.

What might becoming a body of water—ebbing, fluvial, dripping, coursing, traversing time and space, pooling as both matter and meaning—give to feminism, its theories, and its practices?

HYDRO LOGICS

Our cells are inflated by water, our metabolic reactions mediated in aqueous solution.—David Suzuki¹

The oceans are in constant motion... thermohaline circulation. ...occurs deep within the ocean and acts like a conveyor belt.—Environmental Literacy Council²

The land biota has had to find ways to carry the sea within it and, moreover, to construct watery conduits from “node” to “node.” —Mark and Dianna McMenamin³

Somewhere at the bottom of the sea, there must be water that sank from the surface during the ‘Little Ice Age’ three centuries ago... The ocean remembers.—Robert Kandel⁴

Sixty to ninety percent of your bodily matter is composed of water. Water, in this sense, is an entity, individualized as that relatively stable thing you call your body. But water has other logics, other patternings and means of buoying our earthly world, too. Not least, water is a conduit and mode of connection. Just as oceanic currents convey the sun’s warmth, schools of fish, and islands of degraded plastic from one planetary sea to another, our watery bodies serve as material media. In an evolutionary sense, living bodies are necessary for the proliferation of what scientists Mark and Dianna McMenamin call Hypersea, which arose when life moved out of marine waters and by necessity folded a watery habitat “back inside of itself.”⁵ Today, when you or I drink a glass of water, we amplify this Hypersea, as we sustain our existence through other “webs of physical intimacy and fluid exchange.”⁶ In this act of ingestion, we come into contact with all of our companion species⁷ that inhabit the watershed from which that water was drawn—book lice, swamp cabbage, freshwater mussel. But we connect with the sedimentation tanks, and rapid-mix flocculators that make that water drinkable, and the reservoir,

and the rainclouds, too. Hypersea extends to include not only terrestrial flora and fauna, but also technological, meteorological, and geophysical bodies of water.

Even while in constant motion, water is also a planetary archive of meaning and matter. To drink a glass of water is to ingest the ghosts of bodies that haunt that water. When “nature calls” some time later, we return to the cistern and the sea not only our antidepressants, our chemical estrogens, or our more commonplace excretions, but also the meanings that permeate those materialities: disposable culture, medicalized problem solving, ecological disconnect. Just as the deep oceans harbor particulate records of former geological eras, water retains our more anthropomorphic secrets, even when we would rather forget. Our distant and more immediate pasts are returned to us in both trickles and floods.

And that same glass of water will facilitate our movement, growth, thinking, loving. As it works its way down the esophagus, through the blood, the tissues, and to the index finger, the clavicle, and the left plantar fascia, it ensures that our being is always a becoming. An alchemist at once profoundly wondrous and entirely banal, water guides a body from young to old, from here to there, from potentiality to actuality. Translation, transformation. Plurality proliferates.

As a facilitator, water is the milieu, or the gestational element, for other watery bodies as well.⁸

Mammal, reptile, or fish; sapling or seed; river delta or backyard pond—all of these bodies are necessarily brought into being by another body of water that dissolves, partially or completely, to water the bodies that will follow. On a geological scale, we have all arisen out of the same primordial soup, gestated by species upon watery species that have gifted their morphology to new iterations and articulations.

On a more human scale, we gestate in amniotic waters that deliver to us the nutrients that enable our further proliferation. Our waste is removed by similar waterways, and we are protected from external harm by these intrauterine waters, too. Gestational waters are also themselves (in) a body of water, and participate in the greater element of planetary water that continues to sustain us, protect us, and nurture us, both extra- and intercorporeally, beyond these amniotic beginnings. Water connects the human scale to other scales of life, both unfathomable and imperceptible. We are all bodies of water, in the constitutional, the genealogical, and the geographical sense.

Water as body; water as communicator between bodies; water as facilitating bodies into being. Entity, medium, transformative and gestational milieu. All of this enfolding in, seeping from, sustaining and saturating, our bodies of water. “There are tides in the body,” writes Virginia Woolf.⁹ We ebb and flow across time and space—body, to body, to body, to body.

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FEMINISM LEAKS

We ourselves are sea, sands, corals, seaweeds, beaches, tides, swimmers, children, waves... seas and mothers.
—Hélène Cixous and Catherine Clément¹⁰

Woman's writing... draws its corporeal fluidity from images of water... This keeping-alive and life-giving water exists simultaneously as the writer's ink, the mother's milk, the woman's blood and menstruation.—Trinh T. Minh-ha¹¹

In me everything is already flowing.—Luce Irigaray¹²

Thinking about embodiment in ways that challenge the phallogocentric Enlightenment vision of discrete, atomized, and self-sufficient, Man has been a long-standing concern for feminist thinkers. Particularly within the French feminist tradition of *écriture féminine*, the fluid body of woman is invoked as a means of interrupting a philosophical tradition that both valorizes a male (morphological, psychological, symbolic, philosophical) norm, and elides the specificity of “woman.”

At the same time, accounts such as Hélène Cixous's, Luce Irigaray's, and Trinh T. Minh-ha's have been criticized by other feminist thinkers for their purported incarceration of women within a biologically essentialist female and normatively reproductive morphology. Cixous and Clément's “Sorties,” for instance, connects the female body to the sea, in that both are gestators of life. Irigaray, in her love letter to Friedrich Nietzsche, continuously admonishes him for forgetting the watery habitat that birthed him, and to which he owes a great debt.¹³ Both Minh-ha in *Women, Native, Other* and Cixous in “The Laugh of the Medusa” invoke the “mother's milk”¹⁴ or the “white ink,”¹⁵ which seems to reductively connect the woman writer to a lactating female body. Is not, then, the “fluid woman” just another way of invoking the phallogocentric fantasy of “woman as womb”?

The last century of (primarily Western) feminist thought has cultivated the view that to reduce a woman to her (reproductive) biology is problematic, first, because of the troubling symbolic meanings—passive, empty vessel, hysterical, contaminating—that persistently imbue this biology. Moreover, within the social, political, and economic contexts in which this thought has circulated, compulsory reproduction has generally foreclosed rather than facilitated meaningful participation of women outside of the domestic sphere. But why should this history predetermine any appeal to biological matter as necessarily antifeminist or reductionist?

The desire of water to morph, shape-shift, and facilitate the new persistently overflows any attempt at capture.

Is not “woman” similarly uncontainable? After all, “woman's” beings/becomings in these texts are not determined in advance—even as she may be, like water, temporarily dammed by dominant representations and discourse. As watery, woman is hardly (statically, unchangeably) “essentialist.” She too becomes the very matter of transmutation.

In an effort to circumvent the trap of biological essentialism, the texts of Irigaray, Cixous, and Minh-ha have also been read as merely metaphors of gestation: women's fluidity births new ways of thinking, writing, being.¹⁶ But surely, the watery body is no mere metaphor. The intelligibility of any aqueous metaphor depends entirely upon the real waters that sustain not only material bodies, but material language, too.¹⁷ And are we not all bodies of water? In *Marine Lover*, while Irigaray's descriptions highlight woman's aqueous embodiment, she posits no clear separation of the man's body from the amniotic waters he too readily forgets. Irigaray's male interlocutor in this text is birthed in and by a watery body—yet this water is also an integral part of his own flesh: “Where have you drawn what flows out of you?”¹⁸ And, while what her lover thinks he fears is drowning in the mother/sea, Irigaray subtly reminds him that what he should really fear is desiccation, drought, thirst. No body can come into being, thrive, or survive without water to buoy its flesh. Similarly, Minh-ha suggests that woman's writing draws from the wellspring of her reproductively oriented fluid forces (menstruation, lactation)—yet all bodies have reservoirs to be tapped.¹⁹ We might ask: if the fluids of otherwise gendered bodies were acknowledged rather than effaced, how might such attentiveness amplify the creative—and even ethical and political—potential of these bodies? Rather than alerting us to some “essentialist” difference between masculine and feminine (or normatively resexual and nonresexual) embodiment, such aqueous body-writing might invite all bodies to attend to the water that facilitates their existence, and embeds them within ongoing overlapping cycles of aqueous fecundity.

The fluid body is not specific to woman, but watery embodiment is still a feminist question; thinking as a watery body has the potential to bathe new feminist concepts and practices into existence. What if a reorientation of our lived embodiment as watery could move us, for example, beyond the longstanding debate among feminisms whereby commonality (connection, identification) and difference (alterity, unknowability) are posited as an either/or proposition? Inspired by Irigaray, we will still affirm that the rhythms of the fluid woman belong to what Gayatri Chakravorty Spivak has called “the species of alterity”²⁰ (for this alterity also safeguards plurality). But Irigaray also reminds us that no body is self-sufficient in its fluvial corporeality; we have all come from the various seas that have gestated us, both evolutionarily and maternally.²¹ Water, in other words, flows through and across difference. Water does not ask us to confirm either the irreducibility of alterity or material connection. Water flows between, as both: a new hydro-logic. What sort of ethics and politics could I cultivate if I were to acknowledge that the unknowability of the other nonetheless courses through me—just as I do through her?

To say that we harbor waters, that our bodies' gestation, sustenance, and interpermeation with other bodies are facilitated by our bodily waters, and that these waters are both singular and shared, is far more literal than we

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might at first think. Neither essentialist nor purely discursive, this watery feminism is critically materialist.

MEMBRANE, VISCOSITY

Probably the most important feature of a biomembrane is that it is a selectively permeable structure... [which is] essential for effective separation. — Wikipedia²²

Viscosity retains an emphasis on resistance to changing form. — Nancy Tuana²³

Bodies need water, but water also needs a body. Water is always sometime, someplace, somewhere. Even in our aqueous connections, bodies and their others/worlds are still differentiated. The question, then, of “what is” is never sufficient. How is it? Where is it? When is it? Speed, rate, thickness, duration, mixture, contamination, blockage.²⁴ If we are all bodies of water, then we are differentiated not so much by the “what” as by the “how.” But what are the specific mechanisms of this differentiation?

Attention to the mechanics of watery embodiment reveals that in order to connect bodies, water must travel across only partially permeable membranes. In an ocular-centric culture, some of these membranes, like our human skin, give the illusion of impermeability. Still, we perspire, urinate, ingest, ejaculate, menstruate, lactate, breathe, cry. We take in the world, selectively, and send it flooding back out again.

This selection is not a “choice” made by our subjective, human selves; it is rather always, as Nietzsche has taught us, an impersonal expression of *phusis*’ nuances—affirmative material energies striving toward increasingly differentiated forms.²⁵ Selection traverses other more subtle membranes, too—those that are either too ephemeral or too monumental to be perceived by us as such, yet that choreograph our ways of being in relation: a gravitational threshold, a weather front, a wall of grief, a line on a map, equinox, a winter coat, death. Nancy Tuana refers to this membrane logic as “viscous porosity.”

While the concept of fluidity emphasizes traversals across and between bodies, viscosity reminds Tuana that there are still *bodies*—all different—that need to be accounted for. Viscosity draws attention to “sites of resistance and opposition” rather than only “a notion of open possibilities” that might suggest one indiscriminate flow.²⁶ Despite the fact that we are all watery bodies, leaking into and sponging off of one another, we resist total dissolution, material annihilation.

Or more aptly, we postpone it: ashes to ashes, water to water. At what point is the past overtaken by the present?

What marks the definitive shift from one species to a “new” one? Where does the host body end and the amniotic body begin? Our bodies are thresholds of both past and future. The precise material space-time of differentiation is only a matter of convenience, but any body still requires membranes to keep from being swept out to sea altogether.

There is always a risk of flooding.

ADRIFT IN THE MORE-THAN-HUMAN

We are in this together. —Rosi Braidotti²⁷

The problem was that we did not know whom we meant when we said “we.” —Adrienne Rich²⁸

The mostly watery composition of my body is not just a human thing. From the almost imperceptible jellies in the benthos of the Pacific, to the Namibian desert catfish hibernating in the mud; from mangrove to ragweed; from culvert to billabong to the roaring Niagara; cushioned between fractocumulus cloud and deep earth aquifer, we are all bodies of water.

In acknowledging this corporeally connected aqueous community, distinctions between human and non-human start to blur. We live in a watery commons, where the human infant drinks the mother, the mother ingests the reservoir, the reservoir is replenished by the storm, the storm absorbs the ocean, the ocean sustains the fish, the fish are consumed by the whale. The bequeathing of our water to an other is necessary for the custodianship of this commons. But when and how does gift become theft, and sustainability usurpation?

“Trickle down”: while species extinctions are occurring at around 10 percent per decade, aquatic species face a higher threat of extinction than birds or mammals. Much of this oceanic swan song is due to the automotive fluids, household solvents, pesticides, mercury, and other toxins that make their way from human home to culvert to sea. Most affected are those animal bodies that dwell at or near the bottom of an aquatic habitat—such as fish eggs and filter feeders—where pollutants tend to settle.²⁹

“Currency”: resources such as salt and sand have long been harvested from the sea for human use, but marine organisms—tunicates, cnideria, mollusks—also provide us with pharmaceuticals, cosmetics, food additives, depilatories. For example, antigens derived from eleven pounds of sea squirts can supply enough anticancer drugs to satisfy the world’s demand for a year. Flows of power are inaugurated between marine life, human bodies in pain, and Big Pharma. Into which currents and what currencies are the sea squirts being commandeered?³⁰

“Liquidity”: the “human” has probably been around for five to seven million years, but sharks are at least 420 million years old. In recent decades, many shark species have been threatened by a black market finning industry that nets over US\$1 billion a year. A single whaleshark fin can sell for ten thousand dollars.³¹ Cash in hand, they say, is the most liquid asset.

The seeping of the biological into the cultural, of the more-than-human into the human, happens in more ways than one. Watery bodies sustain other bodies, but biological life buttresses our language, our ways of making sense of the world, as well.³² Hydro-logics suggest to us new ontological understandings of body and community, but how might feminism ensure that this aqueous understanding of our interbeing

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become not another appropriation and usurpation of the more-than-human world that sustains us?

To say that my body is marshland, estuary, ecosystem, that it is riven through with tributaries of companion species, nestling in my gut, extending through my fingers, pooling at my feet, is a beautiful way to reimagine my corporeality. But once we recognize that we are not hermetically sealed in our diver's suits of human skin, what do we do with this recognition? What do we owe, and how do we pay?

ECOTONE

I like places and times that are pregnant with change.
—Catriona Mortimer-Sandilands³³

Inorganic life is the movement at the membrane of the organism, where it begins to quiver with virtuality, decomposes, and is recombined again.—Pheng Cheah³⁴

As transition areas between two adjacent but different ecosystems, ecotones appear as both gradual shifts and abrupt demarcations. But more than just a marker of separation or even a marker of connection (although importantly both of these things), an ecotone is also a zone of fecundity, creativity, transformation; of becoming, assembling, multiplying; of diverging, differentiating, relinquishing. Something happens. Estuaries, tidal zones, wetlands: these are all liminal spaces where “two complex systems meet, embrace, clash, and transform one another.”³⁵

An ecotone is a sort of membrane, too: a pause, or even an increase in velocity, where/when/how matter comes to matter differently. If we consider membrane logic as belonging to the species of the ecotone, we are again made aware of the rich complexity of the hydro-logics that sustain us. The liminal ecotone is not only a place of transit, but itself a watery body. In other words, an ecotone has a material fecundity that rejects an ontological separation between “thing” and “transition,” between “body” and “vector.” The watery membrane, then, is no passive prop for the ontologically weightier bodies that traverse it. In Gilles Deleuze's terms, this event-full zone could be called “inorganic life.”³⁶ But saturated with lively water, inorganic life is organic, too. The virtual is also actual. These and other pairs begin to creep.

Eco: home. Tone: tension. We must learn to be at home in the quivering tension of the inbetween. No other home is available. In-between nature and culture, in-between biology and philosophy, in-between the human and everything we ram ourselves up against, everything we desperately shield ourselves from, everything we throw ourselves into, wrecked and recklessly, watching, amazed, as our skins become thinner.

TRANSCORPOREAL CREEP

The material self cannot be disentangled from networks that are simultaneously economic, political, cultural, scientific, and substantial... what was once the ostensibly bounded human subject finds herself in a swirling landscape of uncertainty.—Stacy Alaimo³⁷

Tuana reminds us that our porosity is what enables us to live at all, but “this porosity... does not discriminate against that which can kill us.”³⁸ Because water is such a capable vector, not only does life-giving potentiality course through our transcorporeal waterways, but so also does illness, contamination, inundation.

There are things we do know: skyrocketing rates of cancer in aboriginal communities downstream from the Alberta tar sands megaproject in Northwestern Canada are directly attributable to the toxic tailings ponds created by the bitumen extraction process. In November 2010, seven months after the Deepwater Horizon disaster in the Gulf of Mexico, the deaths of 6,104 birds, 609 sea turtles, and 100 mammals could be directly attributed to the oil spill—and the death toll continues to rise. Ongoing death and illness in the residents of Bhopal, India, almost three decades after the Union Carbide methyl isocyanate gas leak are directly attributable to persistent groundwater contamination stealthily poisoning all that flows beneath. But at what point do the sharp edges of our certainty begin to blur? Consider that in addition to fat, vitamins, lactose, minerals, antibodies, and other life-sustaining stuff, North American breast milk also likely harbors DDT, PCBs, dioxin, trichloroethylene, cadmium, mercury, lead, benzene, arsenic, paint thinner, phthalates, dry-cleaning fluid, toilet deodorizers, Teflon, rocket fuel, termite poison, fungicides, and flame retardant.³⁹ Reducing direct exposure to toxins cannot negate the fact that our bodily archives have deep memories, our flesh fed by streams whose sources are beyond our view.

As Stacy Alaimo notes, transcorporeal threats are often invisible, and risk is incalculable. The future is always an open question, and our bodies must be understood as flowing beyond the bounds of what is knowable. Aqueous transcorporeality therefore demands of us a new ethics—a new way of being responsible and responsive to our others.

On this “ever-changing landscape of continuous interplay, intra-action, emergence, and risk,”⁴⁰ even as we insist upon accountability, we must also make decisions that eschew certainty and necessary courses of action.

This is an ethics of unknowability.

Moreover, this new ethics must also be itself transcorporeal, transiting across and through diverse sites of contestation. For whom should rocket-fuelled breast milk be an issue, and why? Consider that due to cold temperatures and little sunlight, persistent organic pollutants (POPs) flowing from the industrial and agricultural wastes of far-flung rich, Westernized outposts break down slowly in the Arctic. A thumb-sized piece of maktaaq, a staple in the Inuit diet, contains more than the maximum recommended intake of PCBs for an entire week.⁴¹

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As a result, Innu women's breast milk is an especially toxic substance, absorbing the liquid runoff of a global political economy that produces vastly divergent body burdens. The inequalities of neocolonialist globalization course through waterways at scales both individual and oceanic. Nursing one's young becomes a complex congeries of questions in which we all are implicated, rather than an issue for the biologically essentialized, lactating woman alone. The flows of global power meet the flows of biomatter.

HYDROFEMINISM

It is a constant challenge for us to rise to the occasion, to catch the wave of life's intensities and ride it on, exposing the boundaries or limits as we transgress them.
—Rosi Braidotti⁴²

Watershed pollution, a theory of embodiment, amniotic becomings, disaster, environmental colonialism, how to write, global capital, nutrition, philosophy, birth, rain, animal ethics, evolutionary biology, death, storytelling, bottled water, multinational pharmaceutical corporations, drowning, poetry.

These are all feminist questions, and they are mostly inextricable from one another. A key priority for feminism today, as Chandra Talpade Mohanty has claimed, is building a transnational, anticapitalist, and anticolonialist solidarity, where local and global thinking and acting are simultaneous.⁴³ Few things are more planetary and more intimate than our bodies of water. New feminisms thus must also be transspecies, and transcorporeal.

Not only does water connect us, gestate us, sustain us—more than this, water disturbs the very categories that ground the domains of social, political, philosophical, and environmental thought, and those of feminist theory and practice as well.

Thinking about our selves and our broader communities as watery can thus unmoor us in productive (albeit sometimes risky) ways. We are set adrift in the space-time between our certainties, between the various outcrops we cling to for security. It is here, in the borderzones of what is comfortable, of what is perhaps even livable,⁴⁴ that we can open to alterity—to other bodies, other ways of being and acting in the world—in the simultaneous recognition that this alterity also flows through us.

Current feminisms have their own ecotones, where the "objects" of feminist thought extend rhizomatically into areas one might never have considered "feminist." To follow our bodies of water along their rivulets and tributaries is to journey beyond the cleaving and coupling of sexually differentiated human bodies: we find ourselves tangled in intricate choreographies of bodies and flows of all kinds—not only human bodies, but also other animal, vegetable, geophysical, meteorological, and technological ones; not only watery flows, but also flows of power, culture, politics, and economics. So if projects that move us to think about animal ethics, or environmental degradation, or neocolonialist capitalist incursions are still "feminist," it is not because such questions are analogous to sexual oppression; it is rather because a feminist exploration

of the inextricable materiality/semioticity that circulates through all of these bodies pushes at the borders of feminism, and expands it.

By venturing to feminism's ecotones, and leaping in, we can discover that feminism dives far deeper than human sexual difference, and outswims any attempts to limit it thus.

Here is gestation, here is proliferation, here is danger, here is risk. Here is an unknowable future, always already folded into our own watery flesh. Here is hydrofeminism.

At least this is what becoming a body of water has taught me.

- 1 David Suzuki with Amanda McConnell, "A Child's Reminder," in *Whose Water Is It? The Unquenchable Thirst of a Water-Hungry World*, ed. Bernadette MacDonald and Douglas Jehl (Washington, DC: National Geographic Society, 2003), p. 179.
- 2 "The Great Ocean Conveyor Belt," Environmental Literacy Council, <http://www.enviroliteracy.org/article.php/545.html>, accessed on April 23, 2011.
- 3 Mark and Dianna McMenamin, *Hypersea* (New York: Columbia University Press, 1994), p. 5.
- 4 Robert Kandel, *Water from Heaven* (New York: Columbia University Press, 2003), p. 132.
- 5 McMenamin and McMenamin, *Hypersea*, p. 5.
- 6 *Ibid.*, p. 15.
- 7 Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago: Prickly Paradigm Press, 2003).
- 8 See Mielle Chandler and Astrida Neimanis, "Water and Gestationality: What Flows Beneath Ethics," in *Thinking with Water*, ed. Cecilia Chen, Janine MacLeod, and Astrida Neimanis (Montreal: McGill-Queen's University Press, forthcoming). [AU: Can this be updated?]
- 9 Virginia Woolf, *Mrs. Dalloway* (New York: Penguin Classic, 2000), p. 124. I am indebted to Janine MacLeod for drawing my attention to the tidal imagery in Woolf's work. This is a pre-publication author's proof. For citation purposes, please refer to Neimanis, Astrida. "Hydrofeminism: Or, On Becoming a Body of Water." in *Undutiful Daughters: Mobilizing Future Concepts, Bodies and Subjectivities in Feminist Thought and Practice*, eds. Henriette Gunkel, Chrysanthi Nigianni and Fanny Söderbäck. New York: Palgrave Macmillan, 2012.
- 10 Hélène Cixous and Catherine Clément, "Sorties: Out and Out: Attacks/Ways Out/Forays," in *The Newly Born Woman*, trans. Betsy Wing (Minneapolis: University of Minnesota Press, 1986), p. 89.
- 11 Trinh T. Minh-ha, *Woman, Native, Other: Writing Postcoloniality and Feminism* (Bloomington: Indiana University Press, 1989), p. 38.
- 12 Luce Irigaray, *Marine Lover of Friedrich Nietzsche*, trans. Gillian C. Gill (New York: Columbia University Press, 1991), p. 37.
- 13 "And isn't it by forgetting the first waters that you achieve immersion in your abysses and the giddy flight of one who wings far away" (*ibid.*, p. 38).
- 14 Minh-ha, *Woman, Native, Other*, p. 38.
- 15 Hélène Cixous, "The Laugh of the Medusa," *Signs* 1:4 (1976), p. 881.
- 16 For example, see Judith Butler, *Bodies that Matter: On the Discursive Limits of 'Sex'* (New York: Routledge, 1993); or Margaret Whitford, *Luce Irigaray: Philosophy in the Feminine* (London: Routledge, 1991).

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- 17 See Gaston Bachelard, *Water and Dreams: An Essay on the Imagination of Matter*, trans. Edith R. Farrell (Dallas: Dallas Institute of Humanities and Culture, 1993); and Janine MacLeod, "Water, Memory and the Material Imagination," in *Thinking with Water*.
- 18 Irigaray, *Marine Lover*, p. 38.
- 19 "A woman's ink of blood for a man's ink of semen" (Minh-ha, *Woman, Native, Other*, p. 38).
- 20 Gayatri Chakravorty Spivak, *Death of a Discipline* (New York: Columbia University Press, 2003), p. 72.
- 21 See Irigaray, *Marine Lover*, pp. 12–13, where Irigaray makes allusions to Nietzsche's evolutionary "descent."
- 22 "Biological Membrane," Wikipedia, http://en.wikipedia.org/wiki/Biological_membrane, accessed on April 23, 2011.
- 23 Nancy Tuana, "Viscous Porosity: Witnessing Katrina," in *Material Feminisms*, ed. Stacy Alaimo and Susan Hekman (Bloomington: University of Indiana Press, 2008), p. 194.
- 24 See Gilles Deleuze and Félix Guattari on bodies and their composition, for example, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), pp. 152–153.
- 25 See Melissa A. Orlie, "Impersonal Matter," in *New Materialisms: Ontology, Agency, and Politics*, ed. Diana Coole and Samantha Frost (Durham, NC: Duke University Press, 2010), p. 134.
- 26 Tuana, "Viscous Porosity," p. 194. This is a pre-publication author's proof. For citation purposes, please refer to Neimanis, Astrida. "Hydrofeminism: Or, On Becoming a Body of Water." in *Undutiful Daughters: Mobilizing Future Concepts, Bodies and Subjectivities in Feminist Thought and Practice*, eds. Henriette Gunkel, Chrysanthi Nigianni and Fanny Söderbäck. New York: Palgrave Macmillan, 2012.
- 27 Rosi Braidotti, *Transpositions: On Nomadic Ethics* (London: Polity, 2006), p. 119. This refrain is a motto for Braidotti's post-humanist ecological thought.
- 28 Adrienne Rich, "Notes Toward a Politics of Location," in *Feminist Theory Reader: Local and Global Perspectives*, ed. Carole R. McCann and Seung-Kyung Kim (New York: Routledge, 2003), p. 451.
- 29 "Aquatic Extinction," *Earth Gauge*, <http://www.earthgauge.net/2008/aquatic-extinction>, accessed on April 23, 2011.
- 30 Astrida Neimanis, "'Strange Kinship' and Ascidian Life: 13 Repetitions," *Journal of Critical Animal Studies* 9:1 (2011), pp. 117–143.
- 31 "About Shark Finning," *Stop Shark Finning: Keep Sharks in the Ocean and Out of the Soup*, <http://www.stopsharkfinning.net>, accessed on April 23, 2011.
- 32 See MacLeod, "Water, Memory and the Material Imagination" for a complex analysis of the predatory relationship between the language of capital flows and watery materiality.
- 33 Catriona Mortimer-Sandilands, "The Marginal World," in *Every Grain of Sand: Canadian Perspectives on Ecology and Environment*, ed. J. Andrew Wainwright (Waterloo, Ontario: Wilfred Laurier University Press, 2004), p. 46.
- 34 Pheng Cheah, "Non-Dialectical Materialism," in *New Materialisms*, p. 88.
- 35 Mortimer-Sandilands, "The Marginal World," p. 48. See also Cecilia Chen, "Mapping Waters: Thinking with Watery Places," in *Thinking with Water*.
- 36 See Cheah, "Non-Dialectical Materialism," p. 88.
- 37 Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material Self* (Bloomington: Indiana University Press, 2010), p. 20.
- 38 Tuana, "Viscous Porosity," p. 198.
- 39 Florence Williams, "Toxic Breast Milk?" *New York Times Magazine*, January 9, 2005, <http://www.nytimes.com/2005/01/09/magazine/09TOXIC.html?pagewanted=1&r=1>, accessed on February 16, 2011.
- 40 Alaimo, *Bodily Natures*, p. 21.
- 41 Andrew Duffy, "Toxic Chemicals Poison Inuit Food," *Ottawa Citizen*, http://www.chem.unep.ch/POPs/POP_Inc/press_releases/ottawa-1.htm.5_July_1998, accessed on February 16, 2011.
- 42 Rosi Braidotti, "The Ethics of Becoming-Imperceptible," in *Deleuze and Philosophy*, ed. Constantin V. Boundas (Edinburgh: Edinburgh University Press, 2006), p. 139. This is a pre-publication author's proof. For citation purposes, please refer to Neimanis, Astrida. "Hydrofeminism: Or, On Becoming a Body of Water." in *Undutiful Daughters: Mobilizing Future Concepts, Bodies and Subjectivities in Feminist Thought and Practice*, eds. Henriette Gunkel, Chrysanthi Nigianni and Fanny Söderbäck. New York: Palgrave Macmillan, 2012.
- 43 See Chandra Talpade Mohanty, "'Under Western Eyes' Revisited: Feminist Solidarity through Anticapitalist Struggles," *Signs* 28:2 (2003), pp. 499–535.
- 44 Spatio-temporal dynamisms "can be experienced only at the borders of the livable" [Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1994), p. 118]. Copyeditor: No need to reverse brackets here. STET. Braidotti expands this notion as an ethics of sustainability (Braidotti, "The Ethics of Becoming-Imperceptible").

THE GRAMMARIAN'S FIVE DAUGHTERS

Eleanor Arnason

Once there was a grammarian who lived in a great city that no longer exists, so we don't have to name it. Although she was learned and industrious and had a house full of books, she did not prosper. To make the situation worse, she had five daughters. Her husband, a diligent scholar with no head for business, died soon after the fifth daughter was born, and the grammarian had to raise them alone. It was a struggle, but she managed to give each an adequate education, though a dowry—essential in the grammarian's culture—was impossible. There was no way for her daughters to marry. They would become old maids, eking (their mother thought) a miserable living as scribes in the city market. The grammarian fretted and worried, until the oldest daughter was fifteen years old.

Then the girl came to her mother and said, "You can't possibly support me, along with my sisters. Give me what you can, and I'll go out and seek my fortune. No matter what happens, you'll have one less mouth to feed."

The mother thought for a while, then produced a bag. "In here are nouns, which I consider the solid core and treasure of language. I give them to you because you're the oldest. Take them and do what you can with them."

The oldest daughter thanked her mother and kissed her sisters and trudged away, the bag of nouns on her back.

Time passed. She traveled as best she could, until she came to a country full of mist. Everything was shadowy and uncertain. The oldest daughter blundered along, never knowing exactly where she was, till she came to a place full of shadows that reminded her of houses.

A thin, distant voice cried out, "Oyez. The king of this land will give his son or daughter to whoever can dispel the mist."

The oldest daughter thought a while, then opened her bag. Out came the nouns, sharp and definite. Sky leaped up and filled the grayness overhead. Sun leaped up and lit the sky. Grass spread over the dim gray ground. Oak and elm and poplar rose from grass. House followed, along with town and castle and king.

Now, in the sunlight, the daughter was able to see people. Singing her praise, they escorted her to the castle, where the grateful king gave his eldest son to her. Of course they married and lived happily, producing many sharp and definite children.

In time they ruled the country, which acquired a new name: Thingnesse. It became famous for bright skies, vivid landscapes, and solid, clear-thinking citizens who loved best what they could touch and hold.

Now the story turns to the second daughter. Like her sister, she went to the grammarian and said, "There is no way you can support the four of us. Give me what you can, and I will go off to seek my fortune. No matter what happens, you will have one less mouth to feed."

The mother thought for a while, then produced a bag. "This contains verbs, which I consider the strength of language. I give them to you because you are my second child and the most fearless and bold. Take them and do what you can with them."

The daughter thanked her mother and kissed her sisters and trudged away, the bag of verbs on her back.

Like her older sister, the second daughter made her way as best she could, coming at last to a country of baking heat. The sun blazed in the middle of a dull blue, dusty sky. Everything she saw seemed overcome with lassitude. Honeybees, usually the busiest of creatures, rested on their hives, too stupefied to fly in search of pollen. Plowmen dozed at their plows. The oxen in front of the plows dozed as well. In the little trading towns, the traders sat in their shops, far too weary to cry their wares.

The second daughter trudged on. The bag on her back grew ever heavier and the sun beat on her head, until she could barely move or think. Finally, in a town square, she came upon a man in the embroidered tunic of a royal herald. He sat on the rim of the village fountain, one hand trailing in water.

When she came up, he stirred a bit, but was too tired to lift his head. "Oy—" he said at last, his voice whispery and slow. "The queen of this country will give—give a child in marriage to whoever can dispel this stupor."

The second daughter thought for a while, then opened her bag. Walk jumped out, then scamper and canter, run and jump and fly. Like bees, the verbs buzzed through the country. The true bees roused themselves in response. So did the country's birds, farmers, oxen, housewives, and merchants. In every town, dogs began to bark. Only the cats stayed curled up, having their own schedule for sleeping and waking.

Blow blew from the bag, then gust. The country's banners flapped. Like a cold wind from the north or an electric storm, the verbs hummed and crackled. The daughter, amazed, held the bag open until the last slow verb had crawled out and away.

Townfolk danced around her. The country's queen arrived on a milk-white racing camel. "Choose any of my children. You have earned a royal mate."

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The royal family lined up in front of her, handsome lads and lovely maidens, all twitching and jittering, due to the influence of the verbs.

All but one, the second daughter realized: a tall maid who held herself still, though with evident effort. While the other royal children had eyes like deer or camels, this one's eyes—though dark—were keen. The grammarian's daughter turned toward her.

The maiden said, "I am the crown princess. Marry me and you will be a queen's consort. If you want children, one of my brothers will bed you. If we're lucky, we'll have a daughter to rule after I am gone. But no matter what happens, I will love you forever, for you have saved my country from inaction."

Of course, the grammarian's daughter chose this princess.

Weary of weariness and made restless by all the verbs, the people of the country became nomads, riding horses and following herds of great-horned cattle over a dusty plain. The grammarian's second daughter bore her children in carts, saw them grow up on horseback, and lived happily to an energetic old age, always side by side with her spouse, the nomad queen. The country they ruled, which had no clear borders and no set capital, became known as Change.

Now the story turns back to the grammarian. By this time her third daughter had reached the age of fifteen.

"The house has been almost roomy since my sisters left," she told her mother. "And we've had almost enough to eat. But that's no reason for me to stay, when they have gone to seek their fortunes. Give me what you can, and I will take to the highway. No matter what happens, you'll have one less mouth to feed."

"You are the loveliest and most elegant of my daughters," said the grammarian. "Therefore I will give you this bag of adjectives. Take them and do what you can with them. May luck and beauty go with you always."

The daughter thanked her mother, kissed her sisters, and trudged away, the bag of adjectives on her back. It was a difficult load to carry. At one end were words like rosy and delicate, which weighed almost nothing and fluttered. At the other end, like stones, lay dark and grim and fearsome. There seemed no way to balance such a collection. The daughter did the best she could, trudging womanfully along until she came to a bleak desert land. Day came suddenly here, a white sun popping into a cloudless sky. The intense light bleached colors from the earth. There was little water. The local people lived in caves and canyons to be safe from the sun.

"Our lives are bare stone," they told the grammarian's third daughter, "and the sudden alternation of blazing day and pitchblack night. We are too poor to have a king or queen, but we will give our most respected person, our shaman, as spouse to anyone who can improve our situation."

The third daughter thought for a while, then unslung her unwieldy bag, placed it on the bone-dry ground, and opened it. Out flew rosy and delicate like butterflies. Dim followed, looking like a moth.

"Our country will no longer be stark," cried the people with joy. "We'll have dawn and dusk, which have always been rumors."

One by one the other adjectives followed: rich, subtle, beautiful, luxuriant. This last resembled a crab covered with shaggy vegetation. As it crept over the hard ground, plants fell off it—or maybe sprang up around it—so it left a trail of greenness.

Finally, the bag was empty except for nasty words. As slimy reached out a tentacle, the third daughter pulled the drawstring tight. Slimy shrieked in pain. Below it in the bag, the worst adjectives rumbled, "Unjust! Unfair!"

The shaman, a tall, handsome person, was nearby, trying on various adjectives. He/she/it was especially interested in masculine, feminine, and androgynous. "I can't make up my mind," the shaman said. "This is the dark side of our new condition. Before, we had clear choices. Now, the new complexity puts all in doubt."

The sound of complaining adjectives attracted the shaman. He, she, or it came over and looked at the bag, which still had a tentacle protruding and wiggling.

"This is wrong. We asked for an end to starkness, which is not the same as asking for prettiness. In there—at the bag's bottom—are words we might need someday: sublime, awesome, terrific, and so on. Open it up and let them out."

"Are you certain?" asked the third daughter.

"Yes," said the shaman.

She opened the bag. Out crawled slimy and other words equally disgusting. The shaman nodded with approval as more and more unpleasant adjectives appeared. Last of all, after grim and gruesome and terrific, came sublime. The word shone like a diamond or a thundercloud in sunlight.

"You see," said the shaman. "Isn't that worth the rest?"

"You are a holy being," said the daughter, "and may know things I don't."

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Sublime crawled off toward the mountains. The third daughter rolled up her bag. "All gone," she said. "Entirely empty."

The people looked around. Their land was still a desert, but now clouds moved across the sky, making the sunlight on bluff and mesa change. In response to this, the desert colors turned subtle and various. In the mountains rain fell, misty gray, feeding clear streams that ran in the bottoms of canyons. The vegetation there, spread by the land-crab luxuriant and fed by the streams, was a dozen—two dozen—shades of green.

"Our land is beautiful!" the people cried. "And you shall marry our shaman!"

But the shaman was still trying on adjectives, unable to decide if she, he, or it wanted to be feminine or masculine or androgynous.

"I can't marry someone who can't make up her mind," the third daughter said. "Subtlety is one thing. Uncertainty is another."

"In that case," the people said, "you will become our first queen, and the shaman will become your first minister."

This happened. In time the third daughter married a young hunter, and they had several children, all different in subtle ways.

The land prospered, though it was never fertile, except in the canyon bottoms. But the people were able to get by. They valued the colors of dawn and dusk, moving light on mesas, the glint of water running over stones, the flash of bugs and birds in flight, the slow drift of sheep on a hillside—like clouds under clouds. The name of their country was Subtletie. It lay north of Thingnesse and west of Change.

Back home, in the unnamed city, the grammarian's fourth daughter came of age.

"We each have a room now," she said to her mother, "and there's plenty to eat. But my sister and I still don't have dowries. I don't want to be an old maid in the marketplace. Therefore, I plan to go as my older sisters did. Give me what you can, and I'll do my best with it. And if I make my fortune, I'll send for you."

The mother thought for a while and rummaged in her study, which was almost empty. She had sold her books years before to pay for her daughters' educations, and most of her precious words were gone. At last, she managed to fill a bag with adverbs, though they were frisky little creatures and tried to escape.

But a good grammarian can outwit any word. When the bag was close to bursting, she gave it to her fourth daughter.

"This is what I have left. I hope it will serve."

The daughter thanked her mother and kissed her one remaining sister and took off along the highway, the bag of adverbs bouncing on her back.

Her journey was a long one. She made it womanfully, being the most energetic of the five daughters and the one with the most buoyant spirit. As she walked—quickly, slowly, steadily, unevenly—the bag on her back kept jouncing around and squeaking.

"What's in there?" asked other travelers. "Mice?"

"Adverbs," said the fourth daughter.

"Not much of a market for them," said the other travelers. "You'd be better off with mice."

This was plainly untrue, but the fourth daughter was not one to argue. On she went, until her shoes wore to pieces and fell from her weary feet. She sat on a stone by the highway and rubbed her bare soles, while the bag squeaked next to her.

A handsome lad in many-colored clothes stopped in front of her. "What's in the bag?" he asked.

"Adverbs," said the daughter shortly.

"Then you must, like me, be going to the new language fair."

The daughter looked up with surprise, noticing—as she did so—the lad's rosy cheeks and curling, auburn hair. "What?" she asked intently.

"I'm from the country of Subtletie and have a box of adjectives on my horse, every possible color, arranged in drawers: aquamarine, russet, dun, crimson, puce. I have them all. Your shoes have worn out. Climb up on my animal, and I'll give you a ride to the fair."

The fourth daughter agreed, and the handsome lad—whose name, it turned out, was Russet—led the horse to the fair. There, in booths with bright awnings, wordsmiths and merchants displayed their wares: solid nouns, vigorous verbs, subtle adjectives. But there were no adverbs.

"You have brought just the right product," said Russet enviously. "What do you say we share a booth? I'll get cages for your adverbs, who are clearly frisky little fellows, and you can help me arrange my colors in the most advantageous way."

The fourth daughter agreed; they set up a booth. In front were cages of adverbs, all squeaking and jumping, except for the sluggish ones. The lad's adjectives hung on the awning, flapping in a mild wind. As customers came by, drawn by the adverbs, Russet said, "How can we have sky without blue? How can we have gold without shining? And how much use is a verb if

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it can't be modified? Is walk enough, without slowly or quickly?"

"Come and buy! Come and buy! We have mincingly and angrily, knowingly, lovingly, as well as a fine assortment of adjectives. Ride home happily with half a dozen colors and cage full of adverbs."

The adverbs sold like hotcakes, and the adjectives sold well also. By the fair's end, both Russet and the fourth daughter were rich, and there were still plenty of adverbs left.

"They must have been breeding, though I didn't notice," said Russet. "What are you going to do with them?"

"Let them go," said the daughter.

"Why?" asked Russet sharply.

"I have enough money to provide for myself, my mother, and my younger sister. Greedy is an adjective and not one of my wares." She opened the cages. The adverbs ran free—slowly, quickly, hoppingly, happily. In the brushy land around the fairground, they proliferated. The region became known as Varietie. People moved there to enjoy the brisk, invigorating, varied weather, as well as the fair, which happened every year thereafter.

As for the fourth daughter, she built a fine house on a hill above the fairground. From there she could see for miles. Out back, among the bushes, she put feeding stations for the adverbs, and she sent for her mother and one remaining sister. The three of them lived together contentedly. The fourth daughter did not marry Russet, though she remained always grateful for his help. Instead, she became an old maid. It was a good life, she said, as long as one had money and respect.

In time, the fifth daughter came of age. (She was the youngest by far.) Her sister offered her a dowry, but she said, "I will do no less than the rest of you. Let my mother give me whatever she has left, and I will go to seek my fortune."

The mother went into her study, full of new books now, and looked around. "I have a new collection of nouns," she told the youngest daughter.

"No, for my oldest sister took those and did well with them, from all reports. I don't want to repeat someone else's adventures."

Verbs were too active, she told her mother, and adjectives too varied and subtle. "I'm a plain person who likes order and organization."

"How about adverbs?" asked the mother.

"Is there nothing else?"

"Prepositions," said the mother, and showed them to her daughter. They were dull little words, like sometimes a smith might make from pieces of iron rod. Some were bent into angles. Others were curved into hooks. Still others were circles or helixes. Something about them touched the youngest daughter's heart.

"I'll take them," she said and put them in a bag. Then she thanked her mother, kissed her sister, and set off.

Although they were small, the prepositions were heavy and had sharp corners. The youngest daughter did not enjoy carrying them, but she was a methodical person who did what she set out to do. Tromp, tromp she went along the highway, which wound finally into a broken country, full of fissures and jagged peaks. The local geology was equally chaotic. Igneous rocks intruded into sedimentary layers. New rock lay under old rock. The youngest daughter, who loved order, had never seen such a mess. While neat, she was also rational, and she realized she could not organize an entire mountain range. "Let it be what it is," she said. "My concern is my own life and other people."

The road grew rougher and less maintained. Trails split off from it and something rejoined it or ended nowhere, as the daughter discovered by trial. "This country needs engineers," she muttered peevishly. (A few adverbs had hidden among the prepositions and would pop out now and then. Peevishly was one.)

At length the road became nothing more than a path, zig-zagging down a crumbling mountain slope. Below her in a valley was a town of shacks, though town might be the wrong word. The shacks were scattered helter-skelter over the valley bottom and up the valley sides. Nothing was seemly or organized. Pursing her lips—a trick she had learned from her mother, who did it when faced by a sentence that would not parse—the fifth daughter went down the path.

When she reached the valley floor, she saw people running to and fro.

"Madness," said the daughter. The prepositions, in their bag, made a sound of agreement like metal chimes.

In front of her, two women began to argue—over what she could not tell.

"Explain," cried the fifth daughter, while the prepositions went "bong" and "bing."

"Here in the Canton of Chaos nothing is capable of agreement," one woman said. "Is it age before beauty, or beauty before age? What came first, the chicken or the egg? Does might make right, and if so, what is left?"

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"This is certainly madness," said the daughter.

"How can we disagree?" said the second woman. "We live topsy-turvy and pell-mell, with no hope of anything better." Saying this, she hit the first woman on the head with a live chicken.

"Egg!" cried the first woman.

"Left!" cried the second.

The chicken squawked, and the grammarian's last daughter opened her bag.

Out came the prepositions: of, to, from, with, at, by, in, under, over, and so on. When she'd put them into the bag, they had seemed like hooks or angles. Now, departing in orderly rows, they reminded her of ants. Granted, they were large ants, each one the size of a woman's hand, their bodies metallic gray, their eyes like cut and polished hematite. A pair of tongs or pincers protruded from their mouths; their thin legs, moving delicately over the ground, seemed made of iron rods or wire.

Somehow—it must have been magic—the things they passed over and around became organized. Shacks turned into tidy cottages. Winding paths became streets. The fields were square now. The trees ran in lines along the streets and roads. Terraces appeared on the mountainsides.

The mountains themselves remained as crazy as ever, strata sideways and upside down. "There is always a limit to order," said the daughter. At her feet, a handful of remaining prepositions chimed their agreement like bells.

In decorous groups, the locals came up to her. "You have saved us from utter confusion. We are a republic, so we can't offer you a throne. But please become our first citizen, and if you want to marry, please accept any of us. Whatever you do, don't go away, unless you leave these ingenious little creatures that have connected us with one another."

"I will stay," said the fifth daughter, "and open a grammar school. As for marriage, let that happen as it will."

The citizens agreed by acclamation to her plan. She settled in a tidy cottage and opened a tidy school, where the canton's children learned grammar.

In time, she married four other schoolteachers. (Due to the presence of the prepositions, which remained in their valley and throughout the mountains, the local people developed a genius for creating complex social groups. Their diagrams of kinship excited the awe of neighbors, and their marriages grew more intricate with each generation.)

The land became known as Relation. In addition to genealogists and marriage brokers, it produced diplomats and merchants. These last two groups, through trade and

negotiation, gradually unified the five countries of Thingnesse, Change, Subtletie, Varietie, and Relation. The empire they formed was named Cooperation. No place was more solid, more strong, more complex, more energetic, or better organized.

The flag of the new nation was an ant under a blazing yellow sun. Sometimes the creature held a tool: a pruning hook, scythe, hammer, trowel, or pen. At other times its hands (or feet) were empty. Always below it was the nation's motto: WITH.

A CONVERSATION

Emanuele Coccia

Pauline Julier

Through different natural stories filmed between China, France and Italy, Pauline Julier's *Naturales Historiae* questions the ways of thinking and representing nature. Each chapter explores a situation of human beings grappling with nature and its images, which reveals our obsessions and shakes up our certainties.

EC I would like to start with the quote by Jorge Luis Borges that opens the film: the effort to map the world can only fail and lead to a labyrinth of forms which is nothing other than the portrait of the cartographer. To what extent is this film your portrait? One could also say the opposite: every biography is in fact a form of natural history of the planet through an interposed body. We are all a face that Gaïa gives herself to contemplate differently.

PJ The idea of portrait implies a fixity, the capture of a moment. A bit like a description, a map, a definition, an image, "it" freezes things. And what is fixed in this film is the state of my thought at that moment, a thought in the process of being made, articulated and composed with the words of others and which is shaped by the montage. In this sense, there is no doubt that this film is my portrait, at a given moment, when I discovered that the idea of Nature—which I inherited from Western modernity—is the most unshared thing in the world, alongside with how we look at it, the idea of a landscape that doesn't go without saying, etc.

I really like the inversion that you propose, which can be applied to many human deeds. Is a portrait the portrait of the portrayed or the portrayer? Who is described in a story and who sees what through a film? Maybe in the case of Gaïa every human life that is narrated is the description of one of these multiple facets, all our biographies as many natural stories.

EC I was very struck by your definition of cinema: a wind-light image. Could you develop this idea further?

PJ This idea comes from the discovery, as the author François Jullien explains, that the word landscape, as we understand it in the Western world, does not exist in Chinese language, which instead uses either the ideogram "mountain-water" or "wind-light". I have appropriated this idea to apply it to cinema because cinema is a language for me. And the first element of this language, the original word, is the image of a reality facing us and which differs from photography because it moves. It is literally the wind in a tree and light on those leaves that the moving image allows us to capture. If one of the two elements is missing, there is no cinematic image. The association of these two words also evokes fleetingness. It's quite prosaic, probably a bit romantic, but the basis of my attraction to this medium relies on that, which is also what I try to create, a wind-light breath.

EC In your film I also see a strong stance: what we call nature can only be contemplated through narrative, because it is historically constructed, in an arbitrary way, exactly like our history. Natural sciences should therefore embrace the art of storytelling. What is cinema's contribute to the possibility of producing a new natural history? And how to tell today's history?

PJ From my point of view, natural sciences form a narrative and, perhaps unwittingly, use this art. An objectified (objectifying) narrative, with a precise descriptive vocabulary, in search of facts; but a narrative, still.

A CONVERSATION

Emanuele Coccia

Pauline Julier

I believe the strength of cinema (and moving images) lies in the multi-perspectivist vision it can offer. Today, there is a strong need to embrace new perspectives, no one believes in the isolated, devastating position of a single point of view anymore. The fields to be rediscovered are vast and cinema, among other storytelling arts, makes it possible to tackle them, particularly through montage. Telling the story, the stories, these days is perhaps to accept the fragility of a narrative and to show different perspectives within the same context.

EC Your “natural stories” also embrace many episodes of human history (the cult of Saint Gennaro in Naples, the suicide of Cassini, etc.). What does it mean to think of human history in terms of natural history?

PJ We are living in an age that is learning that there is no human history outside natural history, or rather no human histories outside natural histories. And if we needed a proof, here comes the term Anthropocene—which everyone is grasping because it reveals a need to name, I believe—which designates this new geological period in which we live: we have inscribed our traces even in the layers of rock.

The film depicts historical episodes by drawing from different registers of history (literary, pictorial, popular, scientific). For me, the strange splendour of the living world around us is revealed by the composition of *ET*. In the case of Vesuvius, for example, it is not scientific surveillance or the belief in the protection of the Saint that has allowed Neapolitans to live close to the volcano for so long. These are the two versions which hold together, to which all the other stories about this volcano should be added.

EC The last episode ends with the idea of the “artificial observer” Casini crashing into the object to be known together with the hypothesis of a black hole engulfing both. You seem to be saying that all natural history is this black hole which engulfs the narrating subject and the object that is being narrated. Could you revisit the end of the film?

PJ The ending is open and plays on the expected codes of science fiction. I believe that the idea of a unique natural story that excludes us is a black hole indeed, or a lost cause, to put it another way, something that damages us in any case. Like Cassini or Pliny, who is dying by wanting to describe too much. I wonder what we enclose in wanting to explain nature. Human beings, in seeking to shape the raw and changing world, enclose themselves in categories of thought that give them a certain stability. The concepts we use to organise the diversity of the world are our own, we produce them and with them comes perhaps the risk of emptying the world of its essence by fixing it in a catalogue of images, landscapes, definitions, resolutions (scientific, religious, etc.). It is the same movement as that of the volcano, which takes away life by freezing a forest or a city, which destroys while preserving through time. It is the same movement as that of the photographic image, which, cutting out the “real”, participates in fixing a world to be seen, to be understood. It is the same illusion of continuity of movement produced by the cinematic image: the world is emptied out of its raw vitality, organised according to codes of representation that are inevitably anthropised.

THE PLANET IN A PEBBLE: FUTURES

Jan Zalasiewicz

BREAKING UP

The pebble is on the beach, oncemore, unmarked by its brief contact with human sentience. Almost unmarked. The fingerprints that it lightly bears will, however, be washed away by the next tide. It has a long future, still, but probably not as a pebble—though quite how long it remains as a pebble may well depend on human action. Not on immediate, direct human action—whether it is scooped up by a digger and converted into concrete for a sea-front esplanade, for instance, or even collected as a souvenir by some passing tourist. Either of these fates should cause only a brief deflection from its long-term future (the esplanade is, after all, only a cliff to be attacked by the elements, while beach souvenirs are soon discarded). A larger perturbation of its trajectory more probably hinges on wider human effects—but more of that anon. We might assume, first, that nature runs its course.

A pebble on a beach, its natural environment, is changing all the time. Not long ago, it was part of a slab of slate in a cliff, then it briefly became an angular chunk of rock, before the waves and water smoothed it down.

They are still smoothing it, wearing away at it, making it smaller. Even the contact with human hands probably removed a grain or two. A pebble has the appearance of permanence, but it is not permanent. How long does it take to wear down a pebble? This can happen astonishingly quickly. Even over a single tide, being washed backwards and forwards by every incoming wave, a pebble can become detectably lighter—by less than one tenth of one per cent, admittedly, but that weight difference can easily be measured using modern electronic scales. Over a season, on an exposed part of the coast, a pebble can lose between a third and a half of its mass. The rates will vary—on a stormy day the banging of pebbles against each other can produce distinct percussion marks on their surfaces, while on a calm day the attrition rate will drop markedly.

Night and day, though, the pebble is disintegrating. What can save it? Well, perhaps we can, temporarily, though at a high cost to ourselves. Not so much by taking it off the beach and putting it into a drawing-room cabinet, or a museum. But a geologically proven way to stop the erosional processes on a beach is to drown it. And it seems more likely than not, as things now stand, that one by-product of our civilization will be a geologically sudden sea-level rise, of some few metres over the next few centuries.

The shingle beach, and the cliff, will be taken below the destructive wave zone, and covered with mud and silt. If the remnant of our pebble is still somewhere on that beach, it may be smuggled across many millennia still, in what is left of its pebble-form, for it may take a long time for the waters to recede. But recede they eventually will, in perhaps 100,000 years from now. The pebble will be exhumed, and put back into the mill of erosion.

Whether now, or whether in that post-industrial future, the pebble will be dismantled. Its components, that have stayed together for so long, will now part company, and go their

separate ways. Some will go on, in a very short space of time, to literally encircle the world, by air and by sea.

Other components will rest more locally. But as time passes, even these will diffuse outwards, as the parts of the pebble-that-was are scattered far and wide.

The travel paths are to some degree predictable, at least initially. The quartz grains in the pebble will be released into the sand and silt on the beach. They will not be quite as they were, though, when they initially arrived on that Silurian sea floor. They have been reshaped in their long contact with those underground fluids as the strata were first compacted, and then crumpled as the Welsh mountains were built. The original grains have been partly dissolved, partly cemented over by extra silica, partly fused together by the effects of pressure solution. So what emerges will be irregular clusters of former grains, or parts of them, and these will join the other grains on the beach, and be swept along the coast by longshore drift, or washed out to sea, into deeper water by storms and tides, being separated all the time as the lighter grains are driven farther and faster, and the larger ones trundle along more slowly.

Some grains, though, will be pretty much in the shape and form that they were when they arrived, hundreds of millions of years ago, on that Silurian sea floor. These are the well-nigh indestructible zircon grains and their kin, such as rutile and tourmaline. They are physically tough and chemically resistant, and the pressures of mountain building and corrosive effects of underground fluids will have had little effect on them. Released from the pebble again by erosion, they may initially be encased in some silica cement, say, or have a quartz grain or mica flake stuck to them. But those will soon be abraded off, as the grains travel among the sand grains, jostling and tumbling along. For them it may be their second or third or fourth such journey in one or two billion years, being recycled from one set of strata into another.

These resistant grains are heavy. Their density means that they separate out from the quartz grains, and can be winnowed, concentrated into parts of the sea floor where the currents are strongest, or accumulate in depressions and potholes (rather as do gold grains in, say, the alluvial deposits of the mighty Yukon and Klondike rivers, where prospectors have to think through the effects of current velocity and shear and drag to find the best places where they now lie, to stake the best claim).

The micas that make up the bulk of the rock will flake away, along those perfect book-like mineral cleavage planes. Light and delicate, these are washed (or blown) away easily. They have gone back to being mud, and separate quickly from the sand grains, to join other mud particles travelling along that shoreline. These particles can now travel long distances suspended in water, to eventually settle on a mud flat or salt marsh in some sheltered estuary, or to be carried out onto a far and deep sea floor. Once settled, they can then stick as a cohesive layer, perhaps later to be re-eroded, ripped up as lumps, disaggregated, and carried further. These particles are now firmly back in the land of the living. In the shallow seas, their contact with the living world

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will be not dissimilar to that in their transect across the shallow Silurian shoreline. They will be swallowed whole by mud-eating worms, filtered out by the delicate fan-like apparatuses of filterfeeding organisms, pushed aside by crawling and walking crustaceans and, everywhere, covered in those omni-present microbes. Particles blown onto land, though, will encounter a landscape transformed. They will land in thick, humus-rich living soils, penetrated almost everywhere by the roots of plants—a far cry from those largely barren Silurian landscapes.

The microbes will, in part, be greeting the arrival of the remnants of organic matter still left in that slate, trying to make a meal of it as it is released, as carbon wisps, from the pebble. This will be often unsuccessful, for much of the carbon is now little more than graphite and is pretty well indigestible, even for microbes. Those black graphitic wisps are simply washed away with the mud flakes, to form part of a new sediment layer and ultimately a new stratum, reburying that carbon before it rejoins the cycle of living organisms. But some of that carbon will be digested, consumed and join in the great cycle of life, ascending the food chain from microbe to protozoan to worm to fish—to human, perhaps. Metabolized, excreted, reassimilated, it will be travelling all the while, carried by both ocean waters and by the moving and migrating bodies of plants—those mobile planktonic algae—and animals. Respired, it becomes a gas, carbon dioxide, first dissolved in those ocean waters, and then released to the atmosphere where it travels with the winds, circumnavigating the world; it will be redissolved in rainwater and taken back to land or sea, to corrode rock formations or the shells of plankton; or be taken up by plants on land or sea, which are in turn eaten, before the carcasses of herbivores and predators alike fall to the sea floor, to be buried in some newly forming stratum as a prelude to deep Earth burial once more.

At this stage, almost every atom of carbon soon follows its own separate path from those that had been its near neighbours underground for so long, as this component of the pebble is dissipated finely across the globe. Each has its own fate, and each from now will pursue its own path, unlikely ever to rejoin its former neighbours. Some may even be carried into space, venturing into the stratosphere and being stripped away from the Earth by the solar wind; others will be carried deep into the Earth, caught up on some descending oceanic plate and be carried on down into the mantle—there perhaps to be incorporated into a growing diamond crystal. It is a diaspora without compare.

Other pebble components are long-distance travellers too. The pyrite that infills the modular homes of the graptolites, and forms the many framboids scattered within the rock of the pebble, survived the pressures of mountain building, but cannot long tolerate the mild sea breezes and rain showers of the Welsh coast, or the immersion in sea water. This golden iron mineral quickly tarnishes, the sulphide oxidizing to sulphate, while the iron becomes a hydroxide. The graptolite is no longer filled with gleaming fool's gold but with friable orange

rust; often even this falls out, leaving an empty space—the same situation, effectively, as when the dead colony lay on the Silurian sea floor. The sulphate released from the pyrite may link with calcium to form tiny translucent crystals of selenite, a form of gypsum—or it may simply join the huge reservoir of dissolved sulphate in the sea.

Once dissolved in the seas, a sulphate ion may simply stay there for thousands of years, travelling the ocean currents. Its eventual fate may be to drift near to the sea floor and diffuse into the surface sediment layer, there to cross into the anoxic zone, and be used as an energy source by a sulphate-reducing microbe, to be converted into sulphide and once more into pyrite. Or, the sulphate may drift into a shallow lagoon on some hot and arid coastline and be crystallized as gypsum when that water evaporates. Or, perhaps, it might be assimilated by marine algae and released as an aerosol of dimethyl sulphate into the atmosphere above, and in this form it will 'seed' minute droplets of water, to make clouds and rain. It is another grand parting of the ways for sulphur atoms that had shared the same underground home (albeit one that originally belonged to the graptolites) for so long.

Other atoms of the pebble are harder to part. The monazite crystals that grew while—and perhaps because—oil was stewing from those rocks are not quite as tough as the zircons, not least because of their cargo of clay impurities, but they are resistant enough. They typically erode out of slate as elliptical grains about as large as the head of a pin. Like the zircon crystals, they are dense, and so will concentrate wherever the ordinary, lighter sediment grains are winnowed away. Here and there, in Welsh streams and rivers, such eroded crystals have been found in abundance as 'monazite sands'. How far, though, will they ultimately travel? This is an open question. As distinct phenomena, they have been only recently discovered. Have they been reworked, like the zircons, into younger strata? Noone has yet looked.

The particles that once travelled immense distances, in space and on Earth, to eventually meet in the pebble, are now separated. They will move farther and farther apart.

Most will remain on Earth, rather than travelling outwards (like, perhaps, those few stray carbon atoms) into the cosmos. Almost all will—sooner or later—be incorporated into new strata that will be buried in turn, be compacted, hardened, mineralized, crumpled in mountain belts, uplifted and eroded. And then countless new pebbles will arise, in different places and at different points in time, each carrying within it a minuscule part of our original pebble. Many of these will still be made up of sand or silt or mud, but particles of our pebble will turn up in limestones, also, and salt deposits, and new deposits of oil and gas, and in magmas too, to make up a submicroscopic component of some basalt or granite. The new strata will carry within them the remains of very different animals and planets, as the Earth's freight of living organisms carries on evolving, in Darwin's words, endless forms most beautiful and most wonderful.

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EPILOGUE

How long will these cycles continue? Unless some unforeseen catastrophe strikes, natural or man-made, they will last for another billion years, perhaps two. It is enough to make a few more generations of such pebbles. Then, when the dying Sun grows larger, and its thermonuclear fires begin to burn brighter, the Earth will lose its oceans, as they boil away and are stripped off into space, and its oxygen-rich atmosphere, and its life, the microbes last of all. Life, in any event, may have fared poorly for some time. The Earth's metal core will have frozen, or mostly so, and so the Earth will no longer have a magnetic field, or the protection that it affords from the solar wind or cosmic rays. Our pebble will then be scattered far across the Earth, within strata that will now, mostly, be fossilized relics of that earlier, kinder planet. It will be a strange Earth, in this, its old age. Some kind of gaseous envelope will likely still surround it, so winds of a sort there will be, but there will be no rain, no streams or rivers or lakes. Loose sediment will be wind-whipped into dunes, as happens on Mars today. Cliffs and crags will now and again collapse in rock-avalanches, for gravity will not be any less a force than it is today. Mountain ranges will still form, for a while, until the great engine of plate tectonics shuts down. It is an engine that will be weaker in any event, as the Earth's radioactive heat that drives it declines. The removal of that great planetary lubricant, water, will eventually stop it as effectively as removing the oil from a car motor, in rendering the subduction of ocean plates too friction-ridden to be possible.

The Earth's remaining heat must then still have to escape, so volcanism will continue for some time yet. Our planet, increasingly dimly lit by the dying fires of the Sun, will be entering a perpetual night, illuminated only by the distant stars of this galaxy. In such a scenario, on our far future planet, the pebble cycle will be over, and a sleep eternal will begin. After a solar system has run its course, what remains is ashes. But it is nice, always, to have an escape clause. Rebirth might come if the dead remains of our Earth are swept, along with Mercury and Venus, into the Sun as it grows hugely in its final red giant phase, perhaps some five billion years from now.

It will be touch and go whether it does. The Earth's orbit will then be looping outwards as the Sun loses mass, but it may not move fast enough. The Earth might just be caught up in the enveloping edge of the billowing Sun, be dragged inwards, spiral down and be vaporized, as the outer layers of our dying Sun are blown outwards, while its core collapses into a white dwarf which, at the end, is not much bigger than the Earth itself.

There will not be a supernova to mark its passing—nor even an ordinary nova, to generate phantasmagoric nebulae like those—the Cat's Eye, the Siamese Squid, the Red Spider—captured today by the far-seeing eye of the Hubble Telescope. Our Sun is simply too small for such melodrama. Nevertheless, there will be a kind of mineral diaspora from our Sun's final outburst, as some of that vapour from our once-beautiful planet is swept into interstellar space.

And from there, that cosmic dust, with a few of our pebble atoms in it, would drift across the galaxy. Eventually, it may be swept up into the birth of a new star system, which develops planets of its own. It's a long shot—but not impossible. This is how our story started, after all, on this planet, with this pebble. So perhaps it can begin again.

TIMEFULNESS: A GEOLOGIST'S STORY

Anja Claus

Marcia Bjornerud

AC In *Timefulness*, you breathed great life into this magical story of rocks; that's a big feat in our flashy, fast-paced, capitalist culture.

AC In a way, your book is a storytelling of Earth—Earth's past but also its now. You say in your book, "The dramatic narratives of the geologic past are perfectly suited to the human appetite for storytelling." Why do you think that? What is it that makes for such good storytelling?

AC: You used wonderful linguistic expressions of analogies, metaphors, and similes quite a bit throughout your book. For example, you share a metaphor within a larger analogy, highlighting the essentialness of time in life's symphony:

Timefulness includes a feeling for distances and proximities in the geography of deep time. Focusing simply on the age of the Earth is like describing a symphony in terms of its total measure count. Without time, a symphony is a heap of sounds; the duration of notes and re-occurrence of themes gives it shape. Similarly, the grandeur of Earth's story lies in the gradually unfolding, interwoven, rhythms of its many movements, with short motifs scampering over tones that resonate across the entire span of the planet's history. We are learning that the tempo of many geologic processes is not quite as *larghissimo* as once thought; mountains grow at rates that can now be measured in real time, and the quickening pace of the climate system is surprising even for those who have studied it for decades.

Where do all these beautiful, luscious expressions come from—are you a writer as well as a geographer?

MB In most people's minds rocks are dumb, mute, and dull perhaps. So I tried to bring them back to life and share the stories that they have to tell us.

MB I'm positioning the idea of storytelling in contrast to the physical, pure sciences of physics and chemistry, which are of course important fields—and I am partly trained myself as a physicist. But what's lacking in them is this sense of narrative arc. The triumph of physics is that it has distilled out these universal, timeless laws and rules. But if something is timeless, there's no story to really tell. There's no character development.

Earth as a whole system has had a very interesting series of personalities, in a sense. It's had a childhood, an adolescence, a middle-age. It's seen cataclysm and wonderful, bountiful times as well. So that's what I mean. That there are stories in the natural world, and they match our appetite for seeing how things unfold. I think that's the way to draw people in: Tell these Earth stories, develop some kind of relationship with the protagonist, and they're hooked.

MB Well, for the musical ones, I have to partly give credit to Lawrence University itself. We have a Conservatory of Music here, so music is in the air all the time. We have music students coming into our geology classes and so some of the metaphors I use were consciously developed in my teaching, to try to show connections between music and science. And then in other cases, it's just desperation. "How do I explain this rather complicated, arcane thing in a way that students can grasp?"

And I do believe that almost anything—even very complex, subtle ideas—can be explained at some more accessible level, usually through metaphor. And although the metaphor may not be perfect, it can get people on board, provide a framework for understanding that can then be built upon. So I'm pretty shameless, especially with anthropomorphic metaphors.

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We're often told as scientists not to anthropomorphize nature, but we are part of nature—so why wouldn't we see ourselves reflected in the natural world? Not everything is like us, but we came from the natural world, so of course we see echoes of ourselves in everything. And I think it's okay, at least to initially get people engaged in the topic. We have no option. We're deeply embedded in nature.

AC Another interesting grammatical tool you use is turning the verb/noun relationship on its head. You understand rocks as verbs and not as nouns.

Early in an introductory geology course, one begins to understand that rocks are not nouns but verbs—visible evidence of processes: a volcanic eruption, the accretion of a coral reef, the growth of a mountain belt. Everywhere one looks, rocks bear witness to events that unfold over long stretches of time. Little by little, over more than two centuries, the local stories told by rocks in all parts of the world have been stitched together in a great global tapestry—the geologic timescale.

What do you mean by this?

MB People think that rocks just are. But every rock had to come into being in some way. And so very literally geologists see rocks as emerging, as changing. When I see limestone, I see a coral reef that grew over time. Or when I see a granitic rock, I see a volcanic system that formed as plates moved, melting happened, and magmas formed. So that really is at the essence of geologic thinking. Recognizing these seemingly inert objects as records of events. So they really are verbs, I would assert.

AC I have been lucky enough to get to know a member of the Citizen Potawatomi Nation and botanist Robin Kimmerer, who wrote *Braiding Sweetgrass* among other things. Robin highlights the use of verbs versus nouns when speaking of nature in the Potawatomi language. I think the entire language is very much a verb-based language. So it was interesting to see a similar understanding and use of language coming from a Western science perspective. I think using grammar of animacy is the right way of understanding and referring to the whole community of life.

MB Well, I think it gets to the heart of part of our problems with interacting with nature. We treat nature as if it's this passive backdrop for us, when in fact it's doing all kinds of things all the time at different time scales. And our ignorance of that underlies so many environmental problems.

AC I'm curious about your own sense of time, partly because you seem to have been quite captivated by understanding time when you were young. You start the book with a story of being able to miss school because of the snowfall, and how the snow accumulation had halted the human, day-to-day concept of time.

MB A snow day offers a kind of unexpected exemption from everyday routine. It's a moment for stepping outside your own life and looking in. Yes, I do vividly remember one particular snow day when I paged through our family's world atlas and discovered a time zone map showing an Arctic Archipelago, Svalbard, that supposedly had "no official time."

I was in the eighth grade then, an age where you're kind of aware that childhood is ending, adulthood is before you, and standing uncertainly in the threshold between them. As I thought about how to frame the book, that strong memory seemed a natural entry point into a broader discussion of time. In this book, I wanted to establish my credibility

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as a human being and not just a scientist – as someone who personally struggles with the passage of time like everybody else, and not someone who's somehow just taking a purely scientific point of view.

AC Can you give us an annotated definition of “timefulness”? How might this concept help improve our understanding of ourselves and nature and our interconnections?

MB It's meant as a counterpoint to two things: First, timefulness sort of rhymes with “mindfulness,” the idea of being present in the moment. This may be good practice for individuals in times of stress, but not so good for society. We are too myopically focused on the Now, ignorant of history and blind to the future.

I also meant it as a counterpoint to “timelessness,” which we think of as this kind of ideal aspiration. We would like to think that things could be timeless and never-changing, when in fact that's a completely unrealizable goal and arguably a sterile concept anyway. Everything in Nature is full of the work of time. Everything is evolving and changing, and our failure to embrace that causes all kinds of ills, ranging from neuroses about our own aging process to environmental problems that could have been avoided if people just had had the capacity to think on decadal time scales and recognize the potential implications of our actions.

So the call for timefulness is to acknowledge that we are temporal creatures, to learn something about the history of the Earth and the environment in which we are deeply embedded and with which we have evolved. And to learn to anticipate the ways that our actions as humans, who are increasingly numerous, will interact with the unfolding natural processes in ways that may not be what we would like them to be.

AC You also speak of chronophobia: the idea that humans have a fear of longer senses of time, both in the past and the future.

While we humans may never completely stop worrying about time and learn to love it... , perhaps we can find a middle ground between chronophobia and chronophilia, and develop a habit of timefulness—a clear-eyed view of our place in Time, both the past that came long before us and the future that will elapse without us.

MB I think this fear has a number of origins. It's rooted in our own fear of mortality at a very personal level. It's certainly fueled by the demands of the capitalistic world we live in, where short-term profit is the motive force for everything. And there's just very little incentive—certainly in the economic sector, and increasingly in the political sector, either—for people to speak and think on time scales of more than a couple of years. We are so focused on immediate crises and political arguments that we have lost the capacity to step back and take the long view. And so that's a kind of chronophobia, or time-avoidance that has become endemic in our discourse—unfortunately.

And there's no excuse for it. At this point we have the tools to anticipate the consequences of our actions, but we are not taking them seriously. Or we're not taking action fast enough.

TIMEFULNESS: A GEOLOGIST'S STORY

Anja Claus

Marcia Bjornerud

AC You mentioned that in your day-to-day life, you have more of a polytemporal way of thinking. Please tell us more about this.

MB What I meant by “polytemporality” is more of a geological point of view. I walk into work every day, and I truly do see the landscape in four dimensions. I see rock outcrops and think of the shallow seas that were here 400 million years ago. I see the river valley that is carved into clay left by a giant lake at the end of the Ice Age. My walk to campus is a walk through time as I sense the lingering presence of the many different landscapes that have existed at this place.

And that’s at the heart of geologic thinking. Recognizing that every landscape has been written over many times. Another metaphor I often use in teaching is that of a “palimpsest” manuscript. It’s a term that’s used by medieval scholars to describe a parchment that was written on and then—because parchment was an expensive thing to produce—often scraped and then re-inked with a more recent text. But there would always be vestigial remnants of the earlier text that were still there. These days these older texts can be seen by x-ray and reconstructed. So that idea of a palimpsest text that’s been written and erased many times over is the perfect way of describing how a geologist sees the landscape. And in many cases, there are many, many re-inkings that we can track.

So that polytemporal point of view is the habit of mind that I would call geologic thinking. But I think also many of us do this in everyday life. As parents we can see our children as they are today, but also remember vividly how they were when they were younger, and at the same time imagine who they may become. And I think that kind of thinking would be helpful to adopt as a society. To understand where we’ve been, where are we now, where are we going is a mindset that might do us good.

AC One aspect I especially appreciate about your book is how you dive into different themes that are impacted by polytemporal thinking—even governance and citizenship. What might citizenship look like if we begin to think this way? And what might be the policy and planning implications of a more polytemporal decision-making process?

MB Yes. I ventured there with some trepidation into social and political realms because I am just a geologist. I have no experience in the public sector, but as a citizen I feel it’s urgently necessary for those of us who do have the scientific training to try to share what the essential messages are, and the facts that are just not getting through in our policy conversations. It’s really disheartening how few members of Congress have any scientific background. I don’t think they all need to be scientists, but I think at last count, there were maybe ten members who could be considered scientists, and most of them are in the medical profession. Very few people with scientific backgrounds are making a lot of decisions that require a pretty good working knowledge of the natural world. With luck they will have surrounded themselves with good advisors. But that’s a little bit scary to me.

And so what we need is just a more broadly science-literate citizenry, and a higher priority placed on Earth education.

TIMEFULNESS: A GEOLOGIST'S STORY

Anja Claus

Marcia Bjornerud

As I mention in the book, it's frustrating and confounding to me how geology just doesn't get the attention or the prestige that's afforded to the other sciences. I think that it is arguable that if there is any science that every single child should be well-versed in, it would be Earth science, because they're all going to be Earthlings for their entire lives and will be very much affected by all kinds of Earth phenomena ranging from groundwater to earthquakes and volcanic eruptions to climate change to soil degradation. But somehow these topics don't quite have the cachet that the purer sciences do—and then that's reflected in our curricula and the kinds of programs that we encourage our best and brightest students to go into. It's really a shocking failure of our educational system to prepare citizens who urgently need to know about these things.

AC This brings me back to this sense of aliveness about the Earth that you present in the book. You speak of all these changing processes over the last—I think it was 4.5 billion years—of Earth's story. And you speak to the change in chemical structures of the rocks, of the air, the tectonic plate movements, and the overall pace of the planet; you speak of how the pace has changed and how it keeps changing. And sometimes it's a very slow process. Sometimes it's a very fast process. And most importantly these processes are interconnected and continually influence each other. Through these planetary stories you show just how unique planet Earth truly is—especially when compared to the other planets within our solar system. What came to my mind as I read through your chapters is the somewhat still popular Gaia theory that argues the Earth is very much alive. Do you see a connection between this theory and your understanding of Earth and timefulness?

MB I think the Gaia hypothesis is a really useful lens through which to see the Earth. I've been in geology for more than thirty years at this point and remember quite well when James Lovelock introduced the idea of Gaia. I think William Golding, the novelist, who was a neighbor of Lovelock, was the one who suggested the name. And maybe it was too poetic for science at the time.

Interestingly though, in the subsequent decades since Gaia was first posited, geologists have adopted some of the philosophy underlying it in terms of thinking of the Earth as a great bio-geochemical system, that is to some extent able to self-regulate itself. For example, over geologic time it has kept ocean chemistry and the planetary temperature within certain bounds, in a way similar to an organism maintaining its internal biochemistry or body temperature. We can be out in the 15 below weather today and still be at 98.6 degrees inside our bodies.

So Gaia has crept into geology in the guise of what people sometimes call bio-geochemistry or sometimes even geo-physiology. People rarely use the term "Gaia" in the scientific literature. But it certainly is true that Earth is a system of many sub-systems that operate at many different scales, both spatial and temporal, and that's the challenge of studying the Earth. It's a giant big old complex thing. And the more we look, the more complex it is, and the more awe-inspiring I would say it is, as well.

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So although we don't often use the word "Gaia"—the idea that the Earth is in some sense a superorganism or at least something that's more than the sum of its parts in being a complicated system of interacting systems has entered mainstream geological thinking.

Regarding your comment about some geologic processes happening very slowly and others very fast: There's an irony that for years and years geologists have had to be vigilant about Young-Earthers and creationists—and so we've flogged people over the head with the idea that the Earth is old and geological processes are slow. Now we're trying to change the narrative to say, "Yes, mainly geological processes are slow, and yes, the Earth is old, but sometimes things—like climate change—can happen really fast as well."

And that's always been true, but I think we've been too emphatic about the slow part, and now we're trying to turn public perceptions around, but that's what is hard for people to swallow. It's comforting to think that the Earth is old and never-changing, and I think that's part of the reason that some people are slow to accept the idea of climate change. "Well, how could we possibly affect something as big and old and slow as the Earth," is their skeptical response. We geologists have to claim some responsibility for this public skepticism.

AC Yes. Climate change. You touch on this subject in the chapter on air, the changes in the air. What is the job of humans at this point in the climate change process?

MB I think it's mainly to save our own skins. I mean, I am an ardent environmentalist, and I think nature is something to try to protect in its own right. But I'm also a realist, and I think the real message, and the one that's going to leverage change, is that climate change is putting our own civilization at risk. And I'm not thinking that there's some single cataclysm, but it's going to be a slow and exorable grind as we face more and more unexpectedly extreme weather events: longer and longer drought periods, dwindling water supplies in places that rely on either glacier melt or snow melt for water, decreasing predictability of crop yields. All these things will be stresses on our economic and social systems. And we'll spend more and more of our time and our collective investments mopping up after disasters and bad crop years and have fewer resources to invest in positive, constructive things.

Increasingly, when I speak to different groups, I emphasize how economic systems really are averse to uncertainty. And that's really what climate change presents to us. We're not exactly sure what's going to happen, but we know that we're going to be less and less able to predict what will happen because we're entering territory we've never been in as human beings.

The Earth has seen very large climate fluctuations over time, but for most of that time, we weren't around. As a society we count on things like sea level or weather patterns staying constant. Our infrastructure is built on that assumption.

So I think, as much as I do think nature has its own rights and should be protected for a variety of reasons, it may be the case that the most potent arguments that we can advance are going to be the economic ones. And as so

TIMEFULNESS: A GEOLOGIST'S STORY

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often happens, whenever there are stresses imposed on societies, it's the poorest people and the already marginalized ones who are going to bear the brunt of those disruptive events. So it will only exacerbate the inequalities we have in our society as well. That's pretty gloomy.

AC I would like to end this interview by sharing a hopeful note that Marcia shares in the last pages of *Timefulness*:

If widely adopted, an attitude of timefulness could transform our relationships with nature, our fellow humans, and ourselves. Recognizing that our personal and cultural stories have always been embedded in larger, and longer—and still elapsing—Earth stories might save us from environmental hubris. We might learn to place less value on novelty and disruption, and develop respect for durability and resilience. Understanding how historical happenstance is written into each of our personal lives might cause us to treat each other with more empathy. And a timeful, polytemporal worldview might even make us less neurotic about the fact of our own mortality by shifting our focus from the finite length of our life to the rich anthology of experiences that a lifetime represents.

CONVERSATION WITH A STONE

Wisława Szymborska

I knock at the stone's front door
"It's only me, let me come in.
I want to enter your insides,
have a look around,
breathe my fill of you."
"Go away," says the stone.
"I'm shut tight.
Even if you break me to pieces,
we'll all still be closed.
You can grind us to sand,
we still won't let you in."

I knock at the stone's front door.
"It's only me, let me come in.
I've come out of pure curiosity.
Only life can quench it.
I mean to stroll through your palace,
then go calling on a leaf, a drop of water.
I don't have much time.
My mortality should touch you."
"I'm made of stone," says the stone.
"And must therefore keep a straight face.
Go away.
I don't have the muscles to laugh."

I knock at the stone's front door.
"It's only me, let me come in.
I hear you have great empty halls inside you,
unseen, their beauty in vain,
soundless, not echoing anyone's steps.
Admit you don't know them well yourself.
"Great and empty, true enough," says the stone,
"but there isn't any room.
Beautiful, perhaps, but not to the taste
of your poor senses.
You may get to know me but you'll never know me through.
My whole surface is turned toward you,
all my insides turned away."

I knock at the stone's front door.
"It's only me, let me come in.
I don't seek refuge for eternity.
I'm not unhappy.
I'm not homeless.
My world is worth returning to.
I'll enter and exit empty-handed.
And my proof I was there
will be only words,
which no one will believe."
"You shall not enter," says the stone.
"You lack the sense of taking part.
No other sense can make up for your missing sense of taking
part.
Even sight heightened to become all-seeing
will do you no good without a sense of taking part.
You shall not enter,
you have only a sense of what that sense should be,
only its seed, imagination."

I knock at the stone's front door.
"It's only me, let me come in.
I haven't got two thousand centuries,
so let me come under your roof."
"If you don't believe me," says the stone,
"just ask the leaf, it will tell you the same.
Ask a drop of water, it will say what the leaf has said.
And, finally, ask a hair from your own head.
I am bursting from laughter, yes, laughter, vast laughter,
although I don't know how to laugh."
I knock at the stone's front door.
"It's only me, let me come in.
"I don't have a door," says the stone.

THE PLIGHT

Pamela August Russell

Virginia Woolf put stones in her pocket
and wandered off into the sea.
My mother always said
I have rocks in my head
I wonder what will become of me?

EPISTEMOLOGY

Richard Wilbur

Kick at the rock, Sam Johnson, break your bones:
But cloudy, cloudy is the stuff of stones.
We milk the cow of the world, and as we do
We whisper in her ear, "You are not true."

HIDDEN

Naomi Shihab Nye

If you place a fern
under a stone
the next day it will be
nearly invisible
as if the stone has
swallowed it.

If you tuck the name of a loved one
under your tongue too long
without speaking it
it becomes blood
sigh
the little sucked-in breath of air
hiding everywhere
beneath your words.

No one sees
the fuel that feeds you.

WE ALONE CAN DEVALUE GOLD

Alice Walker

by not caring
if it falls or rises
in the marketplace.
Wherever there is gold
there is a chain, you know,
and if your chain
is gold
so much the worse
for you.
Feathers, shells,
and sea-shaped stones
are all as rare.
This could be our revolution:
To love what is plentiful
as much as
what is scarce.



STONE TELLING

COLLECTIVE WRITING RITUALS

cloudy

It is a human thing to do to put something you want, because it's useful, edible, or beautiful, into a bag [...] and then take it home with you, home being another, larger kind of pouch or bag, a container for people. Ursula K. Le Guin, "The Carrier Bag Theory of Fiction," 168.

is the stuff
Thoughts, feelings and ideas are nameless and formless, (Audre Lorde, "Poetry is Not a Luxury," 36.) the poet Audre Lorde suggests, until contained, mineralised, petrified, crystallised into words. In order to be visible and tangible, words need media, some sort of bag. A chatroom, a text message, an etherpad, radio waves, a screen, a voice. Words are always grounded in matter one way or another. Our words become materialised, spatial beings within these frameworks so they can move between us, travelling in infrastructures made from the extracted and processed matter of the world—sand, wood, metals, minerals. In our Rituals we want to collaborate with stones as carriers for memories and stories, as carrier bags for words. With stones we construct stories.

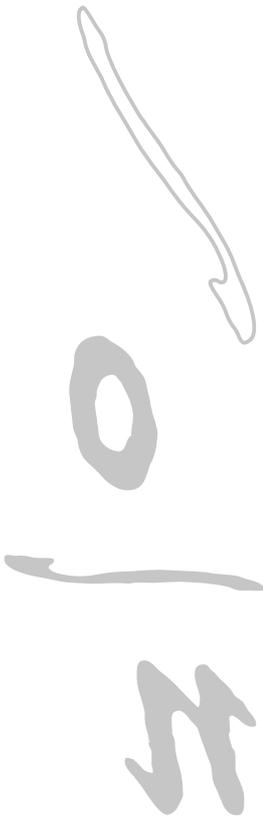
During the COLLECTIVE WRITING RITUALS we want to explore the world through writing with stones. How can we ground ourselves on unsolid grounds? How do we construct worlds in collaboration with stones? How do stones relate to words, stories?

Let's treat the words we write with care, inspect their meanings for us and others and weave texts through a collective writing moment. Take space and make space, take your time, scroll around.

cloudy

cloudy

is the start



of stones



RITUAL 1
DESCRIBING A STONE

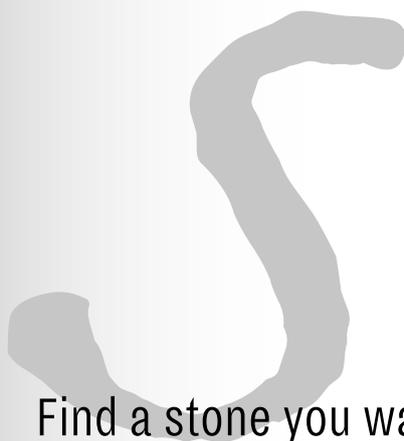
Cloudy

cloudy

is the stuff



of stones



Find a stone you want to talk about/to;
a stone that has been lying in your pocket,
a stone that lingers next to the kitchen sink,
a stone you always wanted to throw,
a stone you are noticing just now for the first time.

How do they feel when you hold them?

How heavy are they?

Do they fit your hand?

Where did you meet them for the first time?

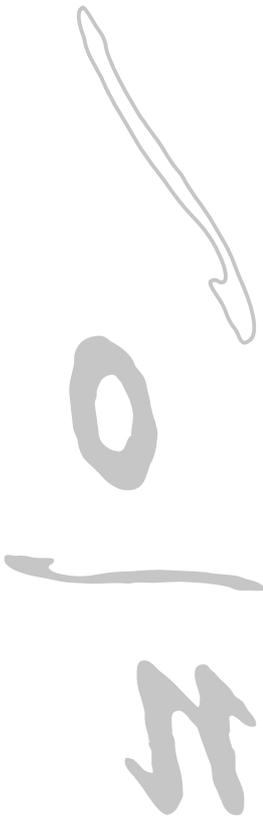
How do they look like when the sun is touching their surface?

What do you think is their story?

cloudy

cloudy

is the start



of stones





a strong smell, I'm wondering if it is because of the drying- the particles mixed into the air when it's turning into aerosols. I smelled rockwool when I was making sound isolation walls, but it didn't irritate my nose, or my eyes, even if I was waiting for that sensation throughout the experience. I still find it a funny substance that doesn't easily compare to any other, making the fingers powdered yet squeaky. The only thing I can think about is chlorine and how it creates an imaginary layer of soap or ultra-grease on your fingers, yet it has actually dissolved all grease, all oils. Soft when wet, dryer than ever when dry. I'm not yet sure what friends chlorine has.

i am trying really hard to think of a stone but my mind is so cloudy today it feels very hard to find something to grip, i get back to what a new friend recently said while we were sitting together on a bench watching the sky she said isnt it funny that clouds just look exactly like stones or the other way round? i think thats true and i wonder why that is

is the stuff

Collect
words you are vibing with,
words you feel a deep connection to,
words that can be spoken tenderly,
words you don't understand,
words that keep on coming back.

Don't think too hard!

Find a spot in the ether, write around 50 words you will
later gift to your neighbor.

Switch after 10 minutes.

You received about 50 words.

Take some of the words you find and make them your own.

Write a sentence for each word, next to the word.

Switch with your neighbor after 10 minutes.

You received 50 words and some sentences growing out of them.
Continue the thoughts of the person who has been here before by
writing a paragraph after the sentences you are connecting with.
Switch as often as you like :)

cloudy

cloudy

is the start



of stones



- ~Blobfish view
- ~Tender bloodstream
- ~Sensibility string
- ~Billboard
- ~Freeway
- ~Runway
- ~Tails
- ~Streams are white lies. He whispered to the air as if the wind could hear him. What if the wind had ears not as humans have, that would be imposible, buy as a magician, wind could create dreams from nothing.
An old man tired of living in a world that matter is silent, was walking down the stream as usual. It was his daily walk. I, the wind, I looked at him as if he was not made of human, as if he was wind like me. I dreamed that he would hear me, i sang as he walked down the stream everyday with my best voice. He looked at me often, in the beggining i was laughing of how he questioned me, how could he! After the best performace i just gave him. I became the wind you knew so well and then suddenly i whispered to him one day so loud that the clouds left away from me. That day he noticed me. That day he asked a question. He asked am i dreaming? And then our friendship developed from a dream to reality.
- ~Rundown
- ~Downtime
- ~Please turn the page
- ~Airtrails
- ~tonsil slime
- ~best of sometimes over and over again
- ~sturr
- ~kinky stone maid
- ~FFFLLL
- ~Won't problematize
- ~complexifying
- ~grassroots
- ~latter
- ~streamspan
- ~inner ear hear
- ~marching band
- ~determined
- ~mornings
- ~metallic sense I dip the circular plastic into some metallic sense
- ~skinrot
- ~bladefire
- ~tightsock
- ~Yellowish gray sticks and sparkles at me
- ~depression of course
- ~main course selfie
- ~course
- ~ground
- ~fine art smell
- ~bleem
- ~Shoulderthoughts as a constant play with modes of address
- ~Thangspace
- ~Wantilitus
- ~Moist slide
- ~scratches n burns
- ~please join
- ~stiff top to toe
- ~toeslag, application
- ~enclosed parking space
- ~please understand
- ~authentic rhymes is there an authentic rhyme passing in between?
- ~bondage sites
- ~kaas

words collected by: Manola ~ sentences added by: Alicia ~ paragraphs added by: Luisa

- ~Smells like volcano spirit that I'd like
- ~trails with traces of hour dust doesn't fit into schedules
- ~Mama is adding spillage to my document, please add stones too
- ~container as a thought for something- how can that be added
- ~Careful on the hill start
- ~mountain seduction programs are unlawful
- ~seafloors are priced too low
- ~a boxed thought within rants I am tired of
- ~Plausible strawberry jam to hold in five-sentence-messages
- ~harvest any more sentences
- ~sun song is the internal beep of freedom
- ~sunscreen is not needed
- ~please crop me in to your liking
- ~fruits are tasty which is funny because we think of them
- ~moth cloth froth wrapped in the yes
- ~I'd like a silk sangria silvoplease
- ~forever solitude within small boxes between the two
- ~Try to be mindfull while falling
- ~drops can alter your worldview turning it this way and that
- ~planet janet jackson - sing a song for that
- ~and also conondrum canon's
- ~the colleagues of the opposite of enemy playing tricks on my ear
- ~the month of september is in my mouth and inseperable from my body
- ~july virgo please
- ~concoct conduct conspire aspire
- ~the bright colour of a cocktail brings worlds together
- ~aperol is not for today in those moments of glitching
- ~the sunset is not visible today, only mouths
- ~aperitivo hour in your dreams it flies into the air
- ~orange juice is not for you
- ~nectarines can't be had today
- ~lava is another color than the one you are thinking of
- ~Viva la bonanza escaped her lungs
- ~abundance at sundance hour
- ~sitting in a field looking at the clock
- ~trip to the lake in silver rise
- ~a mountain river collecting me she said with a sound of relief
- ~transparent packaging floating in its own rhythm
- ~plastic over all in the iridescent liquid
- ~disposal at yours
- ~breaking up is the new blue on the page
- ~moving away lightly to create ripples
- ~sparkling water adds joy and clouds
- ~a tall glass is for companies
- ~a cerimony ceremonella
- ~songs can be had after the ceremony
- ~I take a deep breath and a cheap flight home
- ~a vacuum ringing in my ears
- ~levitation clings to its outline
- ~The heart takes up its volume and fills into space

words collected by: alix ~ sentences added by: manola ~ paragraphs added by: Alicia

- ~baggage of wet clothes, 1000 chili stains add discomfort when i put it on
- ~epiphany is the name of every mother i know
- ~soul sister resonates with the idea of living in peace
- ~crawl
- ~a goblet full of a synthetic-peach-flavoured milk
- ~fragile and forgetful at large
- ~foundation sun protection factor, can you mix it with normal sunscreen if you also want some coverage
- ~cemented faces

- ~moon flowers as eyes
- ~you say the grey space in-between, I point at the dancefloor
- ~in between
- ~butterfly sites for getting more information about the relaxation premises
- ~flowy
- ~griddy
- ~grumpy
- ~protein-filled gummy bear without free toxins please. Am I supposed to reflect on this? It just makes me self conscious. Thinking about eco conscious collection by H&M, and the green letters on the nametags, even 10 years back.
- ~balloon
- ~paperthin silence I told them, it won't be that easy- you'd have to adjust
- ~heavy as a stone is not something I'd easily pack in the back of my head
- ~humble
- ~bumblebee
- ~extravaganza eleganza
- ~hog
- ~fluids, like concentrations, can be multiple, but mostly strive to be one thing
- ~tunes
- ~dreamy ways of collecting words
- ~soliloquy, liquid words
- ~crooked turns I save for later is in the back of the space
- ~willow by the soft grass, I pop my allergy pill
- ~mother salix is the one I prefer for making flutes
- ~yellow dust rubs off onto my clothes
- ~hush hush
- ~psssst
- ~silence
- ~quiet
- ~calm
- ~ocean-sky-vomit-confidence conference
- ~sky what sky what sky is in between
- ~blue
- ~letters coming along the way, but three stuck between the ribs
- ~shapes are constant but the lines are always changing
- ~going with the flow is to not think too much about what you write, it's not written in stone after all
- ~i am feeling blue, here's what you do!
- ~you like me, that's obvious, but let's elaborate
- ~whatever way we can continue from here would be the best way for all of us including the host
- ~howling after 6 o'clock
- ~anonymity trumps autonomy any hour
- ~dork letters give a sense of freedom, possibility to choose
- ~a joker between chicken and meat
- ~lost loveletters in the public library, then collected and published as an art project

words collected by: A ~ sentences added by: Alix ~ paragraphs added by:manola

- ~hot cocoa
- ~wind
- ~busy fish are strudeling in the ocean waves like spaghetti in a pot.
- ~flink
- ~schnell bitte bitte schnell, give me compliments and sing me to shleep
- ~gust
- ~shadowhunter
- ~soundwave going up and down like a heart beat beeeeeeeep. a soft low frequency that sets me to sleep sound
- ~delight and lime, cocktail hours
- ~polish on my nails, can you see the cat? subtle, how i wear my feelings
- ~space
- ~instant
- ~princess diana was murdered! murder on the dancefloor!
- ~helpful

~»I think I hear something lol« she texted me yesterday. lmao, i replied
~glistening, an underwear sound practise
~my drawer is full of socks, but there is always one missing. go tell this to the ocean.
~simultaneously
~unsure about what to write here, maybe I just write what I think? I think about cake
~wave
~Alice, coming from french, means noble or of noble statue. The princess of my heart
~equipment
~architecture is a disgusting word used when thinking about space
~you are such a tool! and i'm always waiting for you
~a collection of old habits and summer clothes, I gave them all away
~list
~empty words mean nothing to me... but can words even be empty?
~clean that dirt, you are a dirty dirty room!
~pressure is building up, until i am squished like that scene in the first star wars movie or
like a kink
~heat
~shiny
~transparent thoughts never seem to find each other. i decided to bleach them
~open windows but I cannot feel the air.
~detail
~mellow
~sluggish lazy and unconcerned squishy squashy jellyfishy squirting up and down.
~fresh
~flower
~bud
~hon
~buzz
~tinfoil
~memory
~shell

words collected by: Stella ~~ sentences added by: A ~~ paragraphs added by: alix

~delight
~innerworld recently someone said about someone else they had a „rich innerworld“
~yellow
~sea creatures jumping and crouching below sea level. gravity does not seem to work for
them. their movements are slowed down, effortless. slow, soft jumps and tender, calm
crouches. the creatures are swirling around like they are performing a ballroom dance. I
wish I could move like that, but I have to be able to breathe under water then.
~mechanical
~underworld i am waiting for you there. you are getting dark here, or are you?
~sunlight
~bright
~warmth
~something once forgotten but keeps coming back to me, like the smell of your
grandparents house or freshly cut grass. It always reminds me of summer on the country
side, chopping wood, planting seeds, taking care of nature. but now I realise I was just
growing nature for my own benefit. oh, all the carrots that were raised just to be devoured
by me. oh, how delicious!
~braids
~waterfall
~depth
~transparent
~Melanie
~cake
~Bath
~veil something to hide under, so you cannot see who you will marry. ugh, what a horrible
tradition this is. as if the men would bounce if he does not approve of the bride's looks.
smash the cis-het patriarchy!
~smoke
~clouds
~cords

~queendom someone should be dom
 ~kingdom
 ~land
 ~stones
 ~shoe laces i keep untying and tying them and i cant explain how its done
 ~roots flexible roots would be fun
 ~he loves putting his hand deep into the soil, making a hole in the ground so the scent can come out. he carefully fills up the hole again, leaving the earth naked and scarred. then he moves on to the next patch, opens up a hole and smells. he feels like home, like he cannot wait to join the earth. they will become one eventually.
 ~fae bae not fair
 ~bat
 ~he has grey eyes, just like a stone. if you look at them, they seem older than time itself, beautiful and clear. I wonder, if his eyes would be covered with lichens and moss and soil if he keeps them open long enough. his tears will nurture them and the sun will let them grow.
 ~little
 ~tiny
 ~moist hands touching apples
 ~butterflies
 ~fingernails
 ~coins
 ~bones
 ~colorless
 ~natural naturelle natural something made
 ~vision
 ~Sunday difficult sunday melancholy
 ~she took the golden key to open that box lingering at the back of the drawer
 ~portal
 ~keyhole
 ~moss very slowly she lies down on the soft moss, her cheek to the ground. she could fall asleep now on the cloudy pillow of nature. she feels like a fairy, ready to fulfill someone's wish. I wish I could be invisible sometimes.
 ~sisters
 ~eyes
 ~joy ~
 ~melacholy

words collected by: Luisa ~~ sentences added by: Stella ~~ paragraphs added by: A

~gossip
 ~translation
 ~whispering
 ~she took her earrings and placed them under her pillow to listen the tingeling sound of the wind from yesterday's date
 ~frequency
 ~fragrance feeding my nose from somewhere, generously gifting a headache to my mind
 ~holding a ring on my finger so tight to not lose my balance i keep on turning it around
 ~everytime my mind wanders somewhere else
 ~loops in hoops
 ~page
 ~i placed thyme with spring water on a bowl to listen the heart of the space as new
 ~sewing
 ~unstitching
 ~ladder
 ~holding bells as if there was no air to hear them
 ~horizon is that a line, or is it a
 ~thread the tendency to thread it into a story, along a line
 ~microphone is it on hello? can you hear me? think there is a bit of delay
 ~oh
 ~mouthing
 ~voice
 ~unreliable realizing yet again, my mind is so unreliable

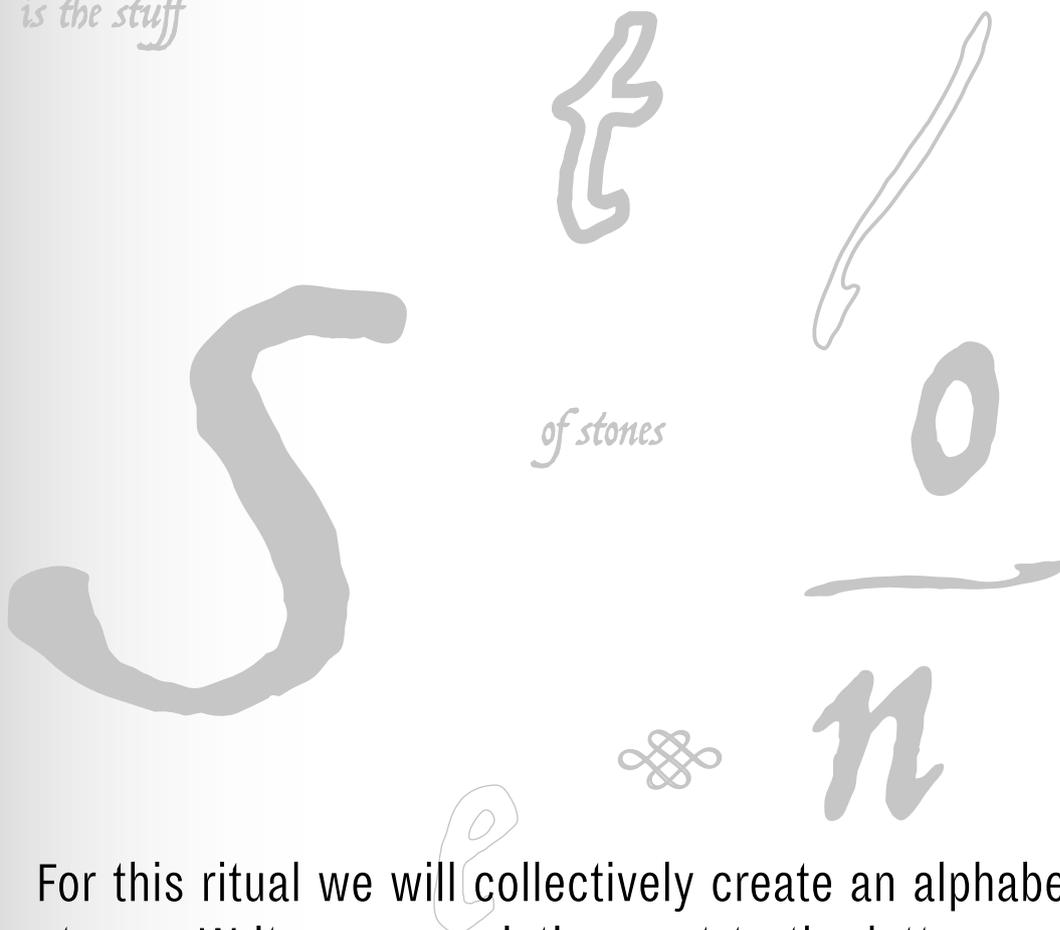
- 
- ~and as if the day was over the night covered the sun clouds where dancing and some
 - ~distant little sounds reached my ears now and then, while i enjoyed some blue screen light on my face
 - ~beyond
 - ~there one secret that was kept inside, only one secret that bloomed unexpectatly huge with time it became bigger and it grew into enourmous size in all directions, leaving almost no space around it it became so big
 - ~between worlds there is a lake like a mirror that tells the trurth reflecting the truth?
 - ~true
 - ~membrane
 - ~porous
 - ~stutter but in a rythmic way
 - ~what do you know about your house if you haven't stay for a whole day in your backyard
 - ~continue and repeat, maybe something will grow out of it!
 - ~the tendency to make a story out of nothing ha!

RITUAL 3
ALPHABET OF STONES

Cloudy

cloudy

is the stuff



For this ritual we will collectively create an alphabet of and with stones. Write an association next to the letters, something that relates to stones, water, time and clouds.

How can we collaborate with stones to construct a text?

Try and react/answer/interact/refer/comment on the words you stumble upon.

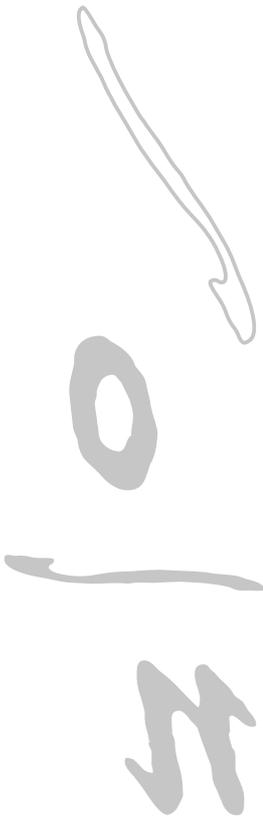
What do they mean to you?

Do they store a memory or a feeling?

cloudy

cloudy

is the start



of stones



~~A~~

Amethyst am-i-rite

Aura imaginative privacy, keep 1.5m distance at all times, that's how big my aura is, and I don't want it to be touched.

angelic angel hands angel mind

acoustic marks

ancient

animate

ambush

~~B~~

bush

basalt

bismal

brimstone

bag in a bag in a bag feeling trapped in a certain kind of circle, the circle of life?

~~C~~

corals catching a different light everytime

clouds read against the grain

clorine

chloroform

call and response but whenever i call it glitches a lot

cave of wonders

conum

cristall gestures

cracks believing that crack break your morthor back. Fear of the cracks. Cracks as a negative thing. falling thru the cracks, that mitski song, crack baby

code if you dont have the code you don't have anything. whoever controls the algorithms is the master of the universe. And who ever controls the universe thinks pitty on all algorithms.

circle

~~D~~

dreams about ruptore and about care, usually a morning dream quickly forgotten if i forget to write them down never to be recovered

drilling

deterritorialize

degredation

dualism maybe a spectrum maybe a ghost maybe a mirror maybe a portal

distilling

daunting perspectives

drama of repairing

dare

deep dreaming is something I always wanted to try. do you know how it works?

developing

~~E~~

etheric

energy goes to page 5 bring energy inward

entrance

echo

empathy

little escapes are the windows of the day I can break out of the routine.

emergency, there is an emergency, a stone fell on my head, and we fused, became one, and I am a stone now.

esoteric

extension

excess untied

~~F~~

fox

fountains open out into triple meanings

fluidity maybe it's like tracing over something touching a limit

fire and water are mere opposites they say, but I don't know if I should believe them. who are they anyways?

following throw a stone into the air and follow where it falls. Then arrive at the fallen place and thrown your mind as a stone into the air and follow where it falls.

fludding

fall

funny little stone that one

~~G~~

granit

grotto

grand

grave stone

nomes

grey that contains a new sense of tears

litch

grammar is grammar the hierarchie of words? grammar is a good game

gesture

~~H~~

humble

hollow

hush means running back again

humans are incredible channels

holding hands holding things

heavy things are not always the heaviest of weight from gravitational force. when buildings are built, the earth does not get heavier, all the resources were already on the planet.

~~I~~

indigo

inside outside to choose your own narrative

island

intention the fairies love them as gifts, they will grant you a wish, if you let them.

~~J~~

jasper

Jewel

juggling with stones (does it hurt?) well if they fall on your head, then yes. but can they be soft stones? or could my head be even harder?

join to follow its shapes

~~K~~

Kindred follies

kin

kind

kiss me quick, before I leave.

~~L~~

lava, i am leaving

listening to lists

Latency

latex (so allergic) oozing from bark

liquid

~~M~~

Moments i holding them as if they were my jewels, wearing them on a night out to focus the light of the other's eyes on me. I want to be seen, I want to be heard.
mile stone, miles as a name
magic stone take with me everywhere. Utilized to project the life I want
metaphors can i see the world through metaphors forever? i believe so, yes.
mountain
magnetism
moss connects the world i live into a huge hug. a sun protractor extentions
are mermaids half human half fish, or half human half bird? they are half mer and half maid.
clear water now, thanks
mystery what if i never know, then I will never know.
memory

~~N~~

Nero zero
nuance which leaves nothing to waste
nothing last forever and ever, only forever does.
nude, you get so rude. y u gotta be so rude?
nevermind what I said before, the rock is unbothered by my words. still curious thoa rock
can listen your words and keep your voice locked inside

~~O~~

opacity
obscure
obsolete
opal
oral histories
ominous
obstructing the seen

~~P~~

Perptual
Prisma creates a new way of seeing the sheerness of reality
peripheral
pebble
piece
planets cooperate
permeable
porous

~~Q~~

quartz
quaint
to reach the quorum

~~R~~

they can become rocks if you let them, if you give them enough pressure and time to grow
and shrink, harden and soften at once.
royalty to honor the body
relief its so nice sometimes not having to talk to yourself
rolling down the sand dune
reliable furnishings
resonate i learned everything vibrates there and here, in my head and in yours.

~~S~~

saturn returns, always returns. it is losing rings, slowly decreasing, dying from the outside.
stones hehe are keepers of memories that people throw astray

shelter a place to hold my essence safe from the weather
sand stones are satisfying to touch and destroy falling apart into tiny particles
swoon
swallow
salt makes life tastier and wounds burn bright and if you spill it,
shallow you know what i wanna put here, but i won't
sorrow leads to bright feelings once is felt deeply
solid as if the inner tangled with the outer and become one forever
static reads the same backwards and forwards
soft as the inner voice of my mother singing me to sleep. what a bliss. mere imagination.
Turned the world into a place I could understand, leading to a swift sleep. goodnight
sylphs
salamanders
sand as supporting structure
spirits are closer to humans so close i feel i am one. i am not a spirit i am a spritz. ok. i can
accept that, although with a bit of difficulty
sentient and more patient then what

~~T~~

telepathy - the way rocks speak to my feelings is by leaving their thoughts entangled with
mine, telepathically connecting and letting me in on their wisdom.
talisman
twenty-four hours: what a difference a day makes? twenty-four little hours.
timber
tremble
tone and mood schmood

~~U~~

waiting underground affairs
mother, father, underwater, overunder
urgency are some stones more urgent than others? some speak with more urgency than
others. is it!

~~V~~

venus, always used as a vessel
vault the need to put away things instead of letting them dissipate into other meanings or
spaces
vinegard

~~W~~

Wash to let go the past as if past was a moment that wants to move forward wash your
stone daily if you want good results
don't go chasing waterfalls in their minds
bath bomb: waves come crushing over my head, I try to breathe some air, but all I can feel
is water filling up the cavities in my body.
wood
words worlds works
wishing stone

~~X~~

xylith
xylophone

~~Y~~

yes permission
yearning

~Z~
zone, to be in the zone
zenit and then falling from



RITUAL4

WORDS WITHIN WORDS

words



For this ritual we will think with stone and through stone.

Choose a word from the alphabet (RITUAL 3).

Find a cozy spot in the ether, put the word there as a foundation and start writing from there.

Why does this word resonate with you?

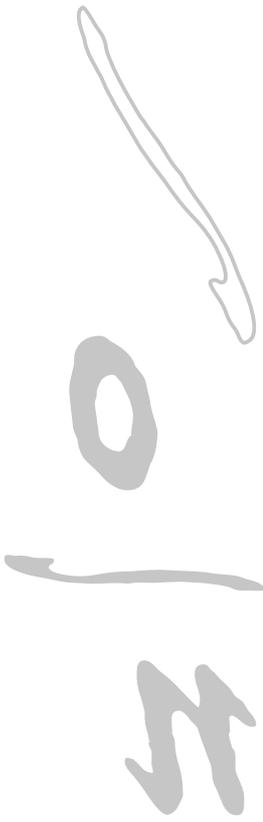
How can you write with and about the word without naming it?

What does the word contain?

cloudy

cloudy

is the start



of stones



aura
as in something that is there but not visible to my eyes
when i enter a space i can feel it tho
makes me think of stone tape theory, memory of things that happened inscribed into the
stones set by humans
i imagine it sort of like a flow of energy
something that is constantly changing but cannot be changed
and makes me also think of these new age shops where you can scan it with some funky
polaroid camera and then you know
(also think its such a beautiful world sorry word)

Memory
it belongs to me and i belong to her as if both we need each other to exist. Somehow i call
her „her“ as if her essence is fluid like water, like emotions.
it is a part that i can visit, when i don't want to see in front of me, but even if i look in front
of me she slips through and wants my attention.
moments to moments, experiences deeped in feelings, emotions, intentions, time is her
favorite action, that moves her forward and backwards or in all directions

gesture
how can I move between the stones and with them so that someone can read it
without standing still in it's contour
it's not reliable but you can lean on it
maybe it will hold you before it changes again and moves
on to the next one
the main thing is that it remains in motion
that it does not always
mean the same thing
they stand here in
plural
they assemble to a
sentence and merge into each other
in waves

cave
I am stuck
lost my way in the labyrinth that is my mind
how can I find my way out
my thoughts are spiralling
is that the reason my head is round?
so they can change direction?
losing track
losing time
losing the trace
of bread crumbs I sprinkled on the floor
that is my brain
in case I got lost
but my brain ate the food
it was starving
and now I am lost
I thought I was prepared for this.

lava, means to wash
maybe when the volcano unleashes lava is because the litosphere wants to take a shower,

or a warm bath with a sizzling bath bomb—see how some words relocate into language and it's always happening
lava, contains length and warm, excess and waste

Coral

Reefs of color floating yet solid. Communities intersectioning of shapes, colors, and interactins. A substantial foundation of ecosystems. How to find a coral of my own that shares with others. Carolling is the same. Building worlds through sound to creat foundation of stories and meanings. A place to visit.

A space to inhabit. Not welcome unless connecting, giving and prospering. Unwanted bleachyness, not needed.

Site of visitation

Color of enticing sounds

Loud intensity

Fun schmood

STONE TELLING CREDITS

Cloudy

cloudy

is the stuff



of stones



STONE TELLING is a research project initiated by Anna Bierler
taking place from 26.5.–28.5.2021 at the Rietveld Pavilion and <https://stone-telling.space>

PERFORMANCES Helena Keskküla, Sigrún Sveinsdóttir, Marisa Torres Rodriguez, Tal
SCREENING Cóilín O'Connell

SOUNDSCAPES Clicking Stones, Helena Keskküla; Meltdown, Sound Cloud in collaboration
with Florestan von Tschammer

MINERAL FLOW WORKSHOP by Marit Mihklepp

READING GROUP in collaboration with Softcore Reading Group (Al Primrose, Violeta Paez Armando)

COLLECTIVE WRITING RITUALS in collaboration with Alix Stria

SET FOR COLLECTIVE WRITING RITUALS Zgjim Elshani

TEXTS ON [HTTPS://STONE-TELLING.SPACE](https://stone-telling.space) by Anna Bierler, Cóilín O'Connell, Francesca Lucchitta,
Helena Keskküla, Marisa Torres Rodriguez, Alix Stria, Sigrún Sveinsdóttir

INSTANT PUBLICATION and READER in collaboration with Alix Stria

WEBDESIGN in collaboration with Insa Deist, CODING by Insa Deist

INVITATION in collaboration with Sheona Turnbull

THANK YOU FOR BEING SO GENEROUS AND SUPPORTIVE to my friends and tutors from the Design Department,
Alice Slyngstad, Christina Bierler, Colette Aliman, Georg Bierler, Gudrun Havsteen-Mikkelsen, Kirsten Brandt,
Manola Buonincontri, Negiste Yesside Johnson, Sina Egger, Tobias Bierler

STONE TELLING is funded by the Student Council and supported by the BB GRA <3 thank you!

Student Council
Gerrit Rietveld Academie
& Sandberg Instituut

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